TECHNICAL PROGRAM

SPIE. PHOTONICS WEST

25–30 JANUARY 2025

THE MOSCONE CENTER | SAN FRANCISCO, CALIFORNIA, USA

SPIE. PHOTONICS WEST

THE WORLD'S PREMIER LASERS, BIOMEDICAL OPTICS AND BIOPHOTONIC TECHNOLOGIES, QUANTUM, AND OPTOELECTRONICS EVENT

The Moscone Center • San Francisco, California, USA

CONFERENCES AND COURSES

25–30 January 2025

FOUR EXHIBITIONS

BiOS Expo: 25–26 January 2025

Quantum West Expo: 28–29 January 2025

Photonics West Exhibition: 28–30 January 2025

Co-located SPIE AR | VR | MR Exhibition: 28–29 January 2025

CO-LOCATED WITH

SPIE AR | VR | MR: 27–29 January 2025

SPIE Global Business Forum: 27 January 2025

SPIE Women in Optics: 26 January 2025

- Cutting-Edge Research
- Four Exhibitions
- Industry Program
- Quantum West Business Summit
- Training and Education

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TRIOPTICS
See the Difference

SPIE.

SPIE is the international society for optics and photonics. We bring engineers, scientists, students, and business professionals together to advance light-based science and technology. Over the past five years, we have invested more than $25 million in the international optics community through our advocacy and support, including scholarships, educational resources, travel grants, endowed gifts, and public-policy development.

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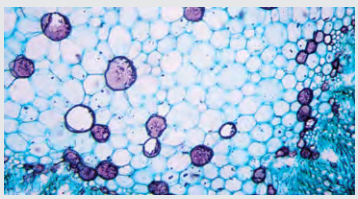
Experience the energy of Photonics West

Welcome! Enjoy a week full of opportunities to learn, share, and grow alongside your peers and community. Listen to cutting-edge research in the conference rooms, engage with the latest technologies on the exhibit floors, learn from experts in courses and the industry stage, and network with the brightest and most innovative minds in photonics.

CONTENTS



BiOS

The largest biomedical optics and photonics event in this field

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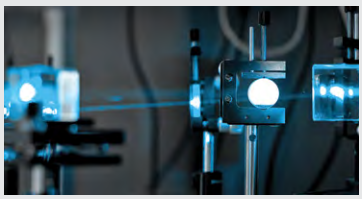
Conferences PAGES 64-274

LASE

Discover the whole range of advancements in industrial laser technologies and applications

PAGES 48–50

Conferences PAGES 275-483



OPTO

The latest developments in optoelectronic devices, components, and materials, and their integration for commercial applications

PAGES 51–54

Conferences PAGES 484-679

Quantum West

Showcasing photonics as an enabling technology for quantum 2.0

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Application tracks—PAGE 56

Application tracks enable attendees to explore presentations across conferences and plan their event schedules around the topic of interest. Use the SPIE App for marking which presentations you want to see.

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SPIE.AR|VR|MR

Full conference registration to Photonics West includes access to this co-located event focused on XR hardware, taking place at Moscone West 27–29 January. Full program is online (spie.org/avr) or in the SPIE App.

bwt
INSPIRE THE WORLD

SPIE Photonics West 2025
San Francisco, CA Moscone Center

Booth Number: **349**

Founded in 2003, BWT is dedicated to the mission of "Let the dream drive the light", the vision to become the "Global leader in laser solutions", and the value of "Outstanding innovation", providing Diode laser, Fiber laser, Ultra-fast laser products and solutions to global customers.

The company has always been pursuing continuous innovation and insisted on autonomous and controllable advanced process and technology since its establishment. By taking Beijing head office as the core, BWT has successively established production and R&D centers in Jiangsu and Shenzhen, and invested in the construction of automated and intelligent production bases in Tianjin. To build world-class technical strength and product quality, BWT established a German subsidiary in 2020, taking a solid step for the internationalization of R&D, production and technological innovation.

Diode Laser System | 380nm ~ 1940nm
2mW ~ 6kW

Fiber Laser | 500W ~ 200kW

Ultrafast Laser | Picosecond Laser
Femtosecond Laser

Official website

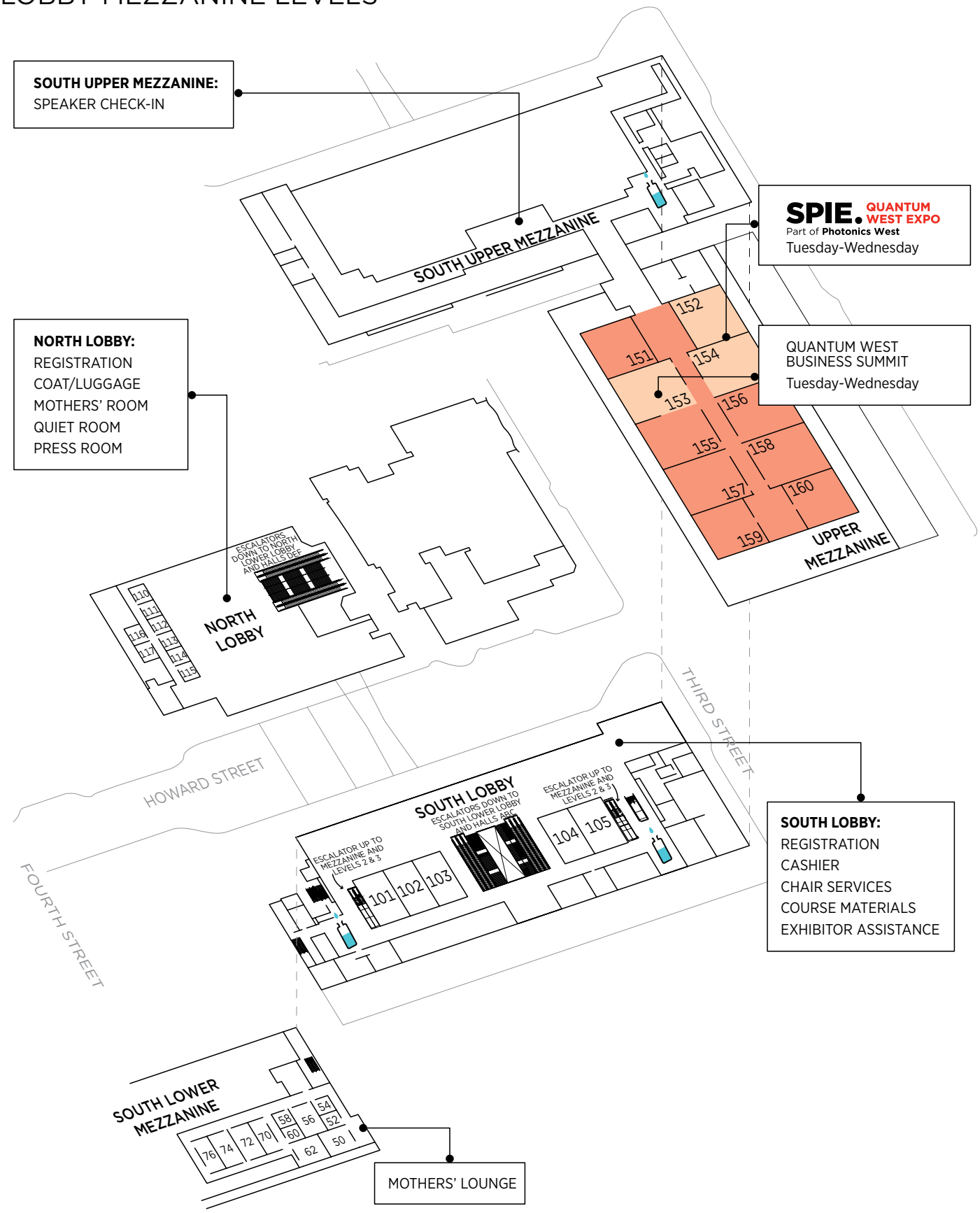
YouTube

BWT Beijing Ltd.
Add: 2nd Fl, Fengtai High-Tech Park,
No. 4A Hangfeng Rd. Beijing, China
Web: www.bwt-bj.com/en

Product & Technical Consultation
Tel: 86-10-83681053
E-mail: sales@bwt-bj.com

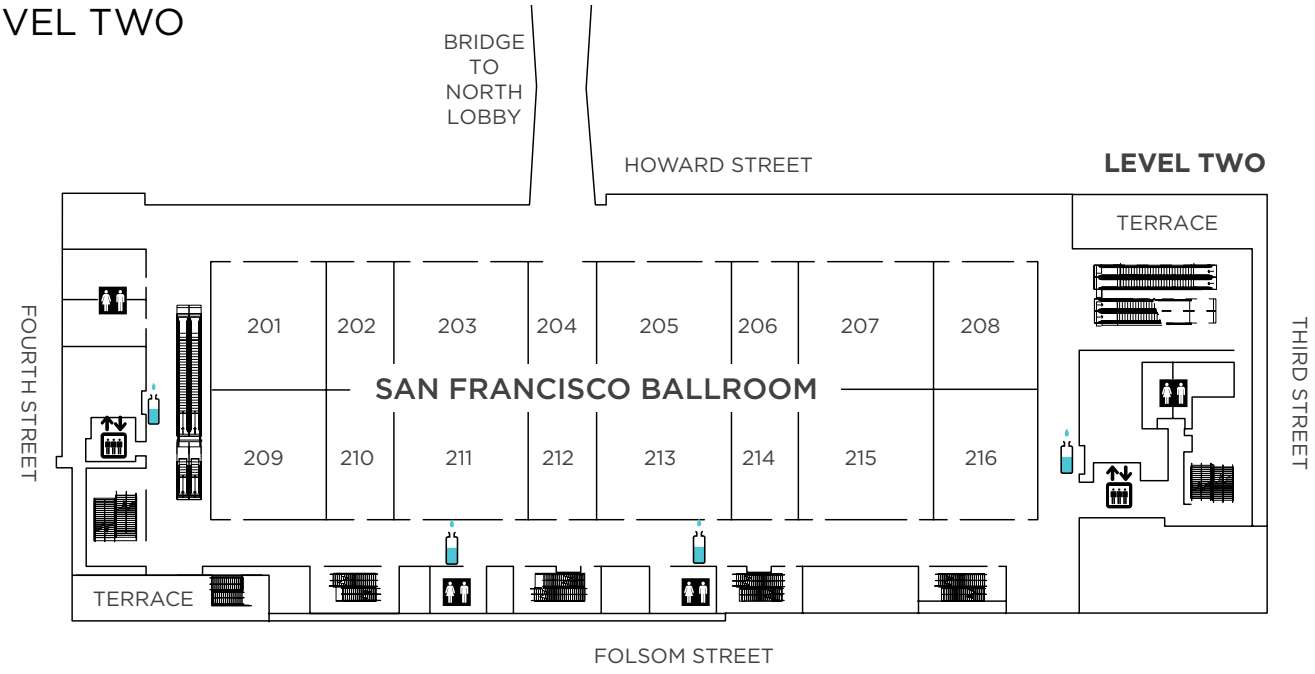
THE MOSCONE CENTER | NORTH AND SOUTH

LOBBY-MEZZANINE LEVELS

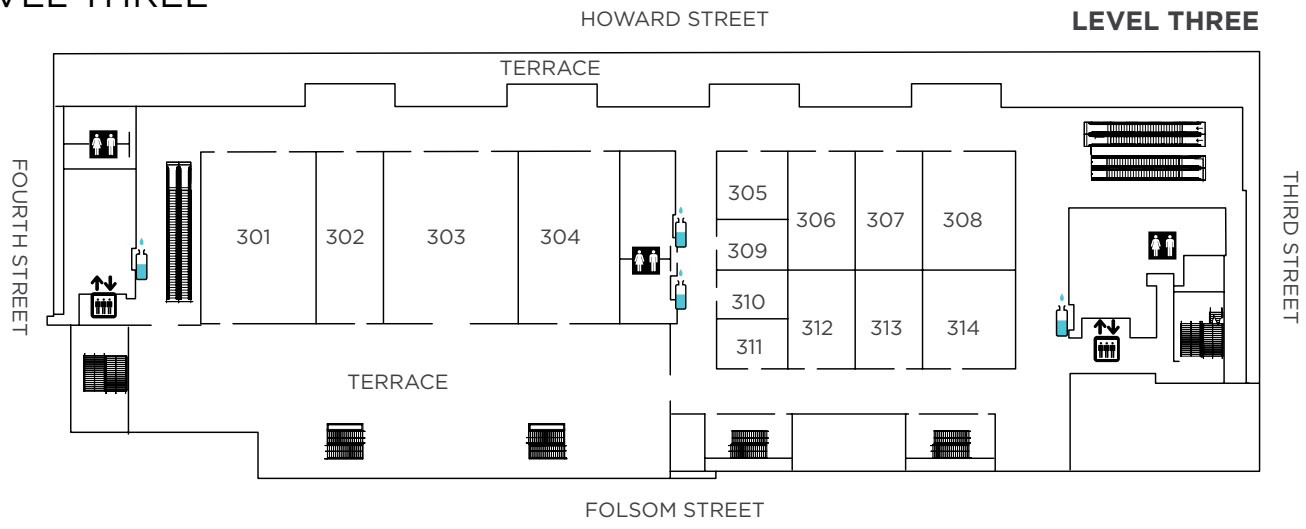


THE MOSCONE CENTER | SOUTH

LEVEL TWO

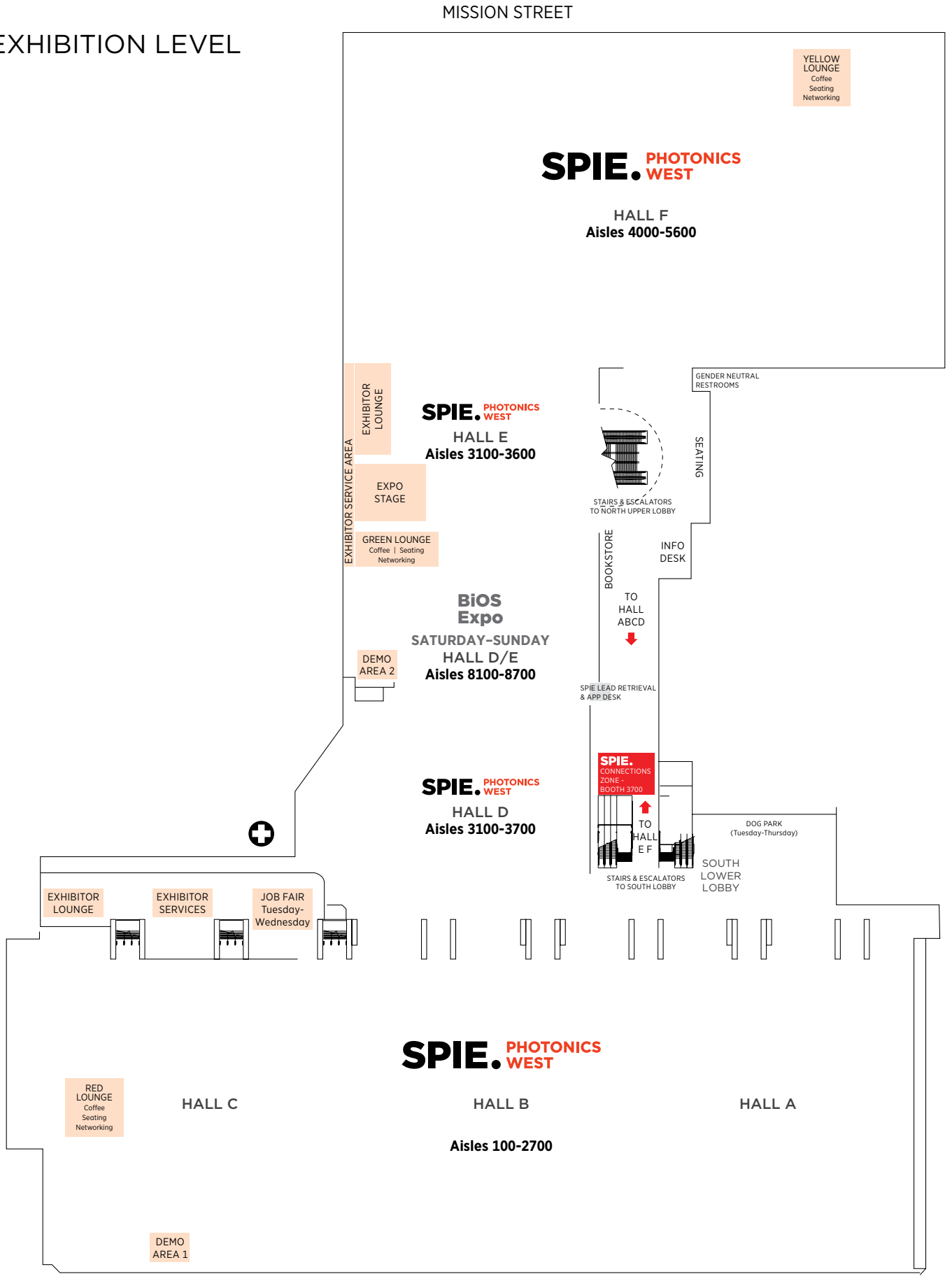


LEVEL THREE



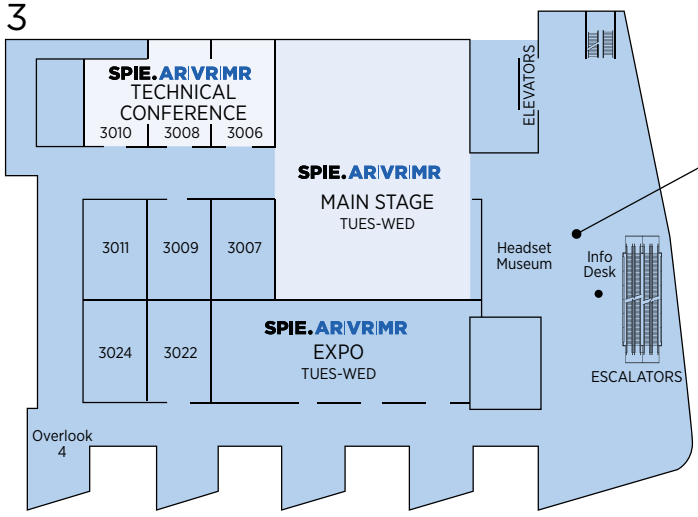
THE MOSCONE CENTER | NORTH AND SOUTH

EXHIBITION LEVEL



THE MOSCONE CENTER | WEST

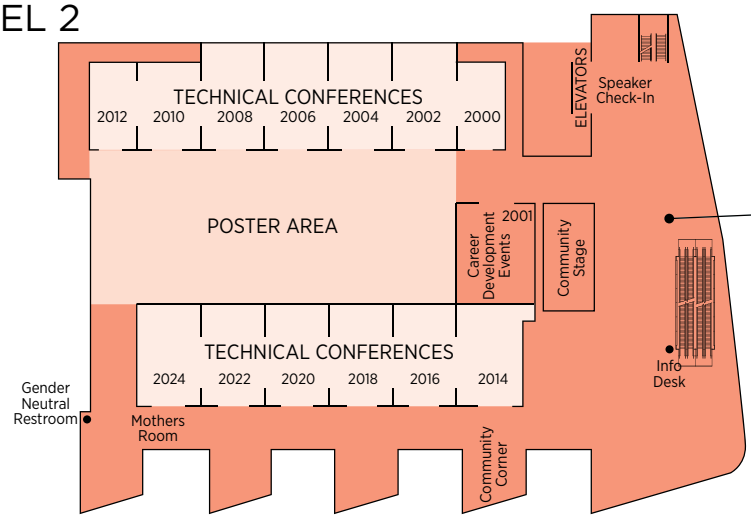
LEVEL 3



SPIE.AR|VR|MR

LEVEL 3 LOBBY:
INFO DESK
AV VR MR POSTERS
EXHIBITOR ASSISTANCE
SPIE LEAD RETRIEVAL & APP DESK

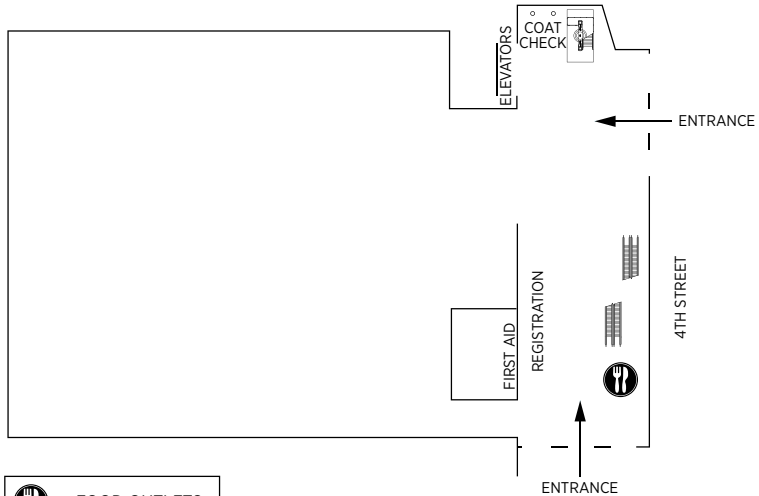
LEVEL 2



SPIE. PHOTONICS WEST

LEVEL 2 LOBBY:
COMMUNITY EVENTS
POSTERS
Sunday, Monday, Tuesday, and Wednesday
RESUME REVIEW
SPIE MEMBER HEADSHOTS

LEVEL 1



Events in Moscone West

SPIE. PHOTONICS WEST

SPIE.AR|VR|MR

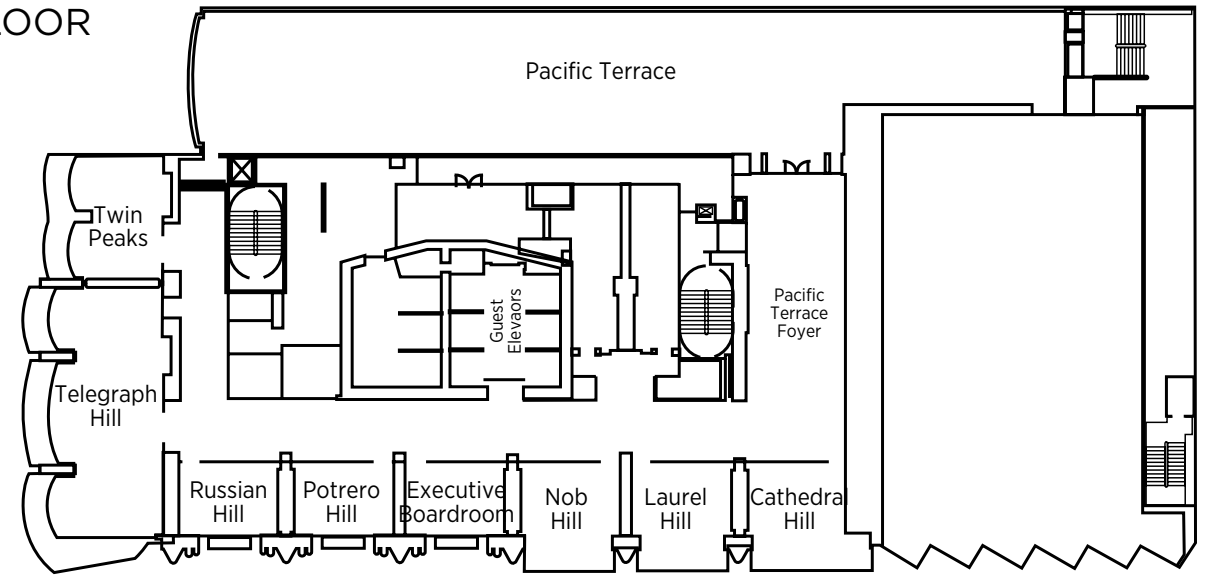
POSTER SESSIONS
Sunday, Monday, Tuesday, Wednesday

SPIE MEMBER HEADSHOTS
Tuesday and Wednesday

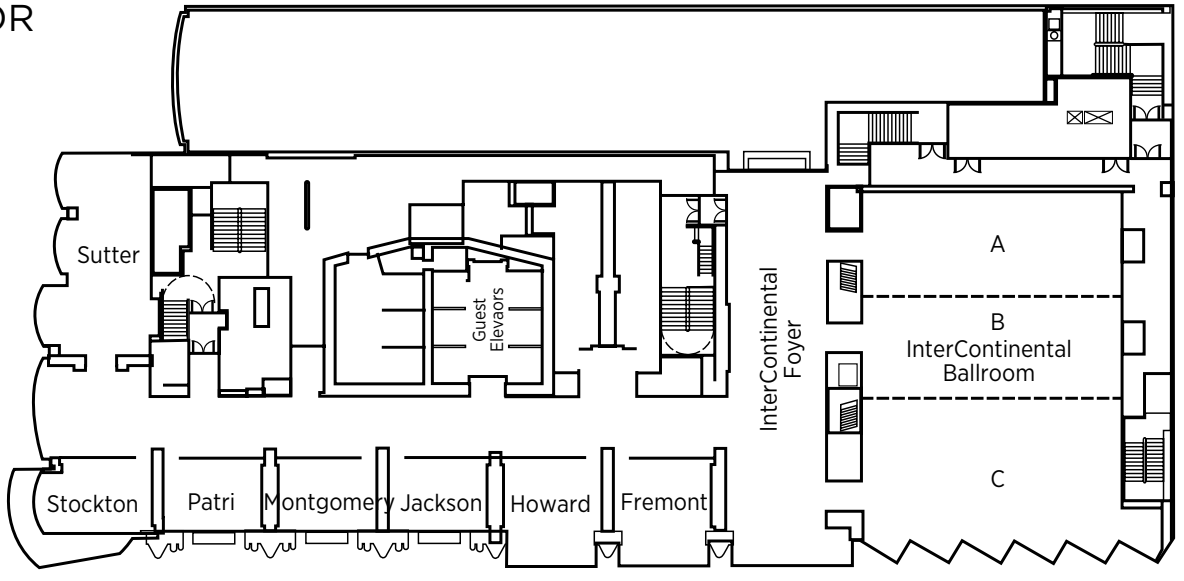
RESUME REVIEW
Tuesday and Wednesday

COMMUNITY EVENTS
Sunday through Wednesday

FOURTH FLOOR

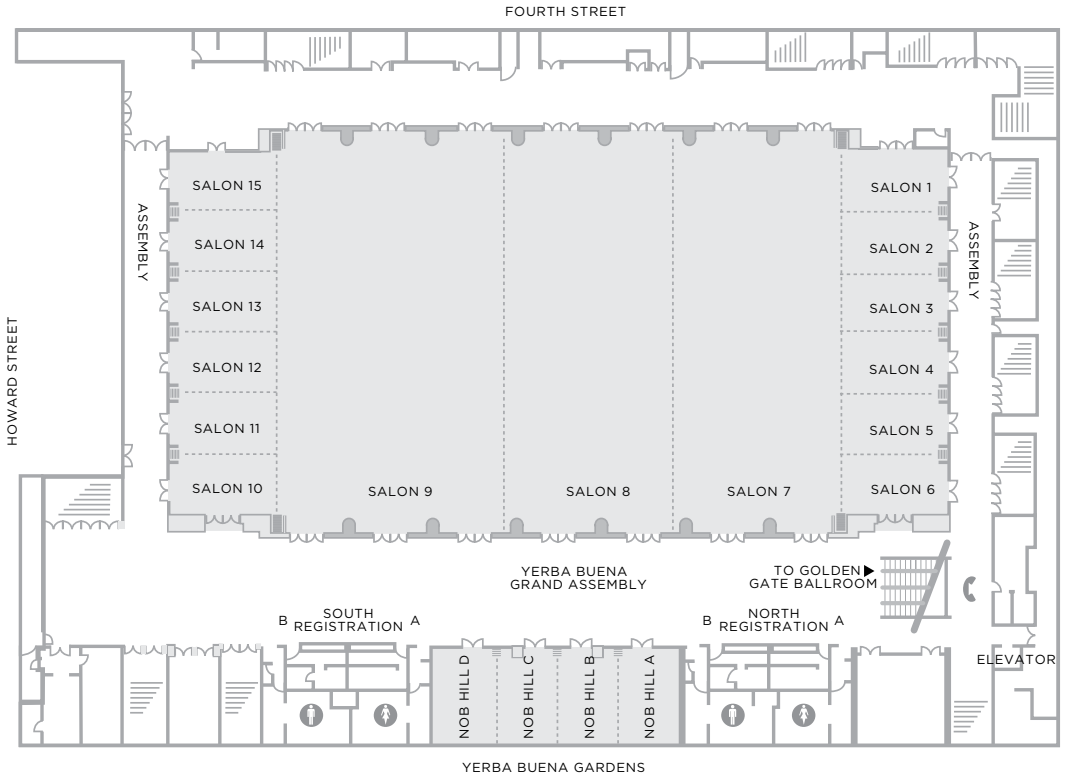


FIFTH FLOOR

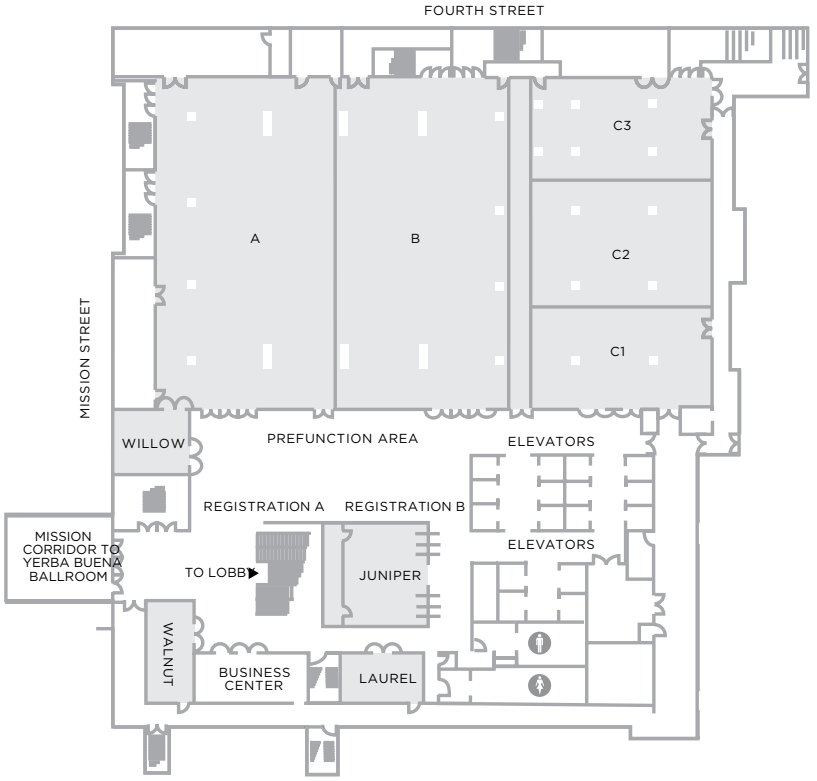


MARRIOTT MARQUIS

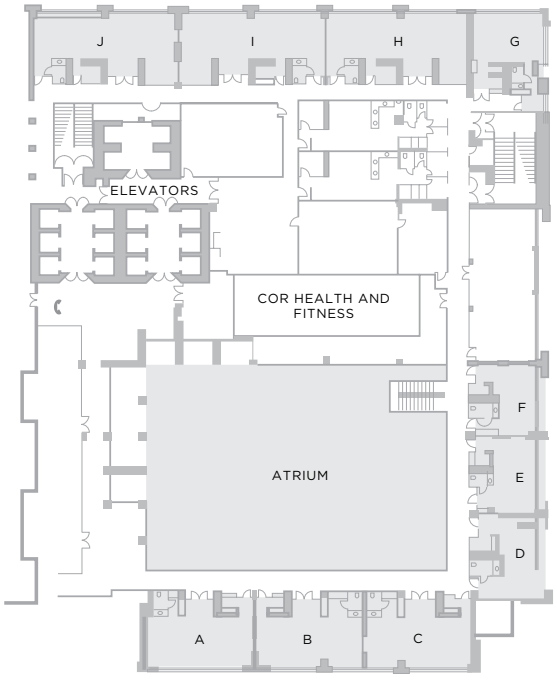
YERBA BUENA BALLROOM / LOWER B2 LEVEL



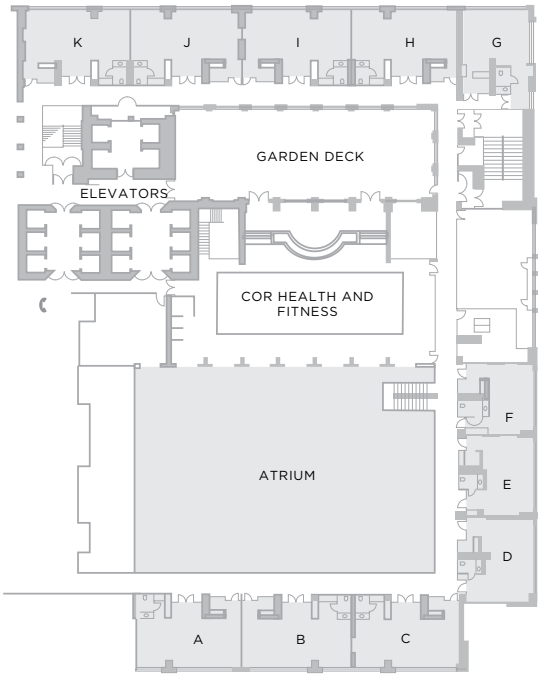
GOLDEN GATE BALLROOM / B2 LEVEL



PACIFIC CONFERENCE SUITES / FOURTH LEVEL



SIERRA CONFERENCE SUITES / FIFTH LEVEL



STREET MAP

PLENARY AND HOT TOPICS SESSIONS

Don't miss this year's fast-paced program of world-class speakers.
Add events to MySchedule online or in the app.

OPEN TO ALL PAID TECHNICAL ATTENDEES.

BiOS Hot Topics

25 January 2025 • 7:00 PM - 9:00 PM
Moscone South, Room 207/215 (Level 2)

Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field.

7:00 PM
Welcome and Opening Remarks
Paola Taroni
BiOS 2025 Symposium Chair
Politecnico di Milano (Italy)

Sergio Fantini
BiOS 2025 Symposium Chair
Tufts Univ. (USA)

7:05 PM

Presentation of 2025 Britton Chance Biomedical Optics Award
Presented by **Jennifer Barton,** SPIE President, The Univ. of Arizona (USA), followed by recipient's talk

7:30 PM
Moderator Remarks and Introductions
Rainer Leitgeb
BiOS 2025 Symposium Co-Chair
Medizinische Univ. Wien (Austria)

7:35 PM
Sensing of the surgical field enabled by vision and robotics
Daniel Elson
Imperial College London (United Kingdom)

7:45 PM
Live imaging of retinal cell dynamics with dynamic full field OCT
Kate Grieve
INSERM National Institute of Health and Medical Research (France)

7:55 PM
Shining light on gut feelings
Michalina Gora
Wyss Center for Bio and Neuroengineering (Switzerland)

8:05 PM
Interferometric diffuse optics: recent advances and future outlook
Vivek Srinivasan
New York Univ. Grossman School of Medicine (USA)

8:15 PM
Moderator Remarks and Introductions
Laura Marcu
BiOS 2025 Symposium Co-Chair,
Univ. of California, Davis (USA)

8:20 PM
Investigating tissue mechanopathology with speckle techniques
Seemantini Nadkarni
Wellman Center for Photomedicine, Harvard Medical School (USA)

8:30 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors
Benjamin Miller
Univ. of Rochester Medical Center (USA)

8:40 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer
Frédéric Leblond
Polytechnic Montréal (Canada)

9:00 PM

Presentation of 2025 Biophotonics Technology Innovator Award
Presented by **Laura Marcu,** BiOS 2025 Symposium Co-Chair, Univ. of California, Davis (USA), followed by recipient's talk

Neurotechnologies Plenary

26 January 2025 • 3:30 PM - 5:30 PM
Moscone South, Room 207/215 (Level 2)

This session highlights the breadth of advances in neurophotonics technologies.

Session Chairs:
Shy Shoham
NYU Langone Health (USA)

Anna Wang Roe
Nathan Kline Institute (USA)

3:30 PM
Welcome and Opening Remarks

3:35 PM - 5:20 PM
PRESENTATIONS:

High-sensitivity optogenetic silencing with novel OptoGPCRs
Ofer Yizhar
Weizmann Institute of Science (Israel)

Combining light and sound for scalable brain interrogation and stimulation
Daniel Razansky
Univ. Zürich (Switzerland)

Additional presentations to be announced.

5:20 PM
Final Discussion

Biophotonics Focus: Nanophotonics and Imaging

26 January 2025 • 7:00 PM - 9:00 PM
Moscone South, Room 207/215 (Level 2)

Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics.

7:00 PM
Welcome and award presentation
Ammasi Periasamy
Univ. of Virginia (USA)

Announcement of the 2025 SPIE-Franz Hillenkamp Fellowship

7:05 PM
Quantum dots in biomedical imaging: a journey of nano-explorations
Moungi Bawendi
Massachusetts Institute of Technology (USA)
Nobel Prize Winner in Chemistry 2023

7:35 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare
Paras Prasad
Univ. at Buffalo (USA)

7:55 PM
Plasmonic nanoparticles for sustainability and societal impact
Naomi Halas
Rice Univ. (USA)

8:15 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect
Joanna Depciuch
Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

8:35 PM: **Q&A**

PLENARY AND HOT TOPICS SESSIONS

OPEN TO ALL PAID TECHNICAL ATTENDEES.

OPTO Plenary

27 January 2025 • 8:00 AM - 10:15 AM
Moscone South, Room 207/215 (Level 2)

Attend the OPTO plenary session to hear the latest on atto-second and THz science, topological photonics, and photonic quantum technologies.

Session Chairs: **Karin Hinzer,** Univ. of Ottawa (Canada) and **Ulrich T. Schwarz,** Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM
Welcome and Opening Remarks

8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science
Paul Corkum
Univ. of Ottawa (Canada)

8:55 AM - 9:35 AM
Topology in space, time, and space-time
Alexander Szameit
Univ. Rostock (Germany)

9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems
Christine Silberhorn
Univ. Paderborn (Germany)

Quantum West Plenary

27 January 2025 • 1:00 PM - 3:05 PM
Moscone South, Room 207/215 (Level 2)

Quantum West showcases the future of applied quantum technologies that will bring about a quantum-enabled future. Hear outstanding leaders discuss their vision for achieving Quantum 2.0.

Session Chair: **Halina Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks

Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

1:05 PM - 1:45 PM
Quantum structured light takes shape
Andrew Forbes
Univ. of the Witwatersrand, Johannesburg (South Africa)

1:45 PM - 2:25 PM
Optical atomic clocks: refining the definition of time and advancing the future of metrology
Tara Fortier
National Institute of Standards and Technology (USA)

2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory
Eric Cornell
National Institute of Standards and Technology (USA)
Nobel Prize in Physics 2001

INTERNATIONAL YEAR OF
Quantum Science and Technology

SPIE is a founding partner of the international year of quantum.

Celebrate with us!

LASE Plenary and Hot Topics

27 January 2025 • 3:45 PM - 5:40 PM
Moscone South, Room 207/215 (Level 2)

Join us for exceptional plenaries and hot topics addressing laser fusion advancements and the impact on the photonics market, data-driven laser processing, optical frequency combs for interferometry, and how outer space is transforming.

3:45 PM - 3:50 PM
Welcome and Opening Remarks
Session Chairs: **Vassilia Zorba,** Lawrence Berkeley National Lab. (USA) and **Kaoru Minoshima,** Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM

Announcement of the 3D Printing Best Paper Awards
Henry Helvajian, The Aerospace Corp. (USA)

4:00 PM - 4:30 PM:
Plenary: Global advancements in laser fusion energy and their implications for the photonics market
Constantin Häfner
Fraunhofer-Institut für Lasertechnik ILT (Germany)

4:30 PM - 4:45 PM:
Hot Topic: Data-driven laser processing: What does the fusion of laser processing and data science bring?
Aiko Narazaki
National Institute of Advanced Industrial Science and Technology (Japan)

4:45 PM - 5:15 PM:
Plenary: Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range
Nathalie Picqué
Max-Born Institute (Germany)

5:15 PM - 5:30 PM:
Hot Topic: The changing landscape of outer space
Henry Helvajian
The Aerospace Corp. (USA)

5:30 PM - 5:40 PM
Q&A for all speakers

TECHNICAL EVENTS

Meet peers interested in the same topics and explore the latest research, hear different perspectives, and participate in engaging discussions. Sessions include poster presentations, panel discussions, and workshops. Find old friends and discover new partnerships.

OPEN TO ALL PAID TECHNICAL ATTENDEES.

Pascal Rol Keynote Address

25 January 2025 • 1:30 PM - 2:30 PM
Moscone South, Room 156 (Upper Mezz)

Join the Ophthalmic Technologies conference for the 2025 Pascal Rol Keynote Address, given this year by Dr. Jeffrey Goldberg, Professor and Chair of Ophthalmology and Director of the Byers Eye Institute at Stanford University.

Panel Discussion: Visualizing and Quantifying Drug Distribution in Tissue

25 January 2025 • 2:30 PM - 3:15 PM
Moscone South, Room 205 (Level 2)

Join the Visualizing and Quantifying Drug Distribution in Tissue conference for a panel discussion on the future of pharmacokinetic and pharmacodynamic technologies in academia and industry.

Translational Research Forum

26 January 2025 • 12:30 PM - 2:00 PM
Moscone South, Room 153 (Upper Mezz)

Join your colleagues in a discussion of outcomes-based studies that can change the lives of patients and visions for translating biophotonics technologies into novel healthcare solutions.

Panel Discussion: Is Light Dosimetry Necessary for Optimal PDT?

26 January 2025 • 9:00 AM - 10:30 AM
Moscone South, Room 151 (Upper Mezz)

Please join the Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy conference for this informative panel discussion.

Panel Discussion: Regulatory Pathways and Market Strategies for Optical Technologies Startups

26 January 2025 • 3:35 PM - 5:20 PM
Moscone South, Room 212 (Level 2)

Join the Optical Fibers and Sensors for Medical Diagnostics, Treatment and Environmental Applications conference for this panel discussion.

Memorial Session for Professor Joe Izatt

27 January 2025 • 8:30 AM - 9:45 AM
Moscone South, Room 203 (Level 2)

Join the Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine conference in honoring Professor Joseph Izatt.

Technical and Business meetings of the Optics and Electro-Optics Standards Council (OEOSC)

26 January 2025
InterContinental Hotel, Sutter (5th Floor)

The technical and business meetings of the Optics and Electro-Optics Standards Council (OEOSC) are open to anyone with an interest in standards for the optics industry. This meeting is specific to Task Force 2, Surface Imperfections.

9:00 AM - 10:30 AM
Accredited Standards Committee for Optics (ASCOP): TF7 - Lasers

11:00 AM - 12:30 PM
Accredited Standards Committee for Optics (ASCOP): TF2 - Surface Imperfections

1:30 PM - 3:00 PM
ASCOP Business Meeting

3:30 PM - 5:30 PM
OEOSC Board and Membership Meeting

Panel Discussion: The Future of Immunophotonics

27 January 2025 • 11:25 AM - 12:15 PM
Moscone South, Room 151 (Upper Mezz)

Please join the Biophotonics and Immune Responses conference for this informative discussion on the future of immunophotonics.

NIH/NIBIB P41 Session

27 January 2025 • 2:00 PM - 5:00 PM
Moscone South, Room 50 (Lower Mezz)

Join a meeting with the leaders and members of the NIH/NIBIB P41 Centers.

Panel Discussion and Awards Ceremony: Microfluidics, BioMEMS, and Medical Microsystems XXIII

27 January 2025 • 3:50 PM - 5:20 PM
Moscone South, Room 204 (Level 2)

Join this panel to discuss current trends in microfluidics, bioMEMS, and medical microsystems. This session will also include an award ceremony for the Microfluidics, BioMEMS, and Medical Microsystems conference.

Panel Discussion: Standardization and Security Aspect of Optical Power Systems

28 January 2025 • 4:45 PM - 5:45 PM
Moscone South, Room 215 (Level 2)

Part of the LASE conference on Optical Power Delivery

Holography Technical Event

28 January 2025 • 7:30 PM - 9:00 PM
InterContinental Hotel, Intercontinental Ballroom B (5th Floor)

Join the Holography Technical Group for a discussion on recent developments and directions in holography.

Innovation Awards in Quantum Sensing and Nano Electronics and Photonics

28 January 2025 • 7:30 PM - 9:00 PM
InterContinental Hotel, Intercontinental Ballroom A (5th Floor)

Join us for presentations by students and outstanding scientists sharing the most notable recent discoveries with broad impact in the areas of quantum sensing and nano electronics and photonics.

Workshop on Methods of Complex Light

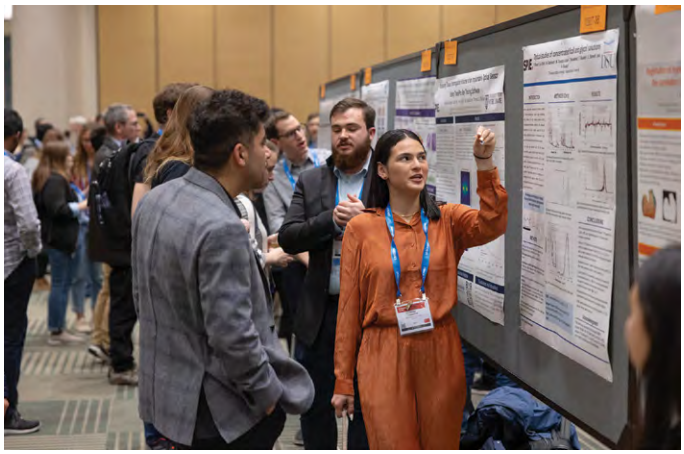
29 January 2025 • 3:30 PM - 5:00 PM
Moscone South, Room 160 (Upper Mezz)

Join us for small-group discussions on technologies related to complex light with a variety of experienced researchers in the field.

Laser Communications

29 January 2025 • 7:30 PM - 9:00 PM
InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

Join us for the annual meeting on laser communications. We invite all professionals involved in theory and applications of free-space laser communications, remote sensing, and supporting technologies.



POSTER SESSIONS

Conference attendees are invited to attend the poster sessions. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

BiOS Poster Session - Sunday

26 January 2025 • 5:30 PM - 7:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Sunday 10:00 AM - 5:00 PM

BiOS Student 3-Minute Poster Presentations

Sponsored by JBO, BIOS, and Neurophotonics

27 January 2025 • 4:30 PM - 5:30 PM
Moscone West, Room 2001 (Level 2)

Students present 3-minute rapid-fire overviews of their BiOS poster research. The top three presentations will receive cash prizes.

BiOS Poster Session - Monday

27 January 2025 • 5:30 PM - 7:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Monday 10:00 AM - 5:00 PM

LASE and select BiOS Poster Session - Tuesday

28 January 2025 • 6:00 PM - 8:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Tuesday 10:00 AM - 5:00 PM

OPTO and Quantum West Poster Session - Wednesday

29 January 2025 • 6:00 PM - 8:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Wednesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at:
https://spie.org/PW/poster-guidelines

QUANTUM WEST BUSINESS SUMMIT

Hear from industry experts who have overcome barriers while bringing new quantum technologies to market. Leverage this opportunity to develop new collaborations that will help launch your products into this technological frontier.

OPEN TO ALL PAID TECHNICAL ATTENDEES.

Building a Quantum Workforce

27 January 2025 • 10:00 AM - 11:45 AM
Moscone South, Room 153 (Upper Mezz)

Come hear a panel discussion on the opportunities, challenges, and best practice in creating a pipeline of talented and well-trained scientists and engineers in the quantum field.

MODERATOR

Jessica Wade
Royal Society University Research Fellow and Lecturer
Imperial College London (United Kingdom)

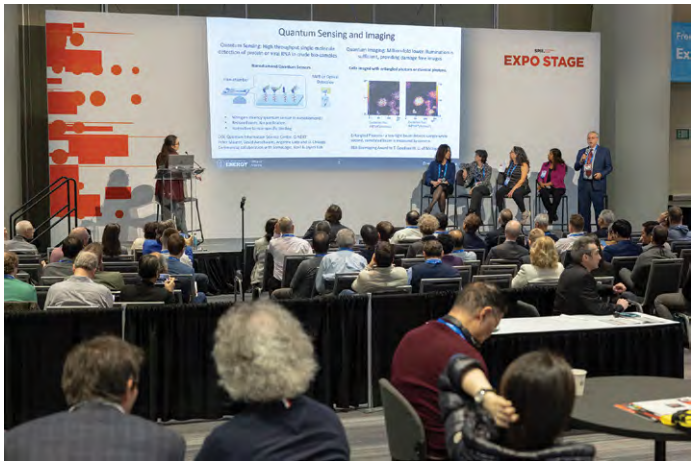
PANELISTS

Heather Lewandowski
Professor, University of Colorado Boulder (USA)
Faculty Director Quantum Initiative Education and Workforce, CUbit (USA)
Fellow, JILA (USA)

Halina Rubinsztein-Dunlop
Professor, University of Queensland (Australia)
Deputy Director, QUBIC (Australia)

Thomas Searles
Associate Professor
University of Illinois Chicago (USA)

Jake Douglass
Quantum Business Development Lead
Sandia National Laboratories (USA)



Opening Session: The State of Quantum

27 January 2025 • 3:15 PM - 4:45 PM
Moscone South, Room 153 (Upper Mezz)

Hear experts discuss the current state of quantum technologies—what is the reality and how close are we to building a robust quantum ecosystem.

MODERATOR

Carl J. Williams
CEO
CJW Quantum Consulting LLC (USA)

PANELISTS

Peter Knight
Professor
Imperial College London (United Kingdom)

James Kushmerick
Director Physical Measurement Laboratory
NIST (USA)

John Burke
Principal Director of Quantum Science
DOD (USA)

Jay Lowell
Principal Disruptive Computing, Networks & Sensors
Boeing Research and Technology (USA)

Keynote Session

28 January 2025 • 10:30 AM - 12:00 PM PST | Moscone South, Room 153 (Upper Mezz)

Join us as the 2025 Quantum West Business Summit continues with a Keynote Address on how quantum can enable scalable AI computing followed by a Business Intelligence update.

HOST

Mark Wippich
CEO
MPW (USA)

Scalable Supercomputers for AI with Quantum Devices
Jeffrey Shainline
Founder and CEO
Great Sky (USA)

The Market Potential of AI and Quantum for Transformative Compute
Alex Challans
CEO
Resonance (USA)

Quantum Devices for Transformative Compute

28 January 2025 • 1:30 PM - 3:00 PM PST | Moscone South, Room 153 (Upper Mezz)

Join us for a panel discussion exploring the intersection of quantum computing, neuromorphic computing, machine learning and anomaly detection for transformative computation tasks.

MODERATOR
Mark Wippich
CEO
MPW (USA)

PANELISTS
Charina Chou
COO
Google Quantum AI
(USA)

Nicholas Harrigan
Marketing Lead Quantum Computing
nVidia (USA)

Nathan Gemelke
Co-founder,
Chief Technology Strategist
QuEra (USA)

Jeffrey Shainline
Founder and CEO
Great Sky (USA)

Michael Förtsch
CEO
Q.ANT (Germany)

The Intersection of Quantum Computing and AI

28 January 2025 • 3:30 PM - 5:00 PM
Moscone South, Room 153 (Upper Mezz)

Join us for a panel discussion exploring the interesting intersection of Quantum Computing and AI and the transformational impact these fields have on each other

MODERATOR
Carl J. Williams
CEO
CJW Quantum Consulting LLC (USA)

PANELISTS
Roman Orus
CSO
Multiverse Computing (Spain)

Stefan Cap JD
Head of Business Development, North America
Riverlane (USA)

Jeannette "Jamie" Garcia
Technical Program Director, Algorithms & Partnerships
IBM Quantum (USA)

Matthias Troyer
Technical Fellow and Corporate Vice President of Quantum
Microsoft (USA)

Quantum West Business Summit Reception

28 January 2025 • 5:00 PM - 6:00 PM
Moscone South, Quantum Expo (Upper Mezz)

This reception is in support of the Quantum West Business Summit and in recognition of the International Year of Quantum

OPEN TO ALL PAID TECHNICAL ATTENDEES.

Burning the Ghost Light—Economic Opportunities to Scale the Photonics Supply Chain

29 January 2025 • 10:30 AM - 12:00 PM
Moscone South, Room 153 (Upper Mezz)

This panel discussion highlights the key pain points facing the photonics supply chain today as more businesses grow quantum technologies from R&D to commercial scale.

MODERATOR

Austin Lin
Quantum Standards
Google (USA)

PANELISTS

Carmen Palacios-Berraquero
CEO
Nu Quantum (United Kingdom)

Brennan Peterson
VP Test & Measurement
PsiQuantum (USA)

Eric Takeuchi
VP, Deputy GM Instrumentation
DRS Daylight Solutions (USA)

Eric Kievit
Chief Operating Officer
Qblox (Netherlands)

Advancing Quantum Technologies Through Scalable Frequency Combs

29 January 2025 • 1:15 PM - 2:45 PM
Moscone South, Room 153 (Upper Mezz)

Optical frequency combs play a key role in enabling and advancing quantum technologies. Hear this panel of experts discuss the status and future of this critical component in the quantum supply chain.

MODERATOR

Saeed Pegahan
Frequency Comb Application Scientist
Toptica Photonics (USA)

PANELISTS

Scott Davis
CEO and Founder
Vescent (USA)

Ronald Holzwarth
CTO and Co-Founder
Menlo Systems (Germany)

Wilhelm Kaenders
CTO and Founder
Toptica Photonics (Germany)

Tara Fortier
Group Lead
NIST (USA)

Arman Cingoz
Director of Photonics
Vector Atomic (USA)

INTERNATIONAL YEAR OF
Quantum Science and Technology

SPIE is a founding partner of the international year of quantum.

Celebrate with us!

The Path from Startups to End Users in Commercializing Quantum Sensing Technology

29 January 2025 • 3:15 PM - 5:00 PM
Moscone South, Room 153 (Upper Mezz)

Learn about the quantum sensor ecosytem and the progress in deploying quantum sensors for commercial applications.

HOST
Roger McKinlay
Challenge Director Quantum Technologies
UK Research and Innovation (United Kingdom)

The Evolving Quantum Sensor Landscape
Anke Lohmann
Founder and Director
Anchored In Ltd (United Kingdom)

High-Precision VCSEL-Based Quantum Sensors: Advancing Commercialization in PNT Applications
Amirhossein Ghods
VP of Photonics
Mesa Quantum, Inc. (USA)

Hamamatsu's Quantum Sensor Technology—Preview of the Upcoming Optically Pumped Magnetometer release
Michael Semmlinger
Research Support Supervisor
Hamamatsu Corporation (USA)

Quantum Sensor Use Cases for PNT
Celia Merzbacher
Executive Director
Quantum Economic Development Consortium (QED-C) (USA)

Quantum Sensing Applications at Boeing
Jay Lowell
Principal Disruptive Computing, Networks & Sensors
Boeing Research and Technology (USA)

Wrap-Up Session

29 January 2025 • 5:00 PM - 5:15 PM
Moscone South, Room 153 (Upper Mezz)

Closing remarks conclude Quantum West Business Summit.

SPIE Global Business Forum is an important event for executives, investors, entrepreneurs, and stakeholders to learn and connect with other leaders. Held in cooperation with leading global analyst organizations, the forum will provide a detailed look at data and trends impacting business across the global photonics industry.

FORUM SCHEDULE

Welcome Networking	
Opening Remarks	**Andrew Brown,** SPIE **Kent Rochford,** SPIE
Global Economic Outlook	**Michael Ryan,** UBS
Photonics Solutions Enabling Advanced Packaging in the AI Era	**John Lee,** MKS Instruments, Inc.
Changing the World, One Nanometer at a Time, Not Alone	**Thomas Plees,** ASML
Materials Inspired Photonics Driving Exciting Megatrends	**Sanjai Parthasarathi,** Coherent Corp.
Networking Lunch	
SPIE 2025 Global Industry Report	**Andrew Brown,** SPIE
The European Photonics Industry: Overview and Prospects in a Fast-Growing Global Market	**Thierry Robin,** TEMATYS
Chinese Laser/Photonics Market Insights	**Bo Gu,** BOS Photonics
Photonics as an Enabling Technology for New Applications: Market and Trends	**Jérôme Mouly,** Yole Group
Networking Break	
CEO Panel	**Industry executives**
Market Update for Photonics	**Brian Perrault,** Needham & Company
SPIE Global Government Affairs Update	**Jennifer O'Bryan,** SPIE
Photonics Industry Trends, Benchmarks and Futures	**John Lincoln,** UK Photonics Leadership Group
Closing Remarks	
Networking Reception	

Separate registration required.

spie.org/gbf

INDUSTRY EVENTS

Valuable information for anyone — from engineers to CEOs — looking for the latest industry insights

Join an energized audience at these informative sessions focused on the business side of photonics. Industry experts and leaders from various fields share opportunities and obstacles to overcome.

INDUSTRY EVENTS ON THE EXPO STAGE ARE OPEN TO ALL REGISTRATION TYPES.

BiOS Expo

Moscone Center, Hall DE (Exhibit Level)

Saturday 25 January 2025 . . . . . 10:00 AM - 5:00 PM
Sunday 26 January 2025. . . . . .10:00 AM - 4:00 PM

Visit top suppliers of the biomedical optics community.

Emergent Quantum and Photonics Technologies in Bio-Applications Beyond National Borders: New Opportunities for International Collaborative Research

25 January 2025 • 1:00 PM - 2:30 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Learn about the importance of multinational partnerships in emerging areas of biophotonics including the intersection of biophotonics with technologies such as quantum and AI.

MODERATOR

Sergey Polyakov
Physicist
NIST (USA)

PANELISTS

Afrouz Anderson
Program Director for the Division of Applied Science and Technology
National Institutes of Health (NIH), National Institute of Biomedical Imaging and Bioengineering (NIBIB) (USA)

Juha Purmonen
Executive Director of Photonics Finland and Development Manager
Business Joensuu (Finland)

Jyrki Saarinen
Professor of Photonics Applications and Commercialization
University of Eastern Finland (Finland)

Petri Koikkalainen
Counselor of Science and Higher Education
Finnish Embassy (Finland)

Sarah Scharf
Regional Program Director for the Division of International Relations
National Institutes of Health (NIH), Fogarty International Center (FIC) (USA)

Light and Sound on Chip for Diagnostics

25 January 2025 • 2:45 PM - 3:15 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear about the development of integrated light sources, photodetectors and opto-mechanical ultrasound sensors that are paving the way for the next generation of photoacoustic systems.

PRESENTER

Xavier Rottenberg
imec Fellow
imec (Belgium)

Quantum Biotechnology in Australia

25 January 2025 • 3:30 PM - 4:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come see an overview of research efforts within the Australian Research Council Centre of Excellence in Quantum Biotechnology (QUBIC).

PRESENTER

Warwick Bowen
Director, Australian Research Council Centre of Excellence in Quantum Biotechnology
University of Queensland (Australia)

Quantum Sensing Use Cases for Biomedical Applications: An Industry-Driven Evaluation

25 January 2025 • 4:15 PM - 4:45 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear a presentation on the results of an industry-driven assessment of quantum sensing use cases in biomedicine.

PRESENTERS

Celia Merzbacher
Executive Director
QED-C (USA)

Geetha Senthil
Deputy Director
Office of Special Initiatives
National Center for Advancing Translational Sciences (NCATS) (USA)

What is Next in the Analysis of Biological Samples with Spectral Imaging Systems?

26 January 2025 • 11:00 AM - 12:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

This podium discussion aims to explore the current state of spectral imaging systems, highlight the latest developments, and address the challenges associated with emerging applications.

MODERATOR
Antonio Castelo
Photonics Technology Manager
EPIC (Spain)

PANELISTS
Oliver Grass
Founder and Managing Director,
inno-spec GmbH (Germany)
CEO, Spectralliance Holding (Germany)

Fabrizio Preda
CEO
NIREOS (Italy)

Gerard Whoriskey
Technical Director
CoolLED (United Kingdom)

Wouter Charle
Program Manager Spectral Imaging
On-Chip
imec (Belgium)

Future of Quantum Biotechnology

26 January 2025 • 1:00 PM - 2:30 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Learn about the opportunities quantum technologies will provide in the life sciences and engage with the panel discussing the opportunities and challenges in moving these technologies from the lab to the field.

MODERATOR
Halina Rubinsztein-Dunlop
Professor, University of Queensland (Australia)
Deputy Director, QUBIC (Australia)

PANELISTS
Warwick Bowen
Director, Australian Research Council Centre of Excellence in Quantum Biotechnology
University of Queensland (Australia)

Celia Merzbacher
Executive Director
QED-C (USA)

Geetha Senthil
Deputy Director
Office of Special Initiatives
National Center for Advancing Translational Sciences (NCATS) (USA)

Gopal Karemore
Global Quantum Lead in Healthcare and Life Sciences
IBM (USA)

FDA Policies and Procedures: What Academic Investigators and Small Businesses Should Know

26 January 2025 • 2:45 PM - 4:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear speakers from industry and regulatory agencies share their perspectives and advice on incorporating regulatory requirements into product development and how to achieve successful regulatory strategies.

HOST
Ramesh Raghavachari
FDA (USA)

Tissue phantoms as regulatory science tools to support medical device development
William C Vogt
FDA/CDRH (USA)

NIBIB opportunities toward technology development and standardization
Afrouz Anderson
NIH/NIBIB (USA)

Unlocking the value of optical tissue phantoms: accelerating clinical translation for medical innovation
Ethan LaRochelle
QUEL Imaging Inc. (USA)

INDUSTRY EVENTS

INDUSTRY EVENTS ON THE EXPO STAGE ARE OPEN TO ALL REGISTRATION TYPES, UNLESS OTHERWISE NOTED.

2025 Global Business Forum

27 January 2025 • 9:30 AM - 7:00 PM
Marriott Marquis, Golden Gate Ballroom (B2 Level)

Separate registration is required.

Join us at a business forum for executives, investors, entrepreneurs, and stakeholders across the global photonics industry.

Startup Challenge: Office Hours Session

27 January 2025 • 12:00 PM - 5:00 PM
InterContinental Hotel, Sutter (5th Floor)

Session is by invitation only. Industry professionals from a variety of expertise and backgrounds meet with Startup Challenge finalists.

Sensors and Instrumentation Technical Advisory Committee Open Session

28 January 2025 • 9:30 AM - 11:30 AM
InterContinental Hotel, Intercontinental Ballroom C (5th Floor)

The Sensors and Instrumentation Technical Advisory Committee is an official federal advisory committee within the US Bureau of Industry and Security. Any SPIE Photonics West attendee is welcome during the open session of this meeting.

CHAIR
Jennifer O'Bryan
Director, Government Affairs
SPIE (USA)

Accelerating Photonics Innovations to the Marketplace with the Tech Hubs

28 January 2025 • 10:30 AM - 12:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

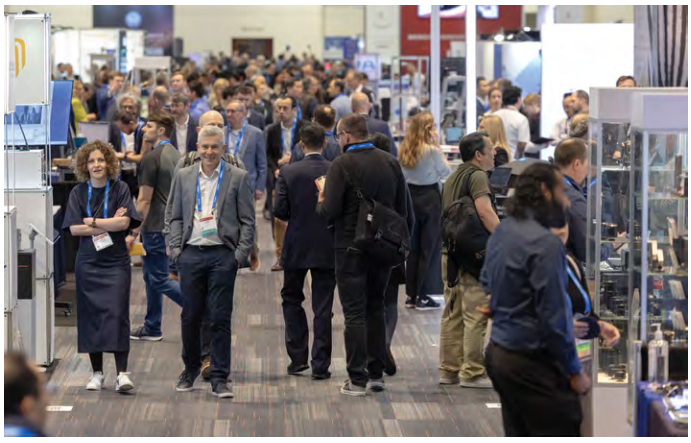
Learn about the US Tech Hubs and the role photonics plays in helping these regional centers of excellence achieve their missions.

MODERATOR
Alexis Vogt
Endowed Chair & Professor of Optics
Monroe Community College (USA)

SPEAKERS
Timothy VanReken
Executive Director
Headwaters Tech Hub (USA)

Joseph Stefko
President and CEO
OneROC (USA)

Zachary Yerushalmi
CEO and Regional Innovation Officer
Elevate Quantum (USA)



Photonics West Exhibition

Moscone Center, North-South (Exhibit Level)

Tuesday 28 January 2025 . . . . . 10:00 AM - 5:00 PM
Wednesday 29 January 2025 . . . . . 10:00 AM - 5:00 PM
Thursday 30 January 2025 . . . . . 10:00 AM - 4:00 PM

The Photonics West Exhibition is the most important show in the industry. Start the year off right by connecting with customers, clients, and prospects. Share your latest solutions, and make important connections as your colleagues and peers continue to build an exciting year of collaboration and business growth.

Exhibitor Product Demos - Hall C

Moscone Center, Hall C (Exhibit Level)

Tuesday 28 January 2025 . . . . . 10:00 AM - 5:00 PM
Wednesday 29 January 2025 . . . . . 10:00 AM - 5:00 PM
Thursday 30 January 2025 . . . . . 10:00 AM - 4:00 PM

See product demonstrations by exhibitors to learn about their latest products and services.

Exhibitor Product Demos - Hall D

Moscone Center, Hall D (Exhibit Level)

Tuesday 28 January 2025 . . . . . 10:00 AM - 5:00 PM
Wednesday 29 January 2025 . . . . . 10:00 AM - 5:00 PM
Thursday 30 January 2025 . . . . . 10:00 AM - 4:00 PM

See product demonstrations by exhibitors to learn about their latest products and services.

Quantum West Expo - Tuesday

Moscone South, Quantum Expo (Upper Mezz)

Tuesday 28 January 2025 . . . . . 10:00 AM - 5:00 PM
Wednesday 29 January 2025 . . . . . 10:00 AM - 5:00 PM

Discover global providers of the best quantum technologies.

How CORNERSTONE is Accelerating the Translation of Technology into the Marketplace for Startup Companies

28 January 2025 • 1:00 PM - 2:15 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear how CORNERSTONE and their silicon photonics foundry is helping startup companies move into the marketplace.

MODERATOR

John Lincoln
Chief Executive
Photonics Leadership Group (United Kingdom)

PANELISTS

Graham Reed
Director (Project Lead CORNERSTONE)
Optoelectronics Research Centre
(United Kingdom)

Lia Li
CEO
Zero Point Motion (United Kingdom)

Alice Iles
Head of Tech Acceleration
Future Worlds (United Kingdom)

Richard Pitwon
Principal Engineer
Seagate Research (United Kingdom)

Startup Challenge Finals

28 January 2025 • 2:30 PM - 4:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come see what is in store for the future of Optics and Photonics! Top finalists from around the world pitch their innovations in front of a panel of judges and compete for $10,000 first place prize.

Startup Challenge Awards and Reception

28 January 2025 • 4:15 PM - 4:45 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come see who takes home the title of Startup Challenge 2025 Winner. Enjoy a refreshment while conversing with finalists and winners.

PLAN TO ATTEND

STARTUP challenge

SPIE Photonics West
28 January 2025

The Moscone Center • San Francisco, CA, USA

Come see what is in store for the future of optics and photonics! Top finalists from around the world pitch their innovations in front of a panel of judges and compete for a $10,000 first place prize.

Take advantage of this opportunity to build connections with up-and-coming businesses, find promising investment opportunities, and learn about new technologies entering the optics and photonics space.

STARTUP CHALLENGE FINALISTS

Atzeyo Biosensors, Inc.: Photonic Resonance Absorption Microscopy. The first molecular diagnostic platform for the physician's office addressing cancer care.

Max-IR Labs: AquaCarbon Monitor. Empowering carbon credits with precise CO_2 monitoring in water systems.

Photosynthetic B.V.: Volumetric Micro-Lithography. Enabling the rapid production of complex 3D devices with submicron features.

OptiCardio: OptiCardio. A spectroscopy-enabled device for real-time guidance to reduce the recurrence rate of ablation procedures for atrial fibrillation.

iSLight: Surface-Emitting SLED (Superluminescent LED). iSLight supplies superior lighting solutions to manufacturers of industrial quality-control systems, smart glasses, and imaging instruments.

SureVision: SureVision. A method that evaluates refractive error in the human eye, with a disruptive, flicker-minimization method that is five times faster and two times more precise than the current gold-standard method.

Modendo, Inc.: NeuroVu. Ultra-thin endoscopes for deep-brain imaging.

Founding Partner

JENOPTIK

Lead Sponsor

HAMAMATSU
PHOTON IS OUR BUSINESS

MORE LIGHT

spie.org/startup

SPIE.

INDUSTRY EVENTS ON THE EXPO STAGE ARE OPEN TO ALL REGISTRATION TYPES.

New Materials for Wafer Scale Manufacturing of Optical Interconnects

29 January 2025 • 10:30 AM - 11:30 AM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear about advances and the next generation of materials for silicon photonics.

MODERATOR
Vlad Kozlov
Chief Analyst
LightCounting (USA)

PANELISTS
Michael Lebby
CEO
Lightwave Logic Inc. (USA)

Corrado Sciancalepore
Technical Marketing Manager
Photonics & Cloud AI Business Unit
SOITEC (France)

Guijun Ji
Senior Vice President of Strategy
Advanced Fiber Resources (China)

Brad Booth
CEO
NLM Photonics (USA)

Imaging the Invisible: Image Sensor Innovations at imec

29 January 2025 • 11:45 AM - 12:15 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear about new image sensor developments at imec, highlighting several world-firsts.

PRESENTER
Pawel Malinowski
Program Manager
imec (Belgium)

Optics and AI: Boundless Synergies for a Limitless Future

29 January 2025 • 1:15 PM - 2:30 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

A discussion to explore how artificial intelligence is both driving innovation in next generation optical products while simultaneously being enhanced by advances in optical technologies.

MODERATOR
Sanjay Gangadhara
Senior Program Director, Optics
Ansys (USA)

PANELISTS
Jessie Rosenberg
Director of Laser Engineering
Lightmatter (USA)

Simon Thibault
Professor
University Laval (Canada)

Chris Smolinski
Founding member
Stealth (USA)

Hannah Noble
Optical Systems Architect
Meta Reality Labs Research (USA)

Challenges in the Characterization and Diagnosis of Ultrafast Laser Beams

29 January 2025 • 2:45 PM - 3:45 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

A forum of experts to discuss the complexities of diagnosing cutting-edge ultrafast pulses, share their insights on characterization difficulties, and explore proposed efficiency and effectivity solutions.

MODERATOR

Antonio Castelo
Photonics Technology Manager
EPIC (Spain)

PANELISTS

Charles Dumas
VP - Sales and Marketing
Gentec-EO (Canada)

Mathieu Semenou
Chief Commercial Officer
Femto Easy (France)

Ingo Rimke
Chief Technology Officer
APE Angewandte Physik & Elektronik GmbH (Germany)

Karolis Madeikis
Senior R&D Engineer
EKSPLA (Lithuania)

Antoine Courjaud
Strategic Business Development
Amplitude (France)

Exploring Applications of Plasma Accelerators at the Extreme Photonics Applications Centre

29 January 2025 • 4:00 PM - 5:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Hear about the newest facility at the Central Laser Facility and the optics and photonics components that make it happen.

Introduction to EPAC and applications of extreme photonics

Tom Butcher
Head, The Centre for Advanced Laser Technology and Applications, Central Laser Facility, STFC Rutherford Appleton Laboratory (United Kingdom)

Panel discussion on laser-driven accelerators: technological challenges and opportunities

MODERATOR

Ric Allott
Director of Business Development and Incubation STFC (United Kingdom)

PANELISTS

John Lincoln
Chief Executive
Photonics Leadership Group (United Kingdom)

Bjorn Manuel Hegelich
CEO and Founder, Tau Systems (USA)
Professor, University of Texas (USA)

Chris Bridle
Large Optic Product and Sales Manager
Manx Precision Optics (United Kingdom)

Tom Butcher
Head, The Centre for Advanced Laser Technology and Applications, Central Laser Facility, STFC Rutherford Appleton Laboratory (United Kingdom)

PRISM AWARDS 2025

Congratulations Prism Awards 2025

Finalists

BIOMEDICAL

Delta Life Science

Enspectra Health

Norlase

CAMERAS AND IMAGING SYSTEMS

Eoptic

NIL Technology

Thorlabs, Inc.

LASERS

n2-Photonics GmbH

Scantinel Photonics GmbH

Thorlabs, Inc.

QUANTUM TECH

Ki3 Photonics Technologies Inc.

Leonardo DRS (Daylight Solutions)

Qunnect

OPTICAL MATERIALS AND COMPONENTS

LightPath Technologies

Omega Optical

xolo GmbH

SENSORS

EXALOS

FluIDect GmbH

Interherence GmbH

SOFTWARE

BRELYON

HyperSpectral Corp.

PlanOpSim

TEST AND MEASUREMENT

Innovations in Optics, Inc.

Quartus Engineering Inc.

TRIOPTICS GmbH

CATALYST AWARD 2025

SCHOTT AG

Thorlabs, Inc.

Vacuum Innovations

SPIE.

prismawards.org

INDUSTRY EVENTS ON THE EXPO STAGE ARE OPEN TO ALL REGISTRATION TYPES.

Creating a Sustainable Photonics Industry: How Photonics Companies are Addressing Environmental Concerns in Their Operations

30 January 2025 • 10:15 AM - 11:15 AM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Come hear from leaders in the photonics industry on how they integrate elements of sustainability into their corporate cultures and daily operations.

HOSTED BY the business of photonics optics.org

MODERATOR

Matthew Peach
Editor-in-Chief
optics.org (United Kingdom)

PANELISTS

Gwen Macchione
Sustainability Coordinator
Thorlabs (USA)

Estefania Cervantes Montano
Global Sustainability Manager
Edmund Optics (United Kingdom)

Ralf Daferner
Head of Global Sales and Marketing for Advanced Optics
SCHOTT (Germany)

TICKETS AND SEPARATE REGISTRATION REQUIRED.

2025 Prism Awards

29 January 2025 • 6:00 PM - 10:00 PM
Marriott Marquis Hotel, Yerba Buena Ballroom (Lower Level)

An annual international competition that honors the best new optics and photonics products on the market.

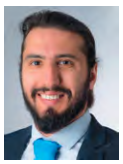
From Surge to Stability: Machine Vision's Next Chapter

30 January 2025 • 11:30 AM - 12:30 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Join the Yole Group team to hear the latest on the machine vision market.

PRESENTERS

Axel Clouet
Senior Technology & Market Analyst – Imaging
Yole Group (France)



Ali Jaffal
Senior Analyst, Compound Semiconductors
Yole Group (France)

Martin Vallo
Senior Analyst, Photonics
Yole Group (France)

Prism Awards Winners Circle

30 January 2025 • 1:30 PM - 3:00 PM
Moscone Center, Expo Stage, Hall DE (Exhibit Level)

Join us to celebrate the winners of the 17th Annual Prism Awards.

PROFESSIONAL DEVELOPMENT

Enjoy four powerful days of career development and job skills advancement. Build these focused events and services into your schedule and use the opportunity to make valuable connections.

OPEN TO ALL PAID TECHNICAL ATTENDEES.

A Celebration of Women in Optics

26 January 2025 • 9:00 AM - 5:00 PM PST | Marriott Marquis Hotel, Golden Gate Ballroom (Level B2)

Separate registration is required.

Join us for a day of keynotes, panels, and networking to celebrate twenty years of our Women in Optics planner.

Evolution and Technology: forces shaping women's roles and opportunities

27 January 2025 • 12:00 PM - 1:00 PM
Moscone West, Community Stage (Level 2)

Join us for lunch and explore how human evolution and technology have shaped women's roles and opportunities, and what the future holds for gender equality.

Evolution and Technology: forces shaping women's roles and opportunities
Presenter: **Jennifer Barton**

Celebrating Optics and Photonics in Africa

27 January 2025 • 4:00 PM - 5:00 PM
Moscone West, Community Stage (Level 2)

Join us in celebrating the growth of the optics and photonics ecosystem across Africa, with a special emphasis on education and outreach in sub-Saharan regions.

Skills to work on now for a future in industry

28 January 2025 • 8:30 AM - 9:30 AM
Moscone West, Room 2001 (Level 2)

Instructor Dr. Ben Cromey walks us through professional skills needed for a successful career in industry. This same workshop is offered on both Tuesday and Wednesday.

Dr. Benjamin Cromey
BAE Systems, Inc

Resumes to Interviews: Student and Early Career Strategies for a Successful Job Search

28 January 2025 • 10:00 AM - 12:00 PM
Moscone West, Room 2001 (Level 2)

Whether you are about to graduate or are a professional looking for a new role, join us for this vital workshop on resume and interview must-dos and don'ts!

Liz Helton
Career Transformation Partners

Neuro-Inclusion in Physics

28 January 2025 • 12:00 PM - 1:00 PM
Moscone West, Community Stage (Level 2)

Join us for lunch and learn how to foster neuro-inclusive physics workspaces by understanding neurodiversity, recognizing barriers, and implementing practical steps for change.

Daisy Shearer
National Quantum Computing Centre

Resume Review

28 January 2025 • 1:00 PM - 5:00 PM
Moscone West, Level 2 Lobby

Free! Bring your resume to receive tactical tips and tricks from a professional resume reviewer.

Liz Helton
Career Transformation Partners

SPIE Student Chapters: Tips and Sips!

28 January 2025 • 1:15 PM - 2:45 PM
Moscone West, Community Stage (Level 2)

SPIE Staff and special guests share best practices, tips and tricks for keeping your Chapter engaged year over year.

Career Speed Mentoring

28 January 2025 • 3:00 PM - 4:00 PM PST | Moscone West, Community Corner (Level 2)

Students and Early Career attendees! Looking to get advice on critical career choices, life in academia, government, industry, and more? Join us for this fun and casual speed-mentoring session. Snacks and drinks provided!

What You Need to Know About Journal Publication: An Intro to Scholarly Publishing

29 January 2025 • 9:00 AM - 10:30 AM
Moscone West, Room 2001 (Level 2)

Learn what to expect, what to avoid, and above all, how to successfully publish your research in a reputable peer-reviewed scholarly journal.

Gwen Weerts
Journals Manager and Editor in Chief of *Photonics Focus*, SPIE

Matt Jungwirth
Manager, Technical Content and Scientific Publishing, SPIE

Resume Review

29 January 2025 • 10:00 AM - 5:00 PM
Moscone West, Level 2 Lobby

Free! Bring your resume to receive tactical tips and tricks from a professional resume reviewer.

Liz Helton
Career Transformation Partners

Skills to work on now for a future in industry

29 January 2025 • 11:00 AM - 12:00 PM
Moscone West, Room 2001 (Level 2)

Instructor Ben Cromey walks us through professional skills needed for a successful career in industry.

Dr. Benjamin Cromey
BAE Systems, Inc

Navigating your Career through Networking: Insights from Women in XR

29 January 2025 • 12:00 PM - 1:00 PM
Moscone West, Community Stage (Level 2)

Join us for lunch and learn how you can elevate your networking skills and advance your career. See conference app for presenter details.

Communication for Self-advocacy and ConflictResolution

30 January 2025 • 12:00 PM - 1:00 PM
Moscone West, Community Stage (Level 2)

Join us for lunch and learn strategies to navigate difficult conversations with confidence and clarity.

Presenter: **Dr. Tara Fortier**

Free Professional Headshots

Moscone West, Level 2 Lobby

Free professional headshots for all SPIE Members and Corporate Members. Be ready to show your proof of Membership.

27 January 2025 • 9:30 AM - 4:30 PM
28 January 2025 • 9:30 AM - 4:30 PM
29 January 2025 • 9:30 AM - 4:30 PM

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SPIE.MEMBERSHIP

SPIE is committed to equipping you with tools to advance and enhance your career.

Moscone Center, Hall C, Room 5 (Exhibit Level)

Tuesday 28 January 2025 • 10:00 AM - 5:00 PM

Wednesday 29 January 2025 • 10:00 AM - 5:00 PM

Meet with companies seeking to hire professionals like you. Bring your resume and put your best foot forward to land your dream job.

Visit the SPIE App or the website for current list of Job Fair exhibitors

spiecareercenter.org

SPIE. CAREER CENTER

MEMBERSHIP EVENTS

Connect with our global optics and photonics community

Your SPIE Membership is your passport to engage with a network of innovators from around the word.

SPIE Fellow & Senior Member Luncheon

27 January 2025 • 12:00 PM - 1:30 PM
InterContinental Hotel, Intercontinental Ballroom (5th Floor)

All Fellow and Senior Members of SPIE are invited to join your colleagues for an SPIE hosted lunch. The new SPIE Fellows attending Photonics West will be introduced and recognized.

SPIE Member After-Dinner Reception

28 January 2025 • 8:00 PM - 9:30 PM
San Francisco Museum of Modern Art (151 Third St)

SPIE Members are invited to join us for an evening of networking, music, art, and celebration of our global optics and photonics community. Enjoy beer, wine, coffee, desserts, and meaningful conversation in one of the largest modern and contemporary art museums in the United States.

Please note: this reception is limited to SPIE Members and Corporate Members only. Please wear your registration badge with your Member ribbon or Corporate Member label and bring a valid ID. If you join as an SPIE Member onsite, please bring your registration receipt. Dress is casual or business attire.

Get your FREE Professional Portrait

Free professional headshots for all SPIE Members and Corporate Members.

Be ready to show your proof of Membership

Moscone West, Level 2 Lobby

27 January 2025 . . . . . 9:30 AM–4:30 PM
28 January 2025 . . . . . 9:30 AM–4:30 PM
29 January 2025 . . . . . 9:30 AM–4:30 PM

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Make connections that lead to new opportunities

GROW PROFESSIONALLY
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SOCIAL AND NETWORKING EVENTS

Network with colleagues

Make connections with new and old colleagues. Unwind in more casual settings where conversations can flow more easily and where true relationship building happens.

OPEN TO ALL PAID TECHNICAL ATTENDEES, UNLESS OTHERWISE NOTED.

Biophotonics Summer School Meetup

26 January 2025 • 4:00 PM - 5:00 PM
Moscone West, Community Corner (Level 2)

Join alumni, lecturers, and organizers of the prestigious Biophotonics Summer School at this casual networking event.

SPIE Fellow & Senior Member Luncheon

27 January 2025 • 12:00 PM - 1:30 PM
InterContinental Hotel, Intercontinental Ballroom (5th Floor)

All Fellow and Senior Members of SPIE are invited to join your colleagues for an SPIE-hosted lunch. The new SPIE Fellows attending Photonics West will be introduced and recognized.

Women in Optics Meetup

27 January 2025 • 3:00 PM - 4:00 PM
Moscone West, Community Corner (Level 2)

Join other women in the field for informal discussions and networking.

Executive Women's Meetup

27 January 2025 • 6:30 PM - 7:30 PM
InterContinental Hotel, Pacific Terrace Foyer (4th Floor)

Join other women executives in optics, photonics, and photonics-enabled communities to meet up, network, and share experience.

Photonics West Welcome Reception

27 January 2025 • 7:00 PM - 9:00 PM
Marriott Marquis Hotel, Yerba Buena Ballroom (Lower Level)

Don't miss the Photonics West Welcome Reception and Experience the Greatest Photonics Show on Earth, including nostalgic activities and entertainment along with a nod to the new and now. Must be a registered and paid attendee.

SPIE Scholarship and Student Conference Support Recipients Meetup

28 January 2025 • 4:00 PM - 5:00 PM
Moscone West, Community Stage (Level 2)

Join SPIE scholarship and Student Conference Support recipients at this networking meetup with MKS industry representatives and SPIE leadership.

Publications Reception

28 January 2025 • 5:00 PM - 6:00 PM
Moscone West, Community Corner (Level 2)

This reception is for all volunteers who serve as Editors for SPIE journals, including Optical Engineering, Advanced Photonics, JEI, JNP, JPE, or JOM. Come reconnect with colleagues over snacks and drinks.

LGBTQ+ Social

28 January 2025 • 6:30 PM - 7:30 PM
Moscone West, Community Corner (Level 2)

Come join us and socialize and network with other LGBTQ+ attendees, students, scientists, and allies in the optics and photonics community.

SPIE Member After-Dinner Reception

28 January 2025 • 8:00 PM - 9:30 PM
San Francisco Museum of Modern Art (151 Third St)

SPIE Members are invited to join us for an evening of networking, music, art, and celebration of our global optics and photonics community.

Black Scientists' Social

29 January 2025 • 5:30 PM - 6:30 PM
Moscone West, Community Corner (Level 2)

Join us as we count down to Black History Month with a Black scientists' social.

OPEN TO ALL REGISTRATION TYPES.

Whiskey Tasting at SPIE Booth

South Lower Lobby, Booth 3700 (Exhibit Level)

Sample specialty whiskeys while chatting with colleagues at SPIE Booth #3700.

28 January 2025 . . . . . 2:00 PM - 5:00 PM
29 January 2025 . . . . . 2:00 PM - 5:00 PM
30 January 2025 . . . . . 2:00 PM - 4:00 PM

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Paws for a Break

Moscone South, Lower Lobby (Exhibit Level)

Paws for a break and join some of the most cuddly four-legged animals for a bit of self-care and animal love at the Community Corner.

25 January 2025 . . . . . 3:00 PM - 5:00 PM
26 January 2025 . . . . . 2:00 PM - 4:00 PM
28 January 2025 . . . . . 3:00 PM - 5:00 PM
29 January 2025 . . . . . 3:00 PM - 5:00 PM
30 January 2025 . . . . . 2:00 PM - 4:00 PM

OPTICS & PHOTONICS International Congress

OPIC 2025

PLAN TO ATTEND

opicon.jp

21-25 April 2025

Pacifico Yokohama, Japan

Co-located with

OPTICS & PHOTONICS International Exhibition

OPIE '25

Plenary Session

Wednesday, 23 April
16:15-18:45

LASERs in Space : LASER utilization in space programs and recent topics on the optical data relay satellite in JAXA

Shiro Yamakawa

Japan Aerospace Exploration Agency (JAXA), Japan

Ultrafast Quantum Simulation and Quantum Computing with Ultracold Atom Arrays at Quantum Speed Limit

Kenji Ohmori

Institute for Molecular Science (IMS), Japan

What is Life? Towards Imaging the Molecular Machinery of the Cell

R. J. Dwayne Miller

University of Toronto, Canada

Conferences

ALPS .....Advanced Lasers and Photon Sources

BISC.....Biomedical Imaging and Sensing Conference

FAAP .....The Future of Agriculture and Advanced Photonics

HEDS .....International Conference on High Energy Density Science

ICNNQ.....International Conference on Nano-photonics, Nano-optoelectronics and Quantum technology

LSC.....Conference on Laser and Synchrotron Radiation Combination Experiment

LSSE.....Laser Solutions for Space and the Earth

META.....Meta Photonics: Design, Fabrication, Characterization, and Applications

OMC.....Optical Manipulation and Structured Materials Conference

OPTM.....Optical Technology and Measurement for Industrial Applications

OWPT.....Optical Wireless and Fiber Power Transmission Conference

SI-Thru.....Sensing and Imaging through Scattering and Fluctuating Field in Biology, Telecommunication, and Astronomy

TILA-LIC....Tiny Integrated Laser and Laser Ignition Conference

XOPT.....International Conference on X-ray Optics and Applications

Organaized by OPI OPTICS & PHOTONICS International Council

International Partners SPIE. PHOTONICS MEDIA

FOUR WORLD-CLASS EXHIBITIONS

Photonics West Exhibition

Tues. 28 January . . . . . 10:00 AM–5:00 PM

Wed. 29 January . . . . . 10:00 AM–5:00 PM

Thurs. 30 January . . . . . 10:00 AM–4:00 PM

Photonics West is the premier photonics and laser exhibition. Find the latest components, devices, and systems for your research or business needs.

BiOS Expo

Sat. 25 January. . . . . 10:00 am–5:00 pm

Sun. 26 January.. . . . . 10:00 am–4:00 pm

BiOS Expo, the world's largest biomedical optics and biophotonics exhibition, kicks off the Photonics West week. Find the latest technologies from companies supplying biomedical research and healthcare solutions.

Quantum West Expo

Tues. 28 January . . . . . 10:00 AM–5:00 PM
Wed. 29 January . . . . . 10:00 AM–5:00 PM

Find the best Quantum 2.0 technologies. Companies offer an inside look into their innovations, capabilities, and services. Build partnerships that will advance your work, save you money, and keep you on the cutting edge of the Quantum 2.0 revolution.

CO-LOCATED WITH

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Tues. 28 January . . . . . 10:00 AM–5:00 PM
Wed. 29 January . . . . . 10:00 AM–5:00 PM

Featuring must-see presentations and demonstrations from the biggest names in consumer electronics and up-and-coming XR companies. Located in Moscone Center West, access to this exhibition is included with all registration types.

Learn more: **spie.org/avr**

Walk the floor and see who is exhibiting

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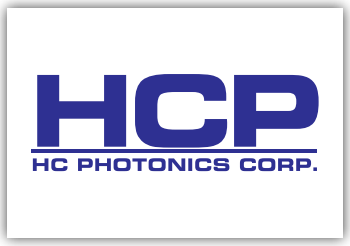
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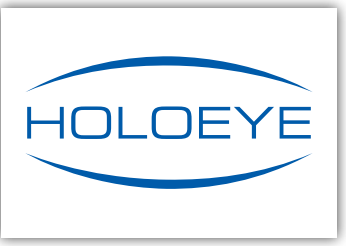
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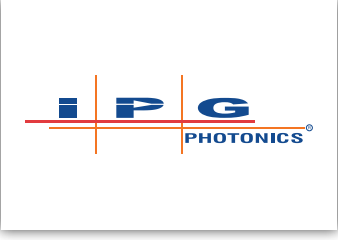
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2025 BIOS PROMOTIONAL PARTNERS

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SPIE. PHOTONICS WEST

17–22 January 2026 | The Moscone Center | San Francisco, California, USA

PHOTONICS WEST EXHIBITION
20–22 January

BIOS EXPO
17–18 January

QUANTUM WEST EXPO
20–22 January

+ All New:
VISION TECH EXPO
20–22 January

The world's premier lasers, biomedical optics and biophotonic technologies, quantum, and optoelectronics event

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OPTICS & PHOTONICS International Exhibition

OPIE '25

https://www.opie.jp/en/

LASER EXPO
- Power Laser Forum zone
- Laser Lighting - Display, Optical Wireless Power Transmission zone

LENS EXPO

Positioning EXPO

Space & Astronomical Optics EXPO

Sensor & Imaging EXPO

Light Source & Optical Devices EXPO

Optical Communication & Applications EXPO

Co-located with Congress **OPIC2025**

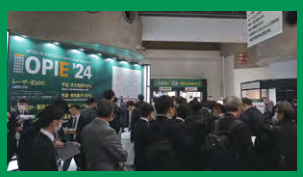
https://opicon.jp/

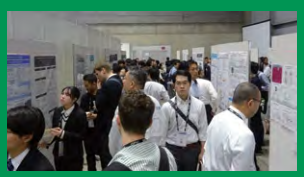
Plan to Attend!

23-25 April, 2025

Pacifico Yokohama, Japan

Total Projected Participation - Exhibitors 500 - Attendees 18,000





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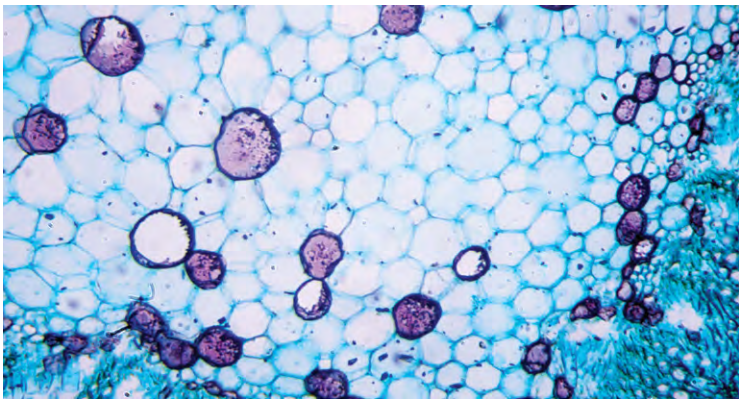
For further information **OPTRONICS** intl@optronics.co.jp



BiOS

The industry's most important meeting for biophotonics, biomedical optics, and imaging

Speaker Check-In and Preview Station

Locations:

Moscone South, Upper Mezzanine Overlook (Saturday-Thursday)

Moscone West, Level 2 Lobby (Sunday–Thursday)

Open during Registration hours

All speakers must stop at Speaker Check-In to upload and preview their slide presentation files at least two hours before their scheduled session or the day before if you present in the first session. Speakers are not able to present using their own devices. All conference rooms have a laptop, projector, screen, lapel microphone, and laser pointer.

BiOS Poster Sessions

Conference attendees are invited to attend the poster sessions. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

BiOS Poster Session - Sunday

26 January 2025 • 5:30 PM - 7:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Sunday 10:00 AM - 5:00 PM

BiOS Student 3-Minute Poster Presentations

Sponsored by JBO, BIOS, and Neurophotonics

27 January 2025 • 4:30 PM - 5:30 PM
Moscone West, Room 2001 (Level 2)

Students present 3-minute rapid-fire overviews of their BiOS poster research. The top three presentations will receive cash prizes.

BiOS Poster Session - Monday

27 January 2025 • 5:30 PM - 7:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Monday 10:00 AM - 5:00 PM

Poster authors: View poster presentation guidelines and set-up instructions at **https://spie.org/PW/poster-guidelines**

BIOS SYMPOSIUM CHAIRS

Sergio Fantini
Tufts Univ. (USA)

Paola Taroni
Politecnico di Milano (Italy)

BIOS SYMPOSIUM CO-CHAIRS

Rainer Leitgeb
Medizinische Univ. Wien (Austria)

Laura Marcu
Univ. of California, Davis (USA)

BIOS PROGRAM TRACK CHAIRS

Medical Photonics: Therapeutics and Diagnostics

Brian Jet-Fei Wong, Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (USA)
Gabriela Apiou, Wellman Center for Photomedicine and Massachusetts General Hospital Research Institute, Harvard Medical School (USA)

Neurophotonics, Neurosurgery, and Optogenetics

Anna Wang Roe, Nathan Kline Institute, New York Univ. (USA)
Shy Shoham, New York Univ. (USA)

Technologies for Translational Biophotonics

Tuan Vo-Dinh, Duke Univ. (USA)
Anita Mahadevan-Jansen, Vanderbilt Univ. (USA)

Tissue Optics and Light-Tissue Interaction

E. Duco Jansen, Vanderbilt Univ. (USA)
Jessica C. Ramella-Roman, Florida International Univ. (USA)

Biomedical Spectroscopy, Microscopy, and Imaging

Ammasi Periasamy, Univ. of Virginia (USA)
Daniel L. Farkas, Univ. of Southern California (USA) and SMI (USA)

Nano/Biophotonics

Paras Prasad, Univ. at Buffalo (USA)
Ewa M. Goldys, The Univ. of New South Wales (Australia)

BiOS DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Medical Photonics: Therapeutics and Diagnostics (Brian Jet-Fei Wong, Gabriela Apiou)					
13292 **Photonics in Dermatology and Plastic Surgery 2025** *(Haishan Zeng; Milind Rajadhyaksha)* Moscone South, Room 154 (Upper Mezz)					
13293 **Advanced Photonics in Urology 2025** *(Hyun Wook Kang; Ronald Sroka; Jian J. Zhang)* Moscone South, Room 301 (Level 3)					
13294 **Imaging, Therapeutics, and Advanced Technology in Head and Neck Surgery and Otolaryngology 2025** *(Brian J. F. Wong; Justus F. Ilgner)* Moscone South, Room 201 (Level 2)					
13295 **Light in Cardiology 2025** *(Gijs van Soest; Irina V. Larina; Christos Bourantas)* Moscone South, Room 155 (Upper Mezz)		13296 **Biophotonics and Immune Responses XX** *(Wei R. Chen; Feifan Zhou)* Moscone South, Room 151 (Upper Mezz)			
13297 **Mechanisms of Photobiomodulation Therapy XIX** *(Ann Liebert; Jeri-Anne Lyons; James D. Carroll)* Moscone South, Room 153 (Upper Mezz)		13298 **Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2025** *(Tianhong Dai; Jürgen Popp; Mei X. Wu)* Moscone South, Room 102 (Level 1 Lobby)			
13299 **Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXIII** *(David H. Kessel; Tayyaba Hasan; Edward V. Maytin)* Moscone South, Room 151 (Upper Mezz)					
13300 **Ophthalmic Technologies XXXV** *(Daniel X. Hammer; Derek Nankivil; Yuankai K. Tao)* Moscone South, Room 156 (Upper Mezz)					
13301 **Molecular-Guided Surgery: Molecules, Devices, and Applications XI** *(Summer L. Gibbs; Kenneth M. Tichauer)* Moscone South, Room 152 (Upper Mezz)					

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Neurophotonics, Neurosurgery, and Optogenetics (Anne Roe, Shy Shoham)					
13302 **Clinical and Translational Neurophotonics 2025** *(Jana M. Kainerstorfer; Erin M. Buckley; Vivek Jay Srinivasan)* Moscone South, Room 105 (Level 1 Lobby)		13303 **Neural Imaging and Sensing 2025** *(Qingming Luo; Jun Ding; Ling Fu)* Moscone South, Room 105 (Level 1 Lobby)			
Conference 13304 **Optogenetics and Optical Manipulation 2025** *(Anna W. Roe; Shy Shoham)* Moscone South, Room 104 (Level 1 Lobby)					
Technologies for Translational Biophotonics (Tuan Vo-Dinh, Anita Mahadevan-Jansen)					
13306 **Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XXIII** *(Caroline Boudoux; James W. Tunnell)* Moscone South, Room 203 (Level 2)		13305 **Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXIX** *(Rainer A. Leitgeb; Yoshiaki Yasuno)* Moscone South, Room 203 (Level 2)			
13307 **Optics and Biophotonics in Low-Resource Settings XI** *(David Levitz; Aydogan Ozcan)* Moscone South, Room 202 (Level 2)					
13308 **Design and Quality for Biomedical Technologies XVIII** *(Gracie Vargas; T. Joshua Pfefer)* Moscone South, Room 211 (Level 2)					
13309 **Multimodal Biomedical Imaging XX** *(Xavier Intes; Marien Ochoa; Mohammad Abbas Yaseen)* Moscone South, Room 204 (Level 2)					
13310 **Optical Fibers and Sensors for Medical Diagnostics, Treatment, and Environmental Applications XXV** *(Israel Gannot; Katy Roodenko)* Moscone South, Room 212 (Level 2)					
		13311 **Optical Biopsy XXIII: Toward Real-Time Spectroscopic Imaging and Diagnosis** *(Robert R. Alfano; Angela B. Seddon; Lingyan Shi; Binlin Wu)* Moscone South, Room 211 (Level 2)			
	13312 **Microfluidics, BioMEMS, and Medical Microsystems XXIII** *(Bastian E. Rapp; Colin Dalton)* Moscone South, Room 204 (Level 2)				
13313 **Biophotonics in Exercise Science, Sports Medicine, Health Monitoring Technologies, and Wearables VI** *(Babak Shadgan; Amir H. Gandjbakhche)* Moscone South, Room 210 (Level 2)		13314 **Optical Tomography and Spectroscopy of Tissue XVI** *(Sergio Fantini; Paola Taroni)* Moscone South, Room 213 (Level 2)			

BiOS DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
13315 **Visualizing and Quantifying Drug Distribution in Tissue IX** *(Kin Foong Chan; Conor L. Evans)* Moscone South, Room 205 (Level 2)		13316 **Optical Diagnostics and Sensing XXV: Toward Point-of-Care Diagnostics** *(Gerard L. Coté; Justin S. Baba)* Moscone South, Room 304 (Level 3)			
Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering (E. Duco Jansen, Jessica C. Ramella-Roman)					
13317 **Optical Interactions with Tissue and Cells XXXVI** *(Norbert Linz; Joel N. Bixler; Alex J. Walsh)* Moscone South, Room 160 (Upper Mezz)					
13318 **Dynamics and Fluctuations in Biomedical Photonics XXII** *(Valery V. Tuchin; Martin J. Leahy; Ruikang K. Wang)* Moscone South, Room 304 (Level 3)					
13320 **Biomedical Light Scattering XV** *(Adam Wax; Vadim Backman)* Moscone South, Room 101 (Level 1 Lobby)	13319 **Photons Plus Ultrasound: Imaging and Sensing 2025** *(Alexander A. Oraevsky; Lihong V. Wang)* Moscone South, Room 205 (Level 2)				
13321 **Optical Elastography and Tissue Biomechanics XII** *(Kirill V. Larin; Giuliano Scarcelli)* Moscone South, Room 103 (Level 1 Lobby)					
13322 **Polarized Light and Optical Angular Momentum for Biomedical Diagnostics 2025** *(Jessica C. Ramella-Roman; Hui Ma; Tatiana Novikova; Daniel S. Elson; I. Alex Vitkin)* Moscone South, Room 102 (Level 1 Lobby)					
	13353 **Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXV** *(Peter R. Herman; Roberto Osellame; Adela Ben-Yakar)* Moscone South, Room 210 (Level 2)				
Biomedical Microscopy, Spectroscopy, and Imaging (Ammasi Periasamy, Daniel L. Farkas)					
		13323 **Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXIII** *(Attila Tarnok; Jessica P. Houston; Xuantao Su)* Moscone South, Room 312 (Level 3)			
	13324 **Multiphoton Microscopy in the Biomedical Sciences XXV** *(Ammasi Periasamy; Peter T. C. So; Karsten König)* Moscone South, Room 301 (Level 3)			13325 **Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXXII** *(Thomas G. Brown; Tony Wilson; Laura Waller)* Moscone South, Room 301 (Level 3)	
13326 **Single Molecule Spectroscopy and Superresolution Imaging XVIII** *(Rainer Erdmann; Mike Heilemann; Felix Koberling)* Moscone South, Room 307 (Level 3)					

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
13327 **Multiscale Imaging and Spectroscopy VI** *(Paul J. Campagnola; Darren M. Roblyer; Alex J. Walsh)* Moscone South, Room 305 (Level 3)					
	13328 **Adaptive Optics and Wavefront Control for Biological Systems XI** *(Thomas G. Bifano; Na Ji; Lei Tian)* Moscone South, Room 308 (Level 3)				
13329 **Quantitative Phase Imaging XI** *(Yang Liu; YongKeun Park)* Moscone South, Room 311 (Level 3)					
13330 **High-Throughput Biophotonics: Imaging, Spectroscopy, and Beyond X** *(Kevin K. Tsia; Keisuke Goda)* Moscone South, Room 312 (Level 3)					
	13331 **Label-free Biomedical Imaging and Sensing (LBIS) 2025** *(Natan T. Shaked; Oliver Hayden)* Moscone South, Room 303 (Level 3)				
13332 **Advanced Chemical Microscopy for Life Science and Translational Medicine 2025** *(Ji-Xin Cheng; Wei Min; Garth J. Simpson)* Moscone South, Room 314 (Level 3)					
13333 **Computational Optical Imaging and Artificial Intelligence in Biomedical Sciences II** *(Liang Gao; Guoan Zheng; Seung Ah Lee)* Moscone South, Room 306 (Level 3)					
13334 **Endoscopic Microscopy XX** *(Guillermo J. Tearney M.D.; Thomas D. Wang; Melissa J. Suter)* Moscone South, Room 313 (Level 3)					
Nano/Biophotonics (Paras Prasad, Ewa M. Goldys)					
	13335 **Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XXII** *(Dror Fixler; Sebastian Wachsmann-Hogiu)* Moscone South, Room 104 (Level 1 Lobby)				
13336 **Colloidal Nanoparticles for Biomedical Applications XX** *(Marek Osiński; Antonios G. Kanaras)* Moscone South, Room 50 (Lower Mezz)					
	13337 **Plasmonics in Biology and Medicine XXII** *(Tuan Vo-Dinh; Ho-Pui A. Ho; Krishanu Ray)* Moscone South, Room 58 (Lower Mezz)				
13338 **Frontiers in Biological Detection: From Nanosensors to** Systems XVII *(Amos Danielli; Benjamin L. Miller; Sharon M. Weiss)* Moscone South, Room 70 (Lower Mezz)			13339 **Reporters, Contrast Agents, and Molecular Probes for Biomedical Applications XVI** *(Mikhail Y. Berezin; Ramesh Raghavachari)* Moscone South, Room 104 (Level 1 Lobby)		
13340 **Quantum Effects and Measurement Techniques in Biology and Biophotonics II** *(Clarice Aiello; Sergey V. Polyakov; Paige Derr)* Moscone South, Room 54 (Lower Mezz)					

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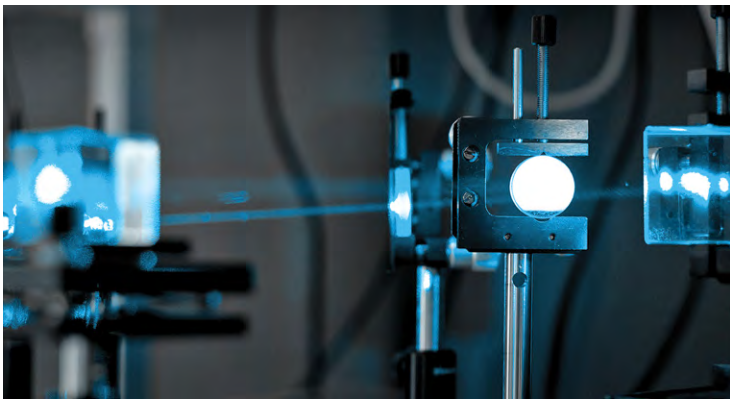

LASE

The most important event for industrial laser, laser source, and laser applications

Speaker Check-In and Preview Station

Locations:

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LASE and select BiOS Poster Session

28 January 2025 • 6:00 PM - 8:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Conference attendees are invited to attend the poster sessions. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster authors: View poster presentation guidelines and set-up instructions at **https://spie.org/PW/poster-guidelines**

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Clemson Univ. (USA)

LASE PROGRAM TRACK CHAIRS

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Clémence Jollivet, Coherent Corp. (USA)
Yasumasa Kawakita, Furukawa Electric Co., Ltd. (Japan)

Nonlinear Optics and Beam Guiding
Vladimir Ilchenko, Jet Propulsion Lab. (USA)
Paul O. Leisher, Luminar Technologies, Inc. (USA)

Micro/Nano Applications
Henry Helvajian, The Aerospace Corp.(USA)
Guido Hennig, Daetwyler Graphics AG (Switzerland)

Macro Applications
Bo Gu, Bos Photonics (USA)
Constantin L. Häfner, Fraunhofer-Institut für Lasertechnik ILT (Germany)

LASE DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates | Presentation times are subject to change

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Laser Sources (Clémence Jollivet, Yasumasa Kawakita)					
	13341 **Solid State Lasers XXXIV: Technology and Devices** *(W. Andrew Clarkson; Ramesh K. Shori)* Moscone South, Room 302 (Level 3)				
		13342 **Fiber Lasers XXII: Technology and Systems** *(Thomas Schreiber; Matthias Savage-Leuchs)* Moscone South, Room 156 (Upper Mezz)			
		13344 **Components and Packaging for Laser Systems XI** *(Alexei L. Glebov; Ruth Houbertz; Stefan W. Heinemann)* Moscone South, Room 206 (Level 2)		13343 **High Power Lasers for Fusion Research VIII** *(Abdul A. S. Awwal; Constantin L. Häfner)* Moscone South, Room 303 (Level 3)	
	13345 **High-Power Diode Laser Technology XXIII** *(Mark S. Zediker; Erik P. Zucker; Jenna Campbell)* Moscone South, Room 201 (Level 2)				
			13346 **Vertical External Cavity Surface Emitting Lasers (VECSELs) XIV** *(Marcel Rattunde)* Moscone South, Room 212 (Level 2)		
Nonlinear Optics/Beam Guiding (Vladimir Ilchenko, Paul O. Leisher)					
			13347 **Nonlinear Frequency Generation and Conversion: Materials and Devices XXIV** *(Jeffrey Moses; Christopher R. Phillips)* Moscone South, Room 151 (Upper Mezz)		
			13348 **Real-time Measurements, Rogue Phenomena, and Single-Shot Applications X** *(Daniel R. Solli; Georg Herink; Serge Bielawski)* Moscone South, Room 314 (Level 3)		
			13349 **Laser Resonators, Microresonators, and Beam Control XXVII** *(Vladimir S. Ilchenko; Andrea M. Armani; Julia V. Sheldakova; Alexis V. Kudryashov; Andrey B. Matsko)* Moscone South, Room 207 (Level 2)		

LASE DAILY CONFERENCE SCHEDULE

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SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Micro/Nano Applications (Henry Helvajian, Guido Hennig)					
		13350 **Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXX** *(Jan Kleinert; Godai Miyaji; Gwenn Pallier)* Moscone South, Room 308 (Sessions 1&4 in Room 214)			
13352 **Nanoscale and Quantum Materials: From Synthesis and Laser Processing to Applications 2025** *(Andrei V. Kabashin; Maria Farsari; Masoud Mahjouri-Samani)* Moscone South, Room 213 (Level 2)		13351 **Laser-based Micro- and Nanoprocessing XIX** *(Rainer Kling; Wilhelm Pfleging; Koji Sugioka)* Moscone South, Room 214 (Level 2)			
	13353 **Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXV** *(Peter R. Herman; Roberto Osellame; Adela Ben-Yakar)* Moscone South, Room 210 (Level 2)				
			13354 **Laser 3D Manufacturing XII** *(Bo Gu; Hongqiang Chen; Henry Helvajian)* Moscone South, Room 201 (Session 1 in Rm 155)		
Macro Applications (Bo Gu, Constantin L. Häfner)					
			13354 **Laser 3D Manufacturing XII** *(Bo Gu; Hongqiang Chen; Henry Helvajian)* Moscone South, Room 201 (Session 1 in Rm 155)		
			13355 **Free-Space Laser Communications XXXVII** *(Hamid Hemmati; Bryan S. Robinson)* Moscone South, Room 208 (Level 2)		
				13356 **High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XIV** *(Stefan Kaierle; Klaus R. Kleine)* Moscone South, Room 212 (Level 2)	
		13358 **Optical Technologies for Inertial Fusion Energy** *(Stavros G. Demos; Carmen S. Menoni)* Moscone South, Room 76 (Lower Mezz)		13357 **Photonic Technologies in Plant and Agricultural Science II** *(Dag Heinemann; Gerrit Polder)* Moscone South, Room 215 (Level 2)	
			13359 **Optical Power Delivery** *(Bahram Jalali; Carlos Algora; Takeo Maruyama)* Moscone South, Room 215 (Tue); Moscone West, Room 2022 (Wed)		

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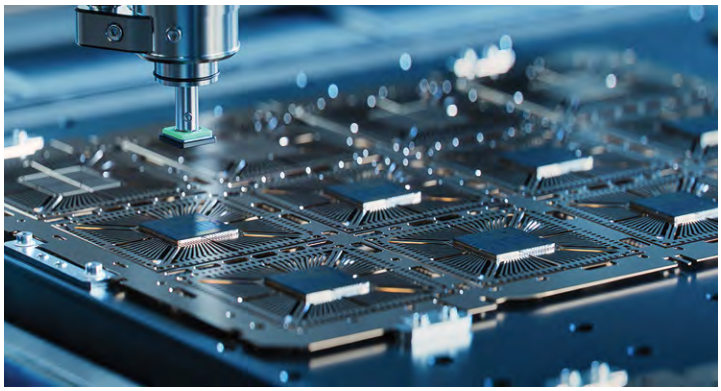

OPTO

OPTO is the most important optoelectronics conference in the field and addresses the latest developments in a broad range of optoelectronic technologies and their integration for a variety of commercial applications.

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OPTO and Quantum West Poster Session

29 January 2025 • 6:00 PM - 8:00 PM
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Poster Setup: Wednesday 10:00 AM - 5:00 PM

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Georg von Freymann
Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

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Shibin Jiang, AdValue Photonics, Inc. (USA)

Photonic Integration
Yakov Sidorin, Quarles & Brady LLP (USA)
Jean-Emmanuel Broquin, Univ. Grenoble Alpes (France)

Nanotechnologies in Photonics
Ali Adibi, Georgia Institute of Technology (USA)

MOEMS-MEMS in Photonics
Hans Zappe, Univ. of Freiburg (Germany)

Semiconductor Lasers, LEDs, and Applications
Alexey Belyanin, Texas A&M Univ. (USA)
Martin Strassburg, ams-OSRAM International GmbH (Germany)

Displays and Holography
Liang-Chy Chien, Kent State Univ. (USA)

OPTO DAILY CONFERENCE SCHEDULE

Check the conference schedule frequently for updates
Presentation times are subject to change

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Optoelectronic Materials and Devices (Shibin Jiang)					
			13360 **Physics and Simulation of Optoelectronic Devices XXXIII** *(Bernd Witzigmann; Marek Osinski; Yasuhiko Arakawa)* Moscone West, Room 2008 (Level 2)		
			13361 **Physics, Simulation, and Photonic Engineering of Photovoltaic Devices XIV** *(Alexandre Freundlich; Karin Hinzer; Ian R. Sellers; Henning Helmers)* Moscone West, Room 2001 (Tue) and Room 2022 (Wed-Thu)		
		13362 **Optical Components and Materials XXII** *(Shibin Jiang; Michel J. F. Digonnet)* Moscone West, Room 2012 (Level 2)		13363 **Organic Photonic Materials and Devices XXVII** *(William M. Shensky III; Ileana Rau; Okihiro Sugihara)* Moscone West, Room 2012 (Level 2)	
		13364 **Ultrafast Phenomena and Nanophotonics XXIX** *(Markus Betz; Abdulhakem Y. Elezzabi)* Moscone West, Room 2020 (Level 2)			
		13365 **Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVIII** *(Laurence P. Sadwick; Tianxin Yang)* Moscone West, Room 2024 (Level 2)			
		13366 **Gallium Nitride Materials and Devices XX** *(Hiroshi Fujioka; Hadis Morkoç; Ulrich T. Schwarz)* Moscone West, Room 2018 (Level 2)			
	13367 **Oxide-based Materials and Devices XVI** *(David J. Rogers; Férechteh H. Teherani)* Moscone West, Room 2014 (Level 2)				
		13368 **2D Photonic Materials and Devices VIII** *(Arka Majumdar; Carlos M. Torres Jr.; Hui Deng)* Moscone West, Room 2010 (Level 2)			
Photonic Integration (Yakov Sidorin, Jean-Emmanuel Broquin)					
		13365 **Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVIII** *(Laurence P. Sadwick; Tianxin Yang)* Moscone West, Room 2024 (Level 2)			
		13369 **Integrated Optics: Devices, Materials, and Technologies XXIX** *(Sonia M. García-Blanco; Pavel Cheben)* Moscone South, Room 307 (Level 3)			
		13370 **Smart Photonic and Optoelectronic Integrated Circuits 2025** *(Laurent Vivien; Sailing He)* Moscone South, Room 305 (Level 3)			
			13371 **Silicon Photonics XX** *(Graham T. Reed; Jonathan Bradley)* Moscone South, Room 306 (Session 1 Room 305)		
			13372 **Optical Interconnects and Packaging 2025** *(Ray T. Chen; Henning Schröder)* Moscone South, Room 204 (Level 2)		
		13373 **Photonic Instrumentation Engineering XII** *(Lynda E. Busse; Yakov Soskind)* Moscone South, Room 313 (Level 3)			
			13374 **Next-Generation Optical Communication: Components, Sub-Systems, and Systems XIV** *(Guifang Li; Kazuhide Nakajima; Atul K. Srivastava)* Moscone South, Room 302 (Level 3)		
		13375 **AI and Optical Data Sciences VI** *(Masaya Notomi; Tingyi Zhou)* Moscone South, Room 202 (Level 2)			

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Nanotechnologies in Photonics (Ali Adibi)					
	13376 **Quantum Sensing and Nano Electronics and Photonics XXI** *(Manijeh Razeghi; Giti A. Khodaparast; Miriam S. Vitiello)* Moscone South, Room 101 (Level 1 Lobby)				
		13377 **Photonic and Phononic Properties of Engineered Nanostructures XV** *(Ali Adibi; Shawn-Yu Lin; Axel Scherer)* Moscone South, Room 70 (Lower Mezz)			
		13378 **High Contrast Metastructures XIV** *(Connie J. Chang-Hasnain; Andrea Alù; Weimin Zhou)* Moscone South, Room 311 (Level 3)			
				13379 **Photonic Heat Engines: Science and Applications VII** *(Denis V. Seletskiy; Masaru K. Kuno; Peter J. Pauzauskie)* Moscone South, Room 105 (Level 1 Lobby)	
			13380 **Optical Sensing and Precision Metrology** *(Jacob Scheuer)* Moscone South, Room 54 (Lower Mezz)		
	13381 **Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVIII** *(Christophe Moser; Eva Blasco; Debashis Chanda; Georg von Freymann)* Moscone South, Room 155 (Upper Mezz)				
MOEMS-MEMS in Photonics (Hans Zappe)					
	13381 **Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVIII** *(Christophe Moser; Eva Blasco; Debashis Chanda; Georg von Freymann)* Moscone South, Room 155 (Upper Mezz)				
		13382 **MOEMS and Miniaturized Systems XXIV** *(Hans Zappe; Wibool Piyawattanametha; Yong-Hwa Park)* Moscone West, Room 2022 (Level 2)			
			13383 **Emerging Digital Micromirror Device Based Systems and Applications XVII** *(Benjamin L. Lee; Alex Lyubarsky)* Moscone South, Room 206 (Session 1 in Room 155)		
Semiconductor Lasers, LEDs, and Applications (Alexey Belyanin, Martin Strassburg)					
			13360 **Physics and Simulation of Optoelectronic Devices XXXIII** *(Bernd Witzigmann; Marek Osiński; Yasuhiko Arakawa)* Moscone West, Room 2008 (Level 2)		
		13366 **Gallium Nitride Materials and Devices XX** *(Hiroshi Fujioka; Hadis Morkoç; Ulrich T. Schwarz)* Moscone West, Room 2018 (Level 2)			
				13384 **Vertical-Cavity Surface-Emitting Lasers XXIX** *(Kent D. Choquette; Luke A. Graham)* Moscone South, Room 102 (Level 1 Lobby)	
		13385 **Novel In-Plane Semiconductor Lasers XXIV** *(Alexey A. Belyanin; Peter M. Smowton)* Moscone South, Room 103 (Level 1 Lobby)			
		13386 **Light-Emitting Devices, Materials, and Applications XXIX** *(Jong Kyu Kim; Michael R. Krames; Martin Strassburg)* Moscone West, Room 2016 (Level 2)			

OPTO DAILY CONFERENCE SCHEDULE

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SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Displays and Holography (Liang-Chy Chien)					
		13387 **Emerging Liquid Crystal Technologies XX** *(Liang-Chy Chien; Nelson V. Tabiryan; Jun Yamamoto)* Moscone West, Room 2004 (Level 2)			
		13388 **Advances in Display Technologies XV** *(Jiun-Haw Lee; Qiong-Hua Wang; Liang-Chy Chien)* Moscone West, Room 2002 (Level 2)		13389 **Ultra-High-Definition Imaging Systems VIII** *(Seizo Miyata; Toyohiko Yatagai; Yasuhiro Koike)* Moscone West, Room 2004 (Level 2)	
			13390 **Practical Holography XXXIX: Displays, Materials, and Applications** *(Pierre-Alexandre J. Blanche; Hiroshi Yoshikawa)* Moscone West, Room 2006 (Level 2)		

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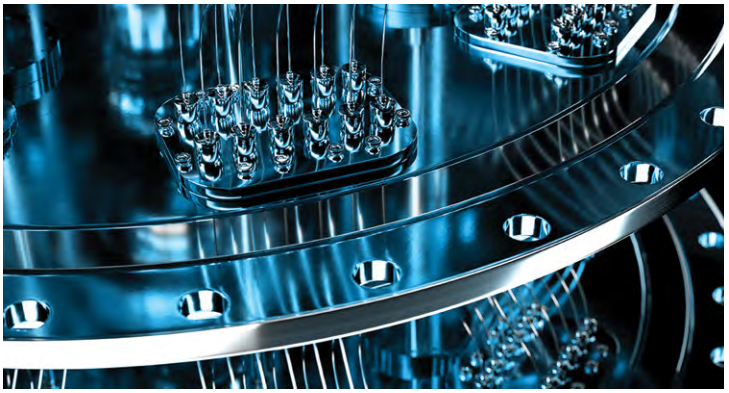

QUANTUM WEST

Quantum West showcases the exciting Possibilities of Quantum 2.0 and the future of applied quantum technologies to solve entirely new challenges and provide unique capabilities in large-scale systems.

Speaker Check-In and Preview Station

Locations:

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OPTO and Quantum West Poster Session

29 January 2025 • 6:00 PM - 8:00 PM
Moscone West, Room 2003 (Level 2)

Poster Setup: Wednesday 10:00 AM - 5:00 PM

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QUANTUM WEST DAILY CONFERENCE SCHEDULE

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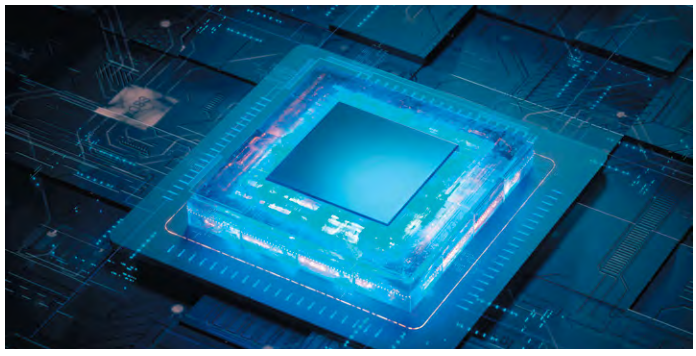
SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
13340 **Quantum Effects and Measurement Techniques in Biology and Biophotonics II** *(Clarice Aiello; Sergey V. Polyakov; Paige Derr)* Moscone South, Room 54 (Lower Mezz)					
13391 **Quantum Computing, Communication, and Simulation V** *(Philip R. Hemmer; Alan L. Migdall)* Moscone South, Room 158 (Upper Mezz)					
13392 **Quantum Sensing, Imaging, and Precision Metrology III** *(Selim M. Shahriar)* Moscone South, Room 157/159 (Upper Mezz)					
		13393 **Complex Light and Optical Forces XIX** *(David L. Andrews; Enrique J. Galvez; Halina Rubinsztein-Dunlop)* Moscone South, Room 160 (Upper Mezz)			

APPLICATION TRACKS

Application tracks enable attendees to group and explore presentations in the conference programs to more easily plan their event schedule around the topic of interest. Application track filters span across all conferences of SPIE Photonics West. The ability to group presentations together across the entire event in this way helps participants more easily locate a presentation in their area of interest and has the reciprocal benefit of helping authors' presentations be more easily found.

Six application tracks to explore

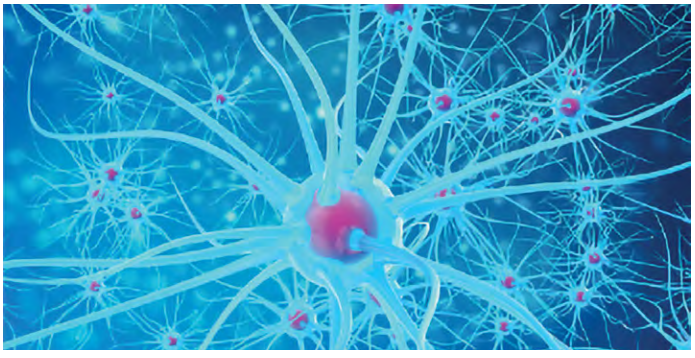


AI/ML - Artificial intelligence / Machine learning

Papers that highlight the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems across multiple sectors, technologies, and applications.

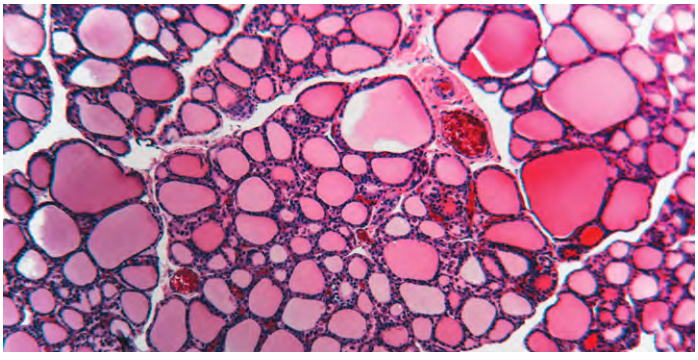
Sustainability

Papers that highlight the use of optics and photonics for renewable energy, natural resource management, sustainable and green manufacturing, and greenhouse gas mitigation in support of the UN Sustainable Development Goals.



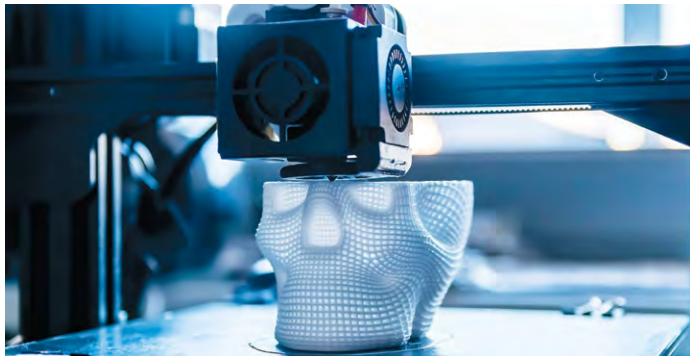
Brain function

Papers that highlight the development of innovative optics and photonics technologies that increase our understanding of brain physiology and function.



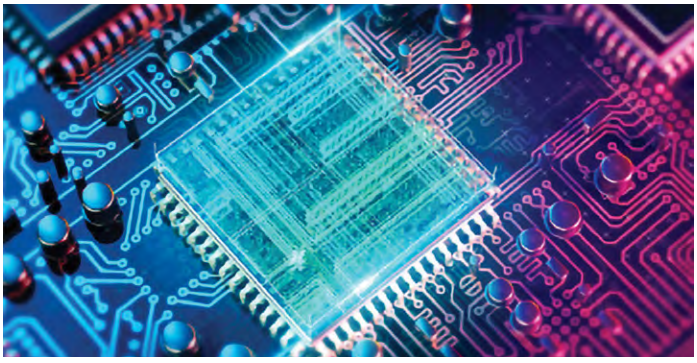
Translational research

Papers that highlight the transition from bench to bedside using the latest photoniacs technologies, tools, and techniques for healthcare.



3D printing

Papers that highlight the innovative use of optics and photonics in multidisciplinary applications for multidimensional manufacturing.



Photonic Chips

Papers that highlight advances in materials, design, fabrication, integration, testing and packaging of photonic components at the chip level.

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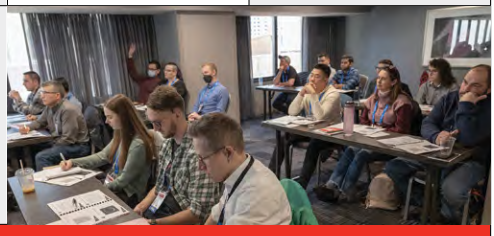
SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
AR | VR | MR					
	SC1310 **Optical Metrology for AR/VR/MR** *(Zhou)* **AM**	SC1338 **Display Engines for Mixed Reality: Optical Design & Technology** *(Georgiou)* **AM**			SC1096 **Head-Mounted Display Requirements and Designs for Augmented Reality Applications** *(Browne, Melzer)* **AM–PM**
	SC1218 **Optical Technologies and Architectures for Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Head-Mounted Displays (HMDs)** *(Kress)* **PM**	SC1317 **Waveguides for Mixed Reality: Principles and Applications** *(Georgiou)* **PM**			
Biomedical Microscopy, Spectroscopy, and Imaging					
SC1345 **Diffuse Optical Imaging and Functional Near Infrared Spectroscopy** *(Dehghani, O'Sullivan)* **AM–PM**					
Imaging					
		SC1336 **Current Trends in Miniature Camera Technology from Visible to Infrared: Optimization for Performance, Size, and Cost** *(Matherson, Dorn)* **AM–PM**	SC1323 **CMOS Image Sensors: Technology, Applications and Camera Design Methodology** *(Crisp)* **PM**	SC1231 **Designing and Specifying Digital Cameras** *(Baldwin)* **AM**	
				SC1334 **Introduction to Photoacoustic (Optoacoustic) Imaging** *(Rosenthal)* **PM**	

AM = 8:30 AM - 12:30 PM
PM = 1:30PM - 5:30 PM
AM-PM: 8:30 AM - 5:30 PM

MONEY-BACK GUARANTEE

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Onsite courses
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DAILY COURSE SCHEDULE

Check the course schedule and view prices and course descriptions online.

See full details and updates at **spie.org/pw** or on the **SPIE App**

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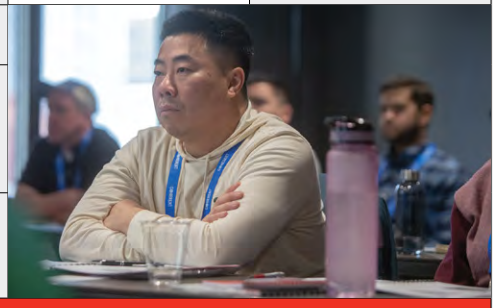
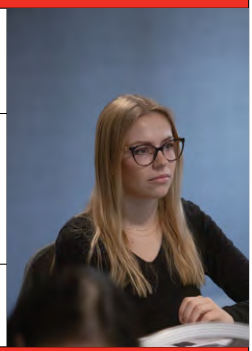
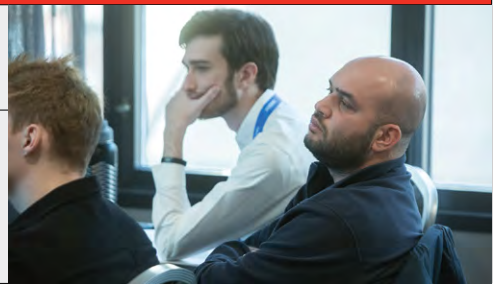
Laser Sources					
	SC1346 **Petawatt Peak Powers and Beyond** *(Waxer)* **AM–PM**			SC972 **Basic Laser Technology: Fundamentals and Performance Specifications** *(Sukuta)* **AM**	
	SC752 **Solid State Laser Technology** *(Hodgson)* **AM–PM**				
Macro Applications					
	SC1335 **Laser Beam Propagation in Random Media for Application in Laser Communications, Active Imaging and Laser Radar** *(Stotts)* **AM–PM**	SC1327 **Optical Turbulence and Laser Beam Propagation** *(Toselli)* **AM–PM**			
Metrology and Standards					
	SC1310 **Optical Metrology for AR/VR/MR** *(Zhou)* **AM**		SC863 **Introduction to Modern Optical Drawings – the ISO 10110 Standard** *(Aikens)* **AM**	SC700 **Understanding Scratch and Dig Specifications** *(Aikens)* **AM**	
				SC212 **Modern Optical Testing** *(Kim)* **PM**	
				SC1017 **Optics Surface Inspection Workshop** *(Aikens, Takaki)* **PM**	
Micro/Nano Applications					
		SC1285 **Industrial Ultrafast Lasers for Micro-Processing and Applications** *(Hodgson)* **AM–PM**			
MOEMS-MEMS in Photonics					
SC1125 **Design, Modeling and Fabrication Techniques for Micro-Optics: Applications to Display, Imaging, Sensing and Metrology** *(Kress)* **PM**					
Nano/Biophotonics					
			SC1186 **Fluorescence Sensing and Imaging: Towards Portable Healthcare** *(Levi)* **PM**		

DAILY COURSE SCHEDULE

Check the course schedule and view course descriptions online

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Nanotechnologies in Photonics					
	SC1333 **Inverse Design for Photonics** *(Jin, Kharel)* **AM**				
Neurophotonics, Neurosurgery, and Optogenetics					
		SC1126 **Neurophotonics** *(Levi)* **AM**			
Nonlinear Optics / Beam Guiding					
	SC047 **Introduction to Nonlinear Optics** *(Fisher)* **PM**				
Optical Materials & Fabrication					
			SC1178 **Fundamentals of Molded Optics** *(Symmons, Schaub)* **PM**	SC1086 **Optical Materials, Fabrication and Testing for the Optical Engineer** *(DeGroote Nelson)* **AM**	
Optical Systems & Design | Optomechanics					
	SC156 **Basic Optics for Engineers** *(Poutous)* **AM–PM**	SC1347 **Design of Experiments (DOE) in Optics and Photonics** *(Nikitin)* **AM–PM**	SC935 **Optical System Design: Aberrations, Optimization, and Optical Design Software** *(Bentley)* **AM–PM**	SC1232 **Introduction to LIDAR for Autonomous Vehicles and AR/VR** *(Shaw)* **AM**	SC003 **Practical Optical System Design and Engineering** *(Youngworth, Olson)* **AM–PM**
	SC720 **Cost-Conscious Tolerancing of Optical Systems** *(LeBaron Michels)* **AM–PM**	SC015 **Fastening Optical Elements with Adhesives** *(Daly)* **AM**	SC1199 **Stray Light Analysis and Control** *(Fest)* **AM–PM**	SC010 **Introduction to Optical Alignment Techniques** *(Medicus)* **AM–PM**	
	SC1331 **Embedded Optical Systems** *(Kudenov)* **AM**	SC1311 **Understanding Optical System Specifications: Identifying and Managing Hidden Conflicts** *(Bentley)* **AM**		SC690 **Optical System Design: Layout Principles and Practice** *(Olson)* **AM–PM**	
	SC014 **Introduction to Optomechanical Design (2 DAYS)** *(Vukobratovich)* **AM–PM**				
	SC1247 **Polarized Light and Optical Design** *(Chipman)* **AM–PM**	SC1352 **Cleaning Basics for Optical Components and Hardware** *(Lehmann, Wheeler)* **PM**			
	SC011 **Design of Efficient Illumination Systems** *(Cassarly)* **PM**				
Optoelectronic Materials and Devices					
	SC1277 **Photodetectors: Theory, Practice, and Applications** *(Piatek)* **AM**				

AM = 8:30 AM - 12:30 PM
PM = 1:30PM - 5:30 PM
AM-PM: 8:30 AM - 5:30 PM

SATURDAY 25 January	SUNDAY 26 January	MONDAY 27 January	TUESDAY 28 January	WEDNESDAY 29 January	THURSDAY 30 January
Photonic Integration					
	SC1316 **Heterogeneous Integration of Electrical IC and Photonic IC (Co-Packaged Optics)** *(Lau)* **AM**	SC817 **Silicon Photonics** *(Saini, Liu)* **PM**		**For course pricing use the app or go online**	
	SC1071 **Understanding Diffractive and Meta-Optics** *(Soskind)* **AM–PM**				
Quantum West					
			SC1319 **Quantum Computing: A Concise Introduction** *(Venegas-Andraca)* **AM–PM**		
Sales, Marketing, and Non-Technical Professionals					
		SC1224 **Fundamentals of Optical Engineering** *(Vogt)* **AM**			
		SC1353 **Quantum Technology Essentials for Non-Quantum Professionals** *(Hasanovic)* **AM**			
		SC1170 **A Hands-On Introduction to Optics** *(Diehl)* **PM**			
Semiconductor Lasers, LEDs, and Applications					
			SC1259 **Introduction to Vertical-Cavity Surface-Emitting Lasers (VCSELs) and Applications** *(Choquette)* **AM**	SC1146 **Laser Diode Beam Basics, Characteristics and Manipulation** *(Sun)* **PM**	
Technologies for Translational Biophotonics					
	SC312 **Principles and Applications of Optical Coherence Tomography** *(Fujimoto)* **PM**	SC981 **Biomedical and Biosensing Applications of Optical Fibers and Fiber Sensors** *(Mendez, Pinet)* **PM**			
Tissue Optics, Laser-Tissue Interaction, and Tissue Engineering					
	SC029 **Tissue Optics** *(Jacques)* **PM**	SC1290 **Medical Laser-Tissue Interactions** *(Verdaasdonk)* **AM**			
		SC1349 **The Monte Carlo Method for Photon Transport and its Practical Applications in Biomedical Optics** *(Doronin)* **PM**			

Badge pick up and registration hours

There are three locations for registration at Moscone Center. Please note the different days and times each location is available for service.

The Moscone Center

Friday 24 January	South Lobby	4:00 PM–7:00 PM
Saturday 25 January	North Lobby and South Lobby	7:15 AM–5:00 PM
Sunday 26 January	North Lobby, South Lobby, and West Lobby	7:30 AM–5:00 PM
Monday 27 January	North Lobby, South Lobby, and West Lobby	7:30 AM–5:00 PM
Tuesday 28 January	North Lobby, South Lobby, and West Lobby	7:30 AM–5:00 PM
Wednesday 29 January	North Lobby, South Lobby, and West Lobby	7:45 AM–5:00 PM
Thursday 30 January	South Lobby	7:45 AM–4:00 PM
	West Lobby	7:45 AM–2:00 PM

SPIE Cashier

Location: Moscone Center, South Lobby
Open Friday - Thursday, during registration hours

Registration payments

If you are planning to register onsite, please do so at the "Need to Register" laptop station.

- Your credit card payment will be processed during registration.
- If you wish to pay with cash or check, you will be directed to the Cashier once you have completed registration for final payment.
- If you have already registered and wish to add a course, workshop, or special event, you may do this online by signing into your SPIE account.

Receipt and Certificate of Participation

Preregistered attendees who need an SPIE-stamped receipt or attendees who need a Certificate of Participation may obtain those at the Cashier.

Badge corrections

Badge corrections can be made at the Cashier. Please mark your badge with your changes before approaching the counter.

Speaker Check-In and Preview Station

Location: Moscone South, Upper Mezzanine Overlook (Saturday - Thursday)

Location: Moscone West, Level 2 Lobby (Sunday - Thursday)

Open during Registration hours

All speakers must stop at Speaker Check-In to upload and preview their slide presentation files at least two hours before their scheduled session or the day before if you present in the first session. Speakers are not able to present using their own devices. All conference rooms have a laptop, projector, screen, lapel microphone, and laser pointer.

Internet access

Locations: Moscone Center, North, South, West

Complimentary wireless internet access is available throughout Moscone Center North, South, and West buildings, including the exhibition halls.

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SPIE Conference and Exhibition App

Location: Moscone Center, Hall D entrance (Exhibit Level)

SPIE App developers will be onsite and available to answer any questions on its use or navigation and how to get the best user experience. We welcome your feedback.

Search and browse the program, special events, participants, exhibitors, courses, and more. Build your personalized schedule and sync with the online MySchedule tool. Free Conference App available for iPhone and Android phones. Information about restaurants and food options also available on the App. If you have questions, visit the App Desk.

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SPIE Bookstore

Location: Moscone Center North Lower Lobby, Exhibition Level

Saturday–Wednesday . . . . . 8:30 AM–5:30 PM

Thursday . . . . . 8:30 AM–4:00 PM

Stop by the SPIE Bookstore to browse the latest SPIE Press Books, proceedings, and educational materials. While there, get a t-shirt or educational toy to bring home to the family. Credit and debit cards only will be accepted; no cash.

SPIE Course Materials

Location: Moscone Center, South Lobby

Open Friday - Thursday, during registration hours

Browse course offerings or learn more about SPIE courses available in portable formats, such as online and private group training.

SPIE Press Room

Open during registration hours

For registered press only. The Press Room provides meeting space, refreshments, access to exhibitor press releases, and Internet connections. Press are urged to register before the meeting by emailing name, contact information, and name of publication to media@spie.org. Preregistration closes approximately 10 days before the start of the event.

SPIE luggage and coat check

Location: Moscone Center, North Lobby
Saturday-Thursday, open during registration hours

Location: Moscone Center, West, Level 1 Lobby
Sunday - Thursday, open during registration hours

Complimentary luggage, package, and coat storage are available. Please note posted hours; no late pickup available.

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Rachael Osorio
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www.bayareasittersunlimited.com

Note: SPIE does not imply an endorsement or recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

Mothers' Lounge

Location: Moscone Center, North and South Lobbies

Open during registration hours

The Mothers' Lounge is a lockable room intended for nursing mothers. There is no storage, running water, or refrigeration available in this space.

Quiet Room

Location: Moscone Center, North Lobby, Level 1, Room 115

Open during registration hours

The Quiet Room is intended for silent meditation, reflection, or prayer. No mobile devices, computer use, and food or beverages allowed.

Gender inclusive restroom

Two locations: Moscone Center, North Lower Lobby (Exhibit Level) and West Level 2

Urgent message line

An urgent message line is available during registration hours: +1 415-978-3700

Lost and found

Location: Moscone Center, South Lobby, Cashier

Open during registration hours

Found items will be kept at SPIE Cashier in the Registration area during the meeting and available only during registration hours. At the end of the meeting, all found items will be turned over to the Moscone Security Control 415.974.4021.

Food and beverage services

Coffee breaks

Location: Moscone Center, near conference rooms and within the exhibit halls when open

Complimentary coffee daily . . . . . 7:00 AM–4:00 PM

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San Francisco restaurants and city information

Location: Moscone Center, South Lobby

The San Francisco Travel Association will have visitor's guides and maps available. The association sells the San Francisco CityPASS, Muni 1-, 3- and 7-Day Pass-ports, cable car tickets, the Explorer Pass, Muni maps and hop-on-hop-off bus tickets. Staff are available to discuss city information including tips on local restaurants, the city's many attractions, sightseeing suggestions and transit information.

See a list of area restaurants, with hours:
https://www.sftravel.com/eat-drink

Food and refreshments for purchase

Location: Moscone Center, various locations
Saturday–Thursday

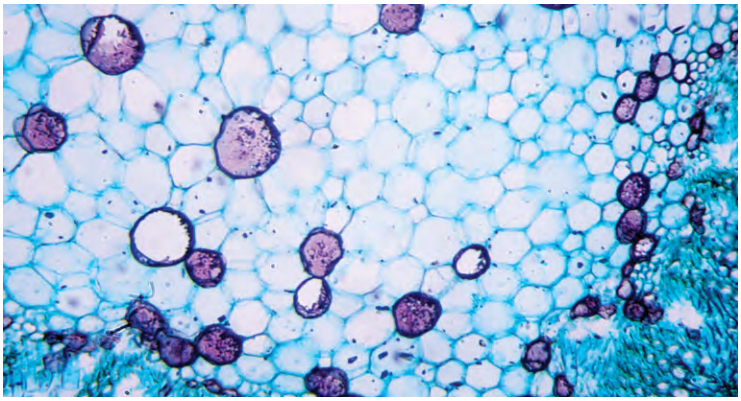
There is a variety of food and drink options, including hot and cold snacks, espresso, beverages, hot entrees, deli sandwiches, salads, and pastries available for purchase. Credit cards payments only.

Food Outlet Locations and Menu Highlights

South Upper Lobby
Sat 7:30 AM–1:30 PM
Sun-Wed 7:00 AM–3:00 PM
Thurs 8:00 AM–2:00 PM
M Coffee: Espresso, specialty coffee.

North Lower Lobby, near Hall F entrance
Sat-Sun 8:00 AM–2:00 PM
Mon 7:30 AM–1:30 PM
Tue-Wed 7:00 AM–5:00 PM
Thurs 8:00 AM–3:00 PM
North Side Espresso: Espresso, specialty coffee and crepes.

Back of Hall F
Tue-Thurs 10:00 AM–4:00 PM
Café Savor: soups and sandwiches.



BiOS

The industry's most important meeting for biophotonics, biomedical optics, and imaging

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CONFERENCE 13292

Photonics in Dermatology and Plastic Surgery 2025

25 - 26 January 2025 | Moscone South, Room 154 (Upper Mezz)

Conference Chair(s): **Haishan Zeng,** BC Cancer Research Institute (Canada); **Milind Rajadhyaksha,** Memorial Sloan-Kettering Cancer Ctr. (United States)

Program Committee: **Tashmeeta Ahad,** The Univ. of British Columbia (Canada); **Kamran Avanaki,** Univ. of Illinois Chicago (United States); **Mihaela Balu**, **Bernard Choi**, **Anthony J. Durkin,** Beckman Laser Institute and Medical Clinic (United States); **Conor L. Evans,** Wellman Ctr. for Photomedicine (United States); **Yusuke Hara,** Shiseido Co., Ltd. (Japan); **Manu Jain,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Hanna Jonasson,** Linköping Univ. (Sweden); **Kristen M. Kelly,** Univ. of California, Irvine School of Medicine (United States); **Kivanc Kose,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Boris Majaron,** Jožef Stefan Institute (Slovenia); **Lise Lyngsnes Randeberg,** Norwegian Univ. of Science and Technology (Norway); **Rolf B. Saager,** Linköping Univ. (Sweden); **Aditi Sahu,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Eric R Tkaczyk,** Vanderbilt Univ. Medical Ctr. (United States); **Hequn Wang,** L'Oreal Research & Innovation (United States); **Ruikang K. Wang,** Univ. of Washington (United States)

Saturday 25 January 2025

SESSION 1: IN VIVO REFLECTANCE CONFOCAL/MULTIPHOTON MICROSCOPY AND CLINICAL APPLICATIONS

25 January 2025 • 8:40 AM - 10:30 AM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Mihaela Balu**, Beckman Laser Institute and Medical Clinic (United States)

13292-1 • 8:40 AM - 9:10 AM
Longitudinal non-invasive optical biopsy of keratinocyte cancers to monitor efficacy and response to treatment *(Invited Paper)*
Author(s): **Shujian Li,** BC Cancer Research Institute (Canada), Vancouver Coastal Health Research Institute (Canada), Photomedicine Institute, The Univ. of British Columbia (Canada); **Sunil Kalia,** Photomedicine Institute, The Univ. of British Columbia (Canada), BC Children's Hospital Research Institute (Canada), The Univ. of British Columbia (Canada); **Harvey Lui,** The Univ. of British Columbia (Canada), Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada); **Zhenguo Wu,** BC Cancer Research Institute (Canada), Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada); **Haishan Zeng,** Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada), BC Cancer Research Institute (Canada); **Tim K. Lee,** Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada), School of Biomedical Engineering, The Univ. of British Columbia (Canada); **Jianhua Zhao,** Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada), BC Cancer Research Institute (Canada); **Tashmeeta Ahad,** Photomedicine Institute, The Univ. of British Columbia (Canada), Vancouver Coastal Health Research Institute (Canada), The Univ. of British Columbia (Canada)

13292-2 • 9:10 AM - 9:30 AM
Multimodal multiphoton tomography in cosmetic research
Author(s): **Karsten König,** JenLab GmbH (Germany), Univ. des Saarlandes (Germany); **Aisada König,** Univ. des Saarlandes (Germany), JenLab GmbH (Germany)

13292-3 • 9:30 AM - 9:50 AM
Combining Wide-field Imaging and Reflectance Confocal Microscopy in a Single Handheld Device
Author(s): **Nathaniel J. Smith,** Montana State Univ. (United States); **Milind Rajadhyaksha**, **Gary Peterson**, **Kivanc Kose,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Justin Wigle**, **Joseph Aist**, **David Dickensheets,** Montana State Univ. (United States); **William Fox**, **Zachary Baltzer, Paul Hemmer,** Caliber I.D. (United States)

13292-4 • 9:50 AM - 10:10 AM
Long term in-vivo studies of human skin at cellular resolution
Author(s): **Alexander Vallmitjana Lees**, **Amanda Durkin**, **Navid Rajil**, **Suman Ranjit, Mihaela Balu,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

13292-5 • 10:10 AM - 10:30 AM
Standardizing multiphoton microscopy for clinical melanoma diagnosis: pilot study outcomes
Author(s): **Suman Ranjit**, **Alexander Vallmitjana Lees**, **Amanda Durkin**, **Belen Torrado**, **Faben F. Messele**, **Kristen Kelly, Mihaela Balu,** Univ. of California, Irvine (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: PHOTOTHERAPEUTICS AND EFFICACY ASSESSMENT BY NON-INVASIVE IMAGING I

25 January 2025 • 11:00 AM - 11:40 AM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Kristen M. Kelly**, Beckman Laser Institute and Medical Clinic (United States); **Kamran Avanaki**, Univ. of Illinois Chicago (United States)

13292-7 • 11:00 AM - 11:20 AM
Real-time cavitation mapping in photo-sono therapy for microvessel removal using doppler OCT
Author(s): **Shuang Wei**, **Yuchen Song**, **Haibin Zou, Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States)

13292-8 • 11:20 AM - 11:40 AM
Modelling pulsed dye laser treatment of psoriatic plaques by combining numerical methods and image-derived lesion morphologies
Author(s): **Leah S. Wilk**, **Meagan Doppegieter,** Amsterdam UMC (Netherlands); **Nick van der Beek,** Independent Treatment Center for Dermatology, ZBC Multicare (Netherlands); **Ton van Leeuwen, Maurice Aalders,** Amsterdam UMC (Netherlands)

Lunch Break 11:40 AM - 1:50 PM

SESSION 3: PHOTOTHERAPEUTICS AND EFFICACY ASSESSMENT BY NON-INVASIVE IMAGING II

25 January 2025 • 1:50 PM - 2:30 PM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Tashmeeta Ahad**, The Univ. of British Columbia (Canada); **Manu Jain**, Memorial Sloan-Kettering Cancer Ctr. (United States)

13292-11 • 1:50 PM - 2:10 PM
A lumped-element thermal model for understanding the selective photothermolysis of sebaceous glands
Author(s): **Mike Estes**, **Ray Sierra, Al Intintoli,** Accure Acne, Inc. (United States)

13292-12 • 2:10 PM - 2:30 PM
Accurate, real-time skin-temperature monitoring and control using a compact thermal-imaging camera for the laser treatment of acne vulgaris
Author(s): **Mike Estes**, **Aubrey Eck**, **Henrik Hofvander,** Accure Acne, Inc. (United States); **Emil Tanghetti,** Ctr. for Dermatology and Laser Surgery (United States)

Coffee Break 2:30 PM - 3:00 PM

SESSION 4: RAMAN, FLUORESCENCE, REFLECTANCE SPECTROSCOPY & SPECTRAL IMAGING

25 January 2025 • 3:00 PM - 4:40 PM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Hanna Jonasson**, Linköping Univ. (Sweden)

13292-17 • 3:00 PM - 3:20 PM
Label-free, non-invasive multispectral imaging of cellular autofluorescence for melanoma detection
Author(s): **Aline Knab**, **Ayad G. Anwer,** Graduate School of Biomedical Engineering, The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics, The Univ. of New South Wales (Australia); **Bernadette Pedersen,** Macquarie Medical School, Macquarie Univ. (Australia), Melanoma Institute Australia, The Univ. of Sydney (Australia); **Shannon Handley**, **Abhilash G. Marupally**, **Abbas Habibalahi, Ewa M. Goldys,** Graduate School of Biomedical Engineering, The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics, The Univ. of New South Wales (Australia)

13292-14 • 3:20 PM - 3:40 PM
Quantitative assessment of biophysical skin properties in vitiligo using in vivo multimodal spectroscopy reveals significant tissue alterations beyond melanopenia
Author(s): **Jianhua Zhao**, **Harvey Lui,** The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada); **Sunil Kalia,** The Univ. of British Columbia (Canada), BC Cancer Research Institute (Canada), BC Children's Hospital Research Institute (Canada); **Haishan Zeng,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada)

13292-15 • 3:40 PM - 4:00 PM
Documenting bruises with spectroscopy and imaging
Author(s): **Pauline Hardeberg Zimmermann**, **Lise Lyngsnes Randeberg, Sony H. George,** Norwegian Univ. of Science and Technology (Norway)

13292-16 • 4:00 PM - 4:20 PM
Multispectral SWIR imaging for equitable pigmentation-insensitive assessment of inflammatory acne in darkly pigmented skin
Author(s): **Anmol Jarang**, **Maysoon Harunani,** Washington Univ. in St. Louis (United States); **Favour Akinjiyan,** Washington Univ. School of Medicine in St. Louis (United States); **Quinlan McGrath,** Washington Univ. in St. Louis (United States); **Leonid Shmuylovich,** Washington Univ. School of Medicine in St. Louis (United States)

13292-67 • 4:20 PM - 4:40 PM
The digital twin framework of skin reflectance spectrum for visual perception
Author(s): **Boyang Ji**, **Zongze Huo**, **Shuai Xia**, **Shibing Wang, Zhiyong Wang,** Tianjin Univ. (China)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: MULTIPHOTON MICROSCOPY AND FLIM IMAGING FOR INTRAOPERATIVE GUIDANCE

26 January 2025 • 8:20 AM - 9:40 AM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Milind Rajadhyaksha**, Memorial Sloan-Kettering Cancer Ctr. (United States); **Haishan Zeng**, BC Cancer Research Institute (Canada)

13292-18 • 8:20 AM - 8:50 AM
Feasibility of using two-photon light sheet fluorescence microscopy to identify skin cancers for intraoperative margin guiding: a prospective study *(Invited Paper)*
Author(s): **Jieun Yun**, **Won Yeong Park**, **Jisang Lee,** Pohang Univ. of Science and Technology (Korea, Republic of); **Byung Ho Oh,** Yonsei Univ. (Korea, Republic of); **Ki Hean Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13292-19 • 8:50 AM - 9:20 AM
Intraoperative margin evaluation of fresh Mohs excisions using two-photon fluorescence microscopy *(Invited Paper)*
Author(s): **Vincent D. Ching-Roa**, **Chi Huang**, **Connor Heckman**, **Xiang Tang,** Univ. of Rochester (United States); **Sherrif Ibrahim,** Rochester Dermatologic Surgery (United States), Univ. of Rochester Medical Ctr. (United States); **Michael Giacomelli,** Univ. of Rochester (United States)

13292-20 • 9:20 AM - 9:40 AM
Fluorescence lifetime imaging (FLIM) system for rapid label-free biochemical imaging of Mohs micrographic surgery (MMS) resection tissue samples
Author(s): **Rodrigo Cuenca Martinez**, **Gabriel P. Tortorelli,** The Univ. of Oklahoma (United States); **Jason Hirshburg**, **Lindsey Collins,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Javier A. Jo,** The Univ. of Oklahoma (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 6: OPTICAL COHERENCE TOMOGRAPHY IN DERMATOLOGY

26 January 2025 • 10:10 AM - 11:30 AM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Ruikang K. Wang**, Univ. of Washington (United States)

13292-21 • 10:10 AM - 10:30 AM
In vivo ultra-high-sensitive OCT angiography with massive-frame-repeat and hardware-and software motion-suppression
Author(s): **Yu Guo**, **Rion Morishita,** Univ. of Tsukuba (Japan); **Ibrahim A. El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Pradipta Mukherjee**, **Yiheng Lim**, **Cunyou Bao**, **Yiqiang Zhu**, **Shuichi Makita, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13292-22 • 10:30 AM - 10:50 AM
Optical coherence tomography-based measurement of photodamage and assessment of photodamage prevention in murine skin
Author(s): **Anna V. Vejlsby,** Technical Univ. of Denmark (Denmark); **Rozarin Kara**, **Celina Pihl**, **Merete Haedersdal**, **Catharina Lerche,** Copenhagen Univ. Hospital (Denmark); **Peter E. Andersen,** Technical Univ. of Denmark (Denmark); **Gavrielle R. Untracht,** Technical Univ. of Denmark (Denmark), Copenhagen Univ. Hospital (Denmark)

13292-23 • 10:50 AM - 11:10 AM
Quantitative analysis of hair follicles using optical coherence microscopy and digital staining
Author(s): **James Ahn,** The Ohio State Univ. (United States); **Sangjin Lee**, **Eunji Lee**, **Hyunmo Yang**, **Yeonwoo Baek,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Song-Yi Choi,** Chungnam National Univ. College of Medicine (Korea, Republic of); **Woonggyu Jung,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13292-24 • 11:10 AM - 11:30 AM
Quantitative real-time imaging of rodent skin adipose tissue remodeling in response to changes in metabolic state
Author(s): **Nazihah Aziz,** Institute of Molecular and Cell Biology, A*STAR Agency for Science, Technology and Research (Singapore); **Yuning Zhang**, **Michaela Taylor,** National Univ. of Singapore (Singapore); **Safwan Burhanudin**, **Joel Ang,** Institute of Molecular and Cell Biology, A*STAR Agency for Science, Technology and Research (Singapore); **Veronique Angeli,** National Univ. of Singapore (Singapore); **Kaicheng Liang,** Institute of Molecular and Cell Biology, A*STAR Agency for Science, Technology and Research (Singapore)

Lunch Break 11:30 AM - 1:20 PM

SESSION 7: SPATIAL FREQUENCY DOMAIN IMAGING FOR BURN WOUND AND SCLERODERMA ASSESSMENT

26 January 2025 • 1:20 PM - 2:20 PM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Rolf B. Saager**, Linköping Univ. (Sweden)

13292-25 • 1:20 PM - 1:40 PM
Enhancing burn wound classification with ensemble learning using spatial frequency domain imaging applied to in-vivo porcine skin
Author(s): **Alberto Martín-Pérez,** Univ. Politécnica de Madrid (Spain); **Chris Campbell**, **Gordon T. Kennedy**, **Alexis M. Fox,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); **Eduardo Juárez**, **César Sánz,** Univ. Politécnica de Madrid (Spain); **Teresa Chin**, **Victor Joe,** Regional Burn Ctr., Univ. of California, Irvine (United States); **Anthony J. Durkin,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States)

13292-27 • 1:40 PM - 2:00 PM
Challenges in burn severity classification: limitations of histology-based model training
Author(s): **Christopher A. Campbell**, **Gordon T. Kennedy**, **Rebecca Rowland,** Beckman Laser Institute and Medical Clinic (United States); **Robert J. Christy,** The Univ. of Texas Health Science Ctr. at Houston (United States); **Theresa Chin**, **Victor Joe,** Regional Burn Ctr., Univ. of California, Irvine (United States); **Anthony J. Durkin,** Beckman Laser Institute and Medical Clinic (United States)

13292-28 • 2:00 PM - 2:20 PM
Skin assessment in scleroderma using spatial frequency domain imaging (SFDI)
Author(s): **Aarohi M. Mehendale**, **Adhithi Ramasubramanian,** Boston Univ. (United States); **Anahita Pilvar,** Allotex, Inc. (United States); **Kavon Karrobi,** Boston Univ. (United States); **Hung Vo**, **Andreea Bujor,** Chobanian & Avedisian School of Medicine, Boston Univ. (United States); **Darren Roblyer,** Boston Univ. (United States)

Coffee Break 2:20 PM - 2:50 PM

SESSION 8: MACHINE LEARNING AND AI IN DERMATOLOGY

26 January 2025 • 2:50 PM - 3:50 PM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States)

13292-29 • 2:50 PM - 3:10 PM
Advancements in photonics for dermatology and plastic surgery: integrating imaging, histology, AI, and minimally invasive in vivo sampling techniques
Author(s): **Tarl Prow,** Univ. of York (United Kingdom)

13292-30 • 3:10 PM - 3:30 PM
Generative AI for enhanced skin cancer diagnosis, dermatologist training, and patient education
Author(s): **Lennart Jütte,** Leibniz Univ. Hannover (Germany); **Sandra González-Villà**, **Josep Quintana Plana,** Coronis Computing (Spain); **Martin Steven,** Leibniz Univ. Hannover (Germany); **Rafael Garcia,** Institute of Computer Vision and Robotics Research, Univ. de Girona (Spain); **Bernhard Roth,** Leibniz Univ. Hannover (Germany)

13292-32 • 3:30 PM - 3:50 PM
Enhanced transfer learning algorithm with zero-shot components for dermatological diagnosis using the HAM10000 dataset
Author(s): **Tajbeed Ahmed Chowdhury**, **Eric Wagner**, **Paul Motzki, Martina Lehser,** Zentrum für Mechatronik und Automatisierungstechnik gGmbH (Germany)

SESSION 9: POLARIZATION IMAGING, SPECKLE IMAGING, AND DERMOSCOPY IMAGING

26 January 2025 • 3:50 PM - 5:10 PM | Moscone South, Room 154 (Upper Mezz)
Session Chair(s): **Bernard Choi**, Beckman Laser Institute and Medical Clinic (United States)

13292-33 • 3:50 PM - 4:10 PM
Prediction of blood volume and oxygen saturation in superficial and deep skin layers using a color polarization camera
Author(s): **Thomas T. Livecchi**, **Ashish Thomas**, **Abmael Oliveira**, **Vrinda Jain,** Rutgers, The State Univ. of New Jersey (United States); **Steven L. Jacques,** Univ. of Washington (United States); **Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States); **Mark C. Pierce,** Rutgers, The State Univ. of New Jersey (United States)

13292-34 • 4:10 PM - 4:30 PM
Color-corrected dermoscopy for objective skin color measurement
Author(s): **Maysoon Harunani,** Washington Univ. in St. Louis (United States); **Patricia K. Mansfield, Leonid Shmuylovich,** Washington Univ. School of Medicine in St. Louis (United States)

13292-35 • 4:30 PM - 4:50 PM
Assessment of the pig compound burns using laser speckle imaging
Author(s): **Nataliya Makeeva,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States), Univ. of California, Irvine (United States); **Thinh Phan**, **Gordon T. Kennedy,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States); **Kristo Nuutila,** U.S. Army Institute of Surgical Research (United States); **Anthony J. Durkin,** Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (United States), Univ. of California, Irvine (United States); **Bernard Choi,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States)

13292-6 • 4:50 PM - 5:10 PM
Q switch Tm:YAP laser for dermatology applications
Author(s): **Salman Noach,** Jerusalem College of Technology (Israel); **Rotem Nahear**, **Neria Suliman, David Friedman,** Laser Team Medical (Israel)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13292-36 • 5:30 PM - 7:00 PM
Enhanced laser treatment with triple wavelength (755, 808, and 1064 nm) on skin rejuvenation
Author(s): **Jiho Lee**, **Hwarang Shin**, **Mijeong Kim, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13292-37 • 5:30 PM - 7:00 PM
High-resolution imaging system for intelligent total body scanner for early detection of melanoma
Author(s): **Lennart Jütte,** Leibniz Univ. Hannover (Germany); **Sandra González-Villà**, **Josep Quintana,** Coronis Computing S.L. (Spain); **Rafael Garcia,** Universitat de Girona (Spain); **Bernhard Roth,** Leibniz Univ. Hannover (Germany)

13292-38 • 5:30 PM - 7:00 PM
Polarization-sensitive optical coherence tomography in the assessment of vulvar lichen sclerosus (VLS)
Author(s): **Raksha Sreeramachandra Murthy**, **Christina Kraus, Zhongping Chen,** Univ. of California, Irvine (United States)

13292-39 • 5:30 PM - 7:00 PM
Noninvasive basal cell carcinoma detection algorithms with OCT
Author(s): **Spencer Borbas**, **Julia May**, **Fiona Gruzmark**, **Carolina Puyana**, **Maria M. Tsoukas**, **Amanda P. Siegel, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-40 • 5:30 PM - 7:00 PM
Second generation of linear array photoacoustic imaging for melanoma thickness measurement
Author(s): **Juliana B. Lara**, **Ravi Prakash**, **Maria M. Tsoukas, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-41 • 5:30 PM - 7:00 PM
Assessing thermal effects of laser illumination in photoacoustic imaging: age-specific skin response and safety guidelines
Author(s): **Farah Mneimneh,** Alvernia Univ. (United States); **Gavin Cao, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-42 • 5:30 PM - 7:00 PM
Optical coherence tomography (OCT) in examining human nails of subjects with different skin types
Author(s): **Emma Cassidy**, **Mohsin Zafar**, **Loïc Saint-Martin**, **Md Tarikul Islam**, **Maria M. Tsoukas, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-43 • 5:30 PM - 7:00 PM
Speckle noise modeling in OCT skin imaging: a maximum likelihood estimation approach for enhanced noise reduction
Author(s): **Elnaz Babaee,** Univ. of Zanjan (Iran, Islamic Republic of); **Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-44 • 5:30 PM - 7:00 PM
Quantitative analysis of skin optical coefficients using OCT for enhanced skin type classification
Author(s): **Abhijith Eathara**, **Sina M. Aliabadi**, **Spencer Borbas**, **Maria M. Tsoukas, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13292-45 • 5:30 PM - 7:00 PM
Estimating skin sub-epidermal moisture for early pressure injury detection using spectroscopy and predictive modeling
Author(s): **Mina Molani**, **Md Hasib Fakir**, **Dina Miqdadi,** Univ. of North Dakota (United States); **Benjamin Tehrani,** Kingspoint Foot and Ankle Specialists (United States); **Fartash Vasefi,** SafetySpect Inc. (United States); **Pantea Tavakolian,** Univ. of North Dakota (United States)

13292-46 • 5:30 PM - 7:00 PM
All-solid-state ultraviolet laser for treating autoimmune skin diseases
Author(s): **Soung-Woong Choi**, **Han-Young Ryu**, **Ji-Young Lee, Youngseok Seo,** WONTECH Co., Ltd. (Korea, Republic of)

13292-13 • 5:30 PM - 7:00 PM
Addressing spectral variations across diverse skin tones with the PIPA prototype
Author(s): **Dina Miqdadi**, **Mina Molani,** Univ. of North Dakota (United States); **Benjamin Tehrani,** Kingspoint Foot and Ankle Specialists (United States); **Fartash Vasefi,** SafetySpect Inc. (United States); **Pantea Tavakolian,** Univ. of North Dakota (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

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25 January 2025 | Moscone South, Room 301 (Level 3)

Conference Chair(s): **Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of); **Ronald Sroka,** Laser-Forschungslabor, LIFE-Center of Department of Urology, LMU University Hospital (Germany); **Jian J. Zhang,** Boston Scientific Corp. (United States)

Program Committee: **Ralf Brinkmann,** Medizinisches Laserzentrum Lübeck GmbH (Germany); **Kin F Chan,** Simpson Interventions (United States); **Nathaniel M. Fried,** The Univ. of North Carolina at Charlotte (United States); **Thomas Hasenberg,** Shockwave Medical Inc. (United States); **Jae Gwan Kim,** Gwangju Institute of Science and Technology (Korea, Republic of); **Joseph C. Liao,** Stanford Univ. (United States); **Kwangsung Park,** Chonnam National Univ. Medical School (Korea, Republic of); **William W. Roberts,** Univ. of Michigan Health System (United States); **Babak Shadgan,** The Univ. of British Columbia (Canada); **Alexander Tamalunas,** Klinikum der Univ. München (Germany); **Ben Turney,** Oxford Univ. Hospitals NHS Foundation Trust (United Kingdom); **Hui Wang,** Miami Univ. (United States)

Saturday 25 January 2025

SESSION 1: PDT / PTT AND PHOTOBIOMODULATION

25 January 2025 • 8:50 AM - 10:10 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Jian J. Zhang**, Boston Scientific Corp. (United States); **Ronald Sroka**, Laser- und Immunologie-Forschungs-Einrichtungen Zentrum (Germany)

13293-1 • 8:50 AM - 9:10 AM
Dosimetry study of photothermal ablation for the treatment of urethral stricture
Author(s): **Seonho Jung, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13293-2 • 9:10 AM - 9:30 AM
Investigation on mechanism of wavelength-dependent laser on stimulative effects of prostate cancer
Author(s): **Myungji Kang**, **Hwarang Shin**, **Jihye Jo, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13293-3 • 9:30 AM - 9:50 AM
Effect of energy dependent photobiomodulation on tumor metastasis
Author(s): **Jihye Jo**, **Myungji Kang, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13293-4 • 9:50 AM - 10:10 AM
Computational evaluation of the effect of tissue characteristics on photodynamic therapy of upper tract urothelial carcinoma using Monte Carlo-based light propagation simulation
Author(s): **Himemi Watabe,** Osaka Univ. (Japan); **Yu Shimojo,** Osaka Univ. (Japan), Osaka Metropolitan Univ. (Japan), Japan Society for the Promotion of Science (Japan); **Asako Shingu**, **Hidenori Ito,** SBI Pharmaceuticals Co., Ltd. (Japan); **Hideo Fukuhara,** Kochi Medical School (Japan); **Makito Miyake,** Nara Medical Univ. (Japan); **Kenji Inoue,** Kochi Medical School (Japan); **Kiyohide Fujimoto,** Nara Medical Univ. (Japan); **Takahiro Nishimura,** Osaka Univ. (Japan)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: LIGHT-TARGET INTERACTIONS

25 January 2025 • 10:40 AM - 12:00 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Hyun Wook Kang**, Pukyong National Univ. (Korea, Republic of); **Alexander Tamalunas**, Klinikum der Univ. München (Germany)

13293-5 • 10:40 AM - 11:00 AM
Ho:YAG laser pulse in-water transient pressure field full space measurement
Author(s): **Jian J. Zhang**, **Omri Yosfan**, **Manuel Teixeira,** Boston Scientific Corp. (United States); **Ori Bassan,** Boston Scientific Corp. (Israel)

13293-6 • 11:00 AM - 11:20 AM

Laser lithotripsy: the impact of beam profile and wavelength on stone ablation
Author(s): **Kimberley Lühring**, **Birgit Lange**, **Lion Schützeck, Ralf Brinkmann,** Medizinisches Laserzentrum Lübeck GmbH (Germany)

13293-23 • 11:20 AM - 11:40 AM
2.1 um compact laser with fiber launched output for urological applications
Author(s): **Scott J. Hamlin**, **Benjamin Hart**, **Alexander Likins**, **Ashley Charpentier, Chris Hardy,** MegaWatt Lasers, Inc. (United States)

13293-8 • 11:40 AM - 12:00 PM
In vivo evaluations on non-ablative transurethral laser treatment of stress urinary incontinence
Author(s): **Hwarang Shin**, **Minh Duc Ta**, **Myungji Kang,** Pukyong National Univ. (Korea, Republic of); **Yeachan Lee,** Univ. of Michigan (United States); **Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

Lunch Break 12:00 PM - 1:30 PM

SESSION 3: TECHNIQUES IN PROSTATE TREATMENT

25 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Ronald Sroka**, Laser- und Immunologie-Forschungs-Einrichtungen Zentrum (Germany); **Jian J. Zhang**, Boston Scientific Corp. (United States)

13293-9 • 1:30 PM - 1:50 PM
Deep learning-based detection of prostate cancer grades and chronic prostatitis in biparametric MRI
Author(s): **Lucas Engelage,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany), ALTA Klinik GmbH (Germany); **Niklas Behnel,** ALTA Klinik GmbH (Germany); **Oleksii Bashkanov,** Otto-von-Guericke Univ. Magdeburg (Germany); **Paul Ehrlich**, **Helena Pfaff**, **Constantin Dickel**, **Agron Lumiani**, **Alexander Reich,** ALTA Klinik GmbH (Germany); **Rolf Muschter,** ALTA Klinik GmbH (Germany), Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany); **Ronald Sroka,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany)

13293-10 • 1:50 PM - 2:10 PM
Benefits of holmium laser enucleation of the prostate (HOLEP) over transurethral resection (TURP) for bladder outlet obstruction (BOO) in patients with prostate cancer: a propensity score-matched evaluation for optimum palliative care
Author(s): **Alexander Tamalunas**, **Patrick Keller**, **Melanie Schott**, **Leo F. Stadelmeier**, **Marc Kidess**, **Michael Atzler**, **Laurenz Berger**, **Philip Nicola**, **Benedikt Ebner**, **Martin Hennenberg**, **Christian G. Stief,** Klinikum der Univ. München (Germany); **Giuseppe Magistro,** Asklepios Klinik Barmbek (Germany)

13293-11 • 2:10 PM - 2:30 PM
MRI-guided transurethral ultrasound ablation (TULSA) for localized prostate cancer: A single-center evaluation of 300 patients
Author(s): **Lucas Engelage,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany), ALTA Klinik GmbH (Germany); **Agron Lumiani**, **Niklas Behnel,** ALTA Klinik GmbH (Germany); **Rolf Muschter,** ALTA Klinik GmbH (Germany), Laser-Forschungslabor (Germany); **Alexander Reich,** ALTA Klinik GmbH (Germany); **Ronald Sroka,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany)

13293-12 • 2:30 PM - 2:50 PM
Switching lasers: comparing efficacy, efficiency, and safety in learning curves of three surgeons with different experience levels in holmium laser enucleation of the prostate (HoLEP) for pulsed thulium laser enucleation of the prostate (ThuLEP).
Author(s): **Leo F. Stadelmeier**, **Patrick Keller**, **Melanie Schott**, **Laurenz Berger**, **Philip Nicola**, **Julian Marcon**, **Philipp Weinhold**, **Martin Hennenberg**, **Christian G. Stief, Alexander Tamalunas,** Klinikum der Univ. München (Germany)

13293-13 • 2:50 PM - 3:10 PM
Artificial intelligence in urology: combining imaging and clinical data for improved prostate diagnostics
Author(s): **Lucas Engelage,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany), ALTA Klinik GmbH (Germany); **Niklas Behnel,** ALTA Klinik GmbH (Germany); **Oleksii Bashkanov,** Otto-von-Guericke Univ. Magdeburg (Germany); **Paul Ehrlich**, **Helena Pfaff**, **Constantin Dickel**, **Agron Lumiani**, **Alexander Reich,** ALTA Klinik GmbH (Germany); **Rolf Muschter,** ALTA Klinik GmbH (Germany), Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany); **Ronald Sroka,** Laser-Forschungslabor, Klinikum der Univ. München, Ludwig-Maximilians-Univ. München (Germany)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: DIAGNOSTICS IN UROLOGY

25 January 2025 • 3:40 PM - 5:50 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Alexander Tamalunas**, Klinikum der Univ. München (Germany); **Hyun Wook Kang**, Pukyong National Univ. (Korea, Republic of)

13293-14 • 3:40 PM - 4:10 PM
Technology advancements in the treatment of benign prostatic hyperplasia *(Invited Paper)*
Author(s): **Kory P. Hamel,** Boston Scientific Corp. (United States)

13293-15 • 4:10 PM - 4:30 PM
Non-invasive synchronous bladder, uroflowmetry and heart rate and heart rate variability for outpatient clinical use in lower urinary tract symptoms and cardiovascular disease
Author(s): **Lynn Stothers,** The Univ. of British Columbia (Canada); **Kyle Zuniga,** Univ. of California, Los Angeles (United States); **Andrew Macnab,** The Univ. of British Columbia (Canada); **Johnathan Baluran,** David Geffen School of Medicine, Univ. of California (United States)

13293-19 • 4:30 PM - 4:50 PM
Intraoperative histology for risk assessment of bladder cancer by coherent Raman imaging
Author(s): **Maximilian Brinkmann**, **Anke Bonse**, **Ramon Droop**, **Felix Neumann**, **Steffen Ullmann**, **Thomas Wuerthwein**, **Niklas Luepken**, **Sven Dobner, Tim Hellwig,** Refined Laser Systems GmbH (Germany)

13293-17 • 4:50 PM - 5:10 PM
Methodology to establish non-invasive synchronous heart rate and heart rate variability measurement during uroflowmetry
Author(s): **Lynn Stothers,** Univ. of California, Los Angeles (United States); **Andrew Macnab,** The Univ. of British Columbia (Canada); **Kyle Zuniga,** Univ. of California, Los Angeles (United States)

13293-18 • 5:10 PM - 5:30 PM
Detection of high-tone pelvic floor dysfunction using near infrared spectroscopy
Author(s): **Michele Torosis**, **Lenore Ackerman,** Univ. of California, Los Angeles (United States); **Andrew Macnab,** The Univ. of British Columbia (Canada); **Lynn Stothers,** Univ. of California, Los Angeles (United States)

13293-16 • 5:30 PM - 5:50 PM
Non-invasive evaluation of urinary exfoliated proximal tubule cells for chronic kidney disease diagnosis using machine-learning and multispectral autofluorescence
Author(s): **Henry H. L. Wu,** Royal North Shore Hospital (Australia), Kolling Institute of Medical Research, The Univ. of Sydney (Australia); **Aline Knab**, **Shannon Handley**, **Akanksha Bhargava**, **Yuan Tian**, **Adnan Agha,** The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); **Carol Pollock,** Kolling Institute of Medical Research (Australia), The Univ. of Sydney (Australia), Royal North Shore Hospital (Australia); **Sonia Saad,** Kolling Institute of Medical Research (Australia), The Univ. of Sydney (Australia); **Ewa M. Goldys,** The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13293-20 • 5:30 PM - 7:00 PM
Photothermal-assisted antibacterial effect of CuS-PEI coatings on bioimplants
Author(s): **Sivakumar Bose**, **Myungji Kang**, **Seonho Jung, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13293-21 • 5:30 PM - 7:00 PM
Advanced targeted photothermal/photodynamic therapy for prostate cancer using PEGylated gold nanorods conjugated with PSMA antibody and indocyanine green
Author(s): **Yeongeun Kim**, **Sudip Mondal**, **Hwarang Shin**, **Soonhyuk Tak**, **Vu Hoang Minh Doan**, **Junghwan Oh, Hyun Wook Kang,** Pukyong National Univ. (Korea, Republic of)

13293-7 • 5:30 PM - 7:00 PM
Numerical analysis for laser endoluminal treatment of stress urinary incontinence
Author(s): **Minh Duc Ta**, **Hwarang Shin**, **Seonho Jung**, **Hyun Wook Kang, Jiho Lee,** Pukyong National Univ. (Korea, Republic of)

CONFERENCE 13294

Imaging, Therapeutics, and Advanced Technology in Head and Neck Surgery and Otolaryngology 2025

25 January 2025 | Moscone South, Room 201 (Level 2)

Conference Chair(s): **Brian J. F. Wong,** Beckman Laser Institute and Medical Clinic (United States); **Justus F. Ilgner,** Uniklinik RWTH Aachen (Germany)

Program Committee: **Javier A. Jo,** The Univ. of Oklahoma (United States); **Amy L. Oldenburg,** The Univ. of North Carolina at Chapel Hill (United States); **Ramesh K. Shori,** Naval Undersea Warfare Ctr. Keyport (United States)

Saturday 25 January 2025

SESSION 1: ADVANCING PHOTONICS FOR DIAGNOSTIC AND NON-SURGICAL INTERVENTIONS IN THE MIDDLE AND INNER EAR

25 January 2025 • 8:10 AM - 10:10 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Justus F. Ilgner**, Uniklinik RWTH Aachen (Germany)

13294-1 • 8:10 AM - 8:30 AM
Cold microplasma exposure as a novel therapeutic treatment: Future implications for the management of bacterial otitis media
Author(s): **Guillermo L. Monroy,** Beckman Institute for Advanced Science and Technology (United States); **Zhenglun Wu,** Univ. of Illinois (United States); **Eric J. Chaney**, **Darold R. Spillman,** Beckman Institute for Advanced Science and Technology (United States); **Michael B. Jamrozy**, **Kavita Desai Kabelitz,** Univ. of Illinois (United States); **Andrey Mironov,** Univ of Illinois (United States); **Alexander Ho**, **Gang Xiao**, **Edita Aksamitiene**, **Marina Marjanovic**, **Daniel A. Llano,** Beckman Institute for Advanced Science and Technology (United States); **Helen Nguyen**, **J. Gary Eden,** Univ. of Illinois (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

13294-2 • 8:30 AM - 8:50 AM
Hand-held probe integrating Raman spectroscopy and optical coherence tomography for in vivo characterization of otitis media
Author(s): **Alexander Ho,** Univ. of Illinois (United States); **Sean Fitzgerald,** Vanderbilt Univ. (United States); **Guillermo L. Monroy**, **Darold R. Spillman**, **Edita Aksamitiene,** Univ. of Illinois (United States); **Alex Walter,** Vanderbilt Univ. (United States); **Eric J. Chaney,** Univ. of Illinois (United States); **Christine Canfield,** Carle Foundation Hospital (United States); **Marina Marjanovic,** Univ. of Illinois (United States); **Jonathan McJunkin**, **Ryan G. Porter,** Carle Foundation Hospital (United States); **Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States); **Stephen A. Boppart,** Univ. of Illinois (United States)

13294-3 • 8:50 AM - 9:10 AM
Optical method of diagnosing middle ear effusions
Author(s): **Jordan Villa**, **Joaquin Cury, Claus-Peter Richter,** Northwestern Univ. (United States)

13294-4 • 9:10 AM - 9:30 AM
Measurement of light delivery to the cochlea using a trans-tympanic fiber-based approach for photobiomodulation therapy
Author(s): **Sophie S. Jang,** Stanford Univ. (United States); **Alejandro E. Ortega,** Wellman Ctr. for Photomedicine (United States); **Kuan Chung Ting,** Stanford Univ. (United States); **Ashley Qu**, **Lillian Wang**, **Shoumik Lodh,** Wellman Ctr. for Photomedicine (United States); **Nikitha Kosaraju**, **Konstantina M. Stankovic,** Stanford Univ. (United States); **Guillermo J. Tearney,** Wellman Ctr. for Photomedicine (United States), Harvard Medical School (United States)

13294-5 • 9:30 AM - 9:50 AM
Optical detection of basilar membrane damage
Author(s): **Joaquin Cury**, **Olivia Griffith, Claus-Peter Richter,** Northwestern Univ. (United States)

13294-6 • 9:50 AM - 10:10 AM
Insights into the fiber architecture of the human tympanic membrane by visualizing the depth-resolved optic axis orientation
Author(s): **Svea Steuer,** TU Dresden (Germany); **Joseph Morgenstern,** Universitätsklinikum Carl Gustav Carus Dresden (Germany), TU Dresden (Germany); **Lars Kirsten,** TU Dresden (Germany); **Marcus Neudert,** Universitätsklinikum Carl Gustav Carus Dresden (Germany), TU Dresden (Germany); **Edmund Koch,** TU Dresden (Germany); **Jonas Golde,** TU Dresden (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: OPTICAL CHARACTERIZATION AND DELINEATION OF MALIGNANT LESIONS IN THE UPPER AERODIGESTIVE TRACT

25 January 2025 • 10:40 AM - 12:00 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Brian J. F. Wong**, Beckman Laser Institute and Medical Clinic (United States)

13294-7 • 10:40 AM - 11:00 AM
Fluorescence lifetime endo-microscopy: Identifying margins of head and neck cancer tissues through multimode fiber endoscopy and machine learning
Author(s): **Victoria Fay**, **Ye Pu,** EPFL (Switzerland); **Genrich Tolstonog**, **Christian Simon,** Ctr. Hospitalier Univ. Vaudois, Univ. de Lausanne (Switzerland); **Demetri Psaltis, Christophe Moser,** EPFL (Switzerland)

13294-8 • 11:00 AM - 11:20 AM
Label-free biochemical and metabolic fluorescence lifetime imaging biomarkers of oral precancer and cancer: Preliminary results of a multicenter study
Author(s): **Javier A. Jo**, **Rodrigo Cuenca Martinez**, **Gabriel P. Tortorelli**, **Seyededriss Mirniaharikandi,** The Univ. of Oklahoma (United States); **Carlos Busso**, **Kayla Caughlin,** The Univ. of Texas at Dallas (United States); **Ronald Faram**, **Kathleen E. Higgins,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Victoria L. Woo**, **Jacqueline Plemons**, **Yi-Shing L. Cheng,** Texas A&M Univ. College of Dentistry (United States); **Sean P. Anderson**, **Nadarajah Vigneswaran,** The Univ. of Texas School of Dentistry (United States); **Thomas Schlieve,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Celeste Abraham**, **Ying S. Wang, Rashmi Hegde,** Texas A&M Univ. College of Dentistry (United States)

13294-9 • 11:20 AM - 11:40 AM
Fluorescence molecular imaging for intraoperative margin assessment in oral cancer patients using cetuximab-800CW
Author(s): **Max J. H. Witjes,** Univ. Medical Ctr. Groningen (Netherlands)

13294-10 • 11:40 AM - 12:00 PM
Enhancing laryngeal cancer diagnosis with dynamic optical contrast imaging
Author(s): **Yazeed Alhiyari,** Univ. of California, Los Angeles (United States); **Solymar Torres,** ; **Brandon Mo,** Ronald Reagan UCLA Medical Ctr. (United States); **Ramesh K. Shori, Maie A. St. John,** Univ. of California, Los Angeles (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 3: PHOTONICS COMPLEMENTING DIAGNOSTIC AND THERAPEUTIC OPTIONS IN HEAD AND NECK ONCOLOGY

25 January 2025 • 1:30 PM - 3:30 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Max J. H. Witjes**, Univ. Medical Ctr. Groningen (Netherlands)

13294-12 • 1:30 PM - 1:50 PM
Differentiated thyroid malignancy pathologic diagnosis via dynamic optical contrast imaging
Author(s): **Lauran Evans**, **Ethan Han,** Ronald Reagan UCLA Medical Ctr. (United States); **Yazeed Alhiyari**, **David A. Cronkite**, **Israa A. Laklouk**, **Dipti P. Sajed,** Univ. of California, Los Angeles (United States); **Christian Wooten,** ; **Maie A. St. John,** Univ. of California, Los Angeles (United States)

13294-13 • 1:50 PM - 2:10 PM
Enabling technology for precision, image-guided photodynamic therapy of oral lesions
Author(s): **Shakir Khan,** Univ. of Massachusetts Boston (United States); **Bofan Song**, **Rongguang Liang,** The Univ. of Arizona (United States); **Tayyaba Hasan,** Massachusetts General Hospital (United States); **Jonathan P. Celli,** Univ. of Massachusetts Boston (United States)

13294-14 • 2:10 PM - 2:30 PM
Dynamic real-world scaling for enhanced PS-FLIm data visualization in TORS
Author(s): **Pu Sun**, **Mohamed A. Hassan**, **Alexander E. Taffe**, **Suparn Sathya**, **Katjana Ehrlich**, **Julien Bec, Laura Marcu,** Univ. of California, Davis (United States)

13294-15 • 2:30 PM - 2:50 PM
Deep learning-based automated segmentation of airway OCT images acquired during drug-induced sleep endoscopy (DISE)
Author(s): **Hongqiu Lei,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); **Hyunmo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Jessica Salas**, **Ellen Hong**, **Zhikai Zhu**, **Danny Chou**, **Elizabeth Lee**, **Raksha Sreeramachandra Murthy,** Beckman Laser Institute and Medical Clinic (United States); **Dylan Frederic Tran,** Univ. of California (United States); **Brian Wong, Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States)

13294-24 • 2:50 PM - 3:10 PM
Auto-fluorescence imaging pen like probe for parathyroid identification
Author(s): **Han Dong,** Vanderbilt Univ. (United States)

13294-25 • 3:10 PM - 3:30 PM
Parathyroid gland identification in neck surgery using augmented reality glasses
Author(s): **Parker A. Willmon,** Vanderbilt Univ. (United States); **Carmen C. Solorzano,** Vanderbilt Univ. Medical Ctr. (United States); **Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: ADVANCED OCT AND OTHER DIAGNOSTIC MODALITIES IN UPPER AIRWAY ASSESSMENT AND TREATMENT

25 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Jo A. Javier**, Cedars-Sinai Medical Ctr. (United States)

13294-16 • 4:00 PM - 4:20 PM
Wall compliance of pediatric airways in suspected subglottic stenosis via anatomic optical coherence tomography
Author(s): **Amy Lynn Oldenburg**, **Yinghan Xu**, **Srikamal Soundararajan, Carlton Zdanski,** The Univ. of North Carolina at Chapel Hill (United States)

13294-17 • 4:20 PM - 4:40 PM
Laser toothbrush
Author(s): **Karsten König,** JenLab GmbH (Germany), Univ. des Saarlandes (Germany)

13294-18 • 4:40 PM - 5:00 PM
In vivo electrochemical therapy of porcine skin burns
Author(s): **Lauren Liu,** Univ. of California, Irvine (United States); **Ellen Hong,** Beckman Laser Institute and Medical Clinic (United States); **Milind Vasudev**, **Ashley Lonergan, Brian J. F. Wong,** Univ. of California, Irvine (United States)

13294-22 • 5:00 PM - 5:20 PM
Reflectance confocal microscopy for noninvasive detection of oral lesions in India: very preliminary experience from a new initiative with Tata Memorial Centre in Mumbai
Author(s): **Milind Rajadhyaksha,** Memorial Sloan-Kettering Cancer Ctr. (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

CONFERENCE 13295

Light in Cardiology 2025

25 - 26 January 2025 | Moscone South, Room 155 (Upper Mezz)

Conference Chair(s): **Gijs van Soest,** Erasmus MC (Netherlands); **Irina V. Larina,** Baylor College of Medicine (United States); **Christos Bourantas,** St. Bartholomew's Hospital (United Kingdom)

Program Committee: **Kenton W. Gregory,** Oregon Medical Laser Ctr. (United States); **Christine P. Hendon,** Columbia Univ. (United States); **Jiawen Li,** The Univ. of Adelaide (Australia); **Laura Marcu,** Univ. of California, Davis (United States); **Guillermo J. Tearney,** Massachusetts General Hospital (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

Saturday 25 January 2025

SESSION 1: CORONARY ATHEROSCLEROSIS: DX/TX

25 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Martin Villiger**, Wellman Ctr. for Photomedicine (United States)

13295-1 • 8:30 AM - 8:50 AM
Automated cap thickness and composition analysis with intravascular polarimetry
Author(s): **Georgia L. Jones,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Kenichiro Otsuka,** Graduate School of Medicine, Osaka Metropolitan Univ. (Japan); **Laurens van Zandvoort**, **Joost Daemen,** Erasmus MC (Netherlands); **Brett E. Bouma,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13295-2 • 8:50 AM - 9:10 AM
Morphological characteristics of non-culprit lesions in patients with chronic and acute coronary syndromes: a NIRS-IVUS study
Author(s): **Emrah Erdogan,** Yuzuncu Yil Univ. (Turkey), Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Murat Çap,** Gazi Yaşargil Education and Research Hospital (Turkey), Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Lorenz Räber,** Inselspital (Switzerland); **Anantharaman Ramasamy,** Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Medeni Karaduman,** Yuzuncu Yil Univ. (Turkey); **Ibrahim Halil Tanboga,** Istanbul Nisantasi University Medical School (Turkey); **Retesh Bajaj,** Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Sylvain Losdat,** Inselspital (Switzerland); **Nathan A. L. Yap,** Barts and The London School of Medicine and Dentistry (United Kingdom); **Soe Maung**, **Anthony Mathur,** Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Jouke Dijkstra,** Leiden Univ. Medical Ctr. (Netherlands); **Andreas Baumbach,** Barts Heart Ctr., Barts Health NHS Trust (United Kingdom); **Christos V. Bourantas,** Barts Heart Ctr., Barts Health NHS Trust (United Kingdom), Ctr. for Cardiovascular Medicine and Devices, William Harvey Research Institute, Queen Mary Univ. (United Kingdom), Institute of Cardiovascular Sciences, Univ. College London (United Kingdom)

13295-3 • 9:10 AM - 9:30 AM
In vivo detection of stent geographic miss during arterial stenting, using intravascular ICG-enhanced NIRF-IVUS biological-structural imaging.
Author(s): **Philipp Rauschendorfer**, **Guillermo J. Tearney, Farouc A. Jaffer,** Mass General Brigham (United States)

13295-4 • 9:30 AM - 9:50 AM
Combined multispectral FLIm/polarization-sensitive OCT catheter system for detection of macrophage foam cells in human atherosclerotic lesions.
Author(s): **Xiangnan Zhou**, **Julien Bec,** Univ. of California, Davis (United States); **Georgia L. Jones,** Massachusetts Institute of Technology (United States), Wellman Ctr. for Photomedicine (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States); **Brett Bouma,** Massachusetts Institute of Technology (United States), Wellman Ctr. for Photomedicine (United States); **Laura Marcu,** Univ. of California, Davis (United States)

13295-5 • 9:50 AM - 10:20 AM
Targeted multimodal imaging-assisted theranostic photoactivation stabilizes inflamed atherosclerotic plaques via TGF-β dependent fibrotic replacement *(Invited Paper)*
Author(s): **Jin Hyuk Kim**, **Joon Woo Song,** Korea Univ. Guro Hospital (Korea, Republic of); **Yeon Hoon Kim,** KAIST (Korea, Republic of); **Hyun Jung Kim**, **Ryeong Hyun Kim**, **Ye Hee Park,** Korea Univ. Guro Hospital (Korea, Republic of); **Hyeong Soo Nam,** KAIST (Korea, Republic of); **Dong Oh Kang,** Korea Univ. Guro Hospital (Korea, Republic of); **Hongki Yoo,** KAIST (Korea, Republic of); **Kyeongsoon Park,** Chung-Ang Univ. (Korea, Republic of); **Jin Won Kim,** Korea Univ. Guro Hospital (Korea, Republic of)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: NEW INSTRUMENTS AND METHODS

25 January 2025 • 10:50 AM - 12:30 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Christos V. Bourantas**, St. Bartholomew's Hospital (United Kingdom)

13295-40 • 10:50 AM - 11:10 AM
The value of high-speed OCT in coronary atherosclerotic plaques: a pilot imaging-pathology comparison study
Author(s): **Yundai Chen**, **Yang Cheng**, **Shanshan Zhou,** Sixth Medical Ctr. of PLA General Hospital (China); **Jianan Li,** Shenzhen Vivolight Medical Device & Technology Co., Ltd. (China)

13295-6 • 11:10 AM - 11:30 AM
Improved intravascular fluorescence quantification in humans using a reusable tissue mimicking phantom with conical lumen and an absorptive reference
Author(s): **Andrew D. Thrapp,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Philipp Rauschendorfer,** MGH Cardiovascular Research Ctr., Massachusetts General Hospital, Harvard Medical School (United States); **Lillian Wang,** Wellman Ctr. for Photomedicine (United States); **Farouc Jaffer,** MGH Cardiovascular Research Ctr. (United States); **Guillermo Tearney,** Wellman Ctr. for Photomedicine (United States)

13295-7 • 11:30 AM - 11:50 AM
Multi-modal fibre-optic balloon probe for real-time monitoring of fluorophores in perfused hearts
Author(s): **Jianrong Qiu**, **Edward Waters**, **Emily Lupton,** King's College London (United Kingdom); **Antoine L. Wallabregue,** Univ. of Oxford (United Kingdom); **Stuart J. Conway,** Univ. of California, Los Angeles (United States); **Richard Southworth, Mads S. Bergholt,** King's College London (United Kingdom)

13295-8 • 11:50 AM - 12:10 PM
Optical method to estimate left atrial wall thickness
Author(s): **Juan Perez**, **Michael Douglass,** Case Western Reserve Univ. (United States); **Kenneth Laurita,** Case Western Reserve Univ. (United States), MetroHealth Medical Ctr. (United States); **Cristine Hendon,** Columbia Univ. (United States); **Andrew M. Rollins,** Case Western Reserve Univ. (United States)

13295-9 • 12:10 PM - 12:30 PM
iCoagLAB permits comprehensive coagulation profiling in patients with percutaneous microaxial pump support
Author(s): **Daniel Hoare**, **Ziqian Zeng**, **Eli Foster**, **Nathaniel Hai, Seemantini Nadkarni,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

Lunch Break 12:30 PM - 2:00 PM

KEYNOTE LECTURE

25 January 2025 • 2:00 PM - 2:30 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Christos V. Bourantas**, St. Bartholomew's Hospital (United Kingdom)

13295-23 • 2:00 PM - 2:30 PM
OCT and NIRS: imaging without compromise (Keynote Presentation)
Author(s): **Eman Namati,** SpectraWAVE, Inc. (United States)

POSTER REVIEW SESSION

25 January 2025 • 2:30 PM - 3:00 PM | Moscone West, Room 155 (Upper Mezz))
Session Chair(s): **Gijs Van Soest**, Erasmus MC (Netherlands)
Please joint the Light in Cardiology conference for a rapid fire poster review session.

CARDIOGENESIS INVITED LECTURE

25 January 2025 • 3:00 PM - 3:30 PM | Moscone South, Room 155 (Upper Mezz)

13295-24 • 3:00 PM - 3:30 PM
Multimodal 3D imaging of genetic expression and electrical activity in the embryonic heart *(Invited Paper)*
Author(s): **Junwoo Suh**, **Jia Fan**, **Stephanie M. Ford**, **Michiko Watanabe**, **Andrew M. Rollins, Michael W. Jenkins,** Case Western Reserve Univ. (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: THE ELECTRIC HEART

25 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Laura Marcu**, Univ. of California, Davis (United States)

13295-10 • 4:00 PM - 4:20 PM
Characterizations of Fosl-2 fibrotic murine Langendorff heart by real-time volumetric multispectral optoacoustic tomography
Author(s): **Çagla Özsoy,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland); **Hsiao-Chun Amy Lin,** National Tsing Hua Univ. (Taiwan); **Lucía Pancorboa**, **Dan Nozdriukhina**, **Michael Reiss,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland); **Amela Hakura**, **Petra Seebeck**, **Andrea Laimbacher**, **Oliver Distler**, **Gabriela Kania,** Univ. Zürich (Switzerland); **Daniel Razansky, Xosé Luís Deán-Ben,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland)

13295-11 • 4:20 PM - 4:40 PM
Hemodynamic changes in the mouse brain during optogenetic induced cardiac arrhythmia
Author(s): **Abigail Matt**, **Kaelyn Schloss**, **Annie Bice**, **Fei Wang**, **Hongwu Liang**, **Adam Bauer, Chao Zhou,** Washington Univ. in St. Louis (United States)

13295-12 • 4:40 PM - 5:00 PM
Interplay of the structure and conduction of the early embryonic atrioventricular junction
Author(s): **Jia Fan**, **Jiawei Chen**, **Junwoo Suh**, **Michiko Watanabe**, **Stephanie Ford**, **Michael W. Jenkins, Andrew M. Rollins,** Case Western Reserve Univ. (United States)

13295-13 • 5:00 PM - 5:20 PM
Excitation wavefront tracking and control of in vitro human induced cardiomyocytes using a digital holographic stimulation system
Author(s): **Felix Schmieder**, **Robert Wendland,** TU Dresden (Germany); **Muhammad Atif Sikandar**, **Wolfram-Hubertus Zimmermann,** Universitätsmedizin Göttingen (Germany); **Lars Büttner,** TU Dresden (Germany), BIOLAS, TU Dresden (Germany); **Olaf Bergmann,** Universitätsmedizin Göttingen (Germany); **Jürgen W. Czarske,** TU Dresden (Germany), BIOLAS, TU Dresden (Germany)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 4: CARDIOGENESIS

26 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Irina V. Larina**, Baylor College of Medicine (United States)

13295-14 • 8:30 AM - 8:50 AM
Novel optogenetics tool for mouse embryonic cardiodynamic study
Author(s): **Guzel R. Musina,** Univ. of Houston (United States), Baylor College of Medicine (United States); **Deirdre M. Scully,** Case Western Reserve Univ. (United States); **Andrew L. Lopez,** Univ. of Houston (United States); **Irina V. Larina,** Baylor College of Medicine (United States), Univ. of Houston (United States)

13295-15 • 8:50 AM - 9:10 AM
Study of ventricular morphogenesis and cardiac dynamics in a live chick embryonic heart slice using combined optical coherence microscopy and confocal microscopy
Author(s): **Santosh Balakrishnan**, **Gening Dong**, **Jonathan T. Butcher, Steven G. Adie,** Cornell Univ. (United States)

13295-16 • 9:10 AM - 9:30 AM
Quantitative OCT angiography for dynamic volumetric analysis of early embryonic circulatory patterns in cardiovascular development
Author(s): **Michaela A. McCown, Irina V. Larina,** Baylor College of Medicine (United States)

13295-17 • 9:30 AM - 9:50 AM
Assessing developmental biomechanics in the embryonic mouse heart
Author(s): **Andre C. Faubert, Shang Wang,** Stevens Institute of Technology (United States)

13295-18 • 9:50 AM - 10:10 AM
Volumetric blood flow imaging in the embryonic mouse heart
Author(s): **Andrew L. Lopez**, **Manmohan Singh**, **Salavat Aglyamov, Kirill Larin,** Univ. of Houston (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: HEMODYNAMICS AND PHYSIOLOGY

26 January 2025 • 10:40 AM - 12:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Christine P. Hendon**, Columbia Univ. (United States)

13295-19 • 10:40 AM - 11:00 AM
Assessing revascularization success in patients with peripheral artery disease using multispectral optoacoustic tomography
Author(s): **Briain Haney**, **Yi Li**, **Julius Kempf**, **Milenko Caranovic**, **Ferdinand Knieling, Ulrich Rother,** Universitätsklinikum Erlangen (Germany)

13295-20 • 11:00 AM - 11:20 AM
Deep-learning-enabled assessment of capillary density in the myocardium using autofluorescence imaging
Author(s): **Zhao Zhang**, **Xiwen Chen**, **Fatemeh Nasehi**, **Ann C. Foley**, **Bruce Z. Gao**, **Robin C. Muise-Helmericks**, **Abolfazl Razi, Tong Ye,** Clemson Univ. (United States)

13295-21 • 11:20 AM - 11:40 AM
Monte Carlo simulation-based transfer learning for estimation of hemoglobin levels from PPG signals
Author(s): **Jonathan Marrero**, **Michael Alvarez, Heidy Sierra,** Univ. de Puerto Rico Mayagüez (United States)

13295-22 • 11:40 AM - 12:00 PM
D-Dimers levels influence fibrin microstructure as a marker of clotting defects in hospitalized patients
Author(s): **Nathaniel Hai**, **Daniel A. Hoare, Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13295-25 • 5:30 PM - 7:00 PM
Detection of vascular calcification via peripheral diffuse reflectance flow patterns changes
Author(s): **Aasma Dahal**, **Shirel Belilty Benmergui**, **Daniela Leizaola**, **Valentina Dargam**, **Joshua Hutcheson, Anuradha Godavarty,** Florida International Univ. (United States)

13295-26 • 5:30 PM - 7:00 PM
Peripheral hemodynamic changes during leg elevation using near-infrared spectroscopic imaging
Author(s): **Aasma Dahal**, **Shirel Belilty Benmergui**, **Joshua Hutcheson, Anuradha Godavarty,** Florida International Univ. (United States)

13295-28 • 5:30 PM - 7:00 PM
The Veelens AI system for OCT image analysis
Author(s): **Tomasz Roleder,** Technical Univeristy of Wrocław (Poland); **Michal Karny**, **Mikhail Darakhovich,** Data Juice Lab. (Poland); **Szymon Wlodarczak**, **Adrian Wlodarczak,** Copper Health Ctr. (Poland); **Natalia Sitko,** Wroclaw Medical Univ. (Poland); **Marcin Chlebus,** Univ. of Warsaw (Poland)

13295-29 • 5:30 PM - 7:00 PM
Integrated IVUS-IVPA for real-time imaging in the assessment of coronary atherosclerosis
Author(s): **Yuchen Jiang**, **Saijun Qiu, Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States)

13295-39 • 5:30 PM - 7:00 PM
Visualization of fiber structure and calcification of porcine and human aortic valve and pericardium tissue via optical coherence tomography
Author(s): **Claudia Dittfeld,** Herzzentrum Dresden GmbH (Germany), TU Dresden (Germany); **Malgorzata Kopycinska-Müller,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Jonas Golde,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Luise Schreiber,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Anett Jannasch,** TU Dresden (Germany); **Ralf Schallert,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Frank Sonntag,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Jörg Opitz,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Sems-Malte Tugtekin,** TU Dresden (Germany)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13296

Biophotonics and Immune Responses XX

27 January 2025 | Moscone South, Room 151 (Upper Mezz)

Conference Chair(s): **Wei R. Chen,** The Univ. of Oklahoma (United States); **Feifan Zhou,** Hainan Univ. (China)

Program Committee: **Praveen Arany,** Univ. at Buffalo (United States); **Michael L. Denton,** Air Force Research Lab. (United States); **Tomas Hode,** Immunophotonics, Inc. (United States); **Satoshi Kashiwagi,** Massachusetts General Hospital (United States); **Hisataka Kobayashi,** National Cancer Institute (United States); **Mladen Korbelik,** BC Cancer Research Ctr. (Canada); **Ann Liebert,** Sydney Adventist Hospital (Australia); **Hong Liu,** The Univ. of Oklahoma (United States); **Jeri-Anne Lyons,** Univ. of Northern Colorado (United States); **Junle Qu,** Shenzhen Univ. (China); **Oxana V. Semyachkina-Glushkovskaya,** Saratov State Univ. (Russian Federation); **Qinggong Tang,** The Univ. of Oklahoma (United States); **Xunbin Wei,** Peking Univ. Health Science Ctr. (China); **Sihua Yang,** South China Normal Univ. (China); **Zhihong Zhang,** Huazhong Univ. of Science and Technology (China)

Saturday 25 January 2025

JOINT SESSION WITH 13297 AND 13296: PBM AND IMMUNOTHERAPY

25 January 2025 • 4:20 PM - 6:00 PM | Moscone South, Room 153 (Upper Mezz)
Session Chair(s): **Wei R. Chen**, The Univ. of Oklahoma (United States)

13297-15 • 4:20 PM - 4:40 PM
A perspective on the role of cytoskeleton in the nervous system and its modulation by PBM: new insights
Author(s): **Ann Liebert,** Sydney Adventist Hospital (Australia); **Roberta Chow,** The Univ. of Sydney (Australia)

13297-16 • 4:40 PM - 5:00 PM
Metabolic rewiring of tumor microenvironment to potentiate immunotherapy by low-level laser
Author(s): **Mei X. Wu,** Harvard Medical School (United States)

13296-20 • 5:00 PM - 5:20 PM
Skull transmittance of transcranial laser in mouse models
Author(s): **Zhenping Xu**, **Xi Li**, **Miao Wang, Feifan Zhou,** Hainan Univ. (China)

13297-17 • 5:20 PM - 5:40 PM
Platelet-rich plasma photo-activation: enhanced release of growth factors for improved regenerative medicine outcomes
Author(s): **Sarassunta Ucci,** Univ. degli Studi del Sannio (Italy); **Anna Aliberti**, **Sara Spaziani,** CeRICT scrl (Italy); **Valeria Iazzetta,** Univ. degli Studi del Sannio (Italy); **Antonio Iele**, **Giancarlo Luongo,** CeRICT scrl (Italy); **Saverio Graziano,** Medical Service (Italy); **Eugenio Caradonna,** Ctr. Diagnostico Italiano (Italy), CeRICT scrl (Italy); **Armando Ricciardi**, **Marco Pisco,** Univ. degli Studi del Sannio (Italy); **Andrea Cusano,** Univ. degli Studi del Sannio (Italy), CeRICT scrl (Italy)

13296-19 • 5:40 PM - 6:00 PM
Photobiomodulation therapy enhances cholesterol efflux in macrophages
Author(s): **Haocai Chang,** South China Normal Univ. (China)

Monday 27 January 2025

SESSION 1: 20 YEARS OF BIOPHOTONICS AND IMMUNE RESPONSES

27 January 2025 • 8:30 AM - 11:25 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Wei R. Chen**, The Univ. of Oklahoma (United States); **Mladen Korbelik**, BC Cancer Research Institute (Canada)

13296-1 • 8:30 AM - 8:50 AM
Biophotonics and immune responses
Author(s): **Wei R. Chen,** The Univ. of Oklahoma (United States)

13296-2 • 8:50 AM - 9:15 AM
Photoimmunotherapy comes of age at the SPIE BiOS Photonics West *(Invited Paper)*
Author(s): **Tayyaba Hasan,** Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States)

13296-3 • 9:15 AM - 9:40 AM
The optical dosimetry of PDT *(Invited Paper)*
Author(s): **Steven L. Jacques,** Univ. of Washington (United States)

13296-4 • 9:40 AM - 10:05 AM
Critical role of lipids in tumor response to photodynamic therapy *(Invited Paper)*
Author(s): **Mladen Korbelik,** BC Cancer Research Institute (Canada)

Coffee Break • 10:05 AM - 10:35 AM

13296-5 • 10:35 AM - 11:00 AM
Development of a novel immune-stimulating drug in combination with local ablation for the treatment metastatic cancers *(Invited Paper)*
Author(s): **Toms Hode**, **Samuel Lam**, **Lu Alleruzoo,** Immunophotonics, Inc. (United States); **Wei R. Chen,** The Univ. of Oklahoma (United States)

13296-6 • 11:00 AM - 11:25 AM
Enhanced lymphocyte antitumor immunity by localized ablative immunotherapy in a breast cancer model using scRNAseq and cell-cell interaction analysis *(Invited Paper)*
Author(s): **Kaili Liu,** The Univ. of Oklahoma (United States); **Ashley R. Hoover,** Stephenson School of Biomedical Engineering, The Univ. of Oklahoma (United States); **Yuanhong Sun**, **Trisha I. Valerio**, **Coline Furrer**, **Jacob Adams**, **Lin Wang, Wei R. Chen,** The Univ. of Oklahoma (United States)

PANEL DISCUSSION: THE FUTURE OF IMMUNOPHOTONICS

27 January 2025 • 11:25 AM - 12:15 PM | Moscone South, Room 151 (Upper Mezz)
Immunophotonics is an emerging and promising field. The Biophotonics and Immune Responses conference was created to foster collaborations and communications within this area. As we celebrate the 20th anniversary of the conference, we would like to host a roundtable discussion on the past, present, and future of Immunophotonics. This discussion will feature a panel of key contributors who have played a pivotal role in the establishment and development of the conference and in the advancement of this new field.

Panelists:
Steve Jacques
Tayyaba Hasan
Xunbin Wei
Tomas Hode
Mladen Korbelik
Feifan Zhou
Wei Chen

Lunch Break 12:15 PM - 1:35 PM

SESSION 2: IN VIVO MONITORING OF IMMUNE RESPONSES

27 January 2025 • 1:35 PM - 3:25 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Xunbin Wei**, Peking Univ. Health Science Ctr. (China); **Jing Wang**, Fujian Normal Univ. (China)

13296-8 • 1:35 PM - 2:00 PM
Circulating tumor cell recognition by relay cavity-based photoacoustic imaging *(Invited Paper)*
Author(s): **Xunbin Wei,** Peking Univ. Health Science Ctr. (China)

13296-9 • 2:00 PM - 2:25 PM
Unveiling immune cell response heterogeneity via longitudinal imaging and multi-parametric analysis of cellular behavior *(Invited Paper)*
Author(s): **Sicong He,** Southern Univ. of Science and Technology (China)

13296-10 • 2:25 PM - 2:45 PM
Deep-UV microscopy for label-free lymphocyte characterization and subtyping
Author(s): **Viswanath Gorti**, **Kaitlyn McCubbins**, **Aaron D. Silva Trenkle, Francisco E. Robles,** Georgia Institute of Technology (United States), Emory Univ. (United States)

13296-11 • 2:45 PM - 3:05 PM
Profiling macrophage responses to biochemical stimuli via stimulated Raman scattering microscopy
Author(s): **Francesco Manetti**, **Benedetta Gavazzoni,** Politecnico di Milano (Italy); **Morteza Behrouzitabar,** Specto Srl (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Manuela Teresa Raimondi,** Politecnico di Milano (Italy); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Emanuela Jacchetti,** Politecnico di Milano (Italy); **Dario Polli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13296-66 • 3:05 PM - 3:25 PM
Effect of simulation on normalized glandular dose coefficients in phase-sensitive breast tomosynthesis prototypes using various x-ray filters
Author(s): **Yuhua Li**, **Molly Wong,** The Univ. of Oklahoma (United States); **Yong Chen,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Farid Omoumi,** Texas A&M Univ. (United States); **Qinghao Zhang**, **Qinggong Tang, Javier A. Jo,** The Univ. of Oklahoma (United States)

Coffee Break 3:25 PM - 3:55 PM

SESSION 3: PHOTOIMMUNOTHERAPY FOR CANCER

27 January 2025 • 3:25 PM - 5:55 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Yuchen Qiu**, The Univ. of Oklahoma (United States); **Honglin Jin**, Huazhong Univ. of Science and Technology (China)

13296-12 • 3:25 PM - 3:50 PM
Enhancing immune responses in pre-clinical oral cancer models through photodynamic priming using a low-cost imaging and treatment device *(Invited Paper)*
Author(s): **Mohammad A. Saad**, **Derek Allen**, **Nayab Tahir,** Massachusetts General Hospital (United States); **Jeonghyun Oh,** Northeastern Univ. (United States); **Bofan Song,** The Univ. of Arizona (United States); **Shakir Khan,** Univ. of Massachusetts Boston (United States); **Rongguang Liang,** The Univ. of Arizona (United States); **Jonathan P. Celli,** Univ. of Massachusetts Boston (United States); **Tayyaba Hasan,** Massachusetts General Hospital (United States)

13296-13 • 3:50 PM - 4:15 PM
Optical imaging guided targeting of cancer and other diseases using human mesenchymal stem cells loaded with thermoresponsive polymeric nanoparticles *(Invited Paper)*
Author(s): **Tymish Y. Ohulchanskyy**, **Iuliia Golovynska,** Shenzhen Univ. (China); **Yurii V. Stepanov,** RE Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology, National Academy of Sciences of Ukraine (Ukraine); **Ludmyla O. Vretik,** Taras Shevchenko National Univ. of Kyiv (Ukraine); **Junle Qu,** Shenzhen Univ. (China)

13296-14 • 4:15 PM - 4:35 PM
A Preliminary Study on Fusing CT and Pathology Information to Improve the Performance of Tumor Response Prediction
Author(s): **Ke Zhang**, **Tiancheng Gai**, **Patrik Gilley**, **Neman Abdoli**, **Youkabed Sadri,** The Univ. of Oklahoma (United States); **Theresa Thai**, **Kar-Ming Fung**, **Yong Chen**, **Kathleen Moore**, **Robert Mannel,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Yuchen Qiu,** The Univ. of Oklahoma (United States)

13296-15 • 4:35 PM - 4:55 PM
Real-time functional imaging of lymphatic hypoxia response using PpIX-based delayed fluorescence imaging
Author(s): **Marien Ochoa**, **Matthew Reed, Brian Pogue,** Univ. of Wisconsin-Madison (United States)

13296-16 • 4:55 PM - 5:15 PM
Optimization of localized ablative immunotherapy for pancreatic cancer treatment
Author(s): **Trisha I. Valerio**, **Coline Furrer**, **Jacob Adams**, **Yuanhong Sun**, **Brian A. Baharestani**, **Malayna Unkel**, **Ghainaa Abousleiman**, **Ashley Hoover**, **Kaili Liu, Wei R. Chen,** The Univ. of Oklahoma (United States)

13296-17 • 5:15 PM - 5:35 PM
Localized nano-ablative immunotherapy enhances specific anti-tumor immune responses for the treatment of pancreatic cancer
Author(s): **Coline Furrer**, **Trisha I. Valerio**, **Sophia-Joy X. Patrock**, **Brian A. Baharestani**, **Ghainaa Abousleiman**, **Ashley R. Hoover**, **Lin Wang**, **Kaili Liu, Wei R. Chen,** The Univ. of Oklahoma (United States)

13296-18 • 5:35 PM - 5:55 PM
Advanced multispectral autofluorescence for immune status assessment
Author(s): **Abbas Habibalahi**, **Ayad G. Anwer**, **Aline Knab,** Graduate School of Biomedical Engineering, The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics, The Univ. of New South Wales (Australia); **Shane T. Grey,** Garvan Institute of Medical Research (Australia), School of Biotechnology and Biomolecular Sciences, The Univ. of New South Wales (Australia); **Ewa M. Goldys, Jared M. Campbell,** Graduate School of Biomedical Engineering, The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics, The Univ. of New South Wales (Australia)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13296-22 • 5:30 PM - 7:00 PM
The strategy of synergistic photodynamic therapy with innate immune activation for enhanced tumor eradication
Author(s): **Jing Yang**, **Minghui Feng**, **Jiajia Fu**, **Bo Liu**, **Wen Song, Feifan Zhou,** Hainan Univ. (China)

13296-23 • 5:30 PM - 7:00 PM
An improved photoacoustic lock-in detection method for contrast-enhanced imaging
Author(s): **Wei Chen,** South China Normal Univ. (China)

13296-24 • 5:30 PM - 7:00 PM
Photoacoustic photothermal therapy monitoring of breast cancer tumors
Author(s): **Pengxuan Ning**, **Chuanhui Ge**, **Jinrui Wang**, **Hui Lin**, **Zhifang Li, Shulian Wu,** Fujian Normal Univ. (China)

13296-25 • 5:30 PM - 7:00 PM
Transcriptome changes of meningeal lymphatic vessels in Alzheimer's disease mice treated with non-invasive photobiological modulation
Author(s): **Yumeng Qu**, **Miao Wang, Feifan Zhou,** Hainan Univ. (China)

13296-26 • 5:30 PM - 7:00 PM
Metamaterial formalism approach towards precise choice of the antibiotic treatment
Author(s): **Tatjana Gric,** Vilnius Gediminas Technical Univ. (Lithuania); **Edik U. Rafailov,** Aston Univ. (United Kingdom)

13296-27 • 5:30 PM - 7:00 PM
Photobiomodulation attenuates neuroinflammation in primary astrocytes identified by transcriptome analysis
Author(s): **Wenjing Chen**, **Xiaotong Gu, Feifan Zhou,** Hainan Univ. (China)

13296-28 • 5:30 PM - 7:00 PM
Whole-face ALA-PDT for the treatment of facial actinic keratosis by skin rejuvenation
Author(s): **Lei Shi,** HuaDong Hospital, Fudan Univ. (China)

13296-29 • 5:30 PM - 7:00 PM
Targeted modulation of the meningeal lymphatics reverse pathway for immunotherapy of breast cancer brain metastases
Author(s): **Yanfeng Dai**, **Xiang Yu,** Hainan Univ. (China); **Yifan Zhao**, **Jianshuang Wei,** Huazhong Univ. of Science and Technology (China); **Zhihong Zhang,** Hainan Univ. (China)

13296-31 • 5:30 PM - 7:00 PM
Successful long-term suppression for refractory male genital lichen sclerosus through ALA-PDT
Author(s): **Lei Shi,** HuaDong Hospital, Fudan Univ. (China)

13296-35 • 5:30 PM - 7:00 PM
GSH-depleting nanoplatform for multi-sensitization to ferroptosis by downregulate Wnt/β-catenin pathway to synergetic enhance photodynamic immunotherapy
Author(s): **Jiayung Luo**, **Kexin Xu**, **Cuixia Lu,** Guangxi Univ. (China); **Jiaxing Song,** Guangxi Medical Univ. (China)

13296-36 • 5:30 PM - 7:00 PM
Zinc-based porphyrin framework nanoparticles enhance photodynamic immunotherapy via remodeling tumor microenvironment
Author(s): **Peilin Tian**, **Cuixia Lu**, **Kexin Xu,** Guangxi Univ. (China); **Jiaxing Song,** Guangxi Medical Univ. (China)

13296-42 • 5:30 PM - 7:00 PM
Unlock the potential of optical intravital imaging to study immune responses in cutaneous inflammatory diseases.
Author(s): **Zhan Fan**, **Zheng Liu, Zhihong Zhang,** Hainan Univ. (China)

13296-43 • 5:30 PM - 7:00 PM
Intravital imaging of monocyte-mediated neutrophil trans-epidermal migration in contact dermatitis
Author(s): **Zhan Fan**, **Zheng Liu, Zhihong Zhang,** Hainan Univ. (China)

13296-44 • 5:30 PM - 7:00 PM
Segment Anything Model (SAM) for metastatic tumor segmentation: evaluating its impact on chemotherapy response prediction
Author(s): **Neman Abdoli**, **Ke Zhang**, **Patrik Gilley,** The Univ. of Oklahoma (United States); **Theresa Thai**, **Yong Chen**, **Kathleen Moore**, **Robert Mannel,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Yuchen Qiu,** The Univ. of Oklahoma (United States)

13296-45 • 5:30 PM - 7:00 PM
Stem cells loaded with polymer nanoparticles for diagnostics of inflammatory focuses in the brain
Author(s): **Rana Zaki Abdul A. Bari**, **Iuliia Golovynska**, **Jiantao Liu,** Shenzhen Univ. (China); **Yurii V. Stepanov,** The National Academy of Sciences of Ukraine (Ukraine); **Ludmyla O. Vretik,** Taras Shevchenko National Univ. of Kyiv (Ukraine); **Siqi Gao**, **Hao Xu**, **Sergii Golovynskyi**, **Tymish Y. Ohulchanskyy, Junle Qu,** Shenzhen Univ. (China)

13296-67 • 5:30 PM - 7:00 PM
Harnessing LIBS for next-generation diagnostics
Author(s): **Christina J. Walker**, **Yuriy Markushin,** Delaware State Univ. (United States); **Noureddine Melikechi,** Univ. of Massachusetts Lowell (United States)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13296-32
Amyloid-β oligomers induced AD-like pathological changes in human cerebral organoids
Author(s): **Zhimeng Tang**, **Yanyu Luo**, **Jin Yan,** Hainan Univ. (China); **Feng Yue,** School of Biomedical Engineering, Hainan Univ. (China), One Health Collaborative Innovation Ctr., Hainan Univ. (China)

13296-34
Reduced glucose utilisation accompanied by inflammation in the brain of spontaneous type 2 diabetic cynomolgus monkeys and its association with AD-like pathology
Author(s): **Junzhen H. Song**, **Xinxin Huang**, **Shanshan Huang,** Hainan Univ. (China); **Feng Yue,** State Key Lab. of Digital Medical Engineering (China), School of Biomedical Engineering, Hainan Univ. (China), One Health Collaborative Innovation Ctr., Hainan Univ. (China)

13296-37
Brain insulin resistance and its effect on AD-like pathological formation in spontaneous type 2 diabetic cynomolgus monkeys
Author(s): **Fangyan Fu**, **Xinxin Huang**, **Shanshan Huang,** Hainan Univ. (China); **Feng Yue,** State Key Lab. of Digital Medical Engineering (China), School of Biomedical Engineering, Hainan Univ. (China)

13296-38
Blood metabolomics analysis combined with machine learning to reveal the key metabolites associated Alzheimer's disease in cynomolgus monkeys with spontaneous obesity
Author(s): **Rongchao Ao,** Hainan Univ. (China); **Feng Yue,** State Key Lab. of Digital Medical Engineering (China), School of Biomedical Engineering, Hainan Univ. (China), One Health Collaborative Innovation Ctr., Hainan Univ. (China)

13296-39
The synthesis and characterization of medin oligomers and its effects on nerve cells in vitro
Author(s): **Yi Zhu**, **Bin Liu,** Hainan Univ. (China); **Feng Yue,** State Key Lab. of Digital Medical Engineering (China), School of Biomedical Engineering, Hainan Univ. (China), One Health Collaborative Innovation Ctr., Hainan Univ. (China)

13296-40
The deposition and cross-seeding of islet amyloid polypeptide and phosphorylated α-Synuclein in gut, myocardium, and brain of cynomolgus monkeys with spontaneous type 2 diabetes mellitus
Author(s): **CaiYan Liang,** Hainan Univ. (China); **Feng Yue,** State Key Lab. of Digital Medical Engineering (China), School of Biomedical Engineering, Hainan Univ. (China)

13296-41
Impaired intestinal barrier and intestinal AD-like pathological formation in type 2 diabetic cynomolgus monkeys
Author(s): **Miaorong Weng**, **Yuling Zhang**, **CaiYan Liang, Feng Yue,** Hainan Univ. (China)

CONFERENCE 13297

Mechanisms of Photobiomodulation Therapy XIX

25 January 2025 | Moscone South, Room 153 (Upper Mezz)

Conference Chair(s): **Ann Liebert,** The Univ. of Sydney (Australia); **Jeri-Anne Lyons,** Univ. of Northern Colorado (United States); **James D. Carroll,** THOR Photomedicine Ltd. (United Kingdom)

Program Committee: **Michael L. Denton,** Air Force Research Lab. (United States); **Dennis Sourvanos,** Univ. of Pennsylvania (United States); **Mei X. Wu,** Harvard Medical School (United States), Wellman Ctr. for Photomedicine (United States)

Saturday 25 January 2025

SESSION 1: MECHANISMS OF PHOTOBIOMODULATION

25 January 2025 • 8:10 AM - 10:30 AM | Moscone South, Room 153 (Upper Mezz)
Session Chair(s): **Dennis Sourvanos**, Univ. of Pennsylvania (United States)

13297-1 • 8:10 AM - 8:30 AM
Proposal for suitable classification of photomedical concepts
Author(s): **Shota Sasaki**, **Hiroshi Kumagai**, **Shun Takeda, Tomohiro Kosuge,** Kitasato Univ. (Japan)

13297-2 • 8:30 AM - 9:00 AM
How photobiomodulation might help delay the four leading causes of chronic noncommunicable death *(Invited Paper)*
Author(s): **James D. Carroll,** THOR Photomedicine Ltd. (United Kingdom)

13297-3 • 9:00 AM - 9:20 AM
In vitro evidence on photobiomodulation by blue LED light
Author(s): **Giada Magni**, **Martina Banchelli,** Consiglio Nazionale delle Ricerche (Italy), Istituto di Fisica Applicata "Nello Carrara" (Italy); **Federica Cherchi**, **Anna Maria Pugliese,** Univ. degli Studi di Firenze (Italy); **Lucia Cavigli**, **Andrea Barucci**, **Roberto Pini, Francesca Rossi,** Consiglio Nazionale delle Ricerche (Italy), Istituto di Fisica Applicata "Nello Carrara" (Italy)

13297-4 • 9:20 AM - 9:40 AM
Harnessing photobiomodulation therapy: a holistic approach to healthcare and wellness for the MZ generation
Author(s): **Sungkyoo Lim,** Dankook Univ. (Korea, Republic of); **Seihwan Choi,** Seoul St. Mary Neurosurgery Clinic (Korea, Republic of)

13297-5 • 9:40 AM - 10:00 AM
Monte Carlo simulation of temperature distribution for skin tissue during photobiomodulation
Author(s): **Weibing Yang**, **Dennis Sourvanos**, **Andreea Dimofte**, **Theresa M. Busch**, **Rodrigo Neiva**, **Joseph P. Fiorellini,** Univ. of Pennsylvania (United States); **Praveen Arany,** Univ. at Buffalo (United States); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13297-6 • 10:00 AM - 10:30 AM
Light distribution and characterization of clinical photobiomodulation therapy devices at 660nm and 810nm. *(Invited Paper)*
Author(s): **Dennis Sourvanos**, **Tmothy C. Zhu**, **Andreea Dimofte**, **Theresa M. Busch**, **Weibing Yang,** Univ. of Pennsylvania (United States); **Praveen Arany,** Univ. at Buffalo (United States); **James D. Carroll,** THOR Photomedicine Ltd. (United Kingdom); **Todd Schoenbaum,** Augusta Univ. (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: PHYSICAL MECHANISMS OF PBM

25 January 2025 • 11:00 AM - 11:50 AM | Moscone South, Room 153 (Upper Mezz)
Session Chair(s): **James D. Carroll**, THOR Photomedicine Ltd. (United Kingdom)

13297-7 • 11:00 AM - 11:30 AM
Photostimulation of mitochondria: A Raman microspectroscopy approach *(Invited Paper)*
Author(s): **Nathaniel J. Pope,** SAIC (United States); **Joshua Lalonde,** National Research Council (NRC) (United States); **Gary D. Noojin,**

Michael L. Denton, Air Force Research Lab. (United States)

13297-9 • 11:30 AM - 11:50 AM
In vitro study of optical vortex and photobiomodulation effects for the development of Parkinson's disease treatment
Author(s): **Hiro Kinugawa**, **Fumitaka Kawakami,** Kitasato Univ. Graduate School of Medical Sciences (Japan); **Katsuhiko Miyamoto,** Chiba Univ. (Japan); **Hiroshi Kumagai,** Kitasato Univ. Graduate School of Medical Sciences (Japan); **Emiyu Ogawa,** Keio Univ. (Japan)

Lunch Break 11:50 AM - 2:00 PM

SESSION 3: CLINICAL APPLICATIONS OF PBM

25 January 2025 • 2:00 PM - 3:50 PM | Moscone South, Room 153 (Upper Mezz)
Session Chair(s): **Ann Liebert**, Kolling Institute of Medical Research (Australia)

13297-10 • 2:00 PM - 2:30 PM
Microbiome modulation as a mechanism of treatment for neurodegenerative disease; the potential for photobiomodulation therapy *(Invited Paper)*
Author(s): **Ann Liebert, Brian Bicknell,** The Univ. of Sydney (Australia)

13297-11 • 2:30 PM - 2:50 PM
Optimization of transient selective neural inhibition via photobiomodulation (tSNIP) parameters in a spared nerve injury model
Author(s): **Aaron Skubal**, **Michael Jenkins, Michael Moffitt,** Case Western Reserve Univ. (United States)

13297-13 • 2:50 PM - 3:10 PM
Evaluating the impact of soft tissue flaps on red and near-infrared light transmission in porcine cortical bone: a preliminary study for dental applications.
Author(s): **Dennis Sourvanos**, **Timothy C. Zhu**, **Andreea Dimofte**, **Theresa M. Busch**, **Weibing Yang,** Univ. of Pennsylvania (United States); **Praveen Arany,** Univ. at Buffalo (United States); **James D. Carroll,** THOR Photomedicine Ltd. (United Kingdom); **Todd Schoenbaum,** Augusta Univ. (United States)

13297-14 • 3:10 PM - 3:30 PM
Enhanced post-arthroplasty shoulder rehabilitation following total rotator cuff tear: a study case with a synergistic approach using physiotherapy and multimodal photobiomodulation
Author(s): **Rui Teixeira**, **Luisa Martins,** Iom, Unipessoal Lda (Portugal); **Daniela dos Santos,** Univ. Ulm (Germany), Iom, Unipessoal Lda (Portugal)

13297-12 • 3:30 PM - 3:50 PM
Laser acupuncture for autism spectrum disorder a randomized sham controlled trial
Author(s): **Shahzad Anwar,** Anwar Shah Trust for Cerebral Palsy & Paralysis (Pakistan)

Coffee Break 3:50 PM - 4:20 PM

SESSION 4: JOINT SESSION WITH 13297 AND 13296: PBM AND IMMUNOTHERAPY

25 January 2025 • 4:20 PM - 6:00 PM | Moscone South, Room 153 (Upper Mezz)
Session Chair(s): **Wei R. Chen**, The Univ. of Oklahoma (United States)

13297-15 • 4:20 PM - 4:40 PM
A perspective on the role of cytoskeleton in the nervous system and its modulation by PBM: new insights
Author(s): **Ann Liebert,** Sydney Adventist Hospital (Australia); **Roberta Chow,** The Univ. of Sydney (Australia)

13297-16 • 4:40 PM - 5:00 PM
Metabolic rewiring of tumor microenvironment to potentiate immunotherapy by low-level laser
Author(s): **Mei X. Wu,** Harvard Medical School (United States)

13296-20 • 5:00 PM - 5:20 PM
Skull transmittance of transcranial laser in mouse models
Author(s): **Zhenping Xu**, **Xi Li**, **Miao Wang, Feifan Zhou,** Hainan Univ. (China)

13297-17 • 5:20 PM - 5:40 PM
Platelet-rich plasma photo-activation: enhanced release of growth factors for improved regenerative medicine outcomes
Author(s): **Sarassunta Ucci,** Univ. degli Studi del Sannio (Italy); **Anna Aliberti**, **Sara Spaziani,** CeRICT scrl (Italy); **Valeria Iazzetta,** Univ. degli Studi del Sannio (Italy); **Antonio Iele**, **Giancarlo Luongo,** CeRICT scrl (Italy); **Saverio Graziano,** Medical Service (Italy); **Eugenio Caradonna,** Ctr. Diagnostico Italiano (Italy), CeRICT scrl (Italy); **Armando Ricciardi**, **Marco Pisco,** Univ. degli Studi del Sannio (Italy); **Andrea Cusano,** Univ. degli Studi del Sannio (Italy), CeRICT scrl (Italy)

13296-19 • 5:40 PM - 6:00 PM
Photobiomodulation therapy enhances cholesterol efflux in macrophages
Author(s): **Haocai Chang,** South China Normal Univ. (China)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13297-20 • 5:30 PM - 7:00 PM
Novel glaucoma therapy rescuing excitotoxicity in an ischemia-reperfusion mice model
Author(s): **Yu-Hsuan Lee,** National Taiwan Univ. (Taiwan); **Yi-Ke Lin**, **Ta-Ching Chen,** National Taiwan University Hospital (Taiwan); **Lih-Chu Chiou,** National Taiwan Univ. (Taiwan)

CONFERENCE 13298

Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2025

27 - 28 January 2025 | Moscone South, Room 102 (Level 1 Lobby)

Conference Chair(s): **Tianhong Dai,** Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Mei X. Wu,** Harvard Medical School (United States)

Program Committee: **Alba Alfonso García,** Univ. of California, Davis (United States); **Timothy M. Baran,** Univ. of Rochester Medical Ctr. (United States); **Alessandra Nara de Souza Rastelli,** Univ. Estadual Paulista "Júlio de Mesquita Filho" (Brazil); **Pu-Ting Dong,** The Forsyth Institute (United States), Harvard School of Dental Medicine (United States); **Yanfang Feng,** Wellman Ctr. for Photomedicine (United States); **Walfre Franco,** Univ. of Massachusetts Lowell (United States); **Verena Hörr,** Universitätsklinikum Bonn (Germany); **Leon G. Leanse,** Univ. of Gibraltar (Gibraltar); **Ute Neugebauer,** Universitätsklinikum Jena (Germany)

Monday 27 January 2025

PHOTONIC DIAGNOSIS AND MONITORING: KEYNOTE

27 January 2025 • 8:50 AM - 9:25 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Richard Grohs**, Leibniz-Institut für Photonische Technologien e.V. (Germany)

13298-200 • 8:50 AM - 9:25 AM
Trends and opportunities in Raman based infection diagnostics (Keynote Presentation)
Author(s): **Anja Silge,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

SESSION 1: PHOTONIC DIAGNOSIS AND MONITORING I

27 January 2025 • 9:25 AM - 10:05 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany)

13298-2 • 9:25 AM - 9:45 AM
Classification of inflammatory tissue remodeling in murine colitis using label-free multiphoton microscopy and a 3D convolutional neural network
Author(s): **Lucas A. Kreiss**, **Maryam Roohian**, **Amey Chaware,** Duke Univ. (United States); **Oana-Maria Thoma,** Universitätsklinikum Erlangen (Germany); **Oliver Friedrich**, **Sebastian Schürmann**, **Maximilian Waldner,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Roarke Horstmeyer,** Duke Univ. (United States)

13298-3 • 9:45 AM - 10:05 AM
Botulinum neurotoxin C dual detection through immunological recognition and endopeptidase activity using porous silicon interferometers
Author(s): **Nanda D. Kumar, Giorgi Shtenberg,** Agricultural Research Organization - The Volcani Institute (Israel)

Coffee Break 10:05 AM - 10:35 AM

SESSION 2: PHOTONIC DIAGNOSIS AND MONITORING II

27 January 2025 • 10:35 AM - 12:25 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Anja Silge**, Friedrich-Schiller-Univ. Jena (Germany)

13298-4 • 10:35 AM - 11:00 AM

Label-free detection of respiratory virus co-infections: integrating surface-enhanced Raman scattering with deep learning *(Invited Paper)*
Author(s): **Yanjun Yang**, **Jiaheng Cui**, **Amit Kumar**, **Dan Luo**, **Jackelyn Murray**, **Leslie Jones**, **Xianyan Chen**, **Ralph Tripp**, **Yiping Zhao,** The Univ. of Georgia (United States); **Sebastian Hülck,** tec5USA, Inc. (United States)

13298-5 • 11:00 AM - 11:20 AM
Graphene oxide and morphology-controlled dendritic silver nanoparticle with facile filter paper as a SERS-active substrate for the detection of interleukin 6
Author(s): **I-Hsuan Chou,** National Tsing Hua Univ. (Taiwan); **Chen-Hao Chang,** National Central University (Taiwan); **E-Ping Tsai**, **Sanskruti Swain**, **Ting Yi Lin**, **Yen-Pei Lin,** National Central Univ. (Taiwan); **Hsing Ying Lin,** National Tsing Hua Univ. (Taiwan); **Chen-Han Huang,** National Central Univ. (Taiwan)

13298-6 • 11:20 AM - 11:40 AM
N-acetyl-β-d-glucosaminidase activity assay for monitoring insulin-dependent diabetes using Ag-porous Si SERS platform
Author(s): **Narsingh R. Nirala, Giorgi Shtenberg,** Agricultural Research Organization - The Volcani Institute (Israel)

13298-7 • 11:40 AM - 12:00 PM
N-acetyl-β-D-glucosaminidase biomarker quantification in milk using Ag-porous Si SERS platform for mastitis severity evaluation
Author(s):

13298-9 • 12:00 PM - 12:25 PM
Antibiotics quantification in a compact SERS-based centrifugal microfluidics platform: the case of Meropenem in ICU settings *(Invited Paper)*
Author(s): **Isidro Badillo-Ramírez**, **Martyna A. Pytlarz**, **Gohar Soufi**, **Laura Serioli**, **Roman Slipets,** Technical Univ. of Denmark (Denmark); **Anders Perner,** Rigshospitalet (Denmark); **Anja Boisen,** Technical Univ. of Denmark (Denmark)

Lunch Break 12:25 PM - 2:15 PM

SESSION 3: PHOTONIC DIAGNOSIS AND MONITORING III

27 January 2025 • 2:15 PM - 4:00 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Yanfang Feng**, Massachusetts General Hospital (United States); **Mei X. Wu**, Harvard Medical School (United States)

13298-10 • 2:15 PM - 2:40 PM
RamanBioAssay™ platform for fast and comprehensive characterization of pathogenic bacteria *(Invited Paper)*
Author(s): **Richard Grohs,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Forschungcampus InfectoGnostics (Germany); **Marie-Lusie Enghardt,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Forschungcampus InfectoGnostics (Germany), Institute of Physical Chemistry, Friedrich-Schiller-Univ. Jena (Germany); **Anja Silge,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Forschungcampus InfectoGnostics (Germany); **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Forschungcampus InfectoGnostics (Germany), Institute of Physical Chemistry, Friedrich-Schiller-Univ. Jena (Germany)

13298-13 • 2:40 PM - 3:00 PM
Rapid Antifungal Susceptibility Testing by Stimulated Raman Photothermal Imaging of D2O Metabolism
Author(s): **Biwen Gao**, **Meng Zhang**, **Jianpeng Ao**, **Hongli Ni**, **Xiaowei Ge**, **Haonan Lin,** Boston Univ. (United States); **Mohamed N. Seleem,** Virginia Polytechnic Institute and State Univ. (United States); **Ji-Xin Cheng,** Boston Univ. (United States)

13298-14 • 3:00 PM - 3:20 PM
Correlated micro-spectroscopic labelling and analysis of leukocytes
Author(s): **Shravan Raghunathan,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Michael Kiehntopf**, **Susann Piehler,** Institute of Clinical Chemistry and Laboratory Diagnostics, Universitätsklinikum Jena (Germany); **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Leibniz-Zentrum für Photonik in der Infektionsforschung (Germany); **Christoph Krafft,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Leibniz-Zentrum für Photonik in der Infektionsforschung (Germany); **Juiia Kunze,** Institute of Clinical Chemistry and Laboratory Diagnostics, Universitätsklinikum Jena (Germany)

13298-15 • 3:20 PM - 3:40 PM
Differentiation and characterization of bacteria using high-wavenumber Raman spectroscopy
Author(s): **Alec B. Walter**, **Ezekiel J. Haugen**, **Anna S. Rourke-Funderburg**, **Anita Mahadevan-Jansen, Andrea K. Locke,** Vanderbilt Univ. (United States)

13298-12 • 3:40 PM - 4:00 PM **(CANCELLED)**
Raman spectroscopy and scanning electron microscopy characterization of morphological and biochemical properties of colistin resistance P. aeruginosa
Author(s): **Dimple Saikia,** Indian Institute of Technology Dharwad (India)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13298-30 • 5:30 PM - 7:00 PM
Combination of 470nm with 405nm light to potentiate photo-killing of *Staphylococcus aureus*
Author(s): **Jiaqi Weng**, **Carolina dos Anjos**, **Leon G. Leanse,** Wellman Ctr. for Photomedicine (United States); **Qi Wang,** Yancheng Institute of Technology (China); **Tianhong Dai,** Wellman Ctr. for Photomedicine (United States)

13298-25 • 5:30 PM - 7:00 PM
Doxycycline and minocycline show greater photodynamic enhancement by blue light than newer FDA–approved, extended-spectrum tetracyclines tigecycline and omadacycline
Author(s): **Laisa Bonafim Negri,** Massachusetts General Hospital (United States); **Alexis Jolly,** The Univ. of Edinburgh (United Kingdom); **Sandeep Korupolu**, **William Farinelli**, **Shifu Aggarwal**, **Laurence Rahme**, **Robert Redmond, Jeffrey Gelfand,** Massachusetts General Hospital (United States)

Tuesday 28 January 2025

ANTIMICROBIAL PHOTOTHERAPY: KEYNOTE

28 January 2025 • 8:30 AM - 9:05 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Timothy M. Baran**, Univ. of Rochester Medical Ctr. (United States)

13298-32 • 8:30 AM - 9:05 AM
Bacteria-specific pro-photosensitizers: An emerging field in phototherapy for multidrug-resistant bacteria (Keynote Presentation)
Author(s): **Mei X. Wu,** Harvard Medical School (United States)

SESSION 4: ANTIMICROBIAL PHOTOTHERAPY I

28 January 2025 • 9:05 AM - 10:10 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Timothy M. Baran**, Univ. of Rochester Medical Ctr. (United States)

13298-16 • 9:05 AM - 9:30 AM
Combating antibiotic resistance with photoactivatable multi-inhibitory liposomes *(Invited Paper)*
Author(s): **Yanfang Feng**, **Jose Quilez Alburquerque,** Massachusetts General Hospital (United States); **Tayyaba G. Hasan,** Massachusetts General Hospital (United States), Harvard Univ. (United States), Massachusetts Institute of Technology (United States)

13298-17 • 9:30 AM - 9:50 AM
Antimicrobial photodynamic inactivation as a means to improve the safety of temporary polymer implants
Author(s): **Alina Rahtz,** Laser Zentrum Hannover e.V. (Germany); **Romina Berger,** Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany); **Alexander Schweigerdt,** Institute of Chemistry and Biochemistry (Germany); **Marie Weinhart,** Institut für Physikalische Chemie und Elektrochemie, Leibniz Univ. Hannover (Germany), Institute of Chemistry and Biochemistry, Freie Univ. Berlin (Germany); **Tammo Ripken, Sonja Johannsmeier,** Laser Zentrum Hannover e.V. (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany)

13298-18 • 9:50 AM - 10:10 AM
Efflux pump inhibition by reserpine enhances pathogen deactivation with nanoparticles and methylene blue
Author(s): **Ali O. Er**, **Yaran Allamyradov**, **Justice ben Yosef**, **Carli Street**, **Hadley Whipple, Mahmood Ateyeh,** Western Kentucky Univ. (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: ANTIMICROBIAL PHOTOTHERAPY II

28 January 2025 • 10:40 AM - 12:10 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Yanfang Feng**, Massachusetts General Hospital (United States)

13298-19 • 10:40 AM - 11:05 AM
Photodynamic therapy in a rabbit model of perforated appendicitis: In vivo pilot study *(Invited Paper)*
Author(s): **Timothy M. Baran**, **Korry Wirth**, **Laurel Baglia**, **Matthew Byrne**, **Martin S. Pavelka, Nicole A. Wilson,** Univ. of Rochester (United States)

13298-20 • 11:05 AM - 11:25 AM
Developing a translational blue light prototype device for antimicrobial wound treatment
Author(s): **Laisa Negri**, **William Farinelli,** Massachusetts General Hospital (United States), Wellman Ctr. for Photomedicine (United States); **Sandeep Korupolu**, **R. Rox Anderson, Jeffrey Gelfand,** Massachusetts General Hospital (United States)

13298-21 • 11:25 AM - 11:45 AM
Airborne singlet oxygen delivery in photodynamic therapy as an innovative approach to tackle antimicrobial multidrug resistance
Author(s): **Fernanda Cabral,** Massachusetts General Hospital (United States), Harvard Medical School (United States), Wellman Ctr. for Photomedicine (United States); **QianFeng Xu,** SingletO2 Therapeutics LLC (United States); **Alexander Greer**, **Alan Lyons,** The City Univ. of New York (United States); **Tayyaba Hasan,** Massachusetts General Hospital (United States)

13298-22 • 11:45 AM - 12:10 PM
Photodynamic treatment of infected skin ulcers mediated by Santabufen, a novel chloride derivative *(Invited Paper)*
Author(s): **Jianhua Huang, Hongwei Wang,** HuaDong Hospital (China)

Lunch Break 12:10 PM - 1:40 PM

SESSION 6: ANTIMICROBIAL PHOTOTHERAPY III

28 January 2025 • 1:40 PM - 3:05 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Tianhong Dai**, Harvard Medical School (United States)

13298-23 • 1:40 PM - 2:05 PM
Cold microplasma exposure as a novel therapeutic treatment for bacterial otitis media: Study results and conclusions in a small animal model *(Invited Paper)*
Author(s): **Guillermo L. Monroy,** Beckman Institute for Advanced Science and Technology (United States); **Zhenglun Wu,** Univ. of Illinois (United States); **Eric J. Chaney**, **Darold R. Spillman,** Beckman Institute for Advanced Science and Technology (United States); **Michael B. Jamrozy**, **Kavita Desai Kabelitz**, **Andrey Mironov,** Univ. of Illinois (United States); **Alexander Ho**, **Gang Xiao**, **Edita Aksamitiene**, **Marina Marjanovic**, **Daniel A. Llano,** Beckman Institute for Advanced Science and Technology (United States); **Thanh Nguyen**, **J. Gary Eden,** Univ. of Illinois (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

13298-24 • 2:05 PM - 2:25 PM
Photosensitization: An alternative approach to control infections
Author(s): **Rehab Amin,** Max-Planck-Institut für Immunbiologie und Epigenetik (Germany)

13298-26 • 2:25 PM - 2:45 PM
Photodynamic therapy for infection treatment through novel laminar flow fibre optics
Author(s): **Alexis K. Jolly,** School of Medicine, Univ. of St. Andrews (United Kingdom); **Marianna L. De Avellar, Robert J. H. Hammond,** Division of Infection and Global Health, School of Medicine, Univ. of St. Andrews (United Kingdom)

13298-27 • 2:45 PM - 3:05 PM
Laser induced changes in articular cartilage
Author(s): **Tyler Iorizzo,** IPG Medical Corp. (United States); **Maryem Mahhou**, **Santana Wright,** Univ. of Massachusetts Lowell (United States); **James Childs**, **Ilya Yaroslavsky**, **Gregory Altshuler,** IPG Medical Corp. (United States); **Anna Yaroslavsky,** Univ. of Massachusetts Lowell (United States)

CONFERENCE 13299

Optical Methods for Tumor Treatment and Detection: Mechanisms and Techniques in Photodynamic Therapy XXXIII

25 - 26 January 2025 | Moscone South, Room 151 (Upper Mezz)

Conference Chair(s): **David H. Kessel,** Wayne State Univ. (United States); **Tayyaba Hasan,** Wellman Ctr. for Photomedicine (United States), Division of Health Sciences and Technology, Harvard-MIT (United States), Harvard Medical School and Massachusetts General Hospital (United States)

Conference Co-Chair(s): **Edward V. Maytin,** Lerner Research Institute - Cleveland Clinic (United States)

Program Committee: **Theresa M. Busch,** Univ. of Pennsylvania (United States); **Huang-Chiao Huang,** Univ. of Maryland, College Park (United States); **Girgis Obaid,** Univ. of Texas at Dallas Chapter (United States); **Fabienne Dumoulin,** Acibadem Üniv. (Turkey); **Merrill A. Biel,** Univ. of Minnesota, Twin Cities (United States); **Kenneth K. Wang,** Mayo Clinic (United States); **Jonathan P. Celli,** Univ. of Massachusetts Boston (United States); **Keith A. Cengel,** Penn Medicine (United States)

Saturday 25 January 2025

SESSION 1: DRUG DELIVERY PROCEDURES

25 January 2025 • 9:00 AM - 10:00 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Girgis Obaid**, The Univ. of Texas at Dallas (United States)

13299-1 • 9:00 AM - 9:20 AM
Applying photodynamics for radiotherapy-controlled drug delivery.
Author(s): **Mans Broekgaarden,** Institut National de la Santé et de la Recherche Médicale (France)

13299-2 • 9:20 AM - 9:40 AM
Device to measure tumor blood oxygenation during interstitial photodynamic therapy
Author(s): **Emily Oakley-Gawrys,** Roswell Park Comprehensive Cancer Ctr. (United States); **Robert Perttilä**, **Petteri Uusimaa,** Modulight Corp. (Finland); **Gal Shafirstein,** Roswell Park Comprehensive Cancer Ctr. (United States)

13299-3 • 9:40 AM - 10:00 AM
Multifunctional perfluorocarbon nanodroplets reverse hypoxia and improve chemotherapy efficacy through photodynamic priming in tumor spheroids
Author(s): **Marvin Xavierselvan**, **Ronak Shethia**, **Brooke Bednarke**, **Satya Siva Kishan Yalamarty, Srivalleesha Mallidi,** Tufts Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: IMAGING AND OXYGENATION

25 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Srivalleesha Mallidi**, Tufts Univ. (United States)

13299-4 • 10:30 AM - 10:50 AM
Amplified with more dye: high-payload Cet-IRDye800CW is capable of photodynamic therapy
Author(s): **Austin P. Nguyen**, **Chanda Bhandari**, **Micah Keown**, **Ashritha Malkoochi**, **Maxwell Quaye**, **Doha Mahmoud**, **Nimit Shah,** The Univ. of Texas at Dallas (United States); **Dina Alzhanova,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13299-6 • 10:50 AM - 11:10 AM
Small fractions of light in ALA-PDT increase blood flow, oxygen and metabolism in normal mouse skin

Author(s): **Aleksandra Ilina**, **Marien Ochoa**, **Xu Cao, Brian W. Pogue,** Univ. of Wisconsin-Madison (United States)

13299-7 • 11:10 AM - 11:30 AM
Monitoring effects of photodynamic therapy on tumor vasculature using multi-parametric high frequency doppler ultrasound and photoacoustic imaging
Author(s): **Deeksha Sankepalle,** Tufts Univ. (United States); **Lucy Wei**, **Pieter Kruizinga,** Erasmus MC (Netherlands); **Srivalleesha Mallidi,** Tufts Univ. (United States)

Lunch Break 11:30 AM - 1:15 PM

SESSION 3: IMMUNOLOGY AND NANOSYSTEMS

25 January 2025 • 1:15 PM - 2:55 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Mohammad A. Saad**, Massachusetts General Hospital (United States)

13299-8 • 1:15 PM - 1:35 PM
Photodynamic priming for sensitizing pancreatic tumors to anti-PD1 therapy
Author(s): **Mohammad A. Saad**, **Derek Allen**, **Tessa D. van Bergen,** Massachusetts General Hospital (United States); **Jimena Nicolás Morala,** Univ. Autónoma de Madrid (Spain); **Harrison J. Roberts, Tayyaba Hasan,** Massachusetts General Hospital (United States)

13299-9 • 1:35 PM - 1:55 PM
Self-penetrating light-activated lipid nanoparticles augment immunotherapy in pancreatic cancer
Author(s): **Girgis Obaid, Chanda Bhandari,** The Univ. of Texas at Dallas (United States)

13299-10 • 1:55 PM - 2:15 PM
Solid lipid nanoparticles or liposomes: Which makes for a better nanoplatform for light activated cancer immunotherapy?
Author(s): **Nimit Shah**, **Siddharth Reddy Soma**, **Maxwell Quaye**, **Doha Mahmoud**, **Sarah Ahmed**, **Ashritha Malkoochi, Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13299-11 • 2:15 PM - 2:35 PM
Photodynamic priming with ALA-PDT to amplify FLASH radiotherapy
Author(s): **Aleksandra Ilina,** Univ. of Wisconsin-Madison (United States); **Kendall Jarvis,** Tulane Univ. (United States), Univ. of Wisconsin-Madison (United States); **William S. Thomas**, **Matthew Reed**, **Marien Ochoa, Brian W. Pogue,** Univ. of Wisconsin-Madison (United States)

13299-12 • 2:35 PM - 2:55 PM
Targeted light-activated multi-agent nanoplatform for enhanced tumor nodule penetration in vivo
Author(s): **Sumiao Pang**, **Carla Arnau,** Univ. of Maryland, College Park (United States); **Robert Perttilä**, **Nada Fadul,** Modulight Corp. (Finland); **Dana Roque,** Univ. of Maryland (United States); **Tayyaba Hasan,** Harvard Medical School (United States); **Petteri Uusimaa,** Modulight Corp. (Finland); **Huang-Chiao Huang,** Univ. of Maryland, College Park (United States)

Coffee Break 2:55 PM - 3:30 PM

SESSION 4: PDT GENERAL TOPICS

25 January 2025 • 3:30 PM - 4:50 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Huang-Chiao Huang**, Univ. of Maryland, College Park (United States)

13299-13 • 3:30 PM - 3:50 PM
In vitro and in vivo analysis in NIR-PDD combining multiphoton excitation and 5-ALA
Author(s): **Shoki Yashiki,** Univ. of Toyama (Japan); **Katsuhiro Ogawa**, **Hidefumi Shiroshita**, **Masafumi Inomata,** Oita Univ. (Japan); **Takashi Katagiri, Yusuke Oshima,** Univ. of Toyama (Japan)

13299-14 • 3:50 PM - 4:10 PM
Multispectral singlet oxygen luminescence dosimetry (MSOLD) for direct singlet oxygen monitoring during in-vivo Photofrin-mediated PDT
Author(s): **Madelyn Johnson**, **Baozhu Lu**, **Hongjing Sun**, **Weibing Yang,** Univ. of Pennsylvania (United States); **Brian C. Wilson,** Univ. of Toronto (Canada); **Robert H. Hadfield,** Univ. of Glasgow (United Kingdom); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13299-15 • 4:10 PM - 4:30 PM
Monte Carlo study of electron beam incident angle and tissue optical properties dependence of Cherenkov emission for TSET patients
Author(s): **Yifeng Zhu**, **Madelyn Johnson**, **Baozhu Lu, Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13299-16 • 4:30 PM - 4:50 PM
Assessment of patient-specific corrections for multiview Cherenkov emission during total skin electron therapy (TSET)
Author(s): **Yifeng Zhu**, **Baozhu Lu**, **Lisha Chen**, **Brook K. Byrd**, **Daniel A. Alexandar**, **Michael LaRiviere**, **John Plastaras, Timothy C. Zhu,** Univ. of Pennsylvania (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

PANEL DISCUSSION: IS LIGHT DOSIMETRY NECESSARY FOR OPTIMAL PDT?

26 January 2025 • 9:00 AM - 10:30 AM | Moscone South, Room 151 (Upper Mezz)
Panel Moderator:
Lothar Lilge, Univ. Health Network (Canada)

Panelists:
Dominic Robinson, Erasmus MC (Netherlands)
Brian Pogue, Univ. of Wisconsin-Madison (United States)
Jonathan Celli, Univ. of Massachusetts Boston (United States)

The panel will discuss whether the use of quantitative, spatially resolved PDT dosimetry has an impact on a patient's clinical outcome. What is the benefit of dosimetry for standardized treatment protocols versus its use in personalized PDT treatment planning?
Clinical translation of PDT, whether investigator-initiated or sponsored by industry, still relies heavily on standardized treatment protocols adjusted to the size and location of the malignancy. Given that light (photon) delivery rate and total dose are under the control of the clinician, the PDT dose can be modulated within limits given by the tissue's optical properties; knowledge of the PDT efficacy determining parameters should yield improved outcomes. When and how can this information be obtained, and under what conditions is including this information in the clinical praxis advantageous for the patient? The aim is to present and discuss current dosimetry approaches, what dosimetry concepts are best for predicting PDT outcomes, and their suitability for their clinical implementation.

Coffee Break 10:30 AM - 11:00 AM

SESSION 5: THERAPEUTIC INDICATIONS

26 January 2025 • 11:00 AM - 12:00 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Timothy C. Zhu**, Perelman Ctr. for Advanced Medicine (United States)

13299-17 • 11:00 AM - 11:20 AM
Monte Carlo simulation for analysis of light fluence distribution in pleural photodynamic therapy
Author(s): **Hongjing Sun**, **Timothy C. Zhu**, **Dennis Sourvanos, Madelyn Johnson,** Penn Medicine (United States)

13299-18 • 11:20 AM - 11:40 AM
The optimization of light dosimetry of modeled-phantom for intra-peritoneal photodynamic therapy for peritoneal carcinomatosis
Author(s): **Jong Hyun Park,** Seoul National Univ. (Korea, Republic of), Yonsei Univ. Health System (Korea, Republic of); **Hyoung-Il Kim**, **Adriana Rivera-Piza,** Yonsei Univ. Health System (Korea, Republic of); **Yoon-Kyu Song,** Seoul National Univ. (Korea, Republic of)

13299-19 • 11:40 AM - 12:00 PM
Direct near-infrared laser-induced suppression of human 2D melanoma
Author(s): **Arooj Khalid**, **Sergei G. Sokolovski, Edik U. Rafailov,** Aston Univ. (United Kingdom)

Lunch Break 12:00 PM - 1:15 PM

SESSION 6: TARGETING AND OXYGENATION

26 January 2025 • 1:15 PM - 2:55 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Edward V. Maytin**, Lerner Research Institute - Cleveland Clinic (United States)

13299-20 • 1:15 PM - 1:35 PM
Characterization of optical parameters with wide-field dual-channel laparoscopic spatial frequency domain imaging system
Author(s): **Rasel Ahmmed, Ulas Sunar,** Stony Brook Univ. (United States)

13299-21 • 1:35 PM - 1:55 PM
Impact of scattering medium on singlet oxygen luminescence generation in photodynamic therapy
Author(s): **Vikas Vikas,** Univ. of Glasgow (United Kingdom); **Weibing Yang**, **Baozhu Lu,** Univ. of Pennsylvania (United States); **Brian C. Wilson,** Univ. Health Network, Univ. of Toronto (Canada); **Timothy C. Zhu,** Univ. of Pennsylvania (United States); **Robert H. Hadfield,** Univ. of Glasgow (United Kingdom)

13299-22 • 1:55 PM - 2:15 PM
Development of targeted photoactivable liposomes for PDT-based combination therapy in ovarian cancer
Author(s): **Payal Srivastava**, **Carla Arnau del Valle**, **Anika Dasgupta**, **Riley Schoch**, **Sumiao Pang, Huang-Chiao Huang,** Univ. of Maryland, College Park (United States)

13299-23 • 2:15 PM - 2:35 PM
Real-time photosensitizer dosimetry for photodynamic therapy
Author(s): **Hongjing Sun**, **Weibiing Yang, Timothy C. Zhu,** Penn Medicine (United States)

13299-24 • 2:35 PM - 2:55 PM
Oxygen sensing and imaging in skin PDT with ALA
Author(s): **Brian W. Pogue**, **Marien Ochoa,** Univ. of Wisconsin-Madison (United States); **Arthur Petusseau,** Dartmouth College (United States); **Edward Maytin,** Cleveland Clinic (United States); **Tayyaba Hasan,** Harvard Medical School (United States); **Petr Bruza,** Dartmouth College (United States); **Aleksandra Ilina,** Univ. of Wisconsin-Madison (United States)

Coffee Break 2:55 PM - 3:30 PM

SESSION 7: PDT GENERAL TOPICS II

26 January 2025 • 3:30 PM - 4:50 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Sanjay Anand**, Cleveland Clinic (United States)

13299-25 • 3:30 PM - 3:50 PM
Multispectral singlet oxygen luminescent dosimetry (MSOLD) using isotropic detector for photodynamic therapy
Author(s): **Weibing Yang**, **Baozhu Lu**, **Madelyn Johnson**, **Hongjing Sun,** Perelman Ctr. for Advanced Medicine (United States); **Vikas Vikas**, **Robert H. Hadfield,** Univ. of Glasgow (United Kingdom); **Brian C. Wilson,** Univ. of Toronto (Canada); **Timothy C. Zhu,** Perelman Ctr. for Advanced Medicine (United States)

13299-26 • 3:50 PM - 4:10 PM
Photodynamic therapy synergizes with an RNA medicine strategy for enrichment of miR-146a-5p in 3D pancreatic tumor models and murine xenografts
Author(s): **Jonathan P. Celli**, **Vida Karimnia,** Univ. of Massachusetts Boston (United States); **Frank Slack,** Beth Israel Deaconess Medical Ctr. (United States); **Shakir Khan,** Univ. of Massachusetts Boston (United States)

13299-27 • 4:10 PM - 4:30 PM
Comparative analysis of multichannel singlet oxygen luminescence dosimetry (MSOLD) and singlet oxygen explicit dosimetry (SOED) in benzoporphyrin derivative (BPD)-mediated photodynamic therapy: A mouse model study
Author(s): **Weibing Yang**, **Baozhu Lu**, **Madelyn Johnson**, **Hongjing Sun,** Perelman Ctr. for Advanced Medicine (United States); **Vikas Vikas**, **Robert H. Hadfield,** Univ. of Glasgow (United Kingdom); **Brian C. Wilson,** Univ. of Toronto (Canada); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13299-28 • 4:30 PM - 4:50 PM
Advanced photodynamic therapy monitoring using a 7-channel continuous singlet oxygen luminescent dosimetry (CSOLD) device
Author(s): **Baozhu Lu**, **Weibing Yang**, **Hongjing Sun,** Univ. of Pennsylvania (United States); **Vikas Vikas,** Univ. of Glasgow (United Kingdom); **Brian C. Wilson,** Princess Margaret Cancer Ctr. (Canada); **Robert Hadfield,** Univ. of Glasgow (United Kingdom); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13299-29 • 5:30 PM - 7:00 PM
Determination of optimal Photofrin-mediated PDT treatment parameters for long-term survival
Author(s): **Madelyn Johnson**, **Hongjing Sun**, **Theresa M. Busch, Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13299-31 • 5:30 PM - 7:00 PM
3-D photographic imaging can serve as an optical biopsy to predict responsivity of human basal cell carcinoma to photodynamic therapy
Author(s): **Edward V. Maytin,** Cleveland Clinic (United States); **Nathalie Zeitouni,** The Univ. of Arizona (United States); **Lauren Heusinkveld,** Brigham and Women's Hospital (United States); **Jeffrey Negrey**, **Abigail Updyke**, **Sanjay Anand**, **Christine B. Warren,** Cleveland Clinic (United States); **Tayyaba Hasan,** Harvard Medical School (United States)

13299-32 • 5:30 PM - 7:00 PM
Immune profiling of murine cutaneous squamous cell carcinoma (SCC) following vitamin D and photodynamic therapy utilizing transcriptomic, flow cytometric and immunofluorescent approaches
Author(s): **Alan Shen**, **Sanjay Anand**, **Cheng-En Cheng**, **Erin Capodanno,** Cleveland Clinic (United States); **Tayyaba Hasan,** Harvard Medical School (United States); **Edward V. Maytin,** Cleveland Clinic (United States)

13299-33 • 5:30 PM - 7:00 PM
Combination of 5-fluorouracil with photodynamic therapy for murine squamous cell carcinoma of the skin: Transcriptomic and immune profile analyses of therapeutic response
Author(s): **Sanjay Anand**, **Alan Shen**, **Cheng-En Cheng**, **Erin Capodanno,** Cleveland Clinic (United States); **Tayyaba Hasan,** Harvard Medical School (United States); **Edward V. Maytin,** Cleveland Clinic (United States)

13299-40 • 5:30 PM - 7:00 PM
Priming the desmoplastic pancreatic tumor microenvironment using PD-L1 immune checkpoint targeted photoactivable liposomes
Author(s): **Chanda Bhandari**, **Azophi Moffat**, **Nimit Shah,** The Univ. of Texas at Dallas (United States); **Adil Khan,** Univ. of Texas at Dallas (United States); **Rolf Brekken,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Jacopo Ferruzzi,** The Univ. of Texas at Dallas (United States); **Tayyaba Hasan,** Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States); **Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13299-41 • 5:30 PM - 7:00 PM
A new approach to PDT dosimetry using an image-guided surgery affibody probe
Author(s): **Siddharth R Soma**, **Chanda Bhandari**, **Maxwell Quaye,** The Univ. of Texas at Dallas (United States); **Alisher Talgatov,** The University of Texas at Arlington (United States); **Gal Shafirstein,** Roswell Park Comprehensive Cancer Ctr. (United States); **Kimberley S. Samkoe,** Thayer School of Engineering at Dartmouth (United States); **Sherri A. McFarland,** The Univ. of Texas at Arlington (United States); **Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13299-42 • 5:30 PM - 7:00 PM
Lipid nanocarrier composition and its role in reactive molecular species, subcellular localization, and immunogenic cell death for photodynamic therapy: Solid lipid nanoparticles and liposomes
Author(s): **Maxwell Quaye**, **Nimit Shah**, **Siddharth Reddy Soma**, **Doha Mahmoud**, **Sarah Ahmed**, **Ashritha Malkoochi, Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13299-43 • 5:30 PM - 7:00 PM
Comparative assessment of verteporfin lipid nanoparticle and liposomal formulations: Implications for photodynamic therapy
Author(s): **Doha Mahmoud**, **Nimit Shah**, **Siddharth Reddy Soma**, **Maxwell Quaye**, **Sarah Ahmed**, **Ashritha Malkoochi, Girgis Obaid,** The Univ. of Texas at Dallas (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13300

Ophthalmic Technologies XXXV

25 - 26 January 2025 | Moscone South, Room 156 (Upper Mezz)

Conference Chair(s): **Daniel X. Hammer,** U.S. Food and Drug Administration (United States); **Derek Nankivil,** Johnson & Johnson Vision Care, Inc. (United States); **Yuankai K. Tao,** Vanderbilt Univ. (United States)

Program Committee: **Kostadinka Bizheva,** Univ. of Waterloo (Canada); **Ralf Brinkmann,** Medizinisches Laserzentrum Lübeck GmbH (Germany); **Wolfgang Drexler,** Medizinische Univ. Wien (Austria); **Sina Farsiu,** Duke Univ. (United States); **Katharine F. Grieve,** Institut de la Vision (France); **Arthur Ho,** Brien Holden Vision Institute (Australia); **Yali Jia,** Casey Eye Institute (United States); **Karen M. Joos,** Vanderbilt Univ. Medical Ctr. (United States); **Anthony N. Kuo,** Duke Univ. School of Medicine (United States); **Kirill V. Larin,** Univ. of Houston (United States); **Zhuolin Liu,** U.S. Food and Drug Administration (United States); **Fabrice Manns,** Univ. of Miami (United States); **Ezra Maguen,** American Eye Institute (United States); **Donald T. Miller,** Indiana Univ. (United States); **Daniel V. Palanker,** Stanford Univ. (United States); **Ygal Rotenstreich,** The Chaim Sheba Medical Ctr., Tel Hashomer (Israel); **Luigi Rovati,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Marco Ruggeri,** Bascom Palmer Eye Institute (United States); **Georg Schuele,** Tesseract Health (United States); **J. Sebag,** VMR Institute for Vitreous Macula Retina (United States); **Per G. Söderberg,** Uppsala Univ. (Sweden); **Ji Yi,** Johns Hopkins Univ. (United States); **Robert J. Zawadzki,** Univ. of California, Davis (United States)

Saturday 25 January 2025

SESSION 1: NEURO-OPHTHALMOLOGY, NEURODEGENERATION, AND GLAUCOMA

25 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Karen M. Joos**, Vanderbilt Univ. Medical Ctr. (United States); **Fabrice Manns**, Univ. of Miami (United States)

13300-1 • 8:00 AM - 8:15 AM
Age related loss rate of the minimal cross section of the waist of the nerve fiber layer in the optic nerve head estimated with OCT
Author(s): **Per G. Söderberg**, **Konstancija Kisonaite**, **Jonatan Holm,** Uppsala Univ. (Sweden); **Qiran Cao**, **Chunliang Wang,** KTH Royal Institute of Technology (Sweden); **Zhaohua Yu,** Uppsala Univ. (Sweden)

13300-2 • 8:15 AM - 8:30 AM
High-resolution multimodal optical coherence tomography and scanning laser ophthalmoscopy for in vivo mouse retinal imaging
Author(s): **Siyu Song**, **Guangru B Liang**, **Tristan Hormel**, **Yukun Guo**, **Min Gao**, **Benjamin Sivyer**, **Siyu Chen**, **Yifan Jian**, **Peter Campbell, Yali Jia,** Oregon Health & Science Univ. (United States)

13300-3 • 8:30 AM - 8:45 AM
The potential of using eye movements as an indicator of brain neuronal response with retinal eye tracker NeuroFET
Author(s): **Marta K. Skrok,** Nicolaus Copernicus Univ. (Poland); **Robert Konklewski-Pilewicz,** Inoko Vision sp. z o.o. (Poland); **Patrcycjusz Stremplewski,** Nicolaus Copernicus Univ. (Poland), Inoko Vision sp. z o.o. (Poland); **Maciej Nowakowski,** Inoko Vision sp. z o.o. (Poland); **Valentyna Pryhodiuk,** Nicolaus Copernicus Univ. (Poland); **Anna Szkulmowska,** Inoko Vision sp. z o.o. (Poland); **Maciej Szkulmowski,** Nicolaus Copernicus Univ. (Poland)

13300-4 • 8:45 AM - 9:00 AM
A lens-based compact dual-channel AOSLO system for in vivo 3D imaging of microglial cells in the mouse retina
Author(s): **Zhongqiang Li**, **Stella Mary**, **Thomas V. Johnson,** Wilmer Eye Institute (United States); **Ji Yi,** Wilmer Eye Institute (United States), Johns Hopkins Univ. (United States)

13300-5 • 9:00 AM - 9:15 AM
Characteristics of immune cells and other structures in the peripapillary region of multiple sclerosis patients
Author(s): **Daniel X. Hammer,** U.S. Food and Drug Administration (United States); **Udayakumar Karuppanan,** Univ. of Maryland School of Medicine (United States); **Achyut Raghavendra,** U.S. Food and Drug Administration (United States); **Osamah J. Saeedi**, **Daniel Harrison,** Univ. of Maryland School of Medicine (United States); **Zhuolin Liu,** U.S. Food and Drug Administration (United States)

13300-6 • 9:15 AM - 9:30 AM
Imaging neurovascular coupling in the healthy and glaucomatous rodent retina
Author(s): **Simran Pattar**, **Khushmeet K. Dhaliwal**, **Zichael Labomarel, Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13300-7 • 9:30 AM - 9:45 AM
Probing neurovascular coupling in the healthy and glaucomatous human retina with a combined OCT+ERG system
Author(s): **Khushmeet K. Dhaliwal**, **Chris Hudson**, **Nadine Furtado,** Univ. of Waterloo (Canada); **Tom Wright**, **Brian G. Ballios,** Kensington Health (Canada), Univ. of Toronto (Canada); **Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13300-8 • 9:45 AM - 10:00 AM
Assessment of long-term changes to retinal ganglion cell morphology in human glaucomatous eyes
Author(s): **Achyut J. Raghavendra,** Univ. of Maryland School of Medicine (United States); **Somayyeh Soltanian-Zadeh**, **Anant Agrawal,** U.S. Food and Drug Administration (United States); **Osamah J. Saeedi,** Univ. of Maryland School of Medicine (United States); **Zhuolin Liu, Daniel X. Hammer,** U.S. Food and Drug Administration (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: NOVEL DEVICES AND METHODOLOGY

25 January 2025 • 10:30 AM - 12:30 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Wolfgang Drexler**, Medizinische Univ. Wien (Austria); **Kate F. Grieve**, Institut de la Vision (France)

13300-9 • 10:30 AM - 10:45 AM
Removal of combined confocal and fall-off effects from OCT B-scans for attenuation coefficient extraction in ophthalmic images
Author(s): **Daniel J. Phan,** Vanderbilt Univ. (United States); **Martin C. Were,** Vanderbilt Univ. Medical Ctr. (United States); **Jörn-Hendrik Weitkamp, Audrey K. Bowden,** Vanderbilt Univ. (United States)

13300-10 • 10:45 AM - 11:00 AM
1.7 MHz, 840 nm swept source ophthalmic OCT
Author(s): **Marie Klufts**, **Wolfgang Draxinger**, **Simon Lotz, Robert Huber,** Univ. zu Lübeck (Germany)

13300-11 • 11:00 AM - 11:15 AM
An eye-tracking device with combined retinal and anterior eye-tracking capabilities
Author(s): **Maciej Szkulmowski**, **Marta K. Skrok,** Nicolaus Copernicus Univ. (Poland); **Robert Konklewski-Pilewicz,** Inoko Vision sp. z o.o. (Poland); **Patrycjusz Stremplewski,** Nicolaus Copernicus Univ. (Poland); **Maciej Nowakowski,** Inoko Vision sp. z o.o. (Poland); **Valentyna Pryhodiuk,** Nicolaus Copernicus Univ. (Poland); **Jakub Lipiński,** Inoko Vision sp. z o.o. (Poland); **Marcus Nystrom,** Lund Univ. (Sweden); **Ignace T. C. Hooge,** Utrecht Univ. (Netherlands); **Diederick C. Niehorster,** Lund Univ. (Sweden); **Anna Szkulmowska,** Inoko Vision sp. z o.o. (Poland)

13300-12 • 11:15 AM - 11:30 AM
Ocular polarimetry using clinical optical coherence tomography instruments
Author(s): **Po-Yi Lee,** Wellman Ctr. for Photomedicine (United States); **Chuan-Bor Chueh,** Wellman Ctr. for Photomedicine (United States), National Taiwan Univ. (Taiwan); **Milen Shishkov,** Wellman Ctr. for Photomedicine (United States); **Tai-Ang Wang**, **Hsiang-Chieh Lee,** National Taiwan Univ. (Taiwan); **Teresa Chen,** Massachusetts Eye and Ear (United States); **Brett E. Bouma, Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13300-13 • 11:30 AM - 11:45 AM
Pupil-tracked whole-eye OCT for quantitative retinal curvature retrieval with reduced motion artifacts
Author(s): **George T. Funkenbusch,** Duke Univ. (United States); **Rick Laoprasert,** Duke Univ. Medical Ctr. (United States); **Pablo Ortiz,** Duke Univ. (United States); **Sydney M. Gospe,** Duke Univ. School of Medicine (United States); **Joseph A. Izatt,** Duke Univ. (United States); **Anthony N. Kuo, Ryan P. McNabb,** Duke Univ. School of Medicine (United States)

13300-14 • 11:45 AM - 12:00 PM
Quantifying Bruch's membrane (BM) thickness in aging with visible light optical coherence tomography (OCT)
Author(s): **Ruoyu Meng,** New York Univ. (United States); **Alok K. Gupta, Vivek J. Srinivasan,** NYU Langone Health (United States)

13300-15 • 12:00 PM - 12:15 PM
Gaze-matched, pupil-steered retinal imaging for arcmin precision eye tracking over a 50° gaze range at 200 Hz
Author(s): **Francesco LaRocca**, **Michael Tilleman**, **Carmen Wang,** Meta Reality Labs Research (United States); **Bartlomiej Kowalski,** Stanford Univ. (United States); **David Li**, **Youmin Wang,** Meta Reality Labs Research (United States); **Qiang Yang,** Univ. of Rochester (United States); **Alfredo Dubra,** Stanford Univ. (United States); **Mohamed El-Haddad,** Meta Reality Labs Research (United States)

13300-16 • 12:15 PM - 12:30 PM
Imaging photoreceptor somas and their loss in disease in the living human eye
Author(s): **Yan Liu**, **Qiuzhi Ji**, **Marcel T. Bernucci**, **Kristen Bowles-Johnson**, **Matthew Keller**, **James A. Crowell,** Indiana Univ. (United States); **Kazuhiro Kurokawa,** Legacy Devers Eye Institute, Legacy Health (United States); **Donald T. Miller,** Indiana Univ. (United States)

Lunch Break 12:30 PM - 1:30 PM

PASCAL ROL KEYNOTE ADDRESS

25 January 2025 • 1:30 PM - 2:30 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Per G. Söderberg**, Uppsala Univ. (Sweden); **Daniel X. Hammer**, U.S. Food and Drug Administration (United States)

13300-200 • 1:30 PM - 2:30 PM
Structural and functional biomarkers for glaucoma neuroprotection trials (Keynote Presentation)
Author(s): **Jeffrey L. Goldberg,** Byers Eye Institute, Stanford Univ. (United States)

SESSION 3: NOVEL THERAPIES, VISION RESTORATION, AND VISION CORRECTION

25 January 2025 • 2:30 PM - 3:45 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Per G. Söderberg**, Uppsala Univ. (Sweden); **Daniel X. Hammer**, U.S. Food and Drug Administration (United States)

13300-17 • 2:30 PM - 2:45 PM
Accelerated customization of contact lenses through the integration of optical coherence tomography and 3D printing
Author(s): **Pengpeng Zhang**, **Raymond Fang**, **Weijia Fan**, **Junqing Leng**, **Hao F. Zhang, Cheng Sun,** Northwestern Univ. (United States)

13300-18 • 2:45 PM - 3:00 PM
Effectiveness of central and peripheral corneal cross-linking in correcting hyperopia and myopia
Author(s): **Pavel V. Nikitin,** Univ. of Houston (United States)

13300-19 • 3:00 PM - 3:15 PM
Automatic temperature-controlled retinal laser therapy: First clinical results
Author(s): **Ralf Brinkmann,** Medizinisches Laserzentrum Lübeck GmbH (Germany), Univ. zu Lübeck (Germany); **Christopher Kren**, **Veit Danicke**, **Dirk Theisen-Kunde,** Medizinisches Laserzentrum Lübeck GmbH (Germany); **Hossam Abbas,** Univ. zu Lübeck (Germany); **Johann Roider, Claus von der Burchard,** Universitätsklinikum Schleswig-Holstein (Germany)

13300-20 • 3:15 PM - 3:30 PM
Retinal thermometry in-vivo using phase-sensitive optical coherence tomography
Author(s): **Yueming Zhuo**, **Mohajeet B. Bhuckory,** Stanford Univ. (United States); **Huakun Li,** Nanyang Technological Univ. (Singapore); **David Veysset,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Junya Hattori,** The Univ. of Tokyo (Japan); **Davis-Pham Howard,** Stanford Univ. (United States); **Tong Ling,** Nanyang Technological Univ. (Singapore); **Daniel V. Palanker,** Stanford Univ. (United States)

13300-21 • 3:30 PM - 3:45 PM
Enhanced prosthetic vision following upgrade of a subretinal photovoltaic implant in-situ
Author(s): **Mohajeet B. Bhuckory**, **Nicharee Monkongpitukkul**, **Andrew Shin**, **Anna Kochnev Goldstein**, **Nathan Jensen**, **Sarthak Shah**, **Davis Pham-Howard**, **Roopa Dalal**, **Ludwig Galambos**, **Theodore Kamins, Daniel V. Palanker,** Stanford Univ. (United States)

Coffee Break 3:45 PM - 4:15 PM

SESSION 4: ANTERIOR SEGMENT IMAGING AND TECHNOLOGIES

25 January 2025 • 4:15 PM - 5:30 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Anthony N. Kuo**, Duke Univ. School of Medicine (United States); **Marco Ruggeri**, Bascom Palmer Eye Institute (United States)

13300-22 • 4:15 PM - 4:30 PM
Algorithm for wide-field thickness mapping of anterior corneal layers from OCT images with a beam near normal to the cornea
Author(s): **Ngoc Lan Vy Truong,** Univ. of Miami (United States), Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Francesco P. Giuffrida,** Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Fabrice Manns,** Bascom Palmer Eye Institute (United States), Univ. of Miami (United States); **Jean-marie Parel,** Bascom Palmer Eye Institute (United States), Brien Holden Vision Institute (Australia); **Arthur Ho,** Bascom Palmer Eye Institute (United States), Brien Holden Vision Institute (Australia), The Univ. of New South Wales (Australia); **Mohamed Abou Shousha,** Brien Holden Vision Institute (Australia); **Marco Ruggeri,** Bascom Palmer Eye Institute (United States), Univ. of Miami (United States)

13300-23 • 4:30 PM - 4:45 PM
Advancements of optical transmission imaging of the anterior eye
Author(s): **Samer Alhaddad,** Institut Langevin (France); **Wajdene Ghouali**, **Christophe Baudouin,** Ctr. Hospitalier National d'Opthalmologie des Quinze-Vingts (France); **Albert Claude Boccara, Viacheslav Mazlin,** Institut Langevin (France)

13300-24 • 4:45 PM - 5:00 PM
Wide-field OCT imaging of the cornea with a hypercentric lens
Author(s): **Marco Ruggeri,** Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States), Univ. of Miami (United States); **Francesco Pozzo Giuffrida,** Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Ngoc Lan Vy Truong,** Bascom Palmer Eye Institute (United States), Univ. of Miami (United States); **Jean-Marie Parel,** Bascom Palmer Eye Institute (United States), Brien Holden Vision Institute (Australia); **Mohamed Abou Shousha,** Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Fabrice Manns,** Bascom Palmer Eye Institute (United States), Univ. of Miami (United States); **Arthur Ho,** Bascom Palmer Eye Institute (United States), Brien Holden Vision Institute (Australia), The Univ. of New South Wales (Australia)

13300-25 • 5:00 PM - 5:15 PM
Imaging the entire human vitreous body in vivo with synchronous OCT window scanning and adaptive focusing
Author(s): **Daniel Ruminski**, **Paweł Ossowski**, **Vasantha K. Kathirvelu,** Nicolaus Copernicus Univ. (Poland); **Bartłomiej Kałużny,** Collegium Medicum UMK, Nicolaus Copernicus Univ. (Poland); **Pablo Artal,** Univ. de Murcia (Spain); **Jerry Sebag,** VMR Institute (United States), Doheny Eye Institute, Univ. of California, Los Angeles (United States); **Ireneusz Grulkowski,** Nicolaus Copernicus Univ. (Poland)

13300-26 • 5:15 PM - 5:30 PM
Age-dependence of in vivo lens stiffness measured using combined Brillouin microscopy and optical coherence elastography
Author(s): **Fabrice Manns**, **Leana Rohman,** Univ. of Miami (United States), Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Justin Schumacher,** Univ. of Maryland, College Park (United States); **Christian Zevallos-Delgado**, **Manmohan Singh,** Univ. of Houston (United States); **Natalie Zaleski,** Univ. of Miami (United States), Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Colette Shea**, **Bianca Maceo Heilman,** Univ. of Miami (United States), Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States); **Marco Ruggeri,** Bascom Palmer Eye Institute, Univ. of Miami Miller School of Medicine (United States), Univ. of Miami (United States); **Arthur Ho,** Brien Holden Vision Institute (Australia), Univ. of Miami (United States); **Salavat R. Aglyamov,** Univ. of Houston (United States); **Jean-Marie Parel,** Bascom Palmer Eye Institute, Univ. of Miami (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States); **Kirill V. Larin,** Univ. of Houston (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: ANGIOGRAPHY, HEMODYNAMICS, AND OXIMETRY

26 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Yali Jia**, Casey Eye Institute (United States); **Ji Yi**, Johns Hopkins Univ. (United States)

13300-27 • 8:00 AM - 8:15 AM
Advanced spatiotemporal analysis of retinal capillary perfusion using commercial OCT
Author(s): **Yudan Chen,** The Univ. of British Columbia (Canada)

13300-28 • 8:15 AM - 8:30 AM
In vivo multi-color scanning laser oximetry of the human retina
Author(s): **Yorick Konijn,** Vrije Univ. Amsterdam (Netherlands); **Vincent S. Zoutenbier,** TNO (Netherlands); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands); **Arjen Amelink,** TNO (Netherlands)

13300-29 • 8:30 AM - 8:45 AM
Quantitative ocular blood flow imaging in rats with macular degeneration
Author(s): **Mircea Mujat,** Physical Sciences Inc. (United States)

13300-30 • 8:45 AM - 9:00 AM
Intravenous flow profile evaluation at arteriovenous crossings using OCT blood flowmeter
Author(s): **Masahiro Akiba**, **Kana Minamide,** Topcon Corp. (Japan); **Toco Y. P. Chui, Richard Rosen,** New York Eye and Ear Infirmary of Mount Sinai (United States)

13300-31 • 9:00 AM - 9:15 AM
Functional OCT reveals anisotropic vessel pulsatility in human retinas
Author(s): **Tobiloba Adejumo**, **Taeyoon Son**, **Guangying Ma**, **Mojtaba Rahimi**, **Albert Dadzie**, **Jie Ding, Xincheng Yao,** Univ. of Illinois Chicago (United States)

13300-32 • 9:15 AM - 9:30 AM
Spectroscopic choroidal oximetry in human subjects using visible-light optical coherence tomography
Author(s): **Qingyu Chen,** Johns Hopkins Univ. (United States)

13300-33 • 9:30 AM - 9:45 AM
140° ultrawide-field handheld swept-source OCT angiography
Author(s): **Guangru B. Liang**, **Shuibin Ni**, **Tristan T Hormel**, **J. Peter Campbell**, **Yifan Jian, Yali Jia,** Oregon Health & Science Univ. (United States)

13300-34 • 9:45 AM - 10:00 AM
High dynamic range choroidal imaging with transcranial illumination
Author(s): **Mojtaba Rahimi**, **Alfa Rossi**, **Tobiloba Adejumo**, **Taeyoon Son**, **Michael Heiferman, Xincheng Yao,** Univ. of Illinois Chicago (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: 35TH ANNIVERSARY OF OPHTHALMIC TECHNOLOGIES

26 January 2025 • 10:30 AM - 12:15 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Daniel X. Hammer**, U.S. Food and Drug Administration (United States); **Yuankai K. Tao**, Vanderbilt Univ. (United States)

13300-35 • 10:30 AM - 10:35 AM
Introduction
Author(s): **Daniel X. Hammer,** U.S. Food and Drug Administration (United States); **Derek Nankivil,** Johnson & Johnson Vision Care, Inc. (United States); **Yuankai K. Tao,** Vanderbilt Univ. (United States)

13300-36 • 10:35 AM - 10:55 AM
Ophthalmic Technologies I-XXXV: A perspective on 34 years of technological innovations in ophthalmology *(Invited Paper)*
Author(s): **Fabrice Manns,** Univ. of Miami (United States); **Arthur Ho,** Brien Holden Vision Institute (Australia); **Per G. Söderberg,** Uppsala Univ. (Sweden); **Jean-Marie Parel,** Univ. of Miami Miller School of Medicine (United States)

13300-37 • 10:55 AM - 11:15 AM
Adaptive optics for the eye *(Invited Paper)*
Author(s): **Austin Roorda,** Univ. of California, Berkeley (United States)

13300-38 • 11:15 AM - 11:35 AM
Prosthetic vision in patients blinded by retinal degeneration *(Invited Paper)*
Author(s): **Daniel V. Palanker,** Stanford Univ. (United States)

13300-39 • 11:35 AM - 11:55 AM
Seeing small and aiming big: the development and clinical impact of optical coherence tomography *(Invited Paper)*
Author(s): **David Huang,** Casey Eye Institute (United States)

13300-40 • 11:55 AM - 12:15 PM
About the throes of laser corneal surgery *(Invited Paper)*
Author(s): **Theo Seiler,** IROC AG (Switzerland)

Lunch Break 12:15 PM - 1:15 PM

SESSION 7: FUNCTIONAL METHODS AND OPTORETINOGRAPHY

26 January 2025 • 1:15 PM - 3:00 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Donald T. Miller**, Indiana Univ. Bloomington (United States); **Kostadinka Bizheva**, Univ. of Waterloo (Canada)

13300-41 • 1:15 PM - 1:30 PM
Fast, volumetric, in vivo calcium imaging of murine corneal nerves
Author(s): **Matthew T. McPheeters**, **Eric Lu**, **Made Airanthi K. Widjaja-Adhi**, **Maryse Lapierre-Landry**, **Brecken J. Blackburn**, **Andrew M. Rollins**, **Marcin Golczak,** Case Western Reserve Univ. (United States); **William J. Dupps,** Case Western Reserve Univ. (United States), The Cleveland Clinic Foundation (United States); **Michael W. Jenkins,** Case Western Reserve Univ. (United States)

13300-42 • 1:30 PM - 1:45 PM
Elastographic OCT of anaesthesia effects on retinal motion patterns in C57BL/6 mice
Author(s): **Sybren Worm**, **Lucas May**, **Maria Varaka**, **Yash Patel,** Medizinische Univ. Wien (Austria); **Georg Ladurner,** Medizinische Univ. Wien (Austria), Scantox Neuro GmbH (Austria); **Conrad Merkle, Bernhard Baumann,** Medizinische Univ. Wien (Austria)

13300-43 • 1:45 PM - 2:00 PM
Measurement of retinal temporal transfer function across multiple stimulation wavelenghts with flicker optoretinography (f-ORG)
Author(s): **Piotr F. Wegrzyn,** Institute of Physical Chemistry (Poland), Univ. of Warsaw (Poland); **Sławomir Tomczewski, Maciej Wojtkowski,** Institute of Physical Chemistry (Poland)

13300-44 • 2:00 PM - 2:15 PM
Retinal light-evoked hemodynamic response with circular OCTA
Author(s): **Naixing Huang,** Oregon Health & Science Univ. (United States); **Tristan T. Hormel,** Casey Eye Institute (United States); **Yali Jia,** Oregon Health & Science Univ. (United States)

13300-45 • 2:15 PM - 2:30 PM
Single-cell imaging, single-spot optoretinography sensing (SCISSORS) in living human subjects
Author(s): **Shangbang Luo**, **Jason H. Wong,** Univ. of California, Berkeley (United States); **Zohreh Hossainaee**, **Fabio Feroldi, Austin Roorda,** Univ. of California (United States)

13300-46 • 2:30 PM - 2:45 PM
Light-adapted flicker-optoretinography based on raster-scan optical coherence tomography towards clinical translation
Author(s): **Zhaoyu Gong**, **Yaping Shi**, **Jian Liu**, **Ramkumar Sabesan, Ruikang K. Wang,** Univ. of Washington (United States)

13300-47 • 2:45 PM - 3:00 PM
Exploring optoretinographic responses of subretinal layers
Author(s): **Reddikumar Maddipatla**, **Christopher S. Langlo**, **Maciej M. Bartuzel,** UC Davis Health System (United States); **Robert J. Zawadzki,** UC Davis Health System (United States), Univ. of California, Davis (United States); **Ravi S. Jonnal,** UC Davis Health System (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: MACHINE LEARNING AND COMPUTATIONAL METHODS

26 January 2025 • 3:30 PM - 4:30 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Georg Schuele**, Tesseract Health, Inc. (United States); **Robert J. Zawadzki**, Univ. of California, Davis (United States)

13300-48 • 3:30 PM - 3:45 PM
Enhancing ophthalmic examinations with real-time eye position monitoring using SVM
Author(s): **Giovanni Gibertoni, Luigi Rovati,** Univ. degli Studi di Modena e Reggio Emilia (Italy)

13300-49 • 3:45 PM - 4:00 PM
Dual-pupil-model based accurate three-dimensional computational aberration correction (CAC) and CAC-enabling speckle reduction for high-resolution retinal imaging
Author(s): **Shuichi Makita**, **Xibo Wang**, **Suzuyo Komeda**, **Nobuhisa Tateno, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13300-50 • 4:00 PM - 4:15 PM
A diffusion-based model for defocus correction in optical coherence tomography images of human cornea
Author(s): **Nima Abbasi Firoozjah**, **Keyu Chen**, **Alexander Wong, Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13300-51 • 4:15 PM - 4:30 PM
Assessment of physiological and glaucomatous retinal aging by scatterer-density estimation based on deep-learning model trained by wave-optically simulated OCT speckle images
Author(s): **Thitiya Seesan,** Univ. of Tsukuba (Japan); **Shuichi Makita,** Univ. of Tsukuba (Japan), Tokyo Medical Univ. (Japan); **Masahiro Miura**, **Kosei Yanagida,** Tokyo Medical Univ. (Japan); **Atsuya Miki,** Aichi Medical Univ. (Japan); **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan), Tokyo Medical Univ. (Japan)

SESSION 9: INTRAOPERATIVE, MICROSCOPE INTEGRATED, HANDHELD, AND ROBOTIC SYSTEMS

26 January 2025 • 4:30 PM - 5:45 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Jerry Sebag**, VMR Institute (United States); **Luigi Rovati**, Univ. degli Studi di Modena e Reggio Emilia (Italy)

13300-52 • 4:30 PM - 4:45 PM
4D imaging and volume quantification of subretinal injections using intraoperative OCT
Author(s): **Alicia Repka**, **Rachel Hecht, Yuankai K. Tao,** Vanderbilt Univ. (United States)

13300-53 • 4:45 PM - 5:00 PM
Developing an affordable smartphone PedCam for comprehensive examination of retinopathy of prematurity
Author(s): **Alfa Rossi,** Univ. of Illinois Chicago (United States); **Devrim Toslak**, **Muhammet Kazim Erol,** Antalya Training And Research Hospital (Turkey); **Mojtaba Rahimi**, **Taeyoon Son**, **R.V. Paul Chan, Xincheng Yao,** Univ. of Illinois Chicago (United States)

13300-54 • 5:00 PM - 5:15 PM
Autonomous in vivo imaging and dynamic illumination with a robotically aligned slit lamp system
Author(s): **Morgan McCloud**, **Amit Narawane,** Duke Univ. (United States); **Mark Draelos,** Univ. of Michigan (United States); **Joseph A. Izatt**, **Anthony N. Kuo, Ryan P. McNabb,** Duke Univ. (United States)

13300-55 • 5:15 PM - 5:30 PM
Towards mobile robotic optical coherence tomography for practical clinical imaging
Author(s): **Haochi Pan**, **Chae Woo Lim**, **Catherine Jin,** Univ. of Michigan (United States); **Morgan McCloud,** Duke Univ. (United States); **Genggeng Zhou, Mark Draelos,** Univ. of Michigan (United States)

13300-56 • 5:30 PM - 5:45 PM
Stereo microscope-based 3D tool tracking for intraoperative OCT in ophthalmic surgery
Author(s): **Harvey Shi**, **Pablo Ortiz**, **Jianwei D. Li**, **Amit Narawane**, **Robert Trout**, **Yuan Tian,** Duke Univ. (United States); **Mark Draelos,** Univ. of Michigan (United States); **Ryan P. McNabb**, **Joseph A. Izatt, Anthony N. Kuo,** Duke Univ. (United States)

PASCAL ROL AWARD PRESENTATION

26 January 2025 • 5:45 PM - 6:00 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Derek Nankivil**, Johnson & Johnson Vision Care, Inc. (United States); **Yuankai K. Tao**, Vanderbilt Univ. (United States)
Please join the Ophthalmic Technologies conference for the presentation of the Pascal Rol Award.

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13300-58 • 5:30 PM - 7:00 PM
An embedded clinical decision support system for OCT
Author(s): **Chang Liu**, **Haoran Zhang,** Shanghai Jiao Tong Univ. (China); **Zheng Zheng**, **Wenjia Liu,** Shanghai General Hospital (China); **Chengfu Gu**, **Qi Lan**, **Weiyi Zhang, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13300-59 • 5:30 PM - 7:00 PM
Precise control of eye movement for real-time video funduscopy and OCT using dynamic fixation patterns
Author(s): **David Harings**, **Niklas Bauer**, **Damian Mendroch**, **Uwe Oberheide,** Technische Hochschule Köln (Germany); **Holger Lubatschowski,** OCUMAX Healthcare GmbH (Germany)

13300-61 • 5:30 PM - 7:00 PM
Dry eye disease analysis with FL imaging and ML segmentation
Author(s): **SeungChan Han,** Pusan National Univ. (Korea, Republic of); **Tae-Hyun Lee,** Korea Photonics Technology Institute (Korea, Republic of); **Hyeon-Jeong Yoon,** Chonnam National Univ. Hospital (Korea, Republic of); **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13300-62 • 5:30 PM - 7:00 PM
Retinal feature analysis from AI-driven OCT to OCTA translation
Author(s): **Rashadul Hasan Badhon,** The Univ. of North Carolina at Charlotte (United States); **Atalie Carina Thompson,** Atrium-Health Wake Forest Baptist (United States); **Jennifer I. Lim,** University of Illinois at Chicago (United States); **Theodore Leng,** Stanford University School of Medicine (United States); **Minhaj Alam,** The Univ. of North Carolina at Charlotte (United States)

13300-63 • 5:30 PM - 7:00 PM
Photoacoustic epiretinal prosthesis with polymer matrix nanocomposites
Author(s): **Mi Zheng,** Univ. of Michigan (United States), Fujian Provincial Hospital (China), Wilmer Eye Institute, Johns Hopkins Univ. (United States); **Yannis M. Paulus,** Univ. of Michigan (United States), Johns Hopkins Univ. (United States); **Van P. Nguyen,** Univ. of Michigan (United States), Wilmer Eye Institute, Johns Hopkins Univ. (United States); **Maomao Chen,** Univ. of Michigan (United States), Wilmer Eye Institute, Johns Hopkins Univ. (United States); **Hyunwoo Song**, **Alexandra Patterson,** Johns Hopkins Univ. (United States); **Chad Weiler,** Johns Hopkins Univ. Applied Physics Lab., LLC (United States); **James B. Spicer,** Johns Hopkins Univ. (United States); **Seth D. Billings,** Johns Hopkins Univ. Applied Physics Lab., LLC (United States); **Emad Boctor,** Johns Hopkins Univ. (United States)

13300-64 • 5:30 PM - 7:00 PM
Label-free, non-invasive reactive oxygen species detection in retinal pigment epithelium cells through autofluorescence multispectral imaging
Author(s): **Abhilash G. Marupally**, **Aline Knab**, **Abbas Habibalahi**, **Ayad G. Anwer,** The Univ. of New South Wales (Australia); **Nicole A. Carnt,** The Univ. of New South Wales (Australia), The Westmead Institute for Medical Research (Australia); **Andrew J. R. White,** Westmead Institute for Medical Research (Australia), Save Sight Institute, The Univ. of Sydney (Australia); **Robert Casson,** The Univ. of Adelaide (Australia); **Ewa M. Goldys,** The Univ. of New South Wales (Australia)

13300-65 • 5:30 PM - 7:00 PM
Automatic segmentation for early glaucoma detection using nnU-Net
Author(s): **Qiran Cao**, **Per G. Söderberg**, **Zhaohua Yu**, **Konstancija Kisonaite,** Uppsala Univ. (Sweden); **Chunliang Wang,** KTH Royal Institute of Technology (Sweden); **Jonatan Holm,** Uppsala Univ. (Sweden)

13300-66 • 5:30 PM - 7:00 PM
Bifunctional metasurface enabled dual pressure and inflammation sensing ocular implant
Author(s): **Aashini Shah**, **Aditya Garg,** Massachusetts Institute of Technology (United States); **Eleftherios Paschalis,** Massachusetts General Hospital (United States), Massachusetts Eye and Ear (United States); **Loza F. Tadesse,** Massachusetts Institute of Technology (United States)

13300-67 • 5:30 PM - 7:00 PM
Quantify absolute choroidal blood flow with speckle imaging
Author(s): **Qiang Wang,** The Univ. of Western Australia (Australia); **Ed James**, **Peter Munro,** Univ. College London (United Kingdom); **Andrew Yang**, **Chulmin Joo,** Yonsei Univ. (Korea, Republic of); **Barry Cense,** The Univ. of Western Australia (Australia); **Gyung-ro Yun,** Yonsei Univ. (Korea, Republic of)

13300-68 • 5:30 PM - 7:00 PM
Denoising diffusion probabilistic models for classifying ophthalmic disease
Author(s): **Sina Gholami**, **Fatema-E Jannat**, **Tania Haghighi,** The Univ. of North Carolina at Charlotte (United States); **Jennifer I. Lim,** Univ. of Illinois Chicago (United States); **Ted Leng,** Stanford Univ. School of Medicine (United States); **Hamed Tabkhivayghan, Minahj Nur Alam,** The Univ. of North Carolina at Charlotte (United States)

13300-69 • 5:30 PM - 7:00 PM
Imaging guided neovascular age-related macular degeneration treatment using soluble silicon nanoneedles
Author(s): **Van-Phuc Nguyen**, **Yannis M. Paulus,** Wilmer Eye Institute, The Johns Hopkins Univ. School of Medicine (United States); **Chi Hwan Lee, Jinheon Jong,** Purdue Univ. (United States)

13300-70 • 5:30 PM - 7:00 PM
Extending the measurement range in ophthalmic linear OCT using dual reference path interferometry
Author(s): **Niklas Bauer**, **David Harings**, **Damian Mendroch**, **Jan Matrisch**, **Uwe Oberheide,** Technische Hochschule Köln (Germany); **Alexander Heisterkamp,** Leibniz Univ. Hannover (Germany)

13300-71 • 5:30 PM - 7:00 PM
A simulation study of fluorescein attenuation and dynamic tracer kinetic model-extracted retinal blood flow from human retinal fluorescein videoangiographies
Author(s): **Sarah R. Vavrek**, **Elif K. Nalbant,** Illinois Institute of Technology (United States); **Nicholas Konopek**, **Nicole L. Decker**, **Amani Fawzi,** Northwestern Univ. (United States); **William Mieler,** Univ. of Illinois Chicago (United States); **Jennifer Kang-Mieler,** Stevens Institute of Technology (United States); **Kenneth M. Tichauer,** Illinois Institute of Technology (United States)

13300-72 • 5:30 PM - 7:00 PM
Fully 3d-printed eye phantom as a standard target to benchmark ophthalmic imaging systems
Author(s): **Joanna Zhang**, **Pengpeng Zhang, Cheng Sun,** Northwestern Univ. (United States)

13300-73 • 5:30 PM - 7:00 PM
Dynamic reference arm adjustment for wide-Field OCT/OCTA of posterior eye with limited imaging depth range
Author(s): **Toshihiro Mino**, **Masato Tamura,** Topcon Corp. (Japan); **Yoshikiyo Moriguchi,** Topcon Corp. (United States); **Masahiro Akiba,** Topcon Corp. (Japan)

13300-74 • 5:30 PM - 7:00 PM
Robust real-time retinal tracking for ophthalmic applications
Author(s): **Damian Mendroch**, **David Harings**, **Niklas Bauer**, **Stefan Altmeyer**, **Uwe Oberheide,** Technische Hochschule Köln (Germany); **Alexander Heisterkamp,** Leibniz Univ. Hannover (Germany)

13300-75 • 5:30 PM - 7:00 PM
Clinical comparison of a high-performance low-cost optical coherence tomography system
Author(s): **Hillel B. Price**, **David A. Miller**, **Wan Wang, Adam P. Wax,** Duke Univ. (United States)

13300-76 • 5:30 PM - 7:00 PM
Modeling of aberrations and spatial coherence for retinal imaging with full-field optical coherence tomography
Author(s): **Inès Loukili,** Institut de la Vision, Institut National de la Santé et de la Recherche Médicale, Sorbonne Univ. (France), ONERA, Univ. Paris-Saclay (France), Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL, CNRS (France); **Laurent Mugnier**, **Vincent Michau,** ONERA, Univ. Paris-Saclay (France); **Kate Grieve,** Institut de la Vision, Institut National de la Santé et de la Recherche Médicale, Sorbonne Univ. (France); **Pedro Mecê,** Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL, CNRS (France); **Serge Meimon,** ONERA, Univ. Paris-Saclay (France)

13300-77 • 5:30 PM - 7:00 PM
Integrating advanced 3D vision techniques for enhanced feature-based image registration of widefield OCT
Author(s): **Tiffany Tse**, **Zhuoting Xie**, **Zaid Mammo**, **Kwang Moo Yi, Myeong Jin Ju,** The Univ. of British Columbia (Canada)

13300-78 • 5:30 PM - 7:00 PM
Automated acquiring high-quality frames from smartphone-based fundus imaging system
Author(s): **Ziyi Huang,** Columbia Univ. (United States); **Chaimae Gouya**, **Mohammed Attia**, **Sophia Donskoy,** Stevens Institute of Technology (United States); **Nirupama Ravi,** Nokia Bell Labs. (United States); **Yu Gan, Jennifer J. Kang-Mieler,** Stevens Institute of Technology (United States)

13300-79 • 5:30 PM - 7:00 PM
Optimizing OCT alignment: a semi-automatic alignment module for OCT imaging
Author(s): **Narasimha Sai Varun Ghanta**, **Vamsi Chintalapati, Rajesh Amudala,** Elisar Life Sciences Pvt. Ltd. (India)

13300-80 • 5:30 PM - 7:00 PM
Three-dimensional OCT segmentation of anatomic and pathologic features of vitreoretinal interface disorders
Author(s): **Daniel S. Kermany**, **Wesley Poon**, **Glori Das**, **Orhun Davarci**, **Raksha Raghunathan, Stephen T. Wong,** The Methodist Hospital Research Institute (United States)

13300-81 • 5:30 PM - 7:00 PM
Improving an optical mouse eye model with an electronically tunable fundus camera
Author(s): **Justin Chen,** Northwestern Univ. (United States); **Roman Kuranov,** Opticent Health (United States); **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13300-82 • 5:30 PM - 7:00 PM
Multimodal scanning confocal light microscopy (SCLM) with optical coherence microscopy (OCM) for ex vivo mouse retinal tissue imaging
Author(s): **Ankur Kumar,** Univ. of California, Davis (United States); **Pengfei Zhang,** Dalian Univ. of Technology (China); **Sarah J. Karlen**, **Ratheesh K. Meleppat**, **Jacqueline A. Menjivar**, **Marie E. Burns**, **Edward N. Pugh, Robert J. Zawadzki,** Univ. of California, Davis (United States)

13300-83 • 5:30 PM - 7:00 PM
Multi-role OCT system for comprehensive eye scanning
Author(s): **Vamsi Chintalapati**, **Narasimsha Sai Varun Ghanta**, **Vishnupriyan D., Thanigachalam Padmanaban,** Elisar Life Sciences Pvt. Ltd. (India)

13300-84 • 5:30 PM - 7:00 PM
Self-correcting optical coherence tomography image enhancer
Author(s): **Munirah Ismail,** Singapore Eye Research Institute (Singapore)

13300-85 • 5:30 PM - 7:00 PM
Potential-driven electrochemical clearing of ex vivo acidic corneal injuries
Author(s): **Lauren Liu,** Univ. of California, Irvine (United States); **Daniel Kim,** Beckman Laser Institute and Medical Clinic (United States); **Wei Jin,** Univ. of California, Irvine (United States); **Michael G. Hill,** Occidental College (United States); **Zhongping Chen**, **Brian J. F. Wong,** Univ. of California, Irvine (United States); **Ila Youssefi,** Beckman Laser Institute and Medical Clinic (United States)

13300-86 • 5:30 PM - 7:00 PM
Dynamic presbyopia correction by using local liquid crystal lenses.
Author(s): **Tigran Galstian, Louis Bégel,** Univ. Laval (Canada)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13300-87
Cracking the code: enhancing interpretability and accessibility of ophthalmic disorder detection using Kolmogorov Arnold Network
Author(s): **Asmit Ganguly,** Indian Institute of Technology Patna (India); **Vasudevan Lakshminarayanan,** Univ. of Waterloo (Canada)

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CONFERENCE 13301

Molecular-Guided Surgery: Molecules, Devices, and Applications XI

25 - 26 January 2025 | Moscone South, Room 152 (Upper Mezz)

Conference Chair(s): **Summer L. Gibbs,** Oregon Health & Science Univ. (United States); **Kenneth M. Tichauer,** Illinois Institute of Technology (United States)

Program Committee: **Michael Bouvet,** Univ. of California, San Diego (United States); **David J. Cuccia,** Modulated Imaging, Inc. (United States); **Sylvain Gioux,** Intuitive Surgical, Sàrl (Switzerland); **Hisataka Kobayashi,** National Cancer Institute (United States); **Frédéric Leblond,** Polytechnique Montréal (Canada); **Jonathan T.C. Liu,** Univ. of Washington (United States); **Vasilis Ntziachristos,** Helmholtz Zentrum München GmbH (Germany), Technical Univ. of Munich (Germany); **Keith D. Paulsen,** Thayer School of Engineering at Dartmouth (United States); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States); **Eben L. Rosenthal,** Stanford Univ. School of Medicine (United States); **Jonathan M. Sorger,** Intuitive Surgical, Inc. (United States); **Alex Vahrmeijer,** Leiden Univ. Medical Ctr. (Netherlands); **Thomas D. Wang,** Univ. of Michigan (United States); **Brian C. Wilson,** Univ. Health Network (Canada)

Saturday 25 January 2025

SESSION 1: ENDOGENOUS AND LABEL-FREE IMAGING

25 January 2025 • 8:00 AM - 9:45 AM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Nicholas J. Durr**, Johns Hopkins Univ. (United States); **Cody C. Rounds**, Illinois Institute of Technology (United States)

13301-2 • 8:00 AM - 8:25 AM
Fluorescence frequency-response imaging (F-FRI) for label-free nondestructive tissue composition assessment *(Invited Paper)*
Author(s): **Javier A. Jo,** The Univ. of Oklahoma (United States)

13301-3 • 8:25 AM - 8:50 AM
FLIM-guided surgical interventions *(Invited Paper)*
Author(s): **Laura Marcu,** Univ. of California, Davis (United States)

13301-4 • 8:50 AM - 9:05 AM
Development of a high-throughput wide-field imaging robotic system for assessing margin status based on cancer biomarkers derived from Raman spectroscopy with preliminary validation in lumpectomy specimens from breast-conserving surgery
Author(s): **Laurence Danis,** Univ. de Montréal (Canada), Polytechnique Montréal (Canada), CRCHUM, Ctr. Hospitalier de l'Univ. de Montréal (Canada); **Valensia N. Anthony,** City Univ. of Hong Kong (Hong Kong, China), Polytechnique Montréal (Canada); **Sandryne David**, **Trang Tran**, **Frédérick Dallaire**, **Guillaume Sheehy,** Polytechnique Montréal (Canada), CRCHUM, Ctr. Hospitalier de l'Univ. de Montréal (Canada); **Feryel Azzi,** CRCHUM, Ctr. Hospitalier de l'Univ. de Montréal (Canada); **Dominique Trudel,** CRCHUM, Ctr. Hospitalier de l'Univ. de Montréal (Canada), Institut du cancer de Montréal (Canada), Univ. de Montréal (Canada); **Francine Tremblay**, **Lara Richer**, **Sarkis Meterissian,** McGill Univ. Health Ctr. (Canada); **Frédéric Leblond,** Polytechnique Montréal (Canada), CRCHUM, Ctr. Hospitalier de l'Univ. de Montréal (Canada), Institut du cancer de Montréal (Canada)

13301-5 • 9:05 AM - 9:20 AM
Hyperspectral endoscopy for enhanced contrast of precancerous progression in Barrett's Oesophagus: Clinical study design and initial results
Author(s): **Katie-Lou White**, **Isabelle Racicot,** Univ. of Cambridge (United Kingdom); **Lianlian Wu,** Early Cancer Institute, Univ. of Cambridge (United Kingdom); **Graham Spicer,** The Johns Hopkins Univ. Applied Physics Lab. (United States); **Massimiliano di Pietro,** Early Cancer Institute, Univ. of Cambridge (United Kingdom), Cambridge Univ. Hospitals NHS Foundation Trust (United Kingdom); **Sarah Bohndiek,** Univ. of Cambridge (United Kingdom)

13301-1 • 9:20 AM - 9:45 AM
Preliminary results of a multi-center randomized clinical trial on the effectiveness of near infrared autofluorescence for guiding endocrine surgery *(Invited Paper)*
Author(s): **Anita Mahadevan-Jansen**, **Alex Cousart**, **Parker A. Willmon,** Vanderbilt Univ. (United States); **Carmen C. Solorzano**, **Colleen M. Kiernan,** Vanderbilt Univ. Medical Ctr. (United States); **Quan-Yang Duh,** Univ. of California, San Francisco (United States); **Paul Gauger,** Univ. of Michigan (United States); **Tracy S. Wang,** Medical College of Wisconsin (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 2: IMAGING SYSTEMS AND ADVANCED IMAGING METHODS I

25 January 2025 • 10:15 AM - 12:00 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Kenneth M. Tichauer**, Illinois Institute of Technology (United States); **Summer L. Gibbs**, Oregon Health & Science Univ. (United States)

13301-6 • 10:15 AM - 10:40 AM
AI-enhanced widefield fluorescence lifetime imaging at multi-scale *(Invited Paper)*
Author(s): **Xavier R. Intes,** Rensselaer Polytechnic Institute (United States)

13301-7 • 10:40 AM - 11:05 AM
Human colon imaging with multimodal flow, topography, and multispectral contrast endoscopy *(Invited Paper)*
Author(s): **Nicholas J. Durr, Taylor L. Bobrow,** Johns Hopkins Univ. (United States)

13301-8 • 11:05 AM - 11:30 AM
Development of a Tissue-Mimicking Fluorescent Target for the Translation of Performance Quality of the Imaging Agent Tozuleristide and its Corresponding Imaging System *(Invited Paper)*
Author(s): **Ethan P. M. LaRochelle**, **Kendra Hebert**, **Eammon Littler**, **Alberto Ruiz,** Quel Imaging, LLC (United States); **David Kittle**, **Steven Daly, Claudia Jochheim,** Blaze Bioscience, Inc. (United States)

13301-9 • 11:30 AM - 11:45 AM
Spatial-frequency 3D fluorescence for surgical guidance: Tumor and margin thickness quantification
Author(s): **Michael J. Daly**, **Natalie Won**, **Elise Schwarz**, **Matthew Siracusa**, **Mandolin Bartling**, **Alessandra Ruaro**, **Jason Townson**, **Harley Chan**, **Brian C. Wilson, Jonathan C. Irish,** Univ. Health Network (Canada)

13301-10 • 11:45 AM - 12:00 PM
Time-resolved measurements of Protoporphyrin IX prompt and delayed fluorescence with a dual-channel time-correlated single photon counting system
Author(s): **Héctor A. García,** Univ. of Wisconsin-Madison (United States), Univ. Nacional del Centro de la Provincia de Buenos Aires (Argentina), Comisión de Investigaciones Científicas de la Provincia de Buenos Aires (Argentina); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States), Dartmouth College (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 3: CONTRAST AGENTS I

25 January 2025 • 1:05 PM - 3:05 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Allison M. Dennis**, Northeastern Univ. (United States); **Summer L. Gibbs**, Oregon Health & Science Univ. (United States)

13301-11 • 1:05 PM - 1:30 PM
Molecular imaging-based surgical guidance: More is better than less… *(Invited Paper)*
Author(s): **Nynke S. van den Berg,** Telix Pharmaceuticals Ltd. (United States)

13301-12 • 1:30 PM - 1:55 PM
Tumor-targeted fluorescent dyes for fluorescence-guided surgery: Preclinical and clinical results *(Invited Paper)*
Author(s): **Philip S. Low,** Purdue Univ. (United States)

13301-13 • 1:55 PM - 2:20 PM
Title TBA *(Invited Paper)*
Author(s): **Edward J. Delikatny,** Perelman School of Medicine (United States)

13301-14 • 2:20 PM - 2:35 PM
Prostate-specific membrane antigen (PSMA) targeted fluorescent probe for improved prostate cancer resections
Author(s): **Dani Szafran**, **Gauri S. Malankar**, **Lei G. Wang, Summer L. Gibbs,** Oregon Health & Science Univ. (United States)

13301-15 • 2:35 PM - 2:50 PM **(CANCELLED)**
Computational modeling of EGFR-targeted imaging agents for optimizing tissue penetration in fluorescence-guided surgery of head and neck cancer
Author(s): **Yao Chen,** Dartmouth College (United States); **Zexiao Wang,** Carnegie Mellon Univ. (United States); **Sassan Hodge,** Dartmouth College (United States); **Greg M. Thurber,** Univ. of Michigan (United States); **Kimberley S. Samkoe,** Dartmouth College (United States)

13301-16 • 2:50 PM - 3:05 PM
Development of prostate cancer targeted near-infrared fluorescent probes for fluorescence-guided surgery
Author(s): **Gauri Sharad Malankar**, **Dani A. Szafran-Reeder**, **Gourav Kumar**, **Lei G. Wang, Summer L. Gibbs,** Oregon Health & Science Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: CONTRAST AGENTS II

25 January 2025 • 3:35 PM - 5:35 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Lei G. Wang**, Oregon Health & Science Univ. (United States); **Philip S. Low**, Purdue Univ. (United States)

13301-19 • 3:35 PM - 4:00 PM
SORS and SERS based approaches for enhancing tumor detection in vivo *(Invited Paper)*
Author(s): **Fay Nicolson,** Dana-Farber Cancer Institute (United States); **Eunah Lee**, **Andrew Whitley,** HORIBA Scientific (United States); **Scott Rudder,** OptoSigma Corp. (United States); **Samuel Mabbott,** Texas A&M Univ. (United States)

13301-17 • 4:00 PM - 4:25 PM
Advancing NIR-II contrast agents for depth-based and multiplexed imaging *(Invited Paper)*
Author(s): **Allison M. Dennis,** Northeastern Univ. (United States)

13301-18 • 4:25 PM - 4:50 PM
VISION: A versatile chip-scale imager for near single-cell intraoperative optical navigation *(Invited Paper)*
Author(s): **Mekhail Anwar,** Univ. of California, San Francisco (United States)

13301-20 • 4:50 PM - 5:05 PM
Investigating mechanisms of action and expanding imaging capabilities for nerve specific fluorophores with utility in fluorescence guided surgery (FGS)
Author(s): **William S. Greer**, **Summer L. Gibbs**, **Lei G. Wang**, **Antonio R. Montaño**, **Dani A. Szafran-Reeder**, **Anas M. Masillati, Connor W. Barth,** Oregon Health & Science Univ. (United States)

13301-21 • 5:05 PM - 5:20 PM
Using paired-agent principles and widefield fluorescence optical projection tomography to rapidly identify and localize lymph node micro metastases.
Author(s): **Cody C. Rounds**, **Anjalika Sharma**, **Simon Parschat,** Illinois Institute of Technology (United States); **Veronica C. Torres,** Dartmouth College (United States); **Chengyue Li,** Illinois Institute of Technology (United States); **Thom S. Nijboer**, **Floris Voskuil**, **Max J. H. Witjes,** Univ. Medical Ctr. Groningen (Netherlands); **Kenneth M. Tichauer,** Illinois Institute of Technology (United States)

13301-22 • 5:20 PM - 5:35 PM
Near-infrared fluorescence imaging of vital nerves and white matter tracts for fluorescence-guided neurosurgery
Author(s): **Antonio R. Montaño**, **Dani Szafran**, **Anas M. Masillati**, **Lei G. Wang**, **Connor W. Barth, Summer L. Gibbs,** Oregon Health & Science Univ. (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: PRECLINICAL AND CLINICAL TRANSLATION I

26 January 2025 • 8:00 AM - 9:45 AM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Farzad Fereidouni**, Emory Univ. (United States); **Kenneth M. Tichauer**, Illinois Institute of Technology (United States)

13301-23 • 8:00 AM - 8:25 AM
Paired-agent imaging for rapid peripheral and deep en face margin margin assessment *(Invited Paper)*
Author(s): **Kimberley S. Samkoe**, **Hang Nguyen**, **Veronica C. Torres,** Thayer School of Engineering at Dartmouth (United States); **Joshua Levy,** Cedars-Sinai Medical Ctr. (United States); **Eunice Chen, Matthew LeBoeuf,** Dartmouth Hitchcock Medical Ctr. (United States)

13301-24 • 8:25 AM - 8:50 AM
Moving beyond fluorescence image guided surgery *(Invited Paper)*
Author(s): **James P. Basilion,** Case Western Reserve Univ. (United States)

13301-25 • 8:50 AM - 9:15 AM
Development, optimization, and preclinical feasibility of a fluorescent somatostatin analog for intraoperative imaging in neuroendocrine tumors *(Invited Paper)*
Author(s): **Ali Azhdarinia,** The Univ. of Texas Health Science Ctr. at Houston (United States)

13301-26 • 9:15 AM - 9:30 AM
Clinical potential of targeting human pancreatic cancer with a fluorescent MUC4 antibody in orthotopic mouse models
Author(s): **Sunidhi Jaiswal**, **Kristin E. Cox**, **Siamak Amirfakhri,** Univ. of California, San Diego (United States), VA San Diego Healthcare System (United States); **Aylin D. P. Saleh**, **Keita Kobayashi,** Univ. of California, San Diego (United States); **Sumbal Talib**, **Abhijit Aithal**, **Maneesh Jain**, **Aaron M. Mohs,** Univ. of Nebraska Medical Ctr. (United States); **Robert M. Hoffman,** AntiCancer, Inc. (United States), Univ. of California, San Diego (United States), VA San Diego Healthcare System (United States); **Surinder K. Batra,** Univ. of Nebraska Medical Ctr. (United States); **Michael Bouvet,** Univ. of California, San Diego (United States), VA San Diego Healthcare System (United States)

13301-27 • 9:30 AM - 9:45 AM
High dynamic range multi-spectral RGB-NIR imaging platform for image-guided surgery
Author(s): **Zhongmin Zhu,** Univ. of Illinois (United States); **Viktor Gruev,** Univ. of Illinois (United States), Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois College of Medicine, Univ. of Illinois (United States); **Brianna S. Hajek,** Univ. of Illinois (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 6: IMAGING SYSTEMS AND ADVANCED IMAGING METHODS II

26 January 2025 • 10:15 AM - 12:00 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Samuel S. Streeter**, Dartmouth Hitchcock Medical Ctr. (United States); **Pablo A. Valdes Quevedo**, University of Texas Medical Branch (United States)

13301-28 • 10:15 AM - 10:40 AM
Multispectral photoacoustic imaging for breast cancer detection and hysterectomy guidance *(Invited Paper)*
Author(s): **Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13301-29 • 10:40 AM - 11:05 AM
Photoacoustic methodologies for image guided cancer therapies using antibody drug conjugates and nanodroplets *(Invited Paper)*
Author(s): **Srivalleesha Mallidi,** Tufts Univ. (United States)

13301-30 • 11:05 AM - 11:30 AM
Development of exogenous contrast agents to identify cancer using optoacoustic imaging *(Invited Paper)*
Author(s): **Rohit Singh**, **Happy Agarwal**, **Mohamed Yahya, Lacey McNally,** The Univ. of Oklahoma Health Sciences Ctr. (United States)

13301-31 • 11:30 AM - 11:45 AM
Bioinspired 9-band camera for image-guided cancer surgery with multiple NIR fluorophores
Author(s): **Brianna S. Hajek**, **Zhongmin Zhu, Viktor Gruev,** Univ. of Illinois (United States)

13301-37 • 11:45 AM - 12:00 PM
Advancing clinical applications of PpIX delayed fluorescence imaging in guided surgery: Technological innovations.
Author(s): **Arthur F. Petusseau,** Dartmouth College (United States); **Marien Ochoa**, **Brian Pogue,** Univ. of Wisconsin-Madison (United States); **Petr Bruza,** Dartmouth College (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 7: PRECLINICAL AND CLINICAL TRANSLATION II

26 January 2025 • 1:30 PM - 3:25 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Michael J. Daly**, Univ. Health Network (Canada); **Edward J. Delikatny**, Perelman School of Medicine (United States)

13301-32 • 1:30 PM - 1:55 PM
Intraoperative guidance of tumor resections with open-top light-sheet (OTLS) microscopy *(Invited Paper)*
Author(s): **Jonathan T. C. Liu,** Univ. of Washington (United States)

13301-33 • 1:55 PM - 2:20 PM
Advancing intraoperative surgery guidance through rapid slide-free histology innovations *(Invited Paper)*
Author(s): **Vimalatharmaiyah Gnanaruban**, **Dena Sayrafi**, **Willy Ju,** Emory Univ. (United States); **Candice Sauder**, **Richard Levenson**, **Alexander Borowsky,** Univ. of California, Davis (United States); **Farzad Fereidouni,** Emory Univ. (United States)

13301-34 • 2:20 PM - 2:35 PM
Real-time diagnosis of life-threatening necrotizing soft-tissue infections using indocyanine fluorescence: Updates on preclinical modeling
Author(s): **Samuel S. Streeter,** Dartmouth-Hitchcock Medical Ctr. (United States); **Logan M. Bateman,** Dartmouth College (United States); **Jason R. Gunn,** Dartmouth-Hitchcock Medical Ctr. (United States); **Meaghan T. Hart,** Univ. of Maryland, College Park (United States); **Nooshin K. Dashti**, **Xiaoying Liu,** Dartmouth-Hitchcock Medical Ctr. (United States); **Sarah E. Hobdey,** VA Boise Healthcare System, U.S. Dept. of Veterans Affairs (United States); **Niles P. Donegan,** VA White River Junction Healthcare System, U.S. Dept. of Veterans Affairs (United States); **Ambrose Cheung,** Dartmouth College (United States); **Kevin S. McIver,** Univ. of Maryland, College Park (United States); **Jonathan T. Elliott**, **Eric R. Henderson, The NEFARIOUS Study Group,** Dartmouth-Hitchcock Medical Ctr. (United States)

13301-35 • 2:35 PM - 2:50 PM
Canvas® fluorescence imaging system characterization for intraoperative visualization of cancer cells with tozuleristide (BLZ-100) for a randomized, multi-center, phase 2/3 pediatric CNS tumor trial
Author(s): **David S. Kittle,** DK BioPhotonics (Canada); **Kristi Harrington**, **Julie Novak**, **Steven Daly, Claudia Jochheim,** Blaze Bioscience, Inc. (United States)

13301-36 • 2:50 PM - 3:05 PM
Intraoperative ICG-based dynamic contrast-enhanced fluorescence imaging in predicting early infection recurrence after open orthopedic surgery
Author(s): **Yue Tang,** Dartmouth College (United States); **Jonathan T. Elliott,** Dartmouth-Hitchcock Medical Ctr. (United States); **Xu Cao**, **Yuanhao Chen,** Dartmouth College (United States); **Logan M. Bateman**, **Lillian A. Fisher**, **Eric R. Henderson**, **Ida L. Gitajn,** Dartmouth-Hitchcock Medical Ctr. (United States); **Shudong Jiang,** Dartmouth College (United States)

13301-51 • 3:05 PM - 3:25 PM
Title TBA
Author(s): **Merlijn Hutteman,** Leiden Univ. Medical Ctr. (Netherlands)

Coffee Break 3:25 PM - 3:55 PM

SESSION 8: CLINICAL APPLICATIONS

26 January 2025 • 3:55 PM - 5:35 PM | Moscone South, Room 152 (Upper Mezz)
Session Chair(s): **Kimberley S. Samkoe**, Thayer School of Engineering at Dartmouth (United States); **Merlijn Hutteman**, Leiden Univ. Medical Ctr. (Netherlands)

13301-38 • 3:55 PM - 4:20 PM
Clinical translation of near infrared optical imaging agents for critical structure delineation and tumor detection up to Phase III pivotal trials *(Invited Paper)*
Author(s): **Alexander L. Vahrmeijer,** Leiden Univ. Medical Ctr. (Netherlands)

13301-39 • 4:20 PM - 4:45 PM
Clinical challenges and image guided surgery in cancer *(Invited Paper)*
Author(s): **Max J. H. Witjes,** Univ. Medical Ctr. Groningen (Netherlands)

13301-40 • 4:45 PM - 5:10 PM
Democratizing advanced surgical guidance: decoupling the state-of-the-art from tertiary centers and breaking trail for autonomous robotic surgery *(Invited Paper)*
Author(s): **Eric R. Henderson,** Dartmouth Hitchcock Medical Ctr. (United States)

13301-41 • 5:10 PM - 5:35 PM
Lighting up the brain: neurosurgical technologies for imaging brain structure and function *(Invited Paper)*
Author(s): **Pablo A. Valdes Quevedo**, **Alankar Kotwal**, **Alfredo Sandoval,** The Univ. of Texas Medical Branch (United States); **Vishwanath Saragadam,** Univ. of California, Riverside (United States); **Melisa Herrero,** The Univ. of Texas Medical Branch (United States); **Ashok Veeraraghavan,** Rice Univ. (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13301-42 • 5:30 PM - 7:00 PM
Assessing the effect of a paired-agent infusion staining protocol for intraoperative lymph node biopsy on subsequent histopathology interpretation
Author(s): **Simon Parschat,** Illinois Institute of Technology (United States); **Thom S. Nijboer,** Univ. Medical Ctr. Groningen (Netherlands); **Cody C. Rounds**, **Anjalika Sharma,** Illinois Institute of Technology (United States); **Floris Voskuil**, **Max J. H. Witjes,** Univ. Medical Ctr. Groningen (Netherlands); **Kenneth M. Tichauer,** Illinois Institute of Technology (United States)

13301-44 • 5:30 PM - 7:00 PM
A single-channel optical tomography system for quantification of PPIX delayed fluorescence imaging for assessment of tissue hypoxia
Author(s): **Madhusudan B. Kulkarni,** Univ. of Wisconsin (United States); **Marien I. Ochoa**, **Xu Cao**, **Matthew S. Reed,** Univ. of Wisconsin-Madison (United States); **Shudong Jiang,** Dartmouth College (United States); **Tayyaba G. Hasan,** Massachusetts General Hospital (United States); **Marvin M. Doyley,** Univ. of Rochester (United States); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13302

Clinical and Translational Neurophotonics 2025

25 - 26 January 2025 | Moscone South, Room 105 (Level 1 Lobby)

Conference Chair(s): **Jana M. Kainerstorfer,** Carnegie Mellon Univ. (United States); **Erin M. Buckley,** Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Tech & Emory Univ. (United States)

Conference Co-Chair(s): **Vivek Jay Srinivasan,** NYU Grossman School of Medicine (United States)

Program Committee: **David Abookasis,** Ariel Univ. of Samaria (Israel); **Aaron D. Aguirre,** Massachusetts General Hospital (United States); **Wesley B. Baker,** The Children's Hospital of Philadelphia (United States); **Bernard Choi,** Beckman Laser Institute and Medical Clinic (United States); **Robert J. J. Cooper,** CoMind Technologies (United Kingdom); **Mamadou Diop,** Western Univ. (Canada); **Andrew K. Dunn,** The Univ. of Texas at Austin (United States); **Turgut Durduran,** ICFO - Institut de Ciències Fotòniques (Spain); **Adam T. Eggebrecht,** Washington Univ. School of Medicine in St. Louis (United States); **Mary Lou Jepsen,** Openwater (United States); **Michele Lacerenza,** PIONIRS s.r.l. (Italy); **Frederic Leblond,** Polytechnique Montréal (Canada); **Seung Yup Lee,** Emory Univ. (United States); **Steen J. Madsen,** Univ. of Nevada, Las Vegas (United States); **Rickson C. Mesquita,** Instituto de Física "Gleb Wataghin" (Brazil); **Ashwin B. Parthasarathy,** Univ. of South Florida (United States); **Katherine L. Perdue,** Kernel (United States); **Cuiru Sun,** Tianjin Univ. (China); **Ulas Sunar,** Stony Brook Univ. (United States); **Nitish V. Thakor,** National Univ. of Singapore (Singapore); **Guoqiang Yu,** Univ. of Kentucky (United States)

Saturday 25 January 2025

SESSION 1: NOVEL NEURO TECHNOLOGY

25 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Ashwin B. Parthasarathy**, Univ. of South Florida (United States)

13302-1 • 8:40 AM - 9:00 AM
Characterizing neural and systemic responses during acute psychosocial stress using functional near-infrared spectroscopy
Author(s): **Luis Felipe Bortoletto,** UNICAMP (Brazil); **Giovani Grisotti Martins,** Emory Univesity (United States); **Bianca Yukari Yamamoto**, **Bruno Sanchez de Lima**, **Victor Sanchez,** UNICAMP (Brazil); **Rickson Coelho Mesquita,** Univ. of Birmingham (United Kingdom), Univ. of Campinas (Brazil)

13302-2 • 9:00 AM - 9:20 AM
DNA-based nano-sensors for recording bioelectrical signals
Author(s): **Marzieh Hanafi**, **Remi Veneziano**, **Giovanni Giammanco**, **Bryce Dunn**, **Nicholas Such**, **John R. Cressman, Parag V. Chitnis,** George Mason Univ. (United States)

13302-3 • 9:20 AM - 9:40 AM
Label-free imaging investigation of bisphenol a (BPA) impact on Alzheimer's disease: amyloid-β plaque formation and progression
Author(s): **Kayvan F. Tehrani**, **Jaena Park**, **Carlos A. Renteria, Stephen A. Boppart,** Univ. of Illinois (United States)

13302-4 • 9:40 AM - 10:00 AM
HyperProbe consortium: transforming tumour neurosurgery with innovative hyperspectral imaging
Author(s): **Luca Giannoni**, **Anam Toaha**, **Marta Marradi,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Duccio Rossi Degl'Innocenti,** EmoLED S.r.l. (Italy); **Ivan Ezhov**, **Kevin Scibilia,** Technische Univ. München (Germany); **Charly Caredda**, **Arthur Gautheron**, **Adithep Kawinkij**, **Antoine Uzel,** Univ. de Lyon (France), Institut National des Sciences Appliquées de Lyon (France), Univ. Claude Bernard Lyon 1 (France); **Camilla Bonaudo,** Azienda Ospedaliera Univ. Careggi (Italy), Univ. degli Studi di Firenze (Italy); **Frédéric Lange**, **Angelos Artemiou,** Univ. College London (United Kingdom); **Eszter Balazs**, **Katharina Krischak**, **Peter Gordebeke,** European Institute for Biomedical Imaging Research (Austria); **Domenico Alfieri,** EmoLED S.r.l. (Italy); **Daniel Rueckert,** Technische Univ. München (Germany); **Bruno Montcel,** Univ. de Lyon (France), Institut National des Sciences Appliquées de Lyon (France), Univ. Claude Bernard Lyon 1 (France); **Alessandro Della Puppa,** Azienda Ospedaliera Univ. Careggi (Italy), Univ. degli Studi di Firenze (Italy); **Thiébaud Picart**, **Jacques Guyotat,** Hospices Civils de Lyon (France); **Ilias Tachtsidis,** Univ. College London (United Kingdom); **Francesco S. Pavone,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto nazionale di ottica, Consiglio Nazionale delle Ricerche (Italy)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: NEUROMONITORING: ANIMAL MODELS

25 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Rodrigo M. Menezes Forti**, The Children's Hospital of Philadelphia (United States)

13302-5 • 10:30 AM - 10:50 AM
Real-time monitoring of cerebral blood flow in dogs during surgery assisted by continuous-wave functional near infrared spectroscopy
Author(s): **Héctor A. García,** Univ. of Wisconsin-Madison (United States), Ctr. de Investigaciones en Física e Ingeniería del Centro de la Provincia de Buenos Aires (Argentina); **Demián A. Vera**, **María V. Waks-Serra**, **Daniela I. Iriarte**, **Juan A. Pomarico,** Ctr. de Investigaciones en Física e Ingeniería del Centro de la Provincia de Buenos Aires (Argentina); **Alejandro Díaz,** CONICET (Argentina), Univ. Nacional del Centro de la Provincia de Buenos Aires (Argentina); **Pablo Nejamkin, Ignacio Álvarez,** Ctr. de Investigación Veterinaria de Tandil (Argentina)

13302-6 • 10:50 AM - 11:10 AM
Infant mice receiving fractionated whole-brain radiation exhibit functional network disorganization as adults
Author(s): **Jiantao Zhu**, **Benjamin Seitzman**, **Francisco Reynoso**, **Timothy Mitchell**, **Annie R. Bice**, **Jonah A. Padawer-Curry**, **Xiaodan Wang**, **Stephanie Perkins, Adam Q. Bauer,** Washington Univ. in St. Louis (United States)

13302-7 • 11:10 AM - 11:30 AM
Anesthetic effects on functional connectivity fingerprinting in mice
Author(s): **Arash Asadian**, **Diego Derman,** Indiana Univ. Bloomington (United States); **Temilola Adepoju**, **Brian R. White,** Univ. of Pennsylvania (United States); **Silvina L. Ferradal,** Indiana Univ. Bloomington (United States)

13302-8 • 11:30 AM - 11:50 AM
Link between respiration depth, hemodynamic responses and neural activity in awake, behaving non-human primates
Author(s): **Emily Skog**, **Deepa Issar**, **Madison Grigg**, **Jana Kainerstorfer, Matthew Smith,** Carnegie Mellon Univ. (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 3: CEREBRAL BLOOD FLOW I

25 January 2025 • 1:20 PM - 3:00 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Mingjun Zhao**, NYU Langone Health (United States)

13302-9 • 1:20 PM - 1:40 PM
Assessing cortical activity using wide-field optical imaging during operant motor tasks: Applications for stroke recovery models
Author(s): **Evan W. Morris**, **Jonah A. Padawer-Curry**, **Zachary C. Lieske**, **Annie R. Bice, Adam Q. Bauer,** Washington Univ. in St. Louis (United States)

13302-10 • 1:40 PM - 2:00 PM
Non-invasive diffuse optical monitoring of cerebral physiology after severe closed-head diffuse injury in swine
Author(s): **Rodrigo M. Menezes Forti**, **Lucas J. Hobson**, **Shannon L. Morton**, **April M. Hurlock**, **Rika Goto**, **Darci Anderson**, **M. Katie Weeks**, **Kumaran Senthil**, **Brian R. White**, **Tiffany S. Ko,** The Children's Hospital of Philadelphia (United States); **Kevin D. Browne**, **D. Kacy Cullen,** Perelman School of Medicine (United States); **Arjun G. Yodh,** Univ. of Pennsylvania (United States); **Todd J. Kilbaugh, Wesley B. Baker,** The Children's Hospital of Philadelphia (United States)

13302-11 • 2:00 PM - 2:20 PM
Estimating intracranial pressure with optically-measured cerebral blood flow cardiac waveforms in pigs
Author(s): **Hongting Zhao,** The Children's Hospital of Philadelphia (United States); **Bradley Scammon**, **Jingyi Wu,** Carnegie Mellon Univ. (United States); **Tiffany S. Ko**, **Brian R. White**, **Rodrigo M. Forti,** The Children's Hospital of Philadelphia (United States); **Jana Kainerstorfer,** Carnegie Mellon Univ. (United States); **Wesley B. Baker,** The Children's Hospital of Philadelphia (United States)

13302-12 • 2:20 PM - 2:40 PM
Low-frequency oscillations of hemodynamic parameters as a novel diagnostic marker for traumatic brain injury
Author(s): **Carsi Kim,** Stony Brook Univ. (United States); **Andrea Gómez-Carillo,** Wright State Univ. (United States); **Ulas Sunar,** Stony Brook Univ. (United States)

13302-13 • 2:40 PM - 3:00 PM
Monitoring optical and physiologic properties of brain in response to anesthetic drugs using hybrid optical imaging system
Author(s): **David Abookasis, Elkana David Cohen,** Ariel Univ. (Israel)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: CEREBRAL BLOOD FLOW II

25 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Adam T. Eggebrecht**, Washington Univ. School of Medicine in St. Louis (United States); **Jennifer M. Lynch**, The Children's Hospital of Philadelphia (United States)

13302-14 • 3:30 PM - 3:50 PM
Towards quantitative measures of blood flow index using speckle contrast optical spectroscopy
Author(s): **Joseph B. Majeski,** Univ. of Pennsylvania (United States); **Rodrigo M. Menezes Forti**, **Wesley B. Baker,** The Children's Hospital of Philadelphia (United States); **Arjun G. Yodh,** Univ. of Pennsylvania (United States)

13302-15 • 3:50 PM - 4:10 PM
Long-wavelength, interferometric diffuse correlation spectroscopy (LW-iDCS) for functional perfusion imaging
Author(s): **Mitchell B. Robinson**, **Bin Deng**, **Ailis Muldoon**, **Shakeeb Habash**, **Maria-Angela Franceschini, Stefan A. Carp,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

13302-16 • 4:10 PM - 4:30 PM
Time-of-flight filtered long wavelength interferometric diffusing wave spectroscopy
Author(s): **Santosh Aparanji**, **Mingjun Zhao**, **Akshay Nadig**, **Hector Garcia Estrada**, **Drew Hamilton, Vivek J. Srinivasan,** NYU Langone Health (United States)

13302-17 • 4:30 PM - 4:50 PM
CoMind R1: a multichannel interferometric optical system for real-time blood flow measurements at late times-of-flight
Author(s): **Veronika Parfentyeva**, **Anurag Behera**, **Stella Avtzi**, **Suzie Freer**, **Octave Etard**, **Alexandra Tran-Van-Minh**, **Youssef Ibrahim**, **Ali Mehmed**, **Artur Isufaj**, **Jan Goodrich**, **Bragadeesh Suresh Babu**, **Navjit Singh**, **Saeed Darabi**, **Pablo Villar Sanjurjo**, **Taimoor Ali**, **Yoojin Kim**, **Tanvi Tambe**, **Clarissa Lin**, **Simone Sturniolo**, **Alexander Ruesch**, **Dominic Hill**, **Amir Salehi Lashkajani**, **Jan Andersen**, **Gordon McCabe**, **Matt Thackrah**, **Benjamin Crutchley**, **Dawid Borycki**, **Matthew Valley**, **Tanja Dragojević**, **Robert J. Cooper, Claus Lindner,** CoMind Technologies Ltd. (United Kingdom)

13302-18 • 4:50 PM - 5:10 PM
Towards beat-to-beat intracranial pressure estimation: a depth-enhanced 1064nm interferometric diffuse correlation spectroscopy system
Author(s): **Marco Renna**, **Mitchell B. Robinson,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); **Sarah Sheng,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Boston Univ. (United States); **Ailis Muldoon**, **Alyssa Martin**, **Zachary Starkweather**, **Stefan A. Carp, Maria-Angela Franceschini,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

13302-19 • 5:10 PM - 5:30 PM
Interferometric near-infrared spectroscopy (iNIRS) at 1060 nm
Author(s): **Dibbyan Mazumder**, **Santosh Aparanji,** NYU Langone Health (United States); **Oybek Kholiqov,** Univ. of California, Davis (United States); **Drew Hamilton**, **Hector Garcia Estrada**, **Rabisankar Samanta, Vivek J. Srinivasan,** NYU Langone Health (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: CEREBRAL BLOOD FLOW III

26 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Hongting Zhao**, The Children's Hospital of Philadelphia (United States)

13302-20 • 8:00 AM - 8:20 AM
Long-term continuous monitoring of aneurysmal subarachnoid hemorrhage using diffuse correlation spectroscopy
Author(s): **Ailis Muldoon,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); **Mitchell B. Robinson,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Harvard Medical School (United States); **Shakeeb Habash,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); **John Sunwoo,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Harvard Medical School (United States); **Justin Gelman,** Harvard Medical School (United States); **Andrew Webb**, **Eric Rosenthal,** Massachusetts General Hospital (United States); **Maria-Angela Franceschini,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Harvard Medical School (United States); **David Y. Chung,** Massachusetts General Hospital (United States); **Stefan A. Carp,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Harvard Medical School (United States)

13302-21 • 8:20 AM - 8:40 AM
Low frequency power in cerebral blood flow detects impaired oxygen metabolism in neonatal hydrocephalus
Author(s): **Wesley B. Baker**, **Rodrigo M. Forti**, **Nicolina Ranieri**, **April M. Hurlock**, **Rika Goto**, **Darci Anderson**, **Jennifer M. Lynch**, **Shih-Shan Lang**, **Tracy Flanders**, **Gregory Heuer**, **Tiffany S. Ko, Brian R. White,** The Children's Hospital of Philadelphia (United States)

13302-22 • 8:40 AM - 9:00 AM
Pulsatile blood flow measured with diffuse correlation spectroscopy as a biomarker of outcome after subarachnoid hemorrhage
Author(s): **Tara M. Urner**, **Eashani Sathialingam**, **Tisha S. Boodooram**, **Vidisha Goyal**, **Yueh-Chi Wu**, **Kyle R. Cowdrick,** Emory Univ. (United States), Georgia Institute of Technology (United States); **Seung Yup Lee,** Kennesaw State Univ. (United States); **Feras Akbik**, **Owen B. Samuels**, **Prem A. Kandiah**, **Ofer Sadan,** Emory Healthcare (United States); **Erin M. Buckley,** Emory Univ. (United States), Georgia Institute of Technology (United States)

13302-23 • 9:00 AM - 9:20 AM
Early brain monitoring of infants with prenatal opioid exposure using quantitative diffuse optical spectroscopy
Author(s): **Ana F. Borges de Almeida Barreto,** Univ. of Notre Dame (United States); **Arash Asadian,** Indiana Univ. Bloomington (United States); **Tahir Irshad Ali Shah,** Univ. of Notre Dame (United States); **Rupa Radhakrishnan,** Indiana Univ. School of Medicine (United States); **Thomas D. O'Sullivan,** Univ. of Notre Dame (United States); **Silvina L. Ferradal,** Indiana Univ. (United States)

13302-24 • 9:20 AM - 9:40 AM
Comprehensive optimization of interferometric diffusing wave spectroscopy (iDWS) and preliminary clinical study
Author(s): **Mingjun Zhao**, **Leah Dickstein**, **Akshay Nadig,** NYU Langone Health (United States); **Wenjun Zhou,** China Jiliang Univ. (China); **Santosh Aparanji**, **Hector Garcia Estrada,** NYU Langone Health (United States); **Shing-Jiuan Liu,** Univ. of California, Davis (United States); **Ting Zhou,** NYU Langone Health (United States); **Weijian Yang,** Univ. of California, Davis (United States); **Aaron Lord, Vivek J. Srinivasan,** NYU Langone Health (United States)

13302-25 • 9:40 AM - 10:00 AM
Measuring cerebral blood flow at late times-of-flight with CoMind R1: A multichannel interferometric optical neuromonitoring system
Author(s): **Stella Avtzi**, **Veronika Parfentyeva**, **Octave Etard**, **Alexandra Tran-Van-Minh**, **Anurag Behera**, **Tanvi Tambe**, **Patrick McCarthy**, **Ali Mehmed**, **Artur Isufaj**, **Jan Goodrich**, **Youssef Ibrahim**, **Bragadeesh Suresh Babu**, **Navjit Singh**, **Saeed Darabi**, **Pablo Villar Sanjurjo**, **Suzie Freer**, **Taimoor Ali**, **Yoojin Kim**, **Clarissa Lin**, **Simone Sturniolo**, **Alexander Ruesch**, **Dominic Hill**, **Amir Salehi Lashkajani**, **Jan Andersen**, **Gordon McCabe**, **Matt Thackrah**, **Benjamin Crutchley**, **Dawid Borycki**, **Matthew Valley**, **Tanja Dragojević**, **Claus Lindner, Robert J. Cooper,** CoMind Technologies Ltd. (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: TRANSLATIONAL NIRS

26 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Mitchell B. Robinson**, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

13302-26 • 10:30 AM - 10:50 AM
Full-head fNIRS data generator calibrated via simulation-based inference
Author(s): **Condell Eastmond**, **Xavier Intes**, **Stefan T. Radev,** Rensselaer Polytechnic Institute (United States); **Suvranu De,** Florida State Univ. (United States)

13302-27 • 10:50 AM - 11:10 AM
Depth-enhanced time-resolved NIRS monitoring of deep brain regions at risk of injury in preterm infants
Author(s): **Alexander Biancaniello,** Western Univ. (Canada); **Keith St. Lawrence, Daniel Milej,** Lawson Health Research Institute (Canada)

13302-28 • 11:10 AM - 11:30 AM
Feasibility of broadband NIRS to assess cerebral water content in adults
Author(s): **Vidisha Goyal,** Emory Univ. (United States), Georgia Institute of Technology (United States); **Michael D. Arrington**, **Hongting Zhao**, **LaBeausha H. Harris,** Emory Univ. (United States); **Tisha S. Boodooram**, **Tara M. Urner,** Emory Univ. (United States), Georgia Institute of Technology (United States); **Rodrigo M. Forti,** The Children's Hospital of Philadelphia (United States); **Shasha Bai,** Emory Univ. School of Medicine (United States); **Puneet Sharma,** Emory Univ. Hospital (United States), Emory Univ. School of Medicine (United States); **Lei Zhou,** Ctr. for Systems Imaging Core, Emory Univ. (United States); **N. J. Shah,** Institut für Neurowissenschaften und Medizin, Forschungszentrum Jülich GmbH (Germany); **Feras Akbik,** Emory Univ. Hospital (United States); **Owen B. Samuels**, **Prem A. Kandiah,** Emory Univ. (United States); **Ana-Maria Oros-Peusquens,** Institut für Neurowissenschaften und Medizin, Forschungszentrum (Germany); **Ofer Sadan,** Emory Univ. Hospital (United States); **Erin M. Buckley,** Emory Univ. (United States), Georgia Institute of Technology (United States)

13302-29 • 11:30 AM - 11:50 AM
Comparative analysis of resting-state functional connectivity networks across different age groups using fNIRS
Author(s): **Victor Sanchez,** Univ. of Campinas (Brazil); **Sergio Novi,** University of Maryland School of Medicine (United States); **Andres F. Quiroga,** Institut de Ciències Fotòniques, The Barcelona Institute of Science and Technology (Spain); **Rickson C. Mesquita,** Univ. of Campinas (Brazil)

Lunch Break 11:50 AM - 1:20 PM

SESSION 7: INDUSTRY SESSION

26 January 2025 • 1:20 PM - 2:40 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Jana M. Kainerstorfer**, Carnegie Mellon Univ. (United States)

13302-30 • 1:20 PM - 1:40 PM
Assessment of cerebral oxygenation in children with pneumonia via TD-NIRS oximetry *(Invited Paper)*
Author(s): **Michele Lacerenza,** PIONIRS s.r.l. (Italy); **Virginia Rossi,** Ospedale dei Bambini "Vittore Buzzi", ASST Fatebenefratelli Sacco (Italy); **Valeria Calcaterra**, **Sara Zanelli,** Univ. degli Studi di Pavia (Italy); **Mauro Buttafava,** PIONIRS s.r.l. (Italy); **Davide Contini**, **Caterina Amendola,** Politecnico di Milano (Italy); **Gianvincenzo Zuccotti,** Ospedale dei Bambini "Vittore Buzzi", ASST Fatebenefratelli Sacco (Italy), Univ. degli Studi di Milano (Italy); **Alessandro Torricelli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13302-31 • 1:40 PM - 2:00 PM
A modular time domain functional near-infrared spectroscopy system for many applications *(Invited Paper)*
Author(s): **Yaroslav Chekin**, **Dakota Decker**, **Julien Dubois**, **Ryan M. Field**, **Viswanath Gopalakrishnan**, **Erin M. Koch**, **Gabriel Lerner**, **Zahra M. Aghajan**, **Naomi Miller**, **Isai Olvera**, **Milin J. Patel**, **Katherine L. Perdue**, **Joshua Schmidt**, **Victor Szczepanski, Moriah Taylor,** Kernel (United States)

13302-32 • 2:00 PM - 2:20 PM
Open-Motion: an open source high sensitivity low cost blood flowmeter platform *(Invited Paper)*
Author(s): **Brad Hartl**, **Andrew Houck**, **Ethan Head**, **Gambhir Ranjit**, **George Vigelette**, **Henry Tang**, **Mary Lou Jepsen**, **Peter Herzlinger, Soren Konecky,** Openwater (United States)

13302-33 • 2:20 PM - 2:40 PM
Developing a product-ready optical sensing platform for non-invasive measurement of cerebral blood flow dynamics *(Invited Paper)*
Author(s): **Robert J. Cooper,** CoMind Technologies Ltd. (United Kingdom)

PANEL DISCUSSION: NEUROPHOTONICS INDUSTRY AND RELATIONSHIPS WITH ACADEMIA

26 January 2025 • 2:40 PM - 3:15 PM | Moscone South, Room 105 (Level 1 Lobby)

Neurophotonic methods have found great success in translational and clinical research. Commercialization of these methods is often paramount for clinical use. This panel will touch upon opportunities and difficulties with commercialization. Topics will include discussing different approaches to engaging and building trust within the research community, comparing and contrasting academic research vs. research at a startup, strategies for tackling challenges with clinical certification, including FDA approval and other regulatory hurdles, and personal experiences by the panelists.

Moderator:
Jana M. Kainerstorfer, Carnegie Mellon Univ. (United States)

Panelists:
Michele Lacerenza, PIONIRS s.r.l. (Italy)
Katherine L. Perdue, Kernel (United States)
Brad Hartl, Openwater (United States)
Robert J. Cooper, CoMind Technologies Ltd. (United Kingdom)

Coffee Break 3:15 PM - 3:30 PM

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)

This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13302-34 • 5:30 PM - 7:00 PM
Assessing blood-flow changes in mice with TBI using time-gated diffuse correlation spectroscopy at 1064nm
Author(s): **Sahar Sabaghian,** Stony Brook Univ. (United States); **Chiensing Poon,** Wright State Univ. (United States); **Timothy M. Rambo**, **Aaron J. Miller,** Quantum Opus, LLC (United States); **Brandon Foreman,** Univ. of Cincinnati (United States); **Ulas Sunar,** Stony Brook Univ. (United States)

13302-35 • 5:30 PM - 7:00 PM
Monitoring of depth-sensitive blood flow changes using time-gated diffuse correlation spectroscopy in NeuroICU
Author(s): **Sahar Sabaghian,** Stony Brook Univ. (United States); **Chiensing Poon,** Wright State Univ. (United States); **Timothy M. Rambo**, **Aaron J. Miller,** Quantum Opus, LLC (United States); **Brandon Foreman,** Univ. of Cincinnati (United States); **Ulas Sunar,** Stony Brook Univ. (United States)

13302-36 • 5:30 PM - 7:00 PM
Investigation on the feasibility of shortwave infrared speckle contrast optical spectroscopy for assessing cerebral blood flow
Author(s): **Seoeun Cho**, **Athar Awan, Seung Yup Lee,** Kennesaw State Univ. (United States)

13302-47 • 5:30 PM - 7:00 PM
Translation of laser speckle contrast imaging for blood flow monitoring
Author(s): **David R. Miller,** The Univ. of Oklahoma (United States); **Alexis Dimanche,** The Univ. of Texas at Austin (United States); **Johannes Goldberg**, **Michael Murek,** Inselspital (Switzerland); **Colin Sullender,** The Univ. of Texas at Austin (United States); **Benjamin Hendricks,** Barrow Neurological Institute (United States); **David Bervini**, **Andreas Raabe,** Inselspital (Switzerland); **Michael T. Lawton,** Barrow Neurological Institute (United States); **Andrew K. Dunn,** The Univ. of Texas at Austin (United States)

13302-48 • 5:30 PM - 7:00 PM
Direct non-invasive measurement of blood flow changes in the anterior cerebral artery using diffuse correlation spectroscopy
Author(s): **Susweta Das**, **Soumyajit Sarkar**, **Murali K.,** Indian Institute of Technology Bombay (India); **U. S. Srinivasan,** Sri Balaji Hospital (India); **Hari M. Varma,** Indian Institute of Technology Bombay (India)

13302-49 • 5:30 PM - 7:00 PM
Evaluating the performance of an implantable near-infrared spectroscopy sensor for monitoring spinal cord tissue oxygenation
Author(s): **Garrett Frank,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada); **Kitty So**, **Jay Ethridge**, **Neda Manouchehri**, **Svitlana Haida,** International Collaboration On Repair Discoveries (Canada); **Katharina Raschdorf,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada); **Ali Zaidi**, **Carly Levinsky**, **Avril Billingsley**, **Juliana Mitchell,** International Collaboration On Repair Discoveries (Canada); **Dane Grasse**, **Vishnoukumaar Sivaji**, **Rahul Saini,** Teliatry, Inc. (United States); **Femke Streijger,** International Collaboration On Repair Discoveries (Canada); **Brian K. Kwon,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada)

13302-50 • 5:30 PM - 7:00 PM
Brain biomarkers of inborn errors of metabolism using fNIRS
Author(s): **Kosar Khaksari,** National Institutes of Health (United States); **Wei-Liang Chen**, **Sasha Santiago, Andrea Gropman,** Children's National Health System (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13303

Neural Imaging and Sensing 2025

27 - 28 January 2025 | Moscone South, Room 105 (Level 1 Lobby)

Conference Chair(s): **Qingming Luo,** Hainan Univ. (China); **Jun Ding,** Stanford Univ. School of Medicine (United States); **Ling Fu,** Huazhong Univ. of Science and Technology (China)

Program Committee: **Michal Balberg,** Holon Institute of Technology (Israel); **David A. Boas,** Boston Univ. (United States); **Shih-Chi Chen,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Yu Chen,** Fujian Normal Univ. (China); **Bernard Choi,** Beckman Laser Institute and Medical Clinic (United States); **Meng Cui,** Purdue Univ. (United States); **Congwu Du,** Stony Brook Univ. (United States); **Sergio Fantini,** Tufts Univ. (United States); **Na Ji,** Univ. of California, Berkeley (United States); **Beop-Min Kim,** Korea Univ. (Korea, Republic of); **Pengcheng Li,** HUST-Suzhou Institute for Brainsmatics (China); **Xingde Li,** Johns Hopkins Univ. (United States); **Francesco Saverio Pavone,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Leilei Peng,** Wyant College of Optical Sciences (United States); **Darcy S. Peterka,** Columbia Univ. (United States); **Anna W. Roe,** Zhejiang Univ. (China); **Oxana V. Semyachkina-Glushkovskaya,** Saratov State Univ. (Russian Federation); **Shy Shoham,** NYU Langone Health (United States); **Qinggong Tang,** The Univ. of Oklahoma (United States); **Wang Xi,** Zhejiang Univ. (China); **Chen Yang,** Boston Univ. (United States); **Weijian Yang,** Univ. of California, Davis (United States); **Mohammad Abbas Yaseen,** Northeastern Univ. (United States); **Shaoqun Zeng,** Britton Chance Ctr. for Biomedical Photonics (China)

Sunday 26 January 2025

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

Monday 27 January 2025

SESSION 1: MICROSCOPY I

27 January 2025 • 1:20 PM - 3:30 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Xingde Li**, Johns Hopkins Univ. (United States)

13303-1 • 1:20 PM - 1:50 PM
High-speed two-photon fluorescence microscopy for neural activity imaging *(Invited Paper)*
Author(s): **Na Ji,** Univ. of California, Berkeley (United States)

13303-2 • 1:50 PM - 2:20 PM
Two-photon fiberscopy for neuronal imaging in freely-moving rodents *(Invited Paper)*
Author(s): **Xingde Li**, **Yuehan Liu**, **Jing Zhang**, **Haolin Zhang**, **Cheng-Yu Lee,** Johns Hopkins Univ. (United States); **Hui Lu,** The George Washington Univ. (United States)

13303-3 • 2:20 PM - 2:50 PM
3D imaging of intracellular tau fibrils and jellyfish neuroscience models via computational chemical and fluorescence microscopy *(Invited Paper)*
Author(s): **Jian Zhao,** Massachusetts Institute of Technology (United States), The Univ. of Oklahoma (United States); **Ji-Xin Cheng**, **Lei Tian**, **Benjamin Wolozin,** Boston Univ. (United States); **Brandon Weissbourd,** Massachusetts Institute of Technology (United States)

13303-4 • 2:50 PM - 3:10 PM
Fast two-photon microscopy with a subsampling elliptical beam
Author(s): **Esther Whang**, **Ji Yi, Adam Charles,** Johns Hopkins Univ. (United States)

13303-5 • 3:10 PM - 3:30 PM
High-speed miniaturized two-photon microscope using multiplexing techniques
Author(s): **Zixiao Zhang**, **Shing-Jiuan Liu**, **Ben Mattison, Weijian Yang,** Univ. of California, Davis (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 2: NOVEL TECHNIQUES I

27 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Na Ji**, Univ. of California, Berkeley (United States)

13303-6 • 4:00 PM - 4:30 PM
Advances in hybrid optical-acoustic neural imaging *(Invited Paper)*
Author(s): **Shy Shoham,** NYU Langone Health (United States)

13303-7 • 4:30 PM - 5:00 PM
Hydrogel fiber optics for in vivo optogenetics during locomotion *(Invited Paper)*
Author(s): **Siyuan Rao,** Binghamton Univ. (United States); **Sizhe Huang,** Binghamton Univ., The State Univ. of New York (United States); **Qianbin Wang,** Binghamton Univ. (United States)

13303-8 • 5:00 PM - 5:20 PM
Integrated approach for large volume imaging through GRIN lenses
Author(s): **Meng Cui**, **Zongyue Cheng**, **Yuting Li, Chenmao Wang,** Purdue Univ. (United States)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13303-23 • 5:30 PM - 7:00 PM
Machine learning analysis of electroencephalography (EEG) signals for sentiment categorization
Author(s): **Daniel Boyce**, **Jinjie Liu**, **Qi Lu, Fatima Boukari,** Delaware State Univ. (United States)

13303-24 • 5:30 PM - 7:00 PM
Digital scanning lightsheet microscopy (DSLM) for *Drosophila* whole brain functional imaging
Author(s): **Heng Chang**, **Zhi-Yuan Chang**, **Kai-Chun Jhan**, **Shun-Chi Wu**, **Chung-Chuan Lo,** National Tsing Hua Univ. (Taiwan); **Bi-Chang Chen,** Academia Sinica (Taiwan); **Li-An Chu,** National Tsing Hua Univ. (Taiwan)

13303-25 • 5:30 PM - 7:00 PM
Mesoscopic and neuron level two-photon mouse imaging
Author(s): **Melena Abijaoude**, **Joe Culver**, **Shengxuan Chen, Arthur Li,** Washington Univ. in St. Louis (United States)

13303-28 • 5:30 PM - 7:00 PM
Simultaneous optical wireless communication and sensing for brain implants
Author(s): **Gokul Manavalan, Shlomi Arnon,** Ben-Gurion Univ. of the Negev (Israel)

13303-29 • 5:30 PM - 7:00 PM
Dual-color 3D in vivo imaging of jellyfish neuroscience models
Author(s): **Jian Zhao,** Massachusetts Institute of Technology (United States), The Univ. of Oklahoma (United States); **Qianwan Yang**, **Ruipeng Guo,** Boston Univ. (United States); **Hariharan Jayaraaman,** Massachusetts Institute of Technology (United States); **Lei Tian,** Boston Univ. (United States); **Brandon Weissbourd,** Massachusetts Institute of Technology (United States)

13303-42 • 5:30 PM - 7:00 PM
Brain imaging with visible light polarization sensitive optical coherence tomography
Author(s): **Bahar Baradaran**, **Adam J. Black,** Univ. of Minnesota, Twin Cities (United States); **Sarah R. Heilbronner,** Baylor College of Medicine (United States); **Taner Akkin,** Univ. of Minnesota, Twin Cities (United States)

Tuesday 28 January 2025

SESSION 3: BRAIN ACTIVITIES I

28 January 2025 • 9:00 AM - 10:30 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Leilei L. Peng**, Wyant College of Optical Sciences (United States)

13303-9 • 9:00 AM - 9:30 AM
Cyto- and myeloarchitectonics characterization of human cortex and brainstem with light sheet fluorescence microscopy *(Invited Paper)*
Author(s): **Irene Costantini**, **Michele Sorelli**, **Danila Di Meo**, **Samuel Bradley**, **Josephine Ramazzotti**, **Beatrice Lorenzon**, **Franco Cheli**, **Laura Perego**, **Giacomo Mazzamuto**, **Curzio Checcucci**, **Paolo Frasconi, Francesco Saverio Pavone,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

13303-10 • 9:30 AM - 9:50 AM
LPS-induced systemic inflammation reduced sensory stimulation- evoked astrocyte Ca2+ without altering the vascular response in the APP/PS1dE9 mouse model
Author(s): **Chang Liu**, **Kimia Sakha**, **Jaime Anton-Arnal**, **Alfredo Cárdenas-Rivera, Mohammad A. Yaseen,** Northeastern Univ. (United States)

13303-11 • 9:50 AM - 10:10 AM
Constructing Equivalent Hodgkin-Huxley Neuron Spice Model of the Subthalamic Nucleus Verified by Swine Deep Brain Stimulation

Author(s): **Kun-Ta Wu,** Industrial Technology Research Institute (Taiwan); **Chih-Chuan Chiang**, **Peng-Jye Chen**, **Yung-Jhe Yan, Mang Ou-Yang,** National Yang Ming Chiao Tung Univ. (Taiwan)

13303-12 • 10:10 AM - 10:30 AM
Extending the wearable high-density diffuse optical tomography noise floor with SiPMs
Author(s): **William T. Hamic**, **Edward J. Richter, Joseph P. Culver,** Washington Univ. in St. Louis (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 4: NOVEL TECHNIQUES II

28 January 2025 • 11:00 AM - 12:10 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Meng Cui**, Purdue Univ. (United States)

13303-13 • 11:00 AM - 11:30 AM
COMPACT 2.0 for large-volume mesoscopic deep brain calcium recording *(Invited Paper)*
Author(s): **Meng Cui**, **Yuting Li**, **Zongyue Cheng, Chenmao Wang,** Purdue Univ. (United States)

13303-14 • 11:30 AM - 11:50 AM
DNA-based nanoprobes for fluorescence K+ sensing in neural systems
Author(s): **Bryce Dunn**, **Remi Veneziano**, **Madinah Azizi**, **John R. Cressman, Parag V. Chitnis,** George Mason Univ. (United States)

13303-15 • 11:50 AM - 12:10 PM
In-Vivo imaging of the subdural space using MHz optical coherence tomography
Author(s): **Wolfgang Draxinger,** Univ. zu Lübeck (Germany); **Sonja Spahr-Hess**, **Patrick Kuppler**, **Matteo Mario Bonsanto,** Universitätsklinikum Schleswig-Holstein (Germany); **Robert Huber,** Univ. zu Lübeck (Germany)

Lunch Break 12:10 PM - 1:40 PM

SESSION 5: MICROSCOPY II

28 January 2025 • 1:40 PM - 3:00 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Francesco Saverio S. Pavone**, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

13303-16 • 1:40 PM - 2:10 PM
Rapid 3D projection microscopy with two-photon glutamate uncaging *(Invited Paper)*
Author(s): **Dongli Xu**, **Leilei Peng,** Wyant College of Optical Sciences, The Univ. of Arizona (United States); **Jun Ding,** Stanford Univ. (United States)

13303-17 • 2:10 PM - 2:40 PM
High-speed short-line-excitation two-photon microscopy to image brain activity *(Invited Paper)*
Author(s): **Yunyang Li**, **Shu Guo**, **Ben Mattison**, **Shing-Jiuan Liu**, **Feng Tian, Weijian Yang,** Univ. of California, Davis (United States)

13303-18 • 2:40 PM - 3:00 PM
Swept-source based high-speed quantitative phase microscopy for three-dimensional label-free imaging
Author(s): **Jing Cao, Qian Liu,** Hainan Univ. (China)

Coffee Break 3:00 PM - 3:50 PM

SESSION 6: BRAIN ACTIVITIES II

28 January 2025 • 3:50 PM - 4:50 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Weijian Yang**, Univ. of California, Davis (United States)

13303-20 • 3:50 PM - 4:10 PM
Semantic mapping of visual object categories in movies using very high-density diffuse optical tomography
Author(s): **Wiete Fehner**, **Morgan Fogarty**, **Aahana Bajracharya**, **Zachary E. Markow**, **Dana Wilhelm,** Washington Univ. in St. Louis (United States); **Jerry Tang,** The Univ. of Texas at Austin (United States); **Jason W. Trobaugh,** Washington Univ. in St. Louis (United States); **Alexander G. Huth,** The Univ. of Texas at Austin (United States); **Joseph P. Culver,** Washington Univ. in St. Louis (United States)

13303-21 • 4:10 PM - 4:30 PM
Establishing the Neuron SPICE Model of Basal Ganglia in Parkinson's Disease Based on the Hodgkin-Huxley Conductance-Based Theory
Author(s): **Kun-Ta Wu,** Industrial Technology Research Institute (Taiwan); **Peng-Jye Chen**, **Chih-Chuan Chiang**, **Yung-Jhe Yan, Mang Ou-Yang,** National Yang Ming Chiao Tung Univ. (Taiwan)

13303-22 • 4:30 PM - 4:50 PM
High-performance design of wearable high-density diffuse optical tomography systems
Author(s): **William T. Hamic**, **Alvin S. Agato**, **Hannah E. DeVore**, **Sean M. Rafferty**, **Dana Wilhelm**, **Anthony C. O'Sullivan**, **Calamity F. Svoboda**, **Jason W. Trobaugh**, **Adam T. Eggebrecht**, **Edward J. Richter, Joseph P. Culver,** Washington Univ. in St. Louis (United States)

CONFERENCE 13304

Optogenetics and Optical Manipulation 2025

25 January 2025 | Moscone South, Room 104 (Level 1 Lobby)

Conference Chair(s): **Anna W. Roe,** Zhejiang Univ. (China); **Shy Shoham,** NYU Langone Health (United States)

Program Committee: **Yasmine El-Shamayleh**, **Elizabeth M. Hillman,** Columbia Univ. (United States); **E. Duco Jansen,** Vanderbilt Univ. (United States); **Samarendra K. Mohanty,** Nanoscope Technologies, LLC (United States); **Darcy S. Peterka,** Columbia Univ. (United States); **Michelle Y. Sander,** Boston Univ. (United States); **Ulrich T. Schwarz,** Technische Univ. Chemnitz (Germany); **Wang Xi,** Zhejiang Univ. (China); **Philip O'Herron,** Augusta Univ. (United States)

Saturday 25 January 2025

SESSION 1: ADVANCES IN PHYSICAL NEURAL STIMULATION

25 January 2025 • 8:30 AM - 9:54 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **E. Duco Jansen**, Vanderbilt Univ. (United States)

13304-25 • 8:30 AM - 9:00 AM
Hybrid-nanomaterials for cellular activity modulation *(Invited Paper)*
Author(s): **Tzahi Cohen-Karni,** Carnegie Mellon Univ. (United States)

13304-1 • 9:00 AM - 9:18 AM
Blood optoacoustic stimulation (BOAS)
Author(s): **Guo Chen**, **Mingsheng Li**, **Ji-Xin Cheng, Chen Yang,** Boston Univ. (United States)

13304-3 • 9:18 AM - 9:36 AM
Advances in photoacoustic retina stimulation: From in vivo studies to injectable approach
Author(s): **Chen Yang**, **Yueming Li**, **Zhiyi Du,** Boston Univ. (United States); **Audrey Leong,** Institut de la Vision (France); **Hélène Moulet**, **Jean-Damien Lousie,** Axorus (France); **Serge Picaud,** Institut de la Vision (France); **Ji-Xin Cheng,** Boston Univ. (United States)

13304-2 • 9:36 AM - 9:54 AM
Optical Bragg wavelength modulation through controlled photosensitive molecular fluorescence switching
Author(s): **Shivananju Bannur Nanjunda**, **Koushik S.S.S.D., Sweta Rath,** Indian Institute of Technology Madras (India)

Coffee Break 9:54 AM - 10:20 AM

SESSION 2: PRIMATE OPTOGENETICS AND INS

25 January 2025 • 10:20 AM - 12:00 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Anna Wang Roe**, Zhejiang Univ. (China)

13304-4 • 10:20 AM - 10:45 AM
Optogenetic approaches for circuit dissection in the non-human primate
Author(s): **Alessandra Angelucci**, **Andrew M. Clark**, **Frederick Federer,** The Univ. of Utah (United States); **Jordane Dimidschstein,** Regel Therapeutics (United States); **Niall McAlinden,** Univ. of Strathclyde (United Kingdom); **Loren Rieth,** West Virginia Univ. (United States); **Keith Mathieson,** Univ. of Strathclyde (United Kingdom); **Steve Blair,** The Univ. of Utah (United States)

13304-5 • 10:45 AM - 11:10 AM
Navigating the perceptual space with neural perturbations
Author(s): **Arash Afraz,** National Institutes of Health (United States)

13304-6 • 11:10 AM - 11:35 AM
Non-invasive longitudinal monitoring of opsins in non-human primates
Author(s): **Adriana Galvan**, **Xing Hu,** Emory Univ. (United States); **Oscar Solis**, **Christopher T. Richie,** National Institute on Drug Abuse, National Institutes of Health (United States); **Thomas Wichmann,** Emory Univ. (United States); **Michael Michaelides,** National Institute on

Drug Abuse, National Institutes of Health (United States)

13304-7 • 11:35 AM - 12:00 PM
Selective activation of mesoscale functional circuits via multi-channel infrared stimulation of cortical columns in 7T MRI
Author(s): **Feiyan Tian**, **Yipeng Liu**, **Meixuan Chen,** Zhejiang Univ. (China); **Kenneth E. Schriver,** Zhejiang Univ. (United States); **Anna Wang Roe,** Zhejiang Univ. (China)

Lunch Break 12:00 PM - 1:30 PM

SESSION 3: EMERGING TECHNOLOGIES I: HIGH THROUGHPUT

25 January 2025 • 1:30 PM - 3:24 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Shy Shoham**, NYU Langone Health (United States)

13304-24 • 1:30 PM - 2:00 PM
Organic LEDs for Optical Stimulation – Learning from the Display Industry? *(Invited Paper)*
Author(s): **Malte C. Gather,** Univ. zu Köln (Germany)

13304-8 • 2:00 PM - 2:18 PM
Laser-engineered fiber for panoramic, reconfigurable control of neural activity
Author(s): **Shuo Yang,** Washington Univ. in St. Louis (United States); **Keran Yang**, **Quentin Chevy**, **Adam Kepecs,** Washington Univ. School of Medicine in St. Louis (United States); **Song Hu,** Washington Univ. in St. Louis (United States)

13304-9 • 2:18 PM - 2:36 PM
A large field-of-view holographic mesoscope for causally probing inter-areal computations
Author(s): **Lamiae Abdeladim**, **Uday Jagadisan**, **Hyeyoung Shin**, **Mora Ogando, Hillel Adesnik,** Univ. of California, Berkeley (United States)

13304-10 • 2:36 PM - 2:54 PM
Three-dimensional scanless patterned illumination with single-cell resolution applying time-multiplexed multi-line temporal focusing.
Author(s): **Kenta Inazawa,** RIKEN Ctr. for Advanced Photonics (Japan), Kyoto Univ. (Japan); **Mayumi Yamada**, **Takayuki Michikawa,** Kyoto Univ. (Japan); **Kana Namiki**, **Atsushi Miyawaki,** RIKEN Ctr. for Brain Science (Japan), RIKEN Ctr. for Advanced Photonics (Japan); **Itaru Imayoshi,** Kyoto Univ. (Japan); **Katsumi Midorikawa,** RIKEN Ctr. for Advanced Photonics (Japan); **Keisuke Isobe,** RIKEN Ctr. for Advanced Photonics (Japan), Kyoto Univ. (Japan)

13304-11 • 2:54 PM - 3:24 PM
CMOS Bioelectronics for Optical Neural Interfaces *(Invited Paper)*
Author(s): **Kenneth Shepard**, **Yatin Gilhotra**, **Sinan Yilmaz**, **Eric Pollmann**, **Henry Overhauser**, **Heyu Yin,** Columbia Univ. (United States); **Agrita Dubey**, **Katie Wingel,** University of Pennsylvania (United States); **Ilke Uguz,** Columbia Univ. (United States); **Bijan Pesaran,** University of Pennsylvania (United States)

Coffee Break 3:24 PM - 3:50 PM

SESSION 4: EMERGING TECHNOLOGIES II: INTELLIGENT STIMULATION

25 January 2025 • 3:50 PM - 5:32 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Darcy S. Peterka**, Columbia Univ. (United States)

13304-12 • 3:50 PM - 4:20 PM
Achieving optical transparency in live animals via the Kramers-Kronig relations *(Invited Paper)*
Author(s): **Guosong Hong,** Stanford Univ. (United States)

13304-13 • 4:20 PM - 4:38 PM
Concurrent optogenetic motor mapping of multiple limbs in awake mice reveals cortical organization of coordinated movements
Author(s): **Nischal Khanal**, **Jonah Padawer-Curry,** Washington Univ. School of Medicine in St. Louis (United States); **Trevor Voss,** Vanderbilt Univ. (United States); **Kevin Schulte,** Univ. of Missouri (United States); **Annie Bice, Adam Q. Bauer,** Washington Univ. School of Medicine in St. Louis (United States)

13304-14 • 4:38 PM - 4:56 PM
Generating vast, information-rich data sets of CNS disease biology using all-optical electrophysiology for discovery of novel drug targets and therapeutics
Author(s): **Yang Lu**, **Luis Borja**, **Nikola Otic**, **Nate Bremmer**, **Adam Barnett**, **Steve Ryan**, **Luis Williams**, **Owen B McManus, Graham T Dempsey,** Quiver Bioscience (United States)

13304-15 • 4:56 PM - 5:14 PM
Advanced human-machine interaction for precision optical control of cellular behavior
Author(s): **Bin Dong**, **Chi Zhang**, **Robert M. Everly**, **Shivam Mahapatra**, **Seohee Ma, Mark Carlsen,** Purdue Univ. (United States)

13304-16 • 5:14 PM - 5:32 PM
(Re)connection of parvalbumin-based inhibitory circuits after ischemic stroke
Author(s): **Kaelyn H. Schloss**, **Xiaodan Wang**, **Annie Bice**, **Jin-Moo Lee, Adam Q. Bauer,** Washington Univ. in St. Louis (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13304-22 • 5:30 PM - 7:00 PM
Adaptive Two-photon Holographic Optogenetics for Long-term Closed-loop Stimulation of Neural Ensembles
Author(s): **Ziyu Chen**, **Jiafeng Liu**, **Jianping Wang, Biqin Dong,** Fudan Univ. (China)

13304-23 • 5:30 PM - 7:00 PM
Structural and functional remodeling of the neurovascular unit following optical manipulation of single microvessel
Author(s): **Liang Zhu**, **Anna Wang Roe, Wang Xi,** Zhejiang Univ. (China)

CONFERENCE 13305

Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXIX

27 - 29 January 2025 | Moscone South, Room 203 (Level 2)

Conference Chair(s): **Rainer A. Leitgeb,** Medizinische Univ. Wien (Austria); **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

Program Committee: **Peter E. Andersen,** Technical Univ. of Denmark (Denmark); **Bernhard Baumann,** Medizinische Univ. Wien (Austria); **Kostadinka Bizheva,** Univ. of Waterloo (Canada); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States); **Caroline Boudoux,** Polytechnique Montréal (Canada); **Brett E. Bouma,** Wellman Ctr. for Photomedicine (United States); **Zhongping Chen,** Univ. of California, Irvine (United States); **Johannes de Boer,** Vrije Univ. Amsterdam (Netherlands); **Wolfgang Drexler,** Medizinische Univ. Wien (Austria); **Sina Farsiu,** Duke Univ. (United States); **James G. Fujimoto,** Massachusetts Institute of Technology (United States); **Grigory V. Gelikonov,** BioMedTech LLC (Russian Federation); **Christine P. Hendon,** Columbia Univ. (United States); **Robert A. Huber,** Univ. zu Lübeck (Germany); **Xingde Li,** Johns Hopkins Univ. (United States); **William Wang-Yuhl Oh,** KAIST (United States); **Adrian Podoleanu,** Univ. of Kent (United Kingdom); **Andrew M. Rollins,** Case Western Reserve Univ. (United States); **Marinko V. Sarunic,** Univ. College London (United Kingdom); **Guillermo J. Tearney,** Wellman Ctr. for Photomedicine (United States); **Valery V. Tuchin,** Saratov State Univ. (Russian Federation), Tomsk State Univ. (Russian Federation), Institute of Precision Mechanics and Control of the RAS (Russian Federation); **Ruikang K. Wang,** Univ. of Washington (United States); **Maciej Wojtkowski,** Institute of Physical Chemistry PAS (Poland); **Hao F. Zhang,** Northwestern Univ. (United States)

Sunday 26 January 2025

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13305-78 • 5:30 PM - 7:00 PM
Fast OCT deconvolution using a light-weight CNN
Author(s): **Weiyi Zhang**, **Haoran Zhang**, **Chang Liu**, **Yuning Su**, **Zehao Wang**, **Jiayao Li**, **Mengnan He**, **Chengfu Gu, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13305-79 • 5:30 PM - 7:00 PM
Deep learning for robotic-assisted OCT
Author(s): **Qi Lan**, **Haoran Zhang**, **Weiyi Zhang**, **Chengfu Gu, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13305-80 • 5:30 PM - 7:00 PM
Coherence-property evaluation of tunable VCSELs for SS-OCT by interferometric method with a 3×3 coupler
Author(s): **Maimi Shimura**, **Akira Takada, Makoto Fujino,** Topcon Corp. (Japan)

13305-81 • 5:30 PM - 7:00 PM
Intracellular activity-type and parameter estimation from dynamic optical coherence tomography signals
Author(s): **Shumpei Fujimura,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Rion Morishita**, **Yuanke Feng, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-82 • 5:30 PM - 7:00 PM
In vivo multi-contrast zebrafish imaging using Jones-matrix optical coherence tomography
Author(s): **Shadil Basheer,** Univ. of Tsukuba (Japan); **Cunyou Bao,** University of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Yiheng Lim, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-83 • 5:30 PM - 7:00 PM
Computational augmentation of spatially coherent full-field optical coherence microscope for cellular-resolution and millimeter-depth imaging
Author(s): **Nobuhisa Tateno,** Univ. of Tsukuba (Japan); **Yue Zhu,** Nanjing Univ. of Science and Technology (China), Univ. of Tsukuba (Japan); **Shuichi Makita**, **Xibo Wang,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Damietta Univ. (Egypt), Univ. of Tsukuba (Japan); **Rion Morishita**, **Atsuko Furukawa**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-84 • 5:30 PM - 7:00 PM
Single-shot off-axis FF-OCT (SO-FF-OCT) as a multimodal contrast system: Doppler and dynamic contrasts
Author(s): **Emmanuel Martins Seromenho**, **Nina Dufour**, **Maud Legrand,** ICube (France); **Jesse Schiffler,** ICube, Univ. of Strasbourg (France); **Hamideh Salehi**, **Vincent Maioli,** ICube (France); **Sybille Facca,** ICube, Univ. of Strasbourg (France); **Nadia Bahlouli, Amir Nahas,** ICube (France)

13305-85 • 5:30 PM - 7:00 PM
Three-dimensional attenuation coefficient analysis for the quantitative evaluation of CAR T cell cytotoxicity in tumor spheroids
Author(s): **Ingyoung Kim,** Yonsei Univ. (Korea, Republic of); **Seokgyu Han,** Sungkyunkwan Univ. (Korea, Republic of); **Baekcheon Seong**, **Woovin Kim**, **Chulmin Joo,** Yonsei Univ. (Korea, Republic of); **Sungsu Park,** Sungkyunkwan Univ. (Korea, Republic of)

13305-86 • 5:30 PM - 7:00 PM
Deep reinforcement learning for automatic focus and axial motion correction for OCT B-scans
Author(s): **Guozheng Xu**, **Thomas J. Smart**, **Arman Athwal, Marinko V. Sarunic,** Univ. College London (United Kingdom)

13305-87 • 5:30 PM - 7:00 PM
Speckle-modulated formulation and speckle-free imaging in full-field swept-source optical coherence tomography based on dispersed scatterer model
Author(s): **Xibo Wang**, **Shuichi Makita**, **Nobuhisa Tateno**, **Suzuyo Komeda**, **Atsuko Furukawa**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-88 • 5:30 PM - 7:00 PM
Deep learning classification of en face multi-spectral optical coherence tomography images
Author(s): **Nicholas Assiotis,** Univ. of Groningen (Netherlands); **Christos Photiou,** Univ. of Cyprus (Cyprus); **Andrew Thrapp**, **Guillermo J. Tearney,** Massachusetts General Hospital, Harvard Medical School (United States); **Costas Pitris,** Univ. of Cyprus (Cyprus)

13305-89 • 5:30 PM - 7:00 PM
Advanced classification of Keratoconus using machine learning and polarization sensitive OCT
Author(s): **Rahul Prashant Patil**, **Rohit Shetty**, **Raghav N.**, **Pooja Khamar**, **Naren Shetty,** Narayana Nethralaya Foundation (India); **Michael Pircher**, **Christoph K. Hitzenberger,** Medizinische Univ. Wien (Austria); **Abhijit Sinha Roy,** Narayana Nethralaya Foundation (India)

13305-90 • 5:30 PM - 7:00 PM
Imaging prostate tumor spheroids longitudinally with dynamic contrast line-field optical coherence tomography (LF-dOCT)
Author(s): **Stephanie Swanson**, **Keyu Chen**, **Elahe Cheraghi,** Univ. of Waterloo (Canada); **Ernest Osei,** Grand River Hospital (Canada); **Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13305-91 • 5:30 PM - 7:00 PM
Semantic segmentation and classification of OCT colorectal polyp images
Author(s): **Gabrielle Miller,** Texas A&M Univ. (United States); **Phillip Konstantinov,** Arizona State Univ. (United States); **Guillermo J. Tearney**, **Andrew Thrapp,** Massachusetts General Hospital, Harvard Medical School (United States); **Christos Photiou**, **Costas Pitris,** Univ. of Cyprus (Cyprus); **Andreas Spanias,** Arizona State Univ. (United States)

13305-92 • 5:30 PM - 7:00 PM
Osteosarcoma chemosensitivity signatures from BETi with holographic dynamic-contrast OCT
Author(s): **Shivani Mahajan**, **Dawith Lim,** Purdue Univ. (United States); **Pankita H. Pandya**, **Karen E. Pollok**, **M. R. Saadatzadeh,** Indiana Univ. School of Medicine (United States); **David Nolte,** Purdue Univ. (United States)

13305-93 • 5:30 PM - 7:00 PM
Realtime optical coherence tomography monitoring suprachoroidal injection in living rabbits
Author(s): **Van-Phuc Nguyen,** Univ. of Michigan (United States)

13305-94 • 5:30 PM - 7:00 PM
A novel approach to depolarization analysis in PS-OCT: complex inner product versus DOPU
Author(s): **Mitra Mirsalehi**, **Xin Zhou**, **Sina Maloufi**, **Rex Wang, Shuo Tang,** The Univ. of British Columbia (Canada)

13305-95 • 5:30 PM - 7:00 PM
Optimization of sensitivity, resolution, and phase-retardance stability in all-fiber Jones matrix optical coherence tomography system
Author(s): **Niraj K. Soni**, **Dmitry Revin**, **Junaid Ahmad, Stephen J. Matcher,** The Univ. of Sheffield (United Kingdom)

13305-96 • 5:30 PM - 7:00 PM
OCT angiography model eye by use of the Brownian motion without flowing liquids
Author(s): **Takuro Okubo**, **Ryuichi Ohara, Makoto Fujino,** Topcon Corp. (Japan)

13305-97 • 5:30 PM - 7:00 PM
Generalized representation of OCT signals and its applications to de-speckling and spatial-differential imaging
Author(s): **Suzuyo Komeda**, **Xibo Wang**, **Rion Morishita**, **Ibrahim Abd El-Sadek**, **Shuichi Makita, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-98 • 5:30 PM - 7:00 PM
Dynamic OCT simulator based on mathematical models of intratissue dynamics, image formation, and measurement noise
Author(s): **Yuanke Feng**, **Shumpei Fujimura**, **Yiheng Lim**, **Thitiya Seesan**, **Rion Morishita,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Pradipta Mukherjee,** Univ. of Tsukuba (Japan), Indian Institute of Technology Delhi (India); **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-99 • 5:30 PM - 7:00 PM
A novel correction method and tissue simulation approach for system polarization mode dispersion in polarization sensitive OCT
Author(s): **Tatiana Soldati**, **Patrick J. González, Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands)

13305-100 • 5:30 PM - 7:00 PM
Switchable lateral resolution real-time MHz-OCT rectoscopy for enhanced colorectal disease diagnosis
Author(s): **Sazgar Burhan,** Univ. zu Lübeck (Germany); **Berenice Schulte,** Universitätsklinikum Schleswig-Holstein (Germany); **Madita Göb**, **Awanish Pratap Singh**, **Bayan Mustafa**, **Simon Lotz**, **Wolfgang Draxinger**, **Philipp Lamminger**, **Yasmeine Saker,** Univ. zu Lübeck (Germany); **Tim Eixmann**, **Martin Ahrens,** Medizinisches Laserzentrum Lübeck GmbH (Germany); **Marvin Heimke**, **Tillmann Heinze**, **Thilo Wedel,** Christian-Albrechts-Univ. zu Kiel (Germany); **Maik Rahlves,** Univ. zu Lübeck (Germany); **Mark Ellrichmann,** Universitätsklinikum Schleswig-Holstein (Germany); **Robert Huber,** Univ. zu Lübeck (Germany), Medizinisches Laserzentrum Lübeck GmbH (Germany)

13305-101 • 5:30 PM - 7:00 PM
Adaptive contour-tracking to aid wide-field swept-source optical coherence tomography imaging of large object with uneven surface topology
Author(s): **Yaping Shi**, **Jian Liu**, **Zhaoyu Gong, Ruikang Wang,** Univ. of Washington (United States)

13305-102 • 5:30 PM - 7:00 PM
1700 nm spectroscopic swept-source OCT imaging system for characterization of Atherosclerosis
Author(s): **Ji Won Bae**, **Jihun Kim**, **Yong-Jae Lee, Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13305-103 • 5:30 PM - 7:00 PM
Elaboration of strategies for polarization-sensitive ultrahigh resolution visible light optical coherence tomography
Author(s): **Johannes Reinhold**, **Christian Schnabel**, **Peter Cimalla**, **Lars Kirsten**, **Edmund Koch, Julia Walther,** TU Dresden (Germany)

13305-104 • 5:30 PM - 7:00 PM
Few-mode OCT with a four-mode-selective photonic lantern for multiple illumination and detection pairs
Author(s): **Rodrigo itzamna Becerra Deana,** Polytechnique Montréal (Canada), Castor Optics, Inc. (Canada); **Raphael Maltais-Tariant**, **Stéphane Virally,** Polytechnique Montréal (Canada); **Nicolas Godbout, Caroline Boudoux,** Polytechnique Montréal (Canada), Castor Optics, Inc. (Canada)

13305-105 • 5:30 PM - 7:00 PM
Development of 3D dental imaging from multiple angles: OCT-based evaluation for caries detection and composite assessment
Author(s): **Julia Grundmann**, **Vincenz Porstmann,** TU Dresden (Germany); **Stephan Becker,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Christian Hannig,** TU Dresden (Germany); **Jonas Golde,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13305-106 • 5:30 PM - 7:00 PM
End-to-end designed endoscopic OCT for high-resolution deep tissue imaging
Author(s): **Di Mei**, **Chao Xu**, **Tinghua Zhang**, **Ruiyang Zhang,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Zhihan Hong,** The Univ. of Arizona (United States); **Wu Yuan,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13305-108 • 5:30 PM - 7:00 PM
Depolarization imaging of de- and remineralization processes in dental hard tissue by polarization-sensitive optical coherence tomography
Author(s): **Stella Hund**, **Jonas Golde**, **Lars Kirsten**, **Edmund Koch**, **Christian Hannig, Julia Walther,** TU Dresden (Germany)

13305-109 • 5:30 PM - 7:00 PM
Depth-dependent dispersion compensation method for visible-light optical coherence tomography
Author(s): **Fengyuanshan Xu**, **Weijia Fan**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13305-110 • 5:30 PM - 7:00 PM
Visible light optical coherence tomography for imaging cardiovascular catheter balloon pleating and folding
Author(s): **Zihang Yan**, **Caralyn Collins**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13305-111 • 5:30 PM - 7:00 PM
Effect of polarization on the point spread function in optical coherence tomography
Author(s): **Patrice Tankam,** Indiana Univ. (United States); **Xiao Liu,** Indiana Univ. (United States)

13305-112 • 5:30 PM - 7:00 PM
Optical path reconstruction for dental OCT imaging
Author(s): **Stephan Becker,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Julia Grundmann**, **Vincenz Porstmann,** TU Dresden (Germany); **Gloria Seidel,** Westsächsische Hochschule Zwickau (Germany); **Christian Hannig,** TU Dresden (Germany); **Jonas Golde,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 1: MEMORIAL SESSION FOR PROFESSOR JOE IZATT

27 January 2025 • 8:30 AM - 9:45 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Rainer A. Leitgeb**, Medizinische Univ. Wien (Austria); **Yoshiaki Yasuno**, Univ. of Tsukuba (Japan)
With the passing of Professor Joseph Izatt, our community has lost a visionary pioneer, a dedicated mentor, and spirit of our OCT conference from its inception. This session, held in his honor, celebrates his prolific and exemplary career through invited talks by close collaborators and friends, who will share reflections on their work with him at various stages of his remarkable academic journey. https://spie.org/news/joseph-izatt-obit

This session is part of the Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXIX conference.

Event Details

FORMAT: General session with live presentations.
MENU: Coffee, decaf, and tea will be available outside the presentation room.
SETUP: Theater style seating.

Coffee Break 9:45 AM - 10:15 AM

SESSION 2: DYNAMIC CONTRAST OCT

27 January 2025 • 10:15 AM - 11:45 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Kostadinka Bizheva**, Univ. of Waterloo (Canada)

13305-1 • 10:15 AM - 10:30 AM
Large-area dynamic contrast MHz optical coherence tomography for label-free imaging of porcine tissue
Author(s): **Sazgar Burhan**, **Madita Göb**, **Mario Pieper**, **Tjalfe Laedtke**, **Thorge Grahl,** Univ. zu Lübeck (Germany); **Michael Münter,** Medical Laser Center Lübeck GmbH (Germany); **Hinnerk Schulz-Hildebrandt,** Massachusetts General Hospital (United States); **Gereon Hüttmann**, **Peter König, Robert Huber,** Univ. zu Lübeck (Germany)

13305-2 • 10:30 AM - 10:45 AM
Fusion of multiple dynamics-OCT contrasts for assessment of intratissue dynamics and visualization of dynamics-domain structures
Author(s): **Rion Morishita,** Univ. of Tsukuba (Japan); **Ibrahim A. El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Pradipta Mukherjee,** Univ. of Tsukuba (Japan), Indian Institute of Technology Delhi (India); **Tomoko Mori**, **Atsuko Furukawa**, **Donny Lukmanto**, **Shinichi Fukuda**, **Satoshi Matsusaka**, **Shuichi Makita, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-3 • 10:45 AM - 11:00 AM
Neural network-based high-speed amplitude spectral dynamic optical coherence tomography
Author(s): **Yusong Liu,** Univ. of Tsukuba (Japan); **Ibrahim Abd El Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Cunyuo Bao**, **Atsuko Furukawa**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-4 • 11:00 AM - 11:15 AM
automatic and non-empirical dynamic contrast optical coherence tomography by unsupervised machine learning
Author(s): **Chao Ren**, **Daniel Yang**, **Leyao Wang, Chao Zhou,** Washington Univ. in St. Louis (United States)

13305-5 • 11:15 AM - 11:30 AM
Quantified speckle variance optical coherence tomography algorithm for high-contrast imaging in vitro and in vivo
Author(s): **Sohini Sarkar**, **Shreyas Shah**, **Bibek R. Samanta**, **Michael S. Crouch, Michael S. Eggleston,** Nokia Bell Labs. (United States)

13305-6 • 11:30 AM - 11:45 AM
Speckle decorrelation rate for visualizing therapeutic thermal field with OCT
Author(s): **Haoran Zhang, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

Lunch Break 11:45 AM - 1:15 PM

SESSION 3: OPHTHALMIC OCT: INSTRUMENTATION AND METHODS

27 January 2025 • 1:15 PM - 3:15 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **James G. Fujimoto**, Massachusetts Institute of Technology (United States)

13305-7 • 1:15 PM - 1:30 PM
Quantitative methods to optimize lightweight and structurally robust handheld ophthalmic OCT designs for clinical translation
Author(s): **Jacob J. Watson**, **Rui Xu**, **Rachel Hecht, Yuankai Tao,** Vanderbilt Univ. (United States)

13305-8 • 1:30 PM - 1:45 PM
Multi-angle, refraction corrected robotically aligned optical coherence tomography for the anterior eye
Author(s): **Aislinn Hurley**, **Julia S. Foust,** Duke Univ. (United States); **Kevin C. Zhou,** Univ. of California, Berkeley (United States); **Roarke Horstmeyer**, **Joseph A. Izatt,** Duke Univ. (United States); **Anthony N. Kuo, Ryan P. McNabb,** Duke Univ. (United States)

13305-9 • 1:45 PM - 2:00 PM
Non-mydriatic ultra-widefield optical coherence tomography retinal imaging with custom optics
Author(s): **Shuibin Ni,** Oregon Health & Science Univ. (United States); **Ringo Ng,** Oregon Health & Science Univ. (United States); **David Sutter**, **Siyu Chen**, **David Huang**, **Benjamin Young**, **Peter Campbell, Yifan Jian,** Oregon Health & Science Univ. (United States)

13305-10 • 2:00 PM - 2:15 PM
Auto-aligning handheld OCT probe for pediatric retinal imaging
Author(s): **Amit Narawane**, **Christian Viehland,** Duke Univ. (United States); **Anthony N. Kuo**, **Xi Chen,** Duke Univ. Medical Ctr. (United States); **Joseph A. Izatt, Al-Hafeez Dhalla,** Duke Univ. (United States)

13305-11 • 2:15 PM - 2:30 PM
Noncontact heartbeat OCE in vivo: using ultra-fast OCT to measure corneal stiffness
Author(s): **Achuth Nair**, **Manmohan Singh**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13305-12 • 2:30 PM - 2:45 PM
Zero-shot OCT segmentation for volumetric and live-streaming data
Author(s): **Kaixiang Zhang**, **Haoran Zhang**, **Qi Lan**, **Zesen Chen**, **Shuo Yin**, **Yongqi Wei**, **Zehao Wang, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13305-13 • 2:45 PM - 3:00 PM
Wide-field space division multiplexing optical coherence tomography for angiographic imaging of the human retina
Author(s): **Senyue Hao**, **Aaron J. Adkins**, **Andrew Song**, **Chao Ren**, **Jiaqi Hua,** Washington Univ. in St. Louis (United States); **Margaret Reynolds**, **Rithwick Rajagopal,** Washington Univ. School of Medicine in St. Louis (United States); **Chao Zhou,** Washington Univ. in St. Louis (United States)

13305-14 • 3:00 PM - 3:15 PM
Fiber OCT probes for retinal surgical guidance
Author(s): **Radu-Florin Stancu**, **Manuel J. Marques,** Univ. of Kent (United Kingdom); **Carlo Seneci**, **Ross Henry,** King's College London (United Kingdom); **Lyndon da Cruz,** Moorfields Eye Hospital (United Kingdom); **Christos Bergeles,** King's College London (United Kingdom); **Michael R. Hughes, Adrian Podoleanu,** Univ. of Kent (United Kingdom)

Coffee Break 3:15 PM - 3:45 PM

SESSION 4: FUNCTIONAL AND ADVANCED RETINAL IMAGING

27 January 2025 • 3:45 PM - 5:45 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Ruikang K. Wang**, Univ. of Washington (United States)

13305-15 • 3:45 PM - 4:00 PM
Artificial intelligence assisted intraocular inflammatory cell differentiation with ultrahigh-resolution OCT
Author(s): **Jiachi Hong**, **Siyu Chen**, **Tejpal Gill**, **Xubo Song**, **Yifan Jian**, **Eric Suhler**, **David Huang, Yan Li,** Oregon Health & Science Univ. (United States)

13305-16 • 4:00 PM - 4:15 PM
Optophysiology using dynamic full-field optical coherence tomography
Author(s): **Nathaniel Norberg**, **Tual Monfort**, **Salvatore Azzollini**, **Julia Granier,** Institut de la Vision (France); **Olivier Thouvenin,** Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France); **Kate Grieve,** Institut de la Vision (France), Ctr. Hospitalier National d'Opthalmologie des Quinze-Vingts, Institut National de la Santé et de la Recherche Médicale (France)

13305-17 • 4:15 PM - 4:30 PM
Combined OCT+ERG system for imaging neurovascular coupling in the healthy and diseased rodent retina
Author(s): **Simran Pattar**, **Khushmeet K. Dhaliwal**, **Zichael Labomarel, Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13305-18 • 4:30 PM - 4:45 PM
Progress on clinical optoretinography using dual-spectrometer OCT in healthy and diseased eyes
Author(s): **Arman Athwal,** Univ. College London (United Kingdom); **Ayoub Faraji,** Roehampton Univ. (United Kingdom); **Ringo Ng**, **Joey Huang**, **Yifan Jian,** Oregon Health & Science Univ. (United States); **Myeong Jin Ju,** The Univ. of British Columbia (Canada); **Marinko V. Sarunic,** Univ. College London (United Kingdom)

13305-19 • 4:45 PM - 5:00 PM
Investigating color dependence of neurovascular coupling in the healthy human retina using functional OCT
Author(s): **Khushmeet K. Dhaliwal**, **James Simmons**, **Alexander Wong**, **Chris Hudson,** Univ. of Waterloo (Canada); **Tom Wright**, **Brian G. Ballios,** Kensington Health (Canada), Univ. of Toronto (Canada); **Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13305-20 • 5:00 PM - 5:15 PM
Wavenumber-space wavefront-sensorless adaptive-optics optical coherence tomography of the retina in vivo
Author(s): **Sebastián Ruiz-Lopera**, **David Veysset,** Massachusetts General Hospital (United States); **Brett E. Bouma,** Massachusetts General Hospital, Harvard Medical School (United States), Institute for Medical Engineering & Science (United States); **Néstor Uribe-Patarroyo,** Massachusetts General Hospital, Harvard Medical School (United States)

13305-21 • 5:15 PM - 5:30 PM
Depth-extended ocular tissue imaging using µOCT with numerical defocus correction algorithm
Author(s): **Jun Song**, **Yujie Hu**, **Ansel Chen**, **Shrivatsan Rajagopalan**, **Hyung-Suk Yoo,** The Univ. of British Columbia (Canada); **Shuichi Makita**, **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan); **Sonia Yeung**, **Joanne Matsubara, Myeong Jin Ju,** The Univ. of British Columbia (Canada)

13305-22 • 5:30 PM - 5:45 PM
Optimized scanning protocol for enhanced visualization of choriocapillaris using 1.6 MHz FDML OCT
Author(s): **Mohammad Shahidul Islam**, **Jun Song, Myeong Jin Ju,** The Univ. of British Columbia (Canada)

Tuesday 28 January 2025

SESSION 5: POLARIZATION-SENSITIVE OCT: CLINICAL TRANSLATION

28 January 2025 • 8:30 AM - 10:30 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Johannes F. de Boer**, Vrije Univ. Amsterdam (Netherlands)

13305-23 • 8:30 AM - 8:45 AM
A multi-modal PSOCT-NIRS catheter for ablation of atrial fibrillation
Author(s): **Michael Douglass,** Case Western Reserve Univ. (United States); **Reza Mohammadpour,** EP Frontiers (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Christine Hendon,** Columbia Univ. (United States); **Andrew M. Rollins,** Case Western Reserve Univ. (United States)

13305-24 • 8:45 AM - 9:00 AM
A novel screening modality for coronary artery disease by assessing retinal blood vessels with polarization sensitive optical coherence tomography
Author(s): **Hadi Afsharan**, **Parmida Ghorbanian**, **Girish Dwivedi, Barry Cense,** The Univ. of Western Australia (Australia)

13305-25 • 9:00 AM - 9:15 AM
In-vivo collagen orientation assessment to predict progression in idiopathic pulmonary fibrosis using polarization sensitive endobronchial optical coherence tomography
Author(s): **Jaeyul Lee**, **Sreyankar Nandy**, **Sarita R. Berigei**, **Colleen M. Keyes**, **Ashok Muniappan**, **Hugh G. Auchincloss**, **Michael Lanuti**, **Amalia DeCoursey**, **Satomi Yamamoto**, **Amita Sharma**, **Martin Villiger, Lida P. Hariri,** Massachusetts General Hospital (United States)

13305-26 • 9:15 AM - 9:30 AM
Retinal nerve fiber layer damage assessment in glaucomatous eyes using cumulated vectorial birefringence measured by polarization-sensitive optical coherence tomography
Author(s): **Xinyu Liu,** Singapore Eye Research Institute (Singapore), Peking Univ. (China); **Parakkel R. Radhakrishnan**, **Damon Wong**, **Jacqueline Chua, Leopold Schmetterer,** Singapore Eye Research Institute (Singapore)

13305-27 • 9:30 AM - 9:45 AM
Advancing dental diagnostics with polarization-sensitive optical coherence tomography for early caries detection
Author(s): **Ronja Koehler**, **Johannes Reinhold**, **Johannes Rohr**, **Jonas Golde**, **Lars Kirsten**, **Christian Hannig**, **Edmund Koch, Julia Walther,** TU Dresden (Germany)

13305-28 • 9:45 AM - 10:00 AM
Characteristic of pulmonary fibrosis using 1700 nm swept-source polarization-sensitive OCT: A comparative study with second harmonic generation imaging
Author(s): **Jihun Kim**, **Yong-Jae Lee**, **Ji Won Bae,** Pusan National Univ. (Korea, Republic of); **Soo Han Kim**, **Chang Hyun Park,** Pusan National Univ. Hospital (Korea, Republic of); **Stephani Edwina Lucia**, **Pilhan Kim,** KAIST (Korea, Republic of); **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13305-29 • 10:00 AM - 10:15 AM
Cardiovascular health assessment through retinal PS-OCT measurements of the retinal pigment epithelium - Bruch's membrane complex
Author(s): **Barry Cense,** The Univ. of Western Australia (Australia); **Hadi Afsharan,** Harry Perkins Institute of Medical Research (Australia); **Parmida Ghorbanian,** The Univ. of Western Australia (Australia); **Girish Dwivedi,** Harry Perkins Institute of Medical Research (Australia)

13305-30 • 10:15 AM - 10:30 AM
Noninvasive evaluation of deceased marginal donor liver viability using polarization-sensitive optical coherence tomography
Author(s): **Feng Yan**, **Qinghao Zhang**, **Bornface Mutembei**, **Takaki Mishima**, **Ebenezer Raj Selvaraj Mercyshalinie**, **Chen Wang,** The Univ. of Oklahoma (United States); **Zhongxin Yu**, **Kar-Ming Fung,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Clint Hostetlet**, **Ashley Milam**, **Bradon Nave,** LifeShare Transplant Donor Services of Oklahoma, Inc. (United States); **Yu Chen,** Fujian Normal Univ. (China); **Qinggong Tang,** The Univ. of Oklahoma (United States)

Coffee Break 10:30 AM - 10:45 AM

SESSION 6: PRECLINICAL IMAGING

28 January 2025 • 10:45 AM - 12:15 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Xingde Li**, Johns Hopkins Univ. (United States)

13305-31 • 10:45 AM - 11:00 AM
Assessing the biomechanical properties of murine mouse embryo inside the yolk sac using multifocal acoustic radiation force-based reverberant optical coherence elastography
Author(s): **Christian Zevallos-Delgado**, **Taye T. Mekonnen**, **Amandeep Singh**, **Manmohan Singh**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13305-32 • 11:00 AM - 11:15 AM
Deciphering morpho-functional stroke repercussions on the cortical microvasculature with Bessel beam OCM
Author(s): **Lukas B. Glandorf,** ETH Zurich, Univ. Zürich (Switzerland); **Etienne Jessen,** Technische Univ. Darmstadt (Germany); **Jeanne Droux,** UniversitätsSpital Zürich, Univ. Zürich (Switzerland); **Bastian Wittmann**, **Bruno Weber,** Univ. Zürich (Switzerland); **Susanne Wegener,** UniversitätsSpital Zürich, Univ. Zürich (Switzerland); **Bjoern Menze,** Univ. Zürich (Switzerland); **Mohamad El Amki,** UniversitätsSpital Zürich, Univ. Zürich (Switzerland); **Rainer Leitgeb,** Medizinische Univ. Wien (Austria); **Dominik Schillinger,** Technische Univ. Darmstadt (Germany); **Daniel Razansky,** ETH Zurich, Univ. Zürich (Switzerland)

13305-33 • 11:15 AM - 11:30 AM
A lightweight wearable Doppler Optical Coherence Tomography device adapted for Freely Moving Mouse
Author(s): **Jingyi Wang, Zhongping Chen,** Univ. of California, Irvine (United States)

13305-34 • 11:30 AM - 11:45 AM
Noninvasive evaluation of mouse embryo quality using time-lapse bright field and optical coherence microscopy
Author(s): **Fei Wang**, **Senyue Hao**, **Kibeom Park**, **Ali Ahmady, Chao Zhou,** Washington Univ. in St. Louis (United States)

13305-35 • 11:45 AM - 12:00 PM
Retinal morphological and vascular images of marmoset (Callithrix jacchus) using wide-field spectral-domain OCT
Author(s): **Hyunji Lee,** Korea Research Institute of Standards and Science (Korea, Republic of), Korea Univ of Science and Technology (Korea, Republic of); **Ha Young Jang,** Seoul National Univ. (Korea, Republic of); **Jina Kwak,** Seoul National Univ. College of Medicine (Korea, Republic of); **Byeong-Cheol Kang,** Seoul National Univ. College of Medicine (Korea, Republic of), Seoul National Univ. (Korea, Republic of); **Jeong Hun Kim,** Seoul National Univ. Hospital (Korea, Republic of), Seoul National Univ. (Korea, Republic of), Seoul National Univ. College of Medicine (Korea, Republic of); **Tae Geol Lee, Sang-Won Lee,** Korea Research Institute of Standards and Science (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of)

13305-36 • 12:00 PM - 12:15 PM
Automated 3D segmentation of hydrogel-treated mice wounds using optical coherence tomography and deep learning
Author(s): **Michael S. Crouch,** Nokia Bell Labs. (United States); **Nicole Hanson**, **Jiyeon Song,** Duke Univ. (United States); **Michael S. Eggleston,** Nokia Bell Labs. (United States); **Sharon Gerecht,** Duke Univ. (United States); **Shreyas Shah,** Nokia Bell Labs. (United States)

Lunch Break 12:15 PM - 1:45 PM

SESSION 7: POLARIZATION SENSITIVE OCT: TECHNOLOGIES

28 January 2025 • 1:45 PM - 3:15 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Brett E. Bouma**, Wellman Ctr. for Photomedicine (United States)

13305-37 • 1:45 PM - 2:00 PM
Measuring diattenuation with alternating input state PS-OCT
Author(s): **Georgia L. Jones,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Maxina Sheft**, **Brett E. Bouma,** Wellman Ctr. for Photomedicine (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13305-38 • 2:00 PM - 2:15 PM
Stokes2Stokes: unsupervised denoising for polarization-sensitive optical coherence tomography
Author(s): **Chuan-Bor Chueh,** Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan), Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Georgia L. Jones,** Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States), Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Bhaskara R. Chintada,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Maxina Sheft,** Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States), Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Po-Yi Lee,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Brett E. Bouma,** Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States), Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Hsiang-Chieh Lee,** Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); **Xinyu Liu,** Singapore Eye Research Institute, Singapore National Eye Ctr. (Singapore); **Martin Villiger,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

13305-39 • 2:15 PM - 2:30 PM
Minimize flow-induced uncertainty in polarization sensitive optical coherence tomography imaging using eigen decomposition
Author(s): **Yaping Shi**, **Ruikang Wang**, **Jian Liu**, **Zhaoyu Gong, Jingjiang Xu,** Univ. of Washington (United States)

13305-40 • 2:30 PM - 2:45 PM
Analyzing the impact of speckle in PS-OCT data
Author(s): **Maxina Sheft**, **Georgia L. Jones,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Chuan-Bor Chueh,** National Taiwan Univ. (Taiwan); **Sebastián Ruiz-Lopera,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Néstor Uribe-Patarroyo,** Wellman Ctr. for Photomedicine (United States); **Brett E. Bouma,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13305-41 • 2:45 PM - 3:00 PM
High contrast brain myelin (normal cross-section/slice)structure imaging with 1700nm PS-OCT system
Author(s): **Yong-Jae Lee**, **Jihun Kim**, **Jiwon Bae, Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13305-42 • 3:00 PM - 3:15 PM
In vivo endoscopic polarization sensitive OCT for the quantification of airway smooth muscle in diseased airways versus healthy
Author(s): **Tatiana Soldati,** Vrije Univ. Amsterdam (Netherlands); **Sofi Vassileva,** Amsterdam UMC (Netherlands); **Margherita Vaselli,** Vrije Univ. Amsterdam (Netherlands); **Kirsten A. Kalverda**, **Jouke T. Annema**, **Peter I. Bonta,** Amsterdam UMC (Netherlands); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands)

Coffee Break 3:15 PM - 3:45 PM

SESSION 8: IMAGING CANCER AND TISSUE PATHOLOGY

28 January 2025 • 3:45 PM - 5:15 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Rainer A. Leitgeb**, Medizinische Univ. Wien (Austria)

13305-43 • 3:45 PM - 4:00 PM
In vivo structural and molecularly-sensitive imaging of Barrett's esophagus and esophageal adenocarcinoma with a novel immuno-OCT capsule endoscope
Author(s): **Tyla Danskin,** Vrije Univ. Amsterdam (Netherlands); **Andrea J. Sterkenburg,** Univ. Medical Ctr. Groningen (Netherlands); **Tom H. Dijkhuis,** Leiden Univ. Medical Ctr. (Netherlands); **Gursah Kats,** Univ. Medical Ctr. Groningen (Netherlands); **Anouk L. Post,** Vrije Univ. Amsterdam (Netherlands); **Alex Vahrmeijer,** Leiden Univ. Medical Ctr. (Netherlands); **Wouter B. Nagengast,** Univ. Medical Ctr. Groningen (Netherlands); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands)

13305-45 • 4:00 PM - 4:15 PM
Integration of dynamic OCT and cell cultivation environment for longitudinal imaging of tumor spheroid's drug response
Author(s): **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Rion Morishita**, **Guo Yu**, **Atsuko Furukawa,** Univ. of Tsukuba (Japan); **Pradipta Mukherjee,** Indian Institute of Technology Delhi (India), Univ. of Tsukuba (Japan); **Shuichi Makita**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13305-46 • 4:15 PM - 4:30 PM
Multi-parametric optical coherence elastography for improved identification of tumor margins in breast-conserving surgery
Author(s): **Jiayue Li**, **Ken Foo**, **Rowan Sanderson**, **Renate Zilkens,** The Univ. of Western Australia (Australia); **Mireille Hardie**, **Laura Gale,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia); **Yen Yeow,** The Univ. of Western Australia (Australia); **Celia Green,** PathWest Lab. Medicine WA (Australia); **Farah Abdul-Aziz,** Hollywood Private Hospital (Australia); **Juliana Hamzah,** Harry Perkins Institute of Medical Research (Australia); **James Stephenson**, **Ammar Tayaran**, **Jose Fernandez**, **Lee Jackson**, **Synn Chin**, **Saud Hamza,** Fiona Stanley Hospital (Australia); **Anmol Rijhumal,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia); **Christobel Saunders,** The Univ. of Melbourne (Australia); **Brendan Kennedy,** The Univ. of Western Australia (Australia), Nicolaus Copernicus Univ. (Poland)

13305-47 • 4:30 PM - 4:45 PM
Integrated intravaginal OCT/OCTA/OCE probe for quantitative measurements of the vagina tissue
Author(s): **Wenqi He**, **Saijun Qiu,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); **Karla Lorente,** UC Irvine Health (United States); **Afiba Arthur,** Univ. of California, Irvine School of Medicine (United States); **Yuchen Jiang,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); **Yona Tadir,** Beckman Laser Institute and Medical Clinic (United States); **Felicia Lane,** Univ. of California, Irvine (United States); **Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States)

13305-48 • 4:45 PM - 5:00 PM
Deep learning classification of colon polyps for colorectal cancer detection (CRC) using feature-enhanced ex vivo optical coherence tomography (OCT) images
Author(s): **Christos Photiou,** Univ. of Cyprus (Cyprus); **Andrew Thrapp**, **Guillermo J. Tearney,** Harvard Univ. (United States); **Costas Pitris,** Univ. of Cyprus (Cyprus)

13305-49 • 5:00 PM - 5:15 PM
Quantitative in vivo microscopy of interstitial lung disease using deep learning and artificial intelligence-based endobronchial optical coherence tomography
Author(s): **Sreyankar Nandy**, **Sarita R. Berigei**, **Satomi Yamamoto**, **Amalia DeCoursey**, **Jaeyul Lee,** Massachusetts General Hospital (United States); **George Washko,** Brigham and Women's Hospital (United States); **Markus Herrmann, Lida P. Hariri,** Massachusetts General Hospital (United States)

SESSION 9: AWARD CEREMONY: OPTICAL COHERENCE TOMOGRAPHY AND COHERENCE DOMAIN OPTICAL METHODS IN BIOMEDICINE

28 January 2025 • 5:15 PM - 5:45 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Rainer A. Leitgeb**, Medizinische Univ. Wien (Austria); **Yoshiaki Yasuno**, Univ. of Tsukuba (Japan)
Join the Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXIX conference for their award ceremony.

Wednesday 29 January 2025

SESSION 10: FULL-FIELD OCT TECHNOLOGY

29 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Maciej Wojtkowski**, Institute of Physical Chemistry PAS (Poland)

13305-50 • 8:30 AM - 8:45 AM
Oblique illumination holographic OCT for improving resolution, reducing speckle and objectively correcting aberrations
Author(s): **Pepijn Klooster**, **Sarvesh Thakur, Dierck Hillmann,** Vrije Univ. Amsterdam (Netherlands)

13305-51 • 8:45 AM - 9:00 AM
Synthetic procedural noise and neural networks: enhancing biomedical images with purely artificial data
Author(s): **Viacheslav Mazlin,** Institut Langevin (France); **Samuel Boccara,** Hunter College High School (United States)

13305-52 • 9:00 AM - 9:15 AM
Customized spatio-temporal optical coherence tomography with enhanced signal-to-noise ratio
Author(s): **Marta Mikula-Zdankowska,** Institute of Physical Chemistry (Poland), International Ctr. for Translational Eye Research (Poland); **Dawid Borycki,** International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); **Piotr Węgrzyn,** International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland), Univ. of Warsaw (Poland); **Maciej Wojtkowski,** International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

13305-53 • 9:15 AM - 9:30 AM
Rapid spectral shaping for full field time domain and swept source OCT
Author(s): **Dimitri Roueff**, **Olivier Thouvenin, Pedro Meçe,** Institut Langevin (France)

13305-54 • 9:30 AM - 9:45 AM
Influence of spatial coherence on lateral resolution and SNR in full-field OCT
Author(s): **Inès Loukili,** Institut de la Vision, Sorbonne Univ. (France), ONERA, Univ. Paris-Saclay (France), Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL, CNRS (France); **Laurent Mugnier**, **Vincent Michau,** ONERA, Univ. Paris-Saclay (France); **Kate Grieve,** Institut de la Vision, Sorbonne Univ. (France); **Pedro Meçe,** Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris, Univ. PSL, CNRS (France); **Serge Meimon,** ONERA, Univ. Paris-Saclay (France)

13305-55 • 9:45 AM - 10:00 AM
Digital adaptive optics and spatio-temporal optical coherence tomography
Author(s): **Jem Love,** Univ. College London (United Kingdom); **Destiny Hsu,** Simon Fraser Univ. (Canada); **Guozheng Xu,** Univ. College London (United Kingdom); **Myeong Jin Ju,** The Univ. of British Columbia (Canada); **Łukasz Kornaszewski,** InCellVu S.A. (Poland); **Maciej Wojtkowski,** Institute of Physical Chemistry (Poland); **Marinko V. Sarunic,** Univ. College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 11: OCT SIGNAL UNDERSTANDING AND MANIPULATION

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Peter Eskil Andersen**, Technical Univ. of Denmark (Denmark)

13305-56 • 10:30 AM - 10:45 AM
Super-resolution optical coherence tomography using a physics-informed diffusion model
Author(s): **Nima Abbasi Firoozjah**, **Keyu Chen**, **Alexander Wong, Kostadinka Bizheva,** Univ. of Waterloo (Canada)

13305-57 • 10:45 AM - 11:00 AM
Open chrono-morph viewer: advanced, open-source, high-dimensional image visualization for the OCT community
Author(s): **Andre C. Faubert, Shang Wang,** Stevens Institute of Technology (United States)

13305-58 • 11:00 AM - 11:15 AM
Strategies to improve the generalizability of deep learning-based OCT despeckling methods
Author(s): **Bhaskara R. Chintada**, **Sebastián Ruiz-Lopera**, **Brett E. Bouma**, **Martin Villiger, Néstor Uribe-Patarroyo,** Wellman Ctr. for Photomedicine (United States)

13305-59 • 11:15 AM - 11:30 AM
A basis method for single-shot recovery of the combined confocal and fall-off function from multiple OCT A-scans
Author(s): **Daniel J. Phan,** Vanderbilt Univ. (United States); **Martin C. Were**, **Jörn-Hendrik Weitkamp,** Vanderbilt Univ. Medical Ctr. (United States); **Audrey K. Bowden,** Vanderbilt Univ. (United States)

13305-60 • 11:30 AM - 11:45 AM
A new particle-wave model for Monte Carlo simulations of OCT signals gives a nearly three orders of magnitude increase in efficiency
Author(s): **Gijs Buist,** Vrije Univ. Amsterdam (Netherlands); **Arjen Amelink,** Vrije Univ. Amsterdam (Netherlands), TNO (Netherlands); **Johannes de Boer,** Vrije Univ. Amsterdam (Netherlands)

13305-61 • 11:45 AM - 12:00 PM
Axial deviations of contours in the swept source optical coherence tomography due to lateral scanning
Author(s): **Adrian Fernandez Uceda**, **Alejandro Martinez Jimenez, Adrian G. H. Podoleanu,** Univ. of Kent (United Kingdom)

Lunch Break 12:00 PM - 1:30 PM

SESSION 12: NEW OCT TECHNOLOGY

29 January 2025 • 1:30 PM - 3:30 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Stephen A. Boppart**, Beckman Institute for Advanced Science and Technology (United States)

13305-62 • 1:30 PM - 1:45 PM
Shearing interferometric fluorescence tomography (SIFT) for depth- and spectrally-resolved volumetric imaging
Author(s): **Jet Rostykus, Yuankai K. Tao,** Vanderbilt Univ. (United States)

13305-63 • 1:45 PM - 2:00 PM
Impact of the biphotons' spectral correlation type on the performance of Fourier-domain quantum optical coherence tomography
Author(s): **Crislane de Brito,** Nicolaus Copernicus Univ. (Poland); **Sylwia M. Kolenderska,** Univ. of Canterbury (New Zealand), Nicolaus Copernicus Univ. (New Zealand); **Piotr Kolenderski,** Nicolaus Copernicus Univ. (Poland)

13305-64 • 2:00 PM - 2:15 PM
Artefact removal in quantum-mimic optical coherence tomography for dispersion-cancelled and resolution-enhanced imaging
Author(s): **Daniel Q. Barbosa**, **Krzysztof A. Maliszewski, Sylwia M. Kolenderska,** Univ. of Canterbury (New Zealand)

13305-65 • 2:15 PM - 2:30 PM
Dual spectrometer based ultra-broadband spectral domain optical coherence tomography at 1450 nm
Author(s): **Santosh Balakrishnan, Steven G. Adie,** Cornell Univ. (United States)

13305-66 • 2:30 PM - 2:45 PM
Meter-scale working distance OCT with optimal Gaussian beam focusing
Author(s): **Julia S. Foust**, **Robert Trout**, **Jingkai Zhang**, **Jianwei D. Li**, **Joseph A. Izatt, Al-Hafeez Dhalla,** Duke Univ. (United States)

13305-67 • 2:45 PM - 3:00 PM
Optimizing sensitivity and maximum probing depth in spatially offset OCT
Author(s): **Gavrielle R. Untracht**, **Stamatina Georgiou, Peter E. Andersen,** Technical Univ. of Denmark (Denmark)

13305-68 • 3:00 PM - 3:15 PM
Enhanced deep tissue imaging using long wavelength conjugate spectral domain OCT with balanced detection
Author(s): **Gauri Arora,** Cornell Univ. (India); **Santosh Balakrishnan, Steven G. Adie,** Cornell Univ. (United States)

13305-69 • 3:15 PM - 3:30 PM
Off-axis endoscope implementation for swept source full field optical coherence tomography using a miniature camera
Author(s): **Alejandro Martínez Jiménez**, **Michael R. Hughes**, **Hal Dorrington, Adrian Podoleanu,** Univ. of Kent (United Kingdom)

Coffee Break 3:30 PM - 4:00 PM

SESSION 13: NOVEL LIGHT SOURCES AND COMPONENTS

29 January 2025 • 4:00 PM - 6:00 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Wolfgang Drexler**, Medizinische Univ. Wien (Austria)

13305-70 • 4:00 PM - 4:15 PM
High performance chip-scale OCT at 1310 and 1060nm with module-level integration
Author(s): **Bibek R. Samanta**, **Flavio Pardo, Michael S. Eggleston,** Nokia Bell Labs. (United States)

13305-71 • 4:15 PM - 4:30 PM
Swept source optical coherence tomography at green wavelengths using broadband frequency doubling of NIR MEMS-VCSELs
Author(s): **Vijaysekhar Jayaraman**, **Christopher Burgner**, **Grace Higgins**, **S.J. Siedschlag,** Praevium Research, Inc. (United States); **Yunchan Hwang, James Fujimoto,** Massachusetts Institute of Technology (United States)

13305-72 • 4:30 PM - 4:45 PM
High-resolution visible light OCT of the human retina with combined superluminescent diodes
Author(s): **Alok Gupta**, **Ruoyu Meng, Vivek J. Srinivasan,** New York Univ. (United States)

13305-73 • 4:45 PM - 5:00 PM
Visible light swept source for optical coherence tomography
Author(s): **Weijia Fan**, **Roman Kuranov**, **David A. Miller**, **Tingwei Zhang**, **Wei Hong Yeo**, **Pengpeng Zhang**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13305-74 • 5:00 PM - 5:15 PM
Phase stable OCT with a 1050 nm tunable VCSEL and photonic integrated circuit
Author(s): **Bart C. Johnson**, **Carlos Melendez**, **Ryan Niemeier**, **David Blasing**, **Tim Ford,** Excelitas Technologies Corp. (United States); **Taran Huffman**, **Ajay Srinivasan**, **Thien-An Nguyen**, **Tina Trimble,** ORCA Computing (United States); **Peter Whitney,** Excelitas Technologies Corp. (United States)

13305-75 • 5:15 PM - 5:30 PM
All-PMF stretched-pulse active mode-locking comb-swept source with high spectrum stability for subsampled optical coherence tomography
Author(s): **Seongjin Bak,** Pusan National Univ. (Korea, Republic of); **Gyeong Hun Kim,** Harvard Medical School (United States); **Hwidon Lee, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13305-76 • 5:30 PM - 5:45 PM
Towards ultrahigh resolution MHz retinal SS-OCT: 187nm section-wise tuning of a FDML laser at 1050nm
Author(s): **Muhammad Asim Bashir**, **Marie Klufts**, **Simon Lotz, Robert Huber,** Univ. zu Lübeck (Germany)

13305-77 • 5:45 PM - 6:00 PM
Reducing cost but not quality with digital scanner interfaces for optical coherence tomography
Author(s): **Kyoungmo Koo**, **Lucia Lee,** Univ. of Michigan (United States); **Morgan McCloud,** Duke Univ. (United States); **Mark Draelos,** Univ. of Michigan (United States)

CONFERENCE 13306

Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XXIII

25 - 26 January 2025 | Moscone South, Room 203 (Level 2)

Conference Chair(s): **Caroline Boudoux,** Polytechnique Montréal (Canada); **James W. Tunnell,** The Univ. of Texas at Austin (United States)

Program Committee: **Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States); **Fouzi Benboujja,** Harvard Medical School (United States); **Dirk J. Faber,** Scinvivo B.V. (Netherlands); **Daniel X. Hammer,** U.S. Food and Drug Administration (United States); **Christine P. Hendon,** Columbia Univ. (United States); **Zhiwei Huang,** National Univ. of Singapore (Singapore); **Brendan F. Kennedy,** Harry Perkins Institute of Medical Research (Australia); **Beop-Min Kim,** Korea Univ. (Korea, Republic of); **Hui Min Leung,** Indiana Univ. Bloomington (United States); **Francisco E. Robles,** Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Institute of Technology (United States); **Tuan Vo-Dinh,** Duke Univ. (United States); **Leah S. Wilk,** Amsterdam UMC (Netherlands)

Saturday 25 January 2025

SESSION 1: CLINICAL DIAGNOSTICS SYSTEMS

25 January 2025 • 8:30 AM - 10:30 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Caroline Boudoux**, Polytechnique Montréal (Canada)

13306-1 • 8:30 AM - 9:00 AM
In vivo characterization of FLIm signatures on the diffuse glioma in the brain cortical surface *(Invited Paper)*
Author(s): **Silvia N. Noble Anbunesan**, **Alba Alfonso García**, **Mohamed A. Hassan**, **Lisanne Kraft**, **Han Sung Lee**, **Orin Bloch, Laura Marcu,** Univ. of California, Davis (United States)

13306-2 • 9:00 AM - 9:30 AM
Diagnostic imaging of burn wounds using a handheld polarization-sensitive terahertz spectral scanner: reports from the first clinical study *(Invited Paper)*
Author(s): **Zachery B. Harris**, **Erica Heller**, **Arash Karimi**, **Deborah Le Blanc**, **Maria Taylor**, **Adam J. Singer**, **Steven Sandoval, M. Hassan Arbab,** Stony Brook Univ. (United States)

13306-3 • 9:30 AM - 9:50 AM
Imaging biomarkers of ex vivo fallopian tubes for tubo-ovarian cancer detection
Author(s): **Jeanie Malone**, **Adrian Tanskanen,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Chloe Hill**, **Allan Zuckermann Cynamon,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada); **Lien Hoang,** Vancouver General Hospital (Canada), The Univ. of British Columbia (Canada); **Calum MacAulay,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Jessica N. McAlpine,** BC Cancer (Canada), The Univ. of British Columbia (Canada); **Pierre M. Lane,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada), The Univ. of British Columbia (Canada)

13306-4 • 9:50 AM - 10:10 AM
Improving diagnostic precision in peritoneal carcinomatosis via photodynamic diagnosis-AI guided laparoscopy in a rabbit model
Author(s): **Hyoungil Kim,** Yonsei Univ. (Korea, Republic of)

13306-5 • 10:10 AM - 10:30 AM
Direct detection of circulating Alzheimer's disease miRNA biomarkers using a SERS-based biosensor platform
Author(s): **Aidan Canning**, **Tyler Vasse**, **Heather Whitson, Tuan Vo-Dinh,** Duke Univ. (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: SURGICAL GUIDANCE IN THE BRAIN

25 January 2025 • 11:00 AM - 12:20 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Hui Min Leung**, Indiana Univ. Bloomington (United States)

13306-6 • 11:00 AM - 11:20 AM
Solid tissue-mimicking phantoms for PpIX fluorescence imaging with improved fluorescence photostability
Author(s): **Yijing Xie**, **Yucheng Bian**, **Hélio Gil**, **Matthew Elliot**, **Graeme Stasiuk**, **Jonathan Shapey**, **Tom Vercauteren, Sébastien Ourselin,** King's College London (United Kingdom)

13306-7 • 11:20 AM - 11:40 AM
Intraoperative stimulated Raman imaging of human brain tissue for therapy optimization
Author(s): **Thomas Würthwein**, **Anke Bonse**, **Felix Neumann,** Refined Laser Systems GmbH (Germany); **Eva Döpker,** Biomedizinisches Technologiezentrum, Univ. Münster (Germany); **Ramon Droop**, **Steffen Ullmann,** Refined Laser Systems GmbH (Germany); **Jürgen Schnekenburger**, **Björn Kemper,** Biomedizinisches Technologiezentrum, Univ. Münster (Germany); **Tim Hellwig,** Refined Laser Systems GmbH (Germany); **Christoph Sippl**, **Stefan Linsler,** Medizincampus Oberfranken (Germany); **Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

13306-8 • 11:40 AM - 12:00 PM
Enabling classification of brain tumor types with quantitative oblique back-illumination microscopy
Author(s): **Srinidhi Bharadwaj**, **Paloma Casteleiro Costa**, **Brie Heinsz,** Georgia Institute of Technology (United States); **Alice Hsu,** Emory University School of Medicine (United States); **Nischita Kaza**, **Caroline Filan**, **Zhe Guang**, **Zhenmin Li, Francisco Robles,** Georgia Institute of Technology (United States)

13306-9 • 12:00 PM - 12:20 PM
Intraoperative light field imaging system for neurosurgery
Author(s): **Yijing Xie**, **Yucheng Bian, Sébastien Ourselin,** King's College London (United Kingdom)

Lunch Break 12:20 PM - 1:50 PM

SESSION 3: SURGICAL GUIDANCE I

25 January 2025 • 1:50 PM - 3:30 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **James W. Tunnell**, The Univ. of Texas at Austin (United States)

13306-10 • 1:50 PM - 2:10 PM
Intraoperative perfusion assessment by continuous, low-latency hyperspectral light-field imaging: development, methodology, and clinIntraoperative perfusion assessment by continuous, low-latency hyperspectral light-field imaging: development, methodology, and clinical applicationical application
Author(s): **Stefan Kray**, **Andreas Schmid,** Institut für Smart Systems und Services, Hochschule Pforzheim (Germany); **Eric L. Wisotzky,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Humboldt-Univ. zu Berlin (Germany); **Moritz Gerlich,** Hochschule Pforzheim (Germany); **Sebastian Apweiler,** Klinikum Darmstadt GmbH (Germany); **Anna Hilsmann,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Thomas Greiner,** Institut für Smart Systems und Services, Hochschule Pforzheim (Germany); **Peter Eisert,** Humboldt-Univ. zu Berlin (Germany), Fraunhofer-Institut für Nachrichtentechnik (Germany); **Werner Kneist,** Klinikum Darmstadt GmbH (Germany)

13306-11 • 2:10 PM - 2:30 PM
Continuous hyperspectral stereo-imaging for image-guided surgery
Author(s): **Eric L. L. L. Wisotzky,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Humboldt-Univ. zu Berlin (Germany); **Jost Triller,** Fraunhofer-Institut für Nachrichtentechnik (Germany); **Anna Hilsmann,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Peter Eisert,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Humboldt-Univ. zu Berlin (Germany)

13306-12 • 2:30 PM - 2:50 PM
Snapshot multispectral camera for enhanced-contrast surgical vision
Author(s): **Katie-Lou White,** Univ. of Cambridge (United Kingdom); **Lina Hacker,** Univ. of Oxford (United Kingdom); **Thomas Else,** Univ. of Cambridge (United Kingdom); **Kris Dreher,** Deutsches Krebsforschungszentrum (Germany), Ruprecht-Karls-Univ. Heidelberg (Germany); **Melissa Watt**, **Sarah Bohndiek,** Univ. of Cambridge (United Kingdom); **Calum Williams,** Univ. of Exeter (United Kingdom)

13306-13 • 2:50 PM - 3:10 PM
Assessment of Da Vinci tool and wrist rotations that maximize fluence in photoacoustic-guided surgery: a simulation study
Author(s): **Gareth Keene, Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13306-14 • 3:10 PM - 3:30 PM
Wireless hand-held diffuse reflectance spectroscopy for noninvasive and label-free assessment of tissue blood perfusion
Author(s): **Linh Luong**, **Jacob Womack**, **Seoeun Cho,** Kennesaw State Univ. (United States); **Khalid Ali,** Children's National Hospital (United States); **Jaehyung Lee,** Stratio, Inc. (United States); **Richard Cha,** Children's National Hospital (United States); **Seung Yup Lee,** Kennesaw State Univ. (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: SURGICAL GUIDANCE II

25 January 2025 • 4:00 PM - 5:40 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Leah S. Wilk**, Amsterdam UMC (Netherlands)

13306-15 • 4:00 PM - 4:20 PM
Ultrasound-guided optical tomographic fluorescence sensing for experimental pancreatic cancer using indocyanine green and protoporphyrin IX
Author(s): **Matthew S. Reed,** Univ. of Wisconsin-Madison (United States); **Madhusudan Kulkarni,** Univ. of Wisconsin-Madison (United States), Manipal Institute of Technology (India); **Xu Cao,** Univ. of Wisconsin-Madison (United States); **Héctor A. García,** Univ. of Wisconsin-Madison (United States), CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina); **Marien I. Ochoa,** Univ. of Wisconsin-Madison (United States); **Shudong Jiang,** Thayer School of Engineering at Dartmouth (United States); **Katia T. Iliza,** Univ. of Rochester (United States); **Tayyaba Hasan,** Massachusetts General Hospital, Harvard Medical School (United States); **Marvin M. Doyley,** Univ. of Rochester (United States); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States)

13306-16 • 4:20 PM - 4:40 PM
Data-centric learning framework for real-time surgical guidance using fiber-based FLIm
Author(s): **Mohamed A. Hassan**, **Pu Sun**, **Alexander E. Taffe**, **Suparn Sathya**, **Xiangnan Zhou, Laura Marcu,** Univ. of California, Davis (United States)

13306-17 • 4:40 PM - 5:00 PM
Development of a ROS2-based photoacoustic-robotic visual servoing system
Author(s): **Taylor R. Folk,** Harvard Univ. (United States); **Mardava R. Gubbi, Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13306-18 • 5:00 PM - 5:20 PM
CNN based demosaicing for labeled fluorescence cancer intraoperative imaging with visible-NIR sensors
Author(s): **Yifei Jin, Viktor Gruev,** Univ. of Illinois (United States)

13306-49 • 5:20 PM - 5:40 PM
Development of an endonasal Raman spectroscopy probe for pituitary adenoma surgery
Author(s): **Victor Blanquez-Yeste,** Polytechnique Montréal (Canada); **Frédéric Leblond**, **Moujahed Labidi,** CRCHUM (Canada); **Felix Janelle,** Ctr. Hospitalier de l'Univ. de Montréal (Canada); **Trang Tran**, **Romain Cayrol,** CRCHUM (Canada); **Guillaume Sheehy, Frederick Dallaire,** Polytechnique Montréal (Canada)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: OPTICAL COHERENCE TOMOGRAPHY

26 January 2025 • 8:20 AM - 10:10 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Xavier Attendu**, Amsterdam UMC (Netherlands)

13306-19 • 8:20 AM - 8:50 AM
Intelligent platform for needle-based intervention (NBI) guidance *(Invited Paper)*
Author(s): **Qinggong Tang**, **Yunlong Liu**, **Paul Calle**, **Qinghao Zhang**, **Ebenezer Raj Selvaraj Mercyshalinie,** The Univ. of Oklahoma (United States); **Kar-Ming Fung,** The Univ. of Oklahoma Health Sciences Ctr. (United States); **Chongle Pan,** The Univ. of Oklahoma (United States)

13306-20 • 8:50 AM - 9:10 AM
Optical imaging biomarkers of oral dysplasia and carcinoma
Author(s): **Jeanie Malone,** BC Cancer Research Institute (Canada); **Chloe Hill,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada); **Adrian Tanskanen**, **Kelly Liu,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Samson Ng,** The Univ. of British Columbia (Canada); **Calum MacAulay**, **Catherine Poh,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Pierre M. Lane,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada), The Univ. of British Columbia (Canada)

13306-21 • 9:10 AM - 9:30 AM
Structural-functional analysis of cilia movement within the human fallopian tubes using optical coherence tomography
Author(s): **Dilara J. Long,** The Univ. of Arizona (United States); **Tian Xia,** Baylor College of Medicine (United States); **Photini F. Rice,** The Univ. of Arizona (United States); **Deirdre Scully,** Baylor College of Medicine (United States); **Ryan Walton**, **Makayla Johnson,** The Univ. of Arizona (United States); **Andrea Aguirre**, **John M. Heusinkveld,** Banner - Univ. Medical Ctr. Tucson (United States); **Irina Larina,** Baylor College of Medicine (United States); **Jennifer Barton,** The Univ. of Arizona (United States)

13306-22 • 9:30 AM - 9:50 AM
Optical coherence tomography and elastography for the visualization of architecture and stiffness differences in soft- and stiff-conditioned murine mammary tumors
Author(s): **Alana Gonzales**, **Ruyuan Dong**, **Ryan Walton Mitstifer**, **Caitlin Ruhland**, **Travis Sawyer**, **Ghassan Mouneimne, Jennifer Barton,** The Univ. of Arizona (United States)

13306-23 • 9:50 AM - 10:10 AM
Co-registration of in vivo optical coherence tomography with histology performed on breast cavity shavings
Author(s): **Rowan W. Sanderson,** Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia); **Renate Zilkens,** Harry Perkins Institute of Medical Research (Australia), Medical School, The Univ. of Western Australia (Australia); **Peijun Gong,** Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia); **Imogen Boman,** Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia), OncoRes Medical Pty. Ltd. (Australia); **Ken Y. Foo,** Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia); **Skandha Shanthakumar,** OncoRes Medical Pty. Ltd. (Australia); **James Stephenson**, **Wei Ling Ooi**, **Jose Cid Fernandez**, **Synn Lynn Chin**, **Lee Jackson,** Breast Ctr., Fiona Stanley Hospital (Australia); **Mireille Hardie,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia); **Benjamin F. Dessauvagie,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia), Clinipath Pathology (Australia); **Anmol Rijhumal,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia); **Saud Hamza,** Breast Ctr., Fiona Stanley Hospital (Australia); **Christobel M. Saunders,** Melbourne Medical School, The Univ. of Melbourne (Australia), Medical School, The Univ. of Western Australia (Australia); **Brendan F. Kennedy,** Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia), Institute of Physics, Nicolaus Copernicus Univ. (Poland)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: MACHINE LEARNING

26 January 2025 • 10:40 AM - 11:40 AM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Fouzi Benboujja**, Harvard Medical School (United States)

13306-26 • 10:40 AM - 11:00 AM
Biophysically interpretable basal cell carcinoma classification using Raman spectroscopy transformer model
Author(s): **Fadeel Sher Khan,** The Univ. of Texas at Austin (United States); **Xu Feng,** The University of Texas at Dallas (United States); **Matthew C. Fox**, **Jason Reichenberg,** Dell Medical School, The Univ. of Texas at Austin (United States); **Fabiana C. P. Lopes**, **Katherine R. Sebastian,** The Univ. of Texas at Austin (United States); **Mia K. Markey, James W. Tunnell,** Dell Medical School, The Univ. of Texas at Austin (United States)

13306-27 • 11:00 AM - 11:20 AM
End-to-end brain cancer diagnosis using high-resolution fiber endoscopy with a learning-based digital twin
Author(s): **Tijue Wang**, **Jakob Dremel,** TU Dresden (Germany); **Sven Richter**, **Witold Polanski**, **Ortrud Uckermann**, **Ilker Eyüpoglu,** Universitätsklinikum Carl Gustav Carus Dresden (Germany); **Robert Kuschmierz, Jürgen Czarske,** TU Dresden (Germany)

13306-28 • 11:20 AM - 11:40 AM
Virtual birefringence imaging and staining of amyloid deposits in label-free tissue sections using deep learning
Author(s): **Xilin Yang**, **Bijie Bai**, **Yijie Zhang**, **Musa Aydin**, **Yuzhu Li**, **Sahan Selcuk**, **Paloma Costa**, **Zhen Guo,** UCLA Samueli School of Engineering (United States); **Gregory Fishbein,** David Geffen School of Medicine, Univ. of California, Los Angeles (United States); **Karine Atlan,** Hadassah Hebrew Univ. Medical Ctr. (Israel); **William Wallace,** Keck School of Medicine, The Univ. of Southern California (United States); **Nir Pillar, Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

Lunch Break 11:40 AM - 1:10 PM

SESSION 7: ENDOSCOPY

26 January 2025 • 1:10 PM - 2:50 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Brendan F. Kennedy**, Harry Perkins Institute of Medical Research (Australia)

13306-29 • 1:10 PM - 1:30 PM
3D-printed common-view-point panoramic colonoscopy with freeform optics
Author(s): **Yuanyuan Sun**, **Tyler Peterson, Rongguang Liang,** Wyant College of Optical Sciences (United States)

13306-30 • 1:30 PM - 1:50 PM
Advanced real-time 3D reconstruction for bronchoscopic navigation using miniaturized robotic endoscopes
Author(s): **Pablo Roldán,** Heriot-Watt Univ. (United Kingdom); **Mohsen Khadem,** The Univ. of Edinburgh (United Kingdom); **Calum Ross,** Heriot-Watt Univ. (United Kingdom); **Kevin Dhaliwal,** The Univ. of Edinburgh (United Kingdom); **Robert Thomson,** Heriot-Watt Univ. (United Kingdom)

13306-31 • 1:50 PM - 2:10 PM
Acceptability of tethered capsule endomicroscopy as an alternative to endoscopy for surveillance of Barrett's esophagus following eradication therapy
Author(s): **Cadman L. Leggett**, **Sandra Algarin Perneth**, **Kevin Buller,** Mayo Clinic (United States); **Zachary D. Jansa**, **Anita S. Chung**, **Catriona N. Grant, Guillermo J. Tearney,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

13306-32 • 2:10 PM - 2:30 PM
Real-time tissue perfusion measurements through a flexible colonoscope using laser speckle contrast imaging
Author(s): **Taylor L. Bobrow,** Johns Hopkins Univ. (United States); **Saowanee Ngamruengphong,** The Johns Hopkins Hospital (United States); **Nicholas J. Durr,** Johns Hopkins Univ. (United States)

13306-33 • 2:30 PM - 2:50 PM
Enhancing endoscopic detection of gastrointestinal lesions: virtual narrow band imaging for improved CAD systems
Author(s): **Louzhe Xu,** Chinese Academy of Medical Sciences & Peking Union Medical College (China); **Shurong Chen**, **Yi Chen,** The First Affiliated Hospital, Zhejiang Univ. School of Medicine (China); **Ting Li,** Chinese Academy of Medical Sciences & Peking Union Medical College (China)

Coffee Break 2:50 PM - 3:20 PM

SESSION 8: NOVEL TECHNIQUES

26 January 2025 • 3:20 PM - 4:50 PM | Moscone South, Room 203 (Level 2)
Session Chair(s): **Dirk J. Faber**, Scinvivo B.V. (Netherlands)

13306-34 • 3:20 PM - 3:50 PM
Integrated photon propagation parallel computation and display system *(Invited Paper)*
Author(s): **Louzhe Xu, Ting Li,** Chinese Academy of Medical Sciences & Peking Union Medical College (China)

13306-35 • 3:50 PM - 4:10 PM
Minimally-invasive laser tissue soldering guided by nanothermometry
Author(s): **Oscar Cipolato, Inge K. Herrmann,** ETH Zurich (Switzerland)

13306-36 • 4:10 PM - 4:30 PM
A minimally invasive and disposable fiber-optic sensor for in-vivo assessment of deep-tissue biomechanical properties
Author(s): **Shuo Yang**, **Jingwei Ling**, **Ziang Feng, Song Hu,** Washington Univ. in St. Louis (United States)

13306-37 • 4:30 PM - 4:50 PM
Development of a miniaturized depth-selective Raman probe for monitoring of osteoarthritis
Author(s): **Vishal Kumar**, **Steven Vanuytsel,** King's College London (United Kingdom); **Dev Mehrotra**, **Erik Ersland,** Boston Univ. (United States); **Brian D. Snyder,** Boston Children's Hospital (United States); **Richard Cook,** King's College London (United Kingdom); **Michael Albro,** Boston Univ. (United States); **Mads S. Bergholt,** King's College London (United Kingdom)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13306-38 • 5:30 PM - 7:00 PM
Ex-vivo differentiation of benign and malignant human colon tissue using texture analysis of optical coherence tomography (OCT) images
Author(s): **Dilara J. Long**, **Ruyuan Dong**, **Photini F. Rice,** The Univ. of Arizona (United States); **Travis Sawyer,** Wyant College of Optical Sciences, The Univ. of Arizona (United States); **Joshua Routh,** Midwestern Univ. (United States); **Kanwal Bains**, **Richard Trieu**, **Joshua Melson, Jennifer Barton,** The Univ. of Arizona (United States)

13306-39 • 5:30 PM - 7:00 PM
Development of a small animal pressure occluding device for mapping peripheral hemodynamic flow patterns in the murine tail
Author(s): **Aasma Dahal**, **Shirel Belilty Benmergui**, **Daniela Leizaola**, **Adam Felch**, **Alejandro Mijares**, **Astrid Padilla Castillo**, **Mohamad Amroush**, **Harold Hoerning**, **Joshua Hutcheson, Anuradha Godavarty,** Florida International Univ. (United States)

13306-40 • 5:30 PM - 7:00 PM
Polarization-based lateral flow assay for early diagnosis of cardiac diseases
Author(s): **Byungjun Park,** Korea Univ. (Korea, Republic of)

13306-41 • 5:30 PM - 7:00 PM
Smart laser osteostomy: past, present, and future
Author(s): **Azhar Zam,** New York Univ. Abu Dhabi (United Arab Emirates), New York Univ. (United States)

13306-42 • 5:30 PM - 7:00 PM
Intraoperative surgical guidance with multiresolution open-top light-sheet (OTLS) microscopy
Author(s): **Qinghua Han**, **David R. Brenes**, **Rui Wang**, **Rauf Kareem, Jonathan T. C. Liu,** Univ. of Washington (United States)

13306-43 • 5:30 PM - 7:00 PM
Two-channel in-vivo early-stage oral cancer screening using field-portable multimodal and multispectral device: a label-free approach
Author(s): **Pramila Thapa**, **Veena Singh,** Indian Institute of Technology Delhi (India); **Varun Surya**, **Deepika Mishra,** All India Institute of Medical Sciences, New Delhi (India); **Anuj Saxena, Dalip S. Mehta,** Indian Institute of Technology Delhi (India)

13306-47 • 5:30 PM - 7:00 PM
A deep learning approach for intraoperative nerve segmentation using shortwave infrared imaging
Author(s): **Betemariyam Gessesse**, **Ezekiel Haugen, Justin Baba,** Vanderbilt Univ. (United States)

13306-51 • 5:30 PM - 7:00 PM
Detection of rare circulating hybrid cells in mouse models of metastatic cancer
Author(s): **Nicole Rueb**, **Ge Huang**, **Abby Gillingham**, **Anna Igler**, **Cody Rounds**, **Isis Monarrez**, **Ashley Anderson**, **Young Hwan Chang**, **Melissa Wong, Summer Gibbs,** Oregon Health & Science Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13307

Optics and Biophotonics in Low-Resource Settings XI

25 - 26 January 2025 | Moscone South, Room 202 (Level 2)

Conference Chair(s): **David Levitz,** DL Analytics, LLC (United States); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

Program Committee: **David Erickson,** Cornell Univ. (United States); **Gerard L. Coté,** Texas A&M Univ. (United States); **Wolfgang Drexler,** Medizinische Univ. Wien (Austria); **Matthew D. Keller,** Global Health Labs., Inc. (United States); **Avi Rasooly,** National Institutes of Health (United States); **Chetan A. Patil,** Temple Univ. (United States); **Bala Pesala,** Adiuvo Diagnostics, Ltd. (India); **Eric A. Swanson,** Massachusetts Institute of Technology (United States); **Sebastian Wachsmann-Hogiu,** McGill Univ. (Canada); **Ian M. White,** Univ. of Maryland, College Park (United States); **Hatice C. Koydemir,** Texas A&M Univ. (United States); **Aniruddha Ray,** The Univ. of Toledo (United States); **Qingshan Wei,** North Carolina State Univ. (United States)

Saturday 25 January 2025

SESSION 1: NEW TECHNOLOGIES I

25 January 2025 • 8:50 AM - 10:10 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Hatice Ceylan Koydemir**, Texas A&M Univ. (United States)

13307-1 • 8:50 AM - 9:10 AM
Light-assisted drying (LAD) for the thermal stabilization of inactivated poliovirus vaccine
Author(s): **Anteneh A. Tsegaye**, **Alexander J. Suptela**, **Jade G. Duerr**, **Itzel Nunez-Ariza**, **Daniel P. Furr**, **Ian Marriott, Susan R. Trammell,** The Univ. of North Carolina at Charlotte (United States)

13307-2 • 9:10 AM - 9:30 AM
Utilizing surface plasmon resonance for accurate detection of the MPT64 biomarker in tuberculosis
Author(s): **Sinegugu P. Nzuza**, **Saturnin Ombinda-Lemboumba**, **Charles Maphanga**, **Mabotse Tjale,** Council for Scientific and Industrial Research (South Africa); **Heidi Abrahamse,** Univ. of Johannesburg (South Africa); **Sipho H. Chauke, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

13307-3 • 9:30 AM - 9:50 AM
M-sequence-based photoacoustic signal amplification with low-power light sources
Author(s): **Kazuma Hashimoto**, **Jun Yamada,** Shibaura Institute of Technology (Japan); **Takahiro Kono,** Tokyo Metropolitan Univ. (Japan); **Uma Maheswari Rajagopalan,** Shibaura Institute of Technology (Japan)

13307-4 • 9:50 AM - 10:10 AM
BlurryScope: a cost-effective and compact scanning microscope for automated HER2 scoring using deep learning on blurry image data
Author(s): **Michael J. Fanous**, **Christopher Seybold**, **Hanlong Chen**, **Nir Pillar, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: NEW APPROACHES FOR LOW COST OPTICAL POC ASSAYS

25 January 2025 • 10:40 AM - 12:10 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Matthew D. Keller**, Global Health Labs., Inc. (United States)

13307-5 • 10:40 AM - 11:10 AM
Smartphone-enabled devices for dynamic analysis of biofluid samples at the point of care *(Invited Paper)*
Author(s): **Hatice Ceylan Koydemir,** Texas A&M Univ. (United States)

13307-6 • 11:10 AM - 11:30 AM

High-sensitivity paper-based vertical flow assay for rapid troponin detection powered by deep learning
Author(s): **Gyeo-Re Han**, **Artem Goncharov**, **Merve Eryilmaz**, **Hyou-Arm Joung**, **Rajesh Ghosh**, **Geon Yim**, **Nicole Chang**, **Minsoo Kim**, **Kevin Ngo**, **Marcell Veszpremi**, **Kun Liao**, **Omai B. Garner**, **Dino Di Carlo, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13307-7 • 11:30 AM - 11:50 AM
Machine learning enhanced paper-based multiplexed assay for monitoring immunity against SARS-COV-2
Author(s): **Merve Eryilmaz**, **Artem Goncharov**, **Gyeo-Re Han**, **Hyou-Arm Joung**, **Zachary S. Ballard**, **Rajesh Ghosh**, **Yijie Zhang**, **Dino Di Carlo, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13307-8 • 11:50 AM - 12:10 PM
A 3D printed microfluidic device and miniaturized fluorimeter towards low-resource environments
Author(s): **Enqiao Qian**, **Kristi Shaka**, **Kent Jones, Philip Measor,** Whitworth Univ. (United States)

Lunch Break 12:10 PM - 1:10 PM

SESSION 3: LOW COST OXIMETRY METHODS

25 January 2025 • 1:10 PM - 3:00 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Aniruddha Ray**, The Univ. of Toledo (United States)

13307-44 • 1:10 PM - 1:40 PM
Recent advances in low-cost tissue oximetry: principles, technologies, and applications *(Invited Paper)*
Author(s): **Mamadou Diop,** Western Univ. (Canada)

13307-9 • 1:40 PM - 2:00 PM
Tissue optics-informed blood hemoglobin assessment for advancing sickle cell care
Author(s): **Sang Mok Park**, **Semin Kwon**, **Haripriya Sakthivel,** Purdue Univ. (United States); **Andrew Pucka,** Indiana Univ. School of Medicine (United States); **Jung Woo Leem,** Purdue Univ. (United States); **Andrew R. O'Brien**, **Ying Wang,** Indiana Univ. School of Medicine (United States); **Young L. Kim,** Purdue Univ. (United States)

13307-10 • 2:00 PM - 2:20 PM
Cost-effective neonatal cerebral oximeter for low-resource settings
Author(s): **Saeed Samaei,** Western Univ. (Canada), Lawson Health Research Institute (Canada); **Natalie C. Li,** Western Univ. (Canada); **Lee D. Sikstrom**, **David W. Holdsworth,** Robarts Research Institute, Western Univ. (Canada); **Mamadou Diop,** Western Univ. (Canada), Lawson Health Research Institute (Canada)

13307-11 • 2:20 PM - 2:40 PM
Illuminate-OxyView: a handheld point-of-care device for imaging tissue oxygen saturation in diabetic foot ulcers using a skin-tone-specific machine learning approach
Author(s): **Sharath Krisnamoorthy**, **Jagdish A. Krishnaswamy**, **Geethanjali Radhakrishnan, Bala Pesala,** Adiuvo Diagnostics Pvt. Ltd. (India)

13307-12 • 2:40 PM - 3:00 PM
Monte Carlo simulations for noninvasive hemoglobin measurements
Author(s): **Wenbo Wang**, **James W. Stafford**, **Simon Ghionea, Matthew D. Keller,** Global Health Labs., Inc. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: OCT FOR LOW RESOURCE SETTINGS

25 January 2025 • 3:30 PM - 4:50 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Merve Eryilmaz**, Univ. of California, Los Angeles (United States)

13307-13 • 3:30 PM - 3:50 PM
Single board computer and adapted 3D-printed case-based low cost and compact optical coherence tomography
Author(s): **Daewoon Seong**, **Sangyeob Han**, **Yoonseok Kim**, **Juyeon Hong,** Kyungpook National Univ. (Korea, Republic of); **Ruchire Eranga Wijesinghe,** Sri Lanka Institute of Information Technology (Sri Lanka); **Mansik Jeon, Jeehyun Kim,** Kyungpook National Univ. (Korea, Republic of)

13307-14 • 3:50 PM - 4:10 PM
Degree of polarization uniformity in dental calculus identification based on polarization-sensitive optical coherence tomography intensity images
Author(s): **Jun-Ming Bai,** National Yang Ming Chiao Tung Univ. (Taiwan); **Shyh-Yuan Lee,** National Yang Ming Chiao Tung Univ. (Taiwan), Taipei Veterans General Hospital (Taiwan), Taipei City Hospital, Yang Ming Branch (Taiwan); **Yi-Ching Ho,** National Yang Ming Chiao Tung Univ. (Taiwan), Taipei Veterans General Hospital (Taiwan); **Tien-Yu Hsiao, Chia-Wei Sun,** National Yang Ming Chiao Tung Univ. (Taiwan)

13307-15 • 4:10 PM - 4:30 PM
Low-cost platform for multi-well bacterial biofilm growth monitoring with optical coherence tomography
Author(s): **Louise Roels**, **Aymeric Moreau**, **Maxime Ardré, Olivier Thouvenin,** Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France)

13307-16 • 4:30 PM - 4:50 PM
Study on global longitudinal strain in optical coherence tomography angiography with few-shot learning
Author(s): **Li-Hsiang Liu,** National Yang Ming Chiao Tung Univ. (Taiwan); **Liang-Kung Chen,** National Yang Ming Chiao Tung Univ. (Taiwan), Taipei Veterans General Hospital (Taiwan), Taipei Municipal Gan-Dau Hospital (Taiwan); **Pi-Shan Hsu,** Taichung Veterans General Hospital (Taiwan); **Wei-Wen Lin,** Taichung Veterans General Hospital (Taiwan), National Chung Hsing Univ. (Taiwan), Tunghai Univ. (Taiwan); **Shih-Ann Chen,** Taipei Veterans General Hospital (Taiwan), Taichung Veterans General Hospital (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan); **Kai-Shih Chiu, Chia-Wei Sun,** National Yang Ming Chiao Tung Univ. (Taiwan)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: NEW TECHNOLOGIES II

26 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Aniruddha Ray**, The Univ. of Toledo (United States)

13307-17 • 8:30 AM - 8:50 AM
BioGames: training of pathologists on HER2 classification through serious games
Author(s): **Paloma Casteleiro Costa**, **Nir Pillar**, **Mark Gross**, **Sahan Yoruc Selcuk, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13307-18 • 8:50 AM - 9:10 AM
A comparison of two biosensing recognition elements using SPR for the detection of drug-resistant genes
Author(s): **Sipho H. Chauke**, **Sinegugu Nzuza**, **Mabotse Tjale**, **Charles Maphanga,** Council for Scientific and Industrial Research (South Africa); **Felix Dube,** Univ. of Cape Town (South Africa); **Saturnin Ombinda-Lemboumba,** Council for Scientific and Industrial Research (South Africa); **Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa), Univ. of Cape Town (South Africa)

13307-19 • 9:10 AM - 9:30 AM
Machine learning-based tracking of glucose levels using an insertable sensor and a phosphorescence lifetime imager
Author(s): **Artem Goncharov**, **Zoltan Gorocs,** Univ. of California, Los Angeles (United States); **Ridhi Pradhan**, **Brian Ko,** Texas A&M Univ. (United States); **Ajmal Ajmal**, **Andres Rodriguez,** Florida International Univ. (United States); **David Baum**, **Marcell Veszpremi**, **Xilin Yang,** Univ. of California, Los Angeles (United States); **Maxime Pindrys,** Univ. of Connecticut (United States); **Tianle Zheng**, **Oliver Wang,** Univ. of California, Los Angeles (United States); **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Michael J. McShane,** Texas A&M Univ. (United States); **Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13307-20 • 9:30 AM - 9:50 AM
Highly sensitive lensless fluorescence microscope for anti-cancer drug screening
Author(s): **Somaiyeh Khoubafarin**, **Cyrus Koogan**, **Bhavesh Rahul Jakhete, Aniruddha Ray,** The Univ. of Toledo (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: OPTICAL DIAGNOSTIC AND THERAPEUTIC METHODS FOR CERVICAL CANCER

26 January 2025 • 10:20 AM - 11:20 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Bala Pesala**, Adiuvo Diagnostics Pvt. Ltd. (India)

13307-21 • 10:20 AM - 10:40 AM
Breaking barriers in cervical cancer screening: Design of the Callascope to enable speculum-free contrast application and self-imaging of the cervix.
Author(s): **Kerry E. Eller**, **Erica Skerrett,** Duke Univ. (United States); **Megan Huchko,** Ctr. for Global Reproductive Health, Duke Global Institute (United States), Duke Univ. School of Medicine (United States); **Nicole Kerner,** Duke Univ. School of Medicine (United States); **Nimmi Ramanujam,** Duke Univ. (United States), Duke Univ. Medical Ctr. (United States)

13307-22 • 10:40 AM - 11:00 AM
Development of image pre-processing tools to refine datasets informing deep learning cervical cancer detection methods
Author(s): **Lillian Ekem**, **Erica Skerrett**, **Megan Huchko, Nimmi Ramanujam,** Duke Univ. (United States)

13307-43 • 11:00 AM - 11:20 AM
Impact of image capture assistance tools and devices on the exam adequacy rate of automated visual evaluation of cervical images
Author(s): **Gabriel Consuelo,** Basic Health International (El Salvador); **Reuven Weiser,** MobileODT Ltd. (Israel); **Pedro Serrano,** NILG.AI, LLC (United States); **Rene Novoa**, **Elizabeth Torres,** Basic Health International (El Salvador); **Cathy Sebag,** DL Analytics, LLC (United States); **Kelwin Fernandes,** NILG.AI, LLC (United States); **David Levitz,** DL Analytics, LLC (United States)

Lunch Break 11:20 AM - 1:10 PM

SESSION 7: INNOVATIVE SPECTRAL METHODS FOR LOW RESOURCE SETTINGS

26 January 2025 • 1:10 PM - 2:10 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **David Levitz**, DL Analytics, LLC (United States)

13307-24 • 1:10 PM - 1:30 PM
Performance evaluation of a miniature 14-channel spectrometer for low-cost qPCR
Author(s): **Tamie L. Poepping**, **Sakina Ali**, **Steven Pollmann**, **Lee Sikstrom, David W. Holdsworth,** Western Univ. (Canada)

13307-25 • 1:30 PM - 1:50 PM
Hyperspectral learning of colors for mHealth applications
Author(s): **Young L. Kim**, **Sang Mok Park**, **Semin Kwon**, **Haripriya Sakthivel**, **Shaun Hong**, **Sreeram Nagappa, Jung Woo Leem,** Purdue Univ. (United States)

13307-27 • 1:50 PM - 2:10 PM
Sharpness-aware minimization (SAM) improves generalization performance of bacterial Raman spectral data enabling portable diagnostics
Author(s): **Jarett C. Dewbury**, **Kaitlin Zareno,** Massachusetts Institute of Technology (United States); **Siamak K. Sorooshyari,** Stanford Univ. (United States); **Hossein Mobahi,** Google (United States); **Loza F. Tadesse,** Massachusetts Institute of Technology (United States)

SESSION 8: POSTER POP: OPTICS AND BIOPHOTONICS IN LOW-RESOURCE SETTINGS XI

26 January 2025 • 2:10 PM - 2:40 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **David Levitz**, DL Analytics, LLC (United States)
Each poster author is invited to give a brief (three-minute) preview of their research with a maximum of three slides during this poster pops session.
Poster authors: bring your slides on a USB flash drive to the Poster Pops session and be prepared to give a short summary of your poster. The posters will be available for viewing at the BiOS Poster Session following the Poster Pops.

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13307-29 • 5:30 PM - 7:00 PM
Domain adaptive deep learning for mobile endoscope
Author(s): **MinSeok Kwon**, **Hyunmo Yang**, **Nurbolat Aimakov,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Sanzhar Askaruly,** Curiosis Inc. (Korea, Republic of); **Geoseong Na,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Jeonghun Jang,** Ajou Univ. School of Medicine (Korea, Republic of); **Woonggyu Jung,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13307-30 • 5:30 PM - 7:00 PM
Photonic-biosensing towards drug-resistant tuberculosis diagnosis
Author(s): **Sipho H. Chauke,** Council for Scientific and Industrial Research (South Africa); **Sinegugu Nzuza,** Council for Scientific and Industrial Research (South Africa), Univ. of Johannesburg (South Africa); **Mabotse Tjale**, **Charles Maphanga**, **Saturnin Ombinda-Lemboumba,** Council for Scientific and Industrial Research (South Africa); **Felix Dube,** Univ. of Cape Town (South Africa); **Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa), Univ. of Cape Town (South Africa), Univ. of South Africa (South Africa)

13307-31 • 5:30 PM - 7:00 PM
Detection of MPT64 TB biomarker using localized surface plasmon resonance (LSPR)
Author(s): **Sinegugu Portia Nzuza**, **Saturnin Ombinda-Lemboumba**, **Charles Maphanga**, **Mabotse Tjale,** Council for Scientific and Industrial Research (South Africa); **Heidi Abrahamse,** Univ. of Johannesburg (South Africa); **Sipho H. Chauke, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

13307-32 • 5:30 PM - 7:00 PM
Cost-effective spectral quantification of skin tone for improved medical optical instrumentation
Author(s): **Lee D. Sikstrom**, **Maria Drangova, David W. Holdsworth,** Western Univ. (Canada)

13307-33 • 5:30 PM - 7:00 PM
Spectral recovery in photographs using a hyperspectral color chart
Author(s): **Semin Kwon**, **Sang Mok Park**, **Yuhyun Ji**, **Haripriya Sakthivel**, **Jung Woo Leem, Young Kim,** Purdue Univ. (United States)

13307-42 • 5:30 PM - 7:00 PM
Multiband terahertz fractal metasurface for detection of malaria with enhanced sensitivity
Author(s): **Afzaal Ahmad,** Univ. of Glasgow (United Kingdom); **Muhammad Qasim Mehmood,** Information Technology Univ. of the Punjab (Pakistan); **Muhammad Zubair, Qammer Abbasi,** Univ. of Glasgow (United Kingdom)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)

Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM

Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)

Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM

Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)

Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM

Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)

Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM

Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)

Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13308

Design and Quality for Biomedical Technologies XVIII

25 - 26 January 2025 | Moscone South, Room 211 (Level 2)

Conference Chair(s): **Gracie Vargas,** The Univ. of Texas Medical Branch (United States)

Conference Co-Chair(s): **T. Joshua Pfefer,** U.S. Food and Drug Administration (United States)

Program Committee: **David W. Allen,** National Institute of Standards and Technology (United States); **Anthony J. Durkin,** Beckman Laser Institute and Medical Clinic (United States); **Jeeseong Hwang,** National Institute of Standards and Technology (United States); **Sanathana Konugolu Venkata Sekar,** Irish Photonic Integration Ctr. (IPIC) (Ireland); **Sang-Won Lee,** Korea Research Institute of Standards and Science (Korea, Republic of); **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Eric J. Seibel,** Univ. of Washington (United States); **Bofan Song,** Wyant College of Optical Sciences (United States); **Sandhya Vasudevan,** U.S. Food and Drug Administration (United States); **Rudolf M. Verdaasdonk,** Univ. Twente (Netherlands); **William C. Vogt,** U.S. Food and Drug Administration (United States)

Saturday 25 January 2025

SESSION 1: BIPHOTONIC DEVICE QUALITY AND DESIGN WITH STANDARDS

25 January 2025 • 8:30 AM - 10:30 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Bofan Song**, Wyant College of Optical Sciences (United States)

13308-1 • 8:30 AM - 8:50 AM
The implementation and impact of the medical device regulations (MDR) for (biophotonics) devices developed by research institutes in Europe: an update
Author(s): **Rudolf M. Verdaasdonk,** Univ. Twente (Netherlands); **Robert van Boxtel,** Medical Device Project B.V. (Netherlands); **Gerard Boyle,** St. James's Hospital (Ireland); **Richard Reilly, Tom Melvin,** Trinity College Dublin (Ireland)

13308-2 • 8:50 AM - 9:10 AM
Multi-parametric standards for performance assessment and quality control of fluorescence molecular imaging and endoscopy systems
Author(s): **Dimitris Gorpas, Vasilis Ntziachristos,** Institut für Biologische und Medizinische Bildgebung, Helmholtz Zentrum München GmbH (Germany), Zentralinstitut für Translationale Krebsforschung, Technische Univ. München (Germany)

13308-3 • 9:10 AM - 9:30 AM
Characterization of an RGB Bayer mask CMOS microsensor endoscope for label free widefield autofluorescence imaging
Author(s): **Paula Villarreal,** The Univ. of Texas Medical Branch (United States); **Daodang Wang,** Wyant College of Optical Sciences (United States); **Suimin Qiu**, **Orly Coblens,** The Univ. of Texas Medical Branch (United States); **Bofan Song,** Wyant College of Optical Sciences (United States); **Sepehr Shabani,** The Univ. of Texas Medical Branch (United States); **Xingde Li,** Johns Hopkins Univ. (United States); **Rongguang Liang,** Wyant College of Optical Sciences (United States); **Gracie Vargas,** The Univ. of Texas Medical Branch (United States)

13308-4 • 9:30 AM - 9:50 AM
Factors affecting the spectral accuracy of hyperspectral endoscopes (HySEs)
Author(s): **Siavash Mazdeyasna**, **Mohammed Shahriar Arefin**, **Andrew Fales,** U.S. Food and Drug Administration (United States); **Silas Leavesley,** Univ. of South Alabama (United States); **T. Joshua Pfefer, Quanzeng Wang,** U.S. Food and Drug Administration (United States)

13308-5 • 9:50 AM - 10:10 AM
Towards ultra-agile endoscopes using miniaturized meta-optics
Author(s): **Johannes Froech**, **Ningzhi Xie**, **Quentin A. A. Tanguy**, **Karl Böhringer**, **Arka Majumdar, Eric J. Seibel,** Univ. of Washington (United States)

13308-6 • 10:10 AM - 10:30 AM
Global design and development of a rapid cancer diagnosis system for core needle biopsies at the point-of-care
Author(s): **Dena Sayrafi,** Emory Univ. (United States); **Nate Anderson,** UC Davis Health System (United States); **Jerry Hopple**, **Chichung K. Yiu,** Univ. of Washington (United States); **Abena O. Addai**, **Benjamin O. Asante**, **Emma B. Abaidoo,** Peace and Love Hospital (Ghana); **Seth Wiafe,** Loma Linda Univ. (United States); **Michael C. Larson,** UC Davis Health System (United States); **Beatrice W. Addai,** Peace and Love Hospital (Ghana); **Richard M. Levenson,** UC Davis Health System (United States); **Eric Seibel,** Univ. of Washington (United States); **Farzad Fereidouni,** Emory Univ. (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: MODELING FOR ENHANCED PERFORMANCE IN BIOMEDICAL PHOTONICS

25 January 2025 • 11:00 AM - 12:15 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Gracie Vargas**, The Univ. of Texas Medical Branch (United States)

13308-29 • 11:00 AM - 11:35 AM
Ray-tracing hardware accelerated mesh-based Monte Carlo photons simulations for modeling biological tissues *(Invited Paper)*
Author(s): **Shijie Yan, Qianqian Fang,** Northeastern Univ. (United States)

13308-7 • 11:35 AM - 11:55 AM
Steady state versus time-resolved photoplethysmography (PPG): the effect of epidermal thickness
Author(s): **Elizabeth Badolato**, **Sophia Fronckowiak, Vinh Nguyen Du Le,** The Univ. of Alabama in Huntsville (United States)

13308-8 • 11:55 AM - 12:15 PM
Semi-analytical model based analysis of sources of error in pulse oximetry due to hardware and skin properties
Author(s): **Aashna Hemkumar**, **Judy Hermann**, **Ben Wilson, Paurakh Rajbhandary,** Meta (United States)

Lunch Break 12:15 PM - 1:45 PM

SESSION 3: TISSUE MIMICKING PHANTOMS FOR IMAGING AND SENSING

25 January 2025 • 1:45 PM - 4:00 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Gracie Vargas**, The Univ. of Texas Medical Branch (United States); **Sanathana Konugolu Venkata Sekar**, Irish Photonic Integration Ctr. (IPIC) (Ireland)

13308-9 • 1:45 PM - 2:20 PM
Tissue-mimicking phantoms for longitudinal multimodality imaging studies *(Invited Paper)*
Author(s): **Shudong Jiang**, **Mengyang Zhao**, **Mingwei Zhou,** Dartmouth College (United States); **Ethan LaRochelle**, **Alberto Ruiz,** Quel Imaging, LLC (United States); **Brian Pogue, Keith Paulsen,** Dartmouth College (United States)

13308-10 • 2:20 PM - 2:40 PM
Hierarchical materials based on polydimethylsiloxane as tissue-like phantoms for photoacoustic imaging and diffusive optics
Author(s): **Lucia Cavigli**, **Fulvio Ratto,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Alessandro Bossi**, **Laura Di Sieno,** Politecnico di Milano (Italy); **Sonia Centi**, **Giada Magni,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Alberto Dalla Mora,** Politecnico di Milano (Italy); **Francesca Rossi,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Bruna Cotrufo**, **Silvia Seoni**, **Kristen M. Meiburger, Filippo Molinari,** Politecnico di Torino (Italy)

13308-11 • 2:40 PM - 3:00 PM
Development of biochemical standards for high wavenumber Raman microspectroscopy and fiber-optic Raman applications
Author(s): **Ezekiel J. Haugen**, **Alec B. Walter**, **Benjamin J. Estes**, **Andrea K. Locke, Anita Mahadevan-Jansen,** Biophotonics Ctr., Vanderbilt Univ. (United States)

13308-12 • 3:00 PM - 3:20 PM
Fabrication of tissue-mimicking epidermis phantom layers with tunable pigmentation
Author(s): **Md Sadique Hasan**, **Anant Bhusal**, **Sandhya Vasudevan**, **William C. Vogt, Joshua Pfefer,** U.S. Food and Drug Administration (United States)

13308-13 • 3:20 PM - 3:40 PM
In vitro model for evaluating catheter-associated infections using skin-like materials
Author(s): **Majed O. Althumayri**, **Azra Tarman, Hatice C. Koydemir,** Texas A&M Univ. (United States)

13308-14 • 3:40 PM - 4:00 PM
Explainable artificial intelligence for point-of-care cancer diagnosis
Author(s): **Bofan Song, Rongguang Liang,** Wyant College of Optical Sciences (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 4: HEALTH EQUITIES IN BIOPHOTONICS

26 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **William C. Vogt**, U.S. Food and Drug Administration (United States)

13308-15 • 8:30 AM - 8:50 AM
Comparison of objective and subjective tools for assessing skin pigmentation diversity in human research cohorts
Author(s): **Michael Lipnick**, **Tyler Law**, **Carolyn Hendrickson,** Univ. of California, San Francisco (United States); **Ronald Bisegerwa,** Makerere Univ. (Uganda); **Lily Ortiz**, **Celine Chou**, **Ella Behnke,** Univ. of California, San Francisco (United States); **Fred Bulamba,** Busitema Univ. (Uganda); **Ellis Monk,** Harvard Univ. (United States); **Fekir Negussie**, **Kelvin Moore**, **Jenna Lester,** Univ. of California, San Francisco (United States); **Liz Igaga,** Makerere Univ. (Uganda); **Seif Elmankabadi**, **Phil Bickler,** Univ. of California, San Francisco (United States); **Leonid Shmuylovich,** Washington Univ. School of Medicine in St. Louis (United States)

13308-16 • 8:50 AM - 9:10 AM
Review of epidermal melanin impact across biophotonic technologies: mechanisms, effects and mitigation
Author(s): **Oluwadamilola O. Oke,** The George Washington Univ. (United States); **Isaac Lin**, **William C. Vogt**, **Chris Scully**, **Sandhya Vasudevan, Joshua Pfefer,** U.S. Food and Drug Administration (United States)

13308-17 • 9:10 AM - 9:30 AM
A dynamic optical phantom for PPG signal at the radial artery incorporation skin tone and obesity variations
Author(s): **Tananant Boonya-Ananta**, **Andres J. Rodriguez**, **JunZhu Pei**, **Ajmal Ajmal**, **Abiel Vasallo,** Florida International Univ. (United States); **Christian Suastegi,** Florida State Univ. (United States); **Nicole Paz,** Univ. of Miami (United States); **Jessica C. Ramella-Roman,** Florida International Univ. (United States)

13308-18 • 9:30 AM - 9:50 AM
Development of a photoplethysmography testing platform using stereolithography 3D printing to create human finger optical phantoms with vascular channels for wearable device applications
Author(s): **Megh Rathod,** Institute of Biomedical Engineering, Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada), Peter Munk Cardiac Ctr., Univ. Health Network (Canada); **Heather Ross,** Peter Munk Cardiac Ctr., Univ. Health Network (Canada), Univ. of Toronto (Canada); **Daniel Franklin,** Institute of Biomedical Engineering, Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada), Peter Munk Cardiac Ctr., Univ. Health Network (Canada)

13308-19 • 9:50 AM - 10:10 AM
Multispectral short wave infrared (SWIR) for equitable assessment of bruising in darkly pigmented skin
Author(s): **Anmol Jarang**, **Maysoon Harunani**, **Quinlan McGrath,** Washington Univ. in St. Louis (United States); **Catherine Cerulli**, **Andrew Berger,** Univ. of Rochester (United States); **Leonid Shmuylovich,** Washington Univ. in St. Louis (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: BIOPHOTONICS DEVICE QUALITY AND DESIGN WITH STANDARDS II

26 January 2025 • 10:40 AM - 11:50 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Gracie Vargas**, The Univ. of Texas Medical Branch (United States); **T. Joshua Pfefer**, U.S. Food and Drug Administration (United States)

13308-25 • 10:40 AM - 11:10 AM
Quantitative hyperspectral microscopy from single cell to tissue imaging *(Invited Paper)*
Author(s): **Jeeseong Hwang, Zhan-Qian John Lu,** National Institute of Standards and Technology (United States)

13308-27 • 11:10 AM - 11:30 AM
Hyperspectral analysis to assess gametocytogenesis stage progression in malaria-infected human erythrocytes
Author(s): **Ik Hwan Kwon**, **Ji Youn Lee,** Korea Research Institute of Standards and Science (Korea, Republic of); **Fuyuki Tokumasu,** Gunma Univ. (Japan); **Sang-Won Lee,** Korea Research Institute of Standards and Science (Korea, Republic of); **Jeeseong Hwang,** National Institute of Standards and Technology (United States)

13308-28 • 11:30 AM - 11:50 AM
Monte Carlo simulation of light transport through spinal cord and surrounding tissues: impact on spinal cord near-infrared spectroscopy
Author(s): **Garrett Frank,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada); **Kitty So**, **Mehara Seneviratne,** International Collaboration On Repair Discoveries (Canada); **Katharina Raschdorf,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada); **Ali Zaidi,** International Collaboration On Repair Discoveries (Canada); **Aysha Brown,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada); **Femke Streijger,** International Collaboration On Repair Discoveries (Canada); **Brian K. Kwon,** International Collaboration On Repair Discoveries (Canada), The Univ. of British Columbia (Canada)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13308-20 • 5:30 PM - 7:00 PM
Epoxy resin phantoms emulating oxy- and deoxyhemoglobin for applications in optical mammography
Author(s): **María V. Waks-Serra**, **Demián A. Vera,** CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina); **Nicolás A. Carbone,** CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina), Bionirs S.A. (Argentina); **Pamela A. Pardini,** Bionirs S.A. (Argentina); **Héctor A. García,** Univ. of Wisconsin-Madison (United States), CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina); **Juan A. Pomarico, Daniela I. Iriarte,** CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13309

Multimodal Biomedical Imaging XX

25 January 2025 | Moscone South, Room 204 (Level 2)

Conference Chair(s): **Xavier Intes,** Rensselaer Polytechnic Institute (United States); **Marien Ochoa,** Univ. of Wisconsin-Madison (United States); **Mohammad Abbas Yaseen,** Northeastern Univ. (United States)

Program Committee: **Fred S. Azar,** Amazon Web Services (United States); **Caroline Boudoux,** Polytechnique Montréal (Canada); **Yu Chen,** Fujian Normal Univ. (China); **Qianqian Fang,** Northeastern Univ. (United States); **Gultekin Gulsen,** John Tu & Thomas Yuen Ctr. for Functional Onco-Imaging (United States); **Kirill V. Larin,** Univ. of Houston (United States); **Sava Sakadžic,** Massachusetts General Hospital (United States); **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

Saturday 25 January 2025

SESSION 1: MULTIMODAL MICROSCOPY

25 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Mohammad Abbas Yaseen**, Northeastern Univ. (United States); **David R. Miller**, The Univ. of Oklahoma (United States)

13309-1 • 8:00 AM - 8:20 AM
Design and implementation of an advanced simultaneous label-free autofluorescence multiharmonic (SLAM) microscopy system for multimodal imaging
Author(s): **Janet E. Sorrells**, **Alexander Ho**, **Rishyashring R. Iyer**, **Kevin K. D. Tan**, **Hongming Fan**, **Jindou Shi**, **Lingxiao Yang**, **Edita Aksamitiene**, **Eric J. Chaney,** Beckman Institute for Advanced Science and Technology (United States); **Aneesh Alex,** GlaxoSmithKline (United States); **Darold R. Spillman**, **Marina Marjanovic,** Beckman Institute for Advanced Science and Technology (United States); **Remben Talaban**, **Steve R. Hood**, **Reid Groseclose,** GlaxoSmithKline (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

13309-2 • 8:20 AM - 8:40 AM
Nanoscale multimodal imaging platform for chromatin study
Author(s): **Geng Wang**, **Ruyi Gong**, **Nicolas Acosta**, **Yuanzhe Su**, **Wingshun Li**, **Luay Almassalha, Vadim Backman,** Northwestern Univ. (United States)

13309-3 • 8:40 AM - 9:00 AM
Mesoscopic light-sheet imaging set-up for 3D SWIR fluorescence intensity and NIR fluorescence lifetime imaging
Author(s): **Luis Chavez**, **Ismail Erbas**, **Vikas Pandey,** Rensselaer Polytechnic Institute (United States); **Catherine Sherry**, **Isaiah Crosbourne,** Albany Medical College (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Margarida Barroso,** Albany Medical College (United States); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-4 • 9:00 AM - 9:20 AM
Programmable multimodality microscope for automated cell culture monitoring in cell therapy
Author(s): **I Jan Chen,** Triad Light Innovation Co., Ltd. (Taiwan)

13309-5 • 9:20 AM - 9:40 AM
Spectroscopic imaging of collagen type I by multimodal coherent nonlinear optical microscopy
Author(s): **Salile Khandani**, **Yryx Luna Palacios, Eric Potma,** Univ. of California, Irvine (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 2: OCT BASED MULTIMODAL IMAGING

25 January 2025 • 10:10 AM - 11:50 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Mohammad Abbas Yaseen**, Northeastern Univ. (United States); **David R. Miller**, The Univ. of Oklahoma (United States)

13309-6 • 10:10 AM - 10:30 AM
Multimodal optical imaging of the effect of alcohol exposure on zebrafish embryonic development
Author(s): **Leah A. Lewis**, **Mohammad Mobarak Karim**, **Christian Zevallos-Delgado**, **Arne C. Lekven**, **Manmohan Singh**, **Kirill V. Larin**,

David Mayerich, Salavat Aglyamov, Univ. of Houston (United States)

13309-7 • 10:30 AM - 10:50 AM
Longitudinal monitoring of controlled delivery of basic fibroblast growth factor and angiogenesis in acoustically-response scaffolds
Author(s): **Zhanpeng Xu**, **Carole Quesada**, **Chenshuo Ma**, **Tianqu Zhai**, **Wei Zhang**, **Mario Fabiilli, Xueding Wang,** Univ. of Michigan (United States)

13309-8 • 10:50 AM - 11:10 AM
Using artificial intelligence to screen for retinal tears in patients with acute, symptomatic posterior vitreous detachments
Author(s): **Arnav Meduri,** Duke Univ. (United States); **Mingyang Zang,** Columbia Univ. (United States); **Bing X. Ho**, **Omar Moussa**, **Jin K. Oh,** Columbia Univ. Irving Medical Ctr. (United States); **Ryan Zukerman,** Univ. of Pittsburgh School of Medicine (United States); **Royce W. S. Chen,** Columbia Univ. Irving Medical Ctr. (United States); **Kaveri A. Thakoor,** Columbia Univ. (United States)

13309-11 • 11:10 AM - 11:30 AM
Multimodal OCT with confocal laser scanning microscopy tandem enables cellular identification and in vivo real-time tracking for zebrafish imaging
Author(s): **Weihao Chen**, **Hui Wang**, **Mark Charlton-Perkins**, **Anna Statsenko, Benjamin Callaway,** Miami Univ. (United States)

13309-32 • 11:30 AM - 11:50 AM
An integrated platform for real-time monitoring animal physiology and behavior during intravital brain imaging
Author(s): **Yuntao Li**, **Alfredo Cárdenas-Rivera**, **Bryce Axe**, **Chang Liu**, **Zhengyi Lu,** Northeastern Univ. (United States); **Mohammed A. Alfadhel,** Northeastern Univ. (United States), Massachusetts General Hospital (United States); **Jaime Anton**, **Priya Rai**, **Praveen Kulkarni**, **Craig Ferris, Mohammad A. Yaseen,** Northeastern Univ. (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 3: MULTIMODAL IMAGING IN RADIATION THERAPY

25 January 2025 • 1:20 PM - 2:00 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Marien I. Ochoa**, Univ. of Wisconsin-Madison (United States)

13309-12 • 1:20 PM - 1:40 PM
Understanding the impact of patient-specific geometries on Cherenkov emission-to-dose relationship during external beam radiation therapy (EBRT)
Author(s): **Baozhu Lu**, **Brook Byrd**, **Yifeng Zhu**, **Daniel Alexander**, **John Plastaras**, **Taoran Li,** Univ. of Pennsylvania (United States); **Brian W. Pogue,** Dartmouth College (United States); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

13309-14 • 1:40 PM - 2:00 PM
Real-time dosimetry using scintillator technology in external beam radiation therapy (EBRT)
Author(s): **Baozhu Lu**, **Yifeng Zhu**, **Brook Byrd**, **Daniel Alexander**, **John Plastaras**, **Taoran Li,** Univ. of Pennsylvania (United States); **Brian W. Pogue,** Dartmouth College (United States); **Timothy C. Zhu,** Univ. of Pennsylvania (United States)

Coffee Break 2:00 PM - 2:30 PM

SESSION 4: MULTIMODAL SPECTROSCOPY AND IMAGING ACROSS TISSUES

25 January 2025 • 2:30 PM - 5:30 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Marien I. Ochoa**, Univ. of Wisconsin-Madison (United States)

13309-15 • 2:30 PM - 2:50 PM
MRI-guided near-infrared spectroscopic tomographic imaging system for breast cancer imaging: system validation and artifacts reduction
Author(s): **Mengyang Zhao**, **Mingwei Zhou,** Dartmouth College (United States); **Jinchao Feng,** Beijing Univ. of Technology (China); **Luxi Xia**, **Brian Pogue**, **Keith Paulsen, Shudong Jiang,** Dartmouth College (United States)

13309-18 • 2:50 PM - 3:10 PM
Simultaneous extraction of tissue blood flow and surface geometry using innovative scDCT
Author(s): **Faezeh Akbari**, **Fatemeh Hamedi**, **Samaneh Rabienia Haratbar**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13309-16 • 3:10 PM - 3:30 PM
Time-of-flight fluorescence-guided surgery with deep learning: towards depth-resolved, artifact-free topography reconstruction
Author(s): **Shiru Wang, Petr Bruza,** Dartmouth College (United States)

13309-17 • 3:30 PM - 3:50 PM
AI-enhanced rapid lifetime determination method for fast macroscopic and mesoscopic fluorescence lifetime imaging
Author(s): **Vikas Pandey**, **Ismail Erbas**, **Luis Chavez,** Rensselaer Polytechnic Institute (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Margarida Barroso,** Albany Medical College (United States); **Stefan Radev,** Rensselaer Polytechnic Institute (United States); **Xavier Michalet,** Univ. of California, Los Angeles (United States); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-19 • 3:50 PM - 4:10 PM
Quantitative diffuse optical spectroscopy and T1 mapping of gadolinium-incorporated porphysome nanoparticles for guided theranostics of oral cancer in mice
Author(s): **Theo D. F. Husby,** Princess Margaret Cancer Ctr., Univ. Health Network (Canada), Univ. of Toronto (Canada); **Jason Townson**, **Alessandra Ruaro,** Princess Margaret Cancer Ctr., Univ. Health Network (Canada), Univ. Health Network (Canada); **Juan Chen,** Princess Margaret Cancer Ctr., Univ. Health Network (Canada); **Ian R. O. Connell,** Univ. of Toronto (Canada), University Health Network (Canada); **Gang Zheng,** Univ. of Toronto (Canada), Princess Margaret Cancer Ctr., Univ. Health Network (Canada), Institute of Biomedical Engineering, Univ. of Toronto (Canada); **Diego Martinez,** Univ. of Toronto (Canada), University Health Network (Canada); **Jessica Lund**, **Kat Zaraska,** Univ. Health Network (Canada); **Brian C. Wilson,** Univ. of Toronto (Canada), Princess Margaret Cancer Ctr., Univ. Health Network (Canada); **Robert A. Weersink,** Univ. of Toronto (Canada), Princess Margaret Cancer Ctr., Univ. Health Network (Canada), Institute of Biomedical Engineering, Univ. of Toronto (Canada)

13309-20 • 4:10 PM - 4:30 PM
Dual modal photoacoustic/ultrasound localization (PAUL) imaging for monitoring blood brain barrier disruption
Author(s): **Shensheng Zhao**, **Sayantani Basu**, **Ji Shi**, **Kewei Song**, **Siripun Pun**, **Yang Zhao**, **Huynh Huan**, **Roy H. Campbell, Yun-Sheng Chen,** Univ. of Illinois (United States)

13309-21 • 4:30 PM - 4:50 PM
Deep learning based virtual multi-modal fluorescence staining of fresh thick tissue using 3D epi-mode quantitative phase imaging
Author(s): **Zhenmin Li**, **Srinidhi Bharadwaj, Francisco Robles,** Georgia Institute of Technology (United States)

13309-22 • 4:50 PM - 5:10 PM
Integrating time-resolved NIR and SWIR imaging for high-resolution mesoscopic fluorescence lifetime imaging using deep learning
Author(s): **Vikas Pandey**, **Stefan Radev**, **Luis Chavez**, **Ismail Erbas,** Rensselaer Polytechnic Institute (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-23 • 5:10 PM - 5:30 PM
Comprehensive characterization and multimodal image processing with the Polaroid P31 intraoral camera
Author(s): **Vrinda Jain**, **Ananya Jana,** Rutgers, The State Univ. of New Jersey (United States); **Steven L. Jacques,** Univ. of Washington (United States); **Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States); **Mark C. Pierce,** Rutgers, The State Univ. of New Jersey (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13309-24 • 5:30 PM - 7:00 PM
Semi-automated mapping of tumor annotations from H&E to fluorescence images of human breast surgical tissues
Author(s): **Tianling Niu,** Marquette Univ. (United States); **Emi Ampo**, **Julie Jorns**, **Mollie Patton,** Medical College of Wisconsin (United States); **Tongtong Lu,** Marquette Univ. (United States); **Dong Hye Ye,** Georgia State Univ. (United States); **Tina Yen,** Medical College of Wisconsin (United States); **Bing Yu,** Marquette Univ. (United States)

13309-25 • 5:30 PM - 7:00 PM
A toolkit for multispectral, multidimensional image classification and analysis
Author(s): **Shannon Handley**, **Aline Knab**, **Xiaohu Xu**, **Max Mackevicius**, **Yuan Tian**, **Ayad Anwer**, **Jared Campbell**, **Ewa Goldys, Akanksha Bhargava,** The Univ. of New South Wales (Australia), ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia)

13309-26 • 5:30 PM - 7:00 PM
Gold nanobipyramid enhanced photoacoustic microscopy and optical coherence tomography of persistent retinal neovascularization in rabbits
Author(s): **Mi Zheng,** Univ. of Michigan (United States), Fujian Provincial Hospital (China), Johns Hopkins Univ. (United States); **Yannis M. Paulus,** Johns Hopkins Univ. (United States), University of Michigan (United States); **Van P. Nguyen,** Univ. of Michigan (United States), Johns Hopkins Univ. (United States)

13309-27 • 5:30 PM - 7:00 PM
Depth detection limits of diffuse fluorescence tomography for system combination with US imaging guidance
Author(s): **Héctor A. García,** Univ. of Wisconsin-Madison (United States), Centro de Investigaciones en Física e Ingeniería del Centro de la Provincia de Buenos Aires (Argentina); **Madhusudan B. Kulkarni**, **Matthew S. Reed**, **Xu Cao,** Univ. of Wisconsin-Madison (United States); **Marvin M. Doyley,** Univ. of Rochester (United States); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States), Thayer School of Engineering at Dartmouth (United States)

13309-28 • 5:30 PM - 7:00 PM
Confidence in NLSF-based lifetime estimation through LUT in time-gated ICCD-based macroscopic fluorescence lifetime imaging
Author(s): **Nanxue Yuan**, **Vikas Pandey,** Rensselaer Polytechnic Institute (United States); **Amit Verma**, **Taylor Humphrey**, **Margarida M. Barroso,** Albany Medical College (United States); **Xavier Intes,** Rensselaer Polytechnic Institute (United States); **Xavier Michalet,** Univ. of California, Los Angeles (United States)

13309-29 • 5:30 PM - 7:00 PM
Design and characterization of a single-pixel light sheet mesoscope for fluorescence lifetime imaging
Author(s): **Navid Ibtehaj Nizam**, **Luis Chavez**, **Vikas Pandey**, **Ismail Erbas, Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-30 • 5:30 PM - 7:00 PM
Characterization and validation of a phantom design for multimodal mesoscopic fluorescence lifetime and optical coherence elastography
Author(s): **Luis Chavez**, **Shan Gao**, **Vikas Pandey**, **Nanxue Yuan**, **Saif Ragab,** Rensselaer Polytechnic Institute (United States); **Jiayue Li**, **Matt S. Hepburn,** The Univ. of Western Australia (Australia); **Percy Smith**, **David T. Corr,** Rensselaer Polytechnic Institute (United States); **Brendan F. Kennedy,** The Univ. of Western Australia (Australia); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-31 • 5:30 PM - 7:00 PM
Implementation of an optical-thermal imaging mobile scanner for diabetic foot ulcers monitoring
Author(s): **Fernando Sebastián Chiwo González**, **Charles P. Policard**, **Stephanie Amaro**, **Oscar Infanzon**, **Himaddri Shakhar Roy**, **Kacie Kaile, Anuradha Godavarty,** Florida International Univ. (United States)

13309-33 • 5:30 PM - 7:00 PM
Progress and validation of integrated optical coherence and confocal fluorescence microscopy for diagnosing ocular surface diseases and tear film disorders
Author(s): **Reddikumar Maddipatla,** UC Davis Health System (United States); **Samuel R. McCuskey**, **Brian C. Leonard**, **Ratheesh K. Meleppat,** Univ. of California, Davis (United States); **Maciej M. Bartuzel**, **Ravi S. Jonnal, Robert J. Zawadzki,** UC Davis Health System (United States)

13309-34 • 5:30 PM - 7:00 PM
Contrast enhanced photoacoustic tomography of mouse organs using ICG-based J-aggregates
Author(s): **Nicholas Such**, **Shrishti Singh,** George Mason Univ. (United States); **Dylan Lawrence,** PhotoSound Technologies, Inc. (United States); **Parag V. Chitnis, Remi Veneziano,** George Mason Univ. (United States)

13309-35 • 5:30 PM - 7:00 PM
Deep learning assistant fast and consistent bio-morphological feature segmentation in clinical Cherenkov imaging
Author(s): **Shiru Wang**, **Petr Bruza**, **Yao Chen,** Dartmouth College (United States); **Rongxiao Zhang,** University of Missouri-Columbia (United States)

13309-36 • 5:30 PM - 7:00 PM
Optimization of carbon-14 radioisotope microscope via étendue analysis
Author(s): **Calliope Martin**, **Sagar Doshi, Rajeev Ram,** Massachusetts Institute of Technology (United States)

13309-37 • 5:30 PM - 7:00 PM
Towards real-time intraoperative perfusion mapping and burn depth assessment through ICG/PpIX based imaging
Author(s): **Marien Ochoa**, **Aiping Liu**, **Matthew Reed**, **Angela Gibson, Brian Pogue,** Univ. of Wisconsin-Madison (United States)

13309-38 • 5:30 PM - 7:00 PM
In-vivo non-invasive imaging of neurovascular dynamics in retina: implications for detection and monitoring of neurodegenerative diseases
Author(s): **Kathleen M. Duncan**, **Zara Husain**, **Yitian Zhang**, **Mahlet Dagachew**, **Chinenyenwa Okolie, Ikbal Sencan-Egilmez,** Washington Univ. in St. Louis (United States)

13309-39 • 5:30 PM - 7:00 PM
Real-time monitoring of melanoma tumor by utilizing high-frequency ultrasounds combined with infrared spectroscopy
Author(s): **Georgios T. Karagiannis,** The Ormylia Foundation (Greece); **Theodoros Karagiannis, Emmanouil Karagiannis,** Diagnosis Multisystems (Greece)

13309-40 • 5:30 PM - 7:00 PM
Fluorescence lifetime imaging and signal reconvolution for characterizing laser-induced melanosome degradation
Author(s): **Mykyta Kizilov**, **Sujeong Jung**, **Vsevolod Cheburkanov, Vladislav Yakovlev,** Texas A&M Univ. (United States)

13309-41 • 5:30 PM - 7:00 PM
FPGA implementation of sequence-to-sequence encoder-decoder deep learning model for real-time fluorescence parameter estimation through SwissSPAD2 camera
Author(s): **Ismail Erbas,** Rensselaer Polytechnic Institute (United States); **Paul Mos,** EPFL (Switzerland); **Vikas Pandey,** Rensselaer Polytechnic Institute (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

13309-9 • 5:30 PM - 7:00 PM
Multimodal OCT intraoral probe for oral cancer early detection
Author(s): **Yihan Wang**, **Shaobai Li**, **Hongzhang Ma**, **Bofan Song, Rongguang Liang,** The Univ. of Arizona (United States)

13309-46 • 5:30 PM - 7:00 PM
Sub-diffusive lifetime reconstruction through high spatial frequency in macroscopic fluorescence lifetime imaging
Author(s): **Saif Ragab**, **Nanxue Yuan**, **Navid I. Nizam,** Rensselaer Polytechnic Institute (United States); **Amit Verma**, **Margarida M. Barroso,** Albany Medical College (United States); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13309-10
Development and integration of OCT/OCTA with snapshot multispectral imaging for advanced tissue analysis for diagnostic applications
Author(s): **Aaron Teng**, **Thomas Livecchi, Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States)

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Optical Fibers and Sensors for Medical Diagnostics, Treatment, and Environmental Applications XXV

25 - 27 January 2025 | Moscone South, Room 212 (Level 2)

Conference Chair(s): **Israel Gannot,** Johns Hopkins Univ. (United States), Tel Aviv Univ. (Israel); **Katy Roodenko,** MAX IR Labs (United States)

Program Committee: **Viacheslav G. Artyushenko,** art photonics GmbH (Germany); **Mathias Belz,** Lytegate GmbH (Germany); **James P. Clarkin,** WEINERT Fiber Optics, Inc. (United States); **Ilko Ilev,** U.S. Food and Drug Administration (United States); **Jin U. Kang,** Johns Hopkins Univ. (United States); **Pierre Lucas,** The Univ. of Arizona (United States); **Yuji Matsuura,** Tohoku Univ. (Japan); **Devinder Saini,** Molex, LLC (United States); **Angela B. Seddon,** The Univ. of Nottingham (United Kingdom); **Justin R. Sperling,** Univ. of Glasgow (United Kingdom); **Zhenpeng Qin,** The Univ. of Texas at Dallas (United States)

Saturday 25 January 2025

SESSION 1: FIBERS FOR BIOMEDICAL SENSING AND SURGICAL GUIDANCE

25 January 2025 • 8:20 AM - 10:05 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Zhenpeng Qin**, The Univ. of Texas at Dallas (United States); **Jin U. Kang**, Johns Hopkins Univ. (United States)

13310-101 • 8:20 AM - 8:35 AM
Design and analysis of a compact metamaterial loaded planar antenna for hyperthermia bone cancer treatment
Author(s): **Hari S. Singh,** Thapar Institute of Engineering and Technology (India); **Asit R. Mridha**, **Adarsh Barwad**, **Venktesan S. Kumar,** All India Institute of Medical Sciences, New Delhi (India); **Vishal Srivastava,** Thapar Institute of Engineering and Technology (India)

13310-1 • 8:35 AM - 8:50 AM
Hybrid organic-inorganic platforms for passive polymeric single-mode optical waveguides
Author(s): **Moqaddaseh Afzali Naniz**, **Amr Al Abed**, **Nigel Lovell**, **Francois Ladouceur**, **Danyang Wang**, **Dorna Esrafilzadeh, Aline Knab,** The Univ. of New South Wales (Australia)

13310-2 • 8:50 AM - 9:05 AM
Fiber Bragg Grating Based Tactile Sensing Tool for Minimally Invasive Surgery
Author(s): **Zhenyu Zhang,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Clausthal (Germany); **Georgios Violakis,** Hellenic Mediterranean Univ. (Greece), Componous P.C. (Greece); **Abu Bakar Dawood,** Queen Mary Univ. of London (United Kingdom); **Ahmad Abdalwareth,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Clausthal (Germany); **Kaspar Althoefer,** Queen Mary Univ. of London (United Kingdom); **Panagiotis Polygerinos,** Hellenic Mediterranean Univ. (Greece); **Martin Angelmahr,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Wolfgang Schade,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Clausthal (Germany)

13310-3 • 9:05 AM - 9:20 AM
Ultra-thin fiber optic sensor for microsurgery
Author(s): **Radu-Florin Stancu**, **Manuel J. Marques,** Univ. of Kent (United Kingdom); **Carlo Seneci**, **Ross Henry,** King's College London (United Kingdom); **Lyndon da Cruz,** Moorfields Eye Hospital (United Kingdom); **Christos Bergeles,** King's College London (United Kingdom); **Michael Hughes, Adrian Podoleanu,** Univ. of Kent (United Kingdom)

13310-4 • 9:20 AM - 9:35 AM
Topology-based deep-learning segmentation method for deep anterior lamellar keratoplasty (DALK) surgical guidance using M-mode OCT data
Author(s): **Jinglun Yu**, **Hongrui Yi**, **Yaning Wang**, **Justin Opfermann,** Johns Hopkins Univ. (United States); **William G. Gensheimer,** Dartmouth Hitchcock Medical Ctr. (United States); **Axel Krieger, Jin U. Kang,** Johns Hopkins Univ. (United States)

13310-5 • 9:35 AM - 9:50 AM
Monitoring blood pCO_2 levels with a low-cost, disposable fluorescent sensor for extracorporeal circulation treatments
Author(s): **Alessia Gallerani**, **Marco Muzzarelli**, **Giovanni Gibertoni,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Alberto Ferrari,** Tecnopolo "Mario Veronesi" di Mirandola (Italy); **Stefano Cattini, Luigi Rovati,** Univ. degli Studi di Modena e Reggio Emilia (Italy)

13310-7 • 9:50 AM - 10:05 AM
Monolithic yellow fiber laser for ophthalmological applications
Author(s): **Valentina Serafini**, **Chiara Bellezza Prinsi**, **Aurora Bellone,** Politecnico di Torino (Italy); **Aizhan Issatayeva,** Univ. degli Studi di Parma (Italy); **Emanuele Ragusa,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Joris Lousteau,** Politecnico di Milano (Italy); **Walter Belardi,** Univ. degli Studi di Parma (Italy); **Laura Bertoni**, **Gian Maria Cavallini,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Annamaria Cucinotta,** Univ. degli Studi di Parma (Italy); **Guido Perrone,** Politecnico di Torino (Italy)

Coffee Break 10:05 AM - 10:25 AM

SESSION 2: INNOVATIONS IN MID-IR SPECTROSCOPY AND SENSING

25 January 2025 • 10:25 AM - 12:40 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Viacheslav G. Artyushenko**, art photonics GmbH (Germany)

13310-8 • 10:25 AM - 11:10 AM
External cavity quantum cascade laser vibrational circular dichroism spectroscopy for fast and sensitive analysis of proteins at low concentrations (Keynote Presentation)
Author(s): **Bernhard Lendl**, **Georg Ramer, Daniel-Ralph Hermann,** Technische Univ. Wien (Austria)

13310-9 • 11:10 AM - 11:35 AM
Development of a mid-infrared fiber sensor for molecular monitoring *(Invited Paper)*
Author(s): **Tse-Ang Lee**, **Zhenyang Xiao**, **David Burghoff, Tanya Hutter,**The Univ. of Texas at Austin (United States)

13310-10 • 11:35 AM - 12:00 PM
Advanced fiber solutions for live biomedical and industrial applications *(Invited Paper)*
Author(s): **Alexander Novikov,** art photonics GmbH (Germany), Technische Univ. Berlin (Germany); **Tatiana Sakharova**, **Alexey Bocharnikov**, **Haro Fritsche**, **Mustafa Yusuf**, **Wolfgang Gries**, **Martin Warman, Viacheslav Artyushenko,** art photonics GmbH (Germany)

13310-11 • 12:00 PM - 12:15 PM
Data-driven Mid-IR spectroscopy for contaminant analysis in wastewater
Author(s): **Trey Daunis**, **Matthew Molyneux**, **Jennifer C. Dussor**, **Dennis I. Robbins, Katy Roodenko,** Max-IR Labs., LLC (United States)

13310-12 • 12:15 PM - 12:40 PM
Graphene and Mxene layers for sensing applications *(Invited Paper)*
Author(s): **Karsten Hinrichs,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Tilmann Neubert,** Humboldt-Univ. zu Berlin (Germany); **Mailis Lounasvuori**, **Fatima Akhtar**, **Namrata Sharma,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Kannan Balasubramanian,** Humboldt-Univ. zu Berlin (Germany); **Tristan Petit, Jörg Rappich,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

Lunch Break 12:40 PM - 2:10 PM

SESSION 3: INNOVATIONS IN OPTICAL TECHNIQUES FOR MEDICAL APPLICATIONS

25 January 2025 • 2:10 PM - 3:55 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Israel Gannot**, Tel Aviv Univ. (Israel); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom)

13310-13 • 2:10 PM - 2:25 PM
Real-time distributed optical fiber system for simultaneous temperature and viscoelasticity monitoring during laser ablation in biological tissues enabled by nanoparticle-doped fibers
Author(s): **Shakhrizat Alisherov**, **Bayan Kurbanova**, **Zhanerke Katrenova**, **Zhannat Ashikbayeva**, **Akbota Sametova**, **Abduzhappar Gaipov,** Nazarbayev Univ. (Kazakhstan); **Wilfried Blanc,** Univ. Côte d'Azur (France); **Zhandos Utegulov,** Nazarbayev Univ. (Kazakhstan); **Daniele Tosi,** Nazarbayev Univ. (Kazakhstan), National Lab. Astana (Kazakhstan); **Carlo Molardi,** Nazarbayev Univ. (Kazakhstan)

13310-14 • 2:25 PM - 2:40 PM
Multicore fiber modified via ablation and thermal treatment for lensless endoscopic imaging
Author(s): **Kinga Zolnacz,** TU Dresden (Germany), Wroclaw Univ. of Science and Technology (Poland); **Jakob Dremel,** TU Dresden (Germany); **Ronja Stephan**, **Michael Steinke,** Leibniz Univ. Hannover (Germany); **Tobias Antrack**, **Johannes Benduhn**, **Karl Leo**, **Jürgen Czarske, Robert Kuschmierz,** TU Dresden (Germany)

13310-15 • 2:40 PM - 2:55 PM
Towards a smart delivery probe for endo-venous laser ablation
Author(s): **Aurora Bellone,** Politecnico di Torino (Italy); **Michal Zeleny,** Czech Technical Univ. in Prague (Czech Republic); **Ritjola Kulluri,** ALITE (Italy); **Massimo Olivero,** Politecnico di Torino (Italy); **Vratislav Fabián,** Czech Technical Univ. in Prague (Czech Republic); **Alberto Vallan, Guido Perrone,** Politecnico di Torino (Italy)

13310-16 • 2:55 PM - 3:10 PM
Kalman filter/deep-learning hybrid automatic boundary tracking of optical coherence tomography data for deep anterior layer keratoplasty (DALK)
Author(s): **Hongrui Yi**, **Jinglun Yu**, **Yaning Wang**, **Justin Opfermann**, **Axel Krieger, Jin U. Kang,** Johns Hopkins Univ. (United States)

13310-17 • 3:10 PM - 3:25 PM
Mid-infrared photoacoustic spectroscopy detecting continuous ultrasound for non-invasive tissue component analysis
Author(s): **Kiiko Aiba**, **Saiko Kino, Yuji Matsuura,** Tohoku Univ. (Japan)

13310-18 • 3:25 PM - 3:40 PM
Robotic minimally invasive laser tissue soldering guided by fluorescent nanothermometry
Author(s): **Oscar Cipolato**, **Marco von Salis, Inge K. Herrmann,** ETH Zurich (Switzerland)

13310-19 • 3:40 PM - 3:55 PM
Hyperspectral imaging and fiber optic sensors-based thermometry for monitoring photothermal therapy of cancer
Author(s): **Leonardo Bianchi,** Politecnico di Milano (Italy); **Martina Bruna Violatto**, **Maria Monica Barzago**, **Annalisa Morelli**, **Gabriela Paroni,** Istituto di Ricerche Farmacologiche Mario Negri IRCCS (Italy); **Carolina Iadanza,** Politecnico di Milano (Italy); **Nicola Giulietti,** Univ. degli Studi di Pavia (Italy); **Paolo Chiariotti,** Politecnico di Milano (Italy); **Paolo Bigini,** Istituto di Ricerche Farmacologiche Mario Negri IRCCS (Italy); **Paola Saccomandi,** Politecnico di Milano (Italy)

Coffee Break 3:55 PM - 4:15 PM

SESSION 4: NAVIGATING COMMERCIALIZATION AND REGULATIONS IN BIOPHOTONICS

25 January 2025 • 4:15 PM - 5:30 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Viacheslav G. Artyushenko**, art photonics GmbH (Germany); **Devinder Saini**, Molex, LLC (United States)

13310-20 • 4:15 PM - 4:40 PM
From the diaries of a translational scientist *(Invited Paper)*
Author(s): **Israel Gannot,** Tel Aviv Univ. (Israel)

13310-21 • 4:40 PM - 5:05 PM
Medical start-up: you can't do everything and all the lessons learned *(Invited Paper)*
Author(s): **Jin U. Kang,** Johns Hopkins Univ. (United States)

13310-22 • 5:05 PM - 5:30 PM
Laser and optical radiation safety evaluation in emerging biophotonics technology and medical devices *(Invited Paper)*
Author(s): **Ilko Ilev,** U.S. Food and Drug Administration (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: ADVANCED OPTICAL METHODS FOR ENVIRONMENTAL MONITORING

26 January 2025 • 8:00 AM - 10:05 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Mathias Belz**, Lytegate GmbH (Germany)

13310-102 • 8:00 AM - 8:15 AM
Fiber optic SERS sensors for rapid detection and identification of salmonella in turkey products
Author(s): **Mai Abuhelwa**, **Fnu Chenggeer**, **Adheesha Bandara**, **Jiayu Liu**, **Paige Willoughby,** Univ. of Missouri (United States); **Anna Carlson,** Cargill, Inc. (United States); **Kate Trout,** Univ. of Missouri (United States); **Amit Morey,** Auburn Univ. (United States); **Ed Kinzel,** University of Notre Dame (United States); **Azlin Mustapha, Mahmoud F. Almasri,** Univ. of Missouri (United States)

13310-23 • 8:15 AM - 8:30 AM
Miniaturized optical biosensor based on engineered Escherichia coli for mercury detection in water systems
Author(s): **Giuseppe Andrea A. Screpis,** Univ. degli Studi di Catania (Italy); **Giuseppe Emanuele Capuano**, **Roberta Farina**, **Domenico Corso**, **Sebania Libertino,** Istituto per la Microelettronica e Microsistemi (Italy); **Maria Anna Coniglio,** Univ. degli Studi di Catania (Italy)

13310-24 • 8:30 AM - 8:45 AM
A step towards the identification of non-pristine microplastics and their origins in environmental analysis through the novel application of polarized Raman spectroscopy
Author(s): **Aisha Bibi**, **Daniel Hill,** Aston Univ. (United Kingdom); **Christoph Krafft, Shravan Raghunathan,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

13310-25 • 8:45 AM - 9:10 AM
Transforming environmental analysis with Raman and SERS spectroscopy: rapid on-site monitoring of agricultural and industrial pollutants *(Invited Paper)*
Author(s): **Wei Yu**, **Il Han, Michael W. Allen,** Metrohm Spectro, Inc. (United States)

13310-26 • 9:10 AM - 9:25 AM
Carbon dioxide detection using Raman spectroscopy inside of drilled hollow core fibers
Author(s): **Brandon J. Demory**, **Jorge Arteaga**, **Sarah Sahota-Dhillon,** Lawrence Livermore National Lab. (United States); **Sayantani Ghosh,** Department of Physics, University of California Merced (United States); **Tiziana Bond, Allan Chang,** Lawrence Livermore National Lab. (United States)

13310-27 • 9:25 AM - 9:50 AM
Plasmonic tastebuds for the optical assessment of water contaminants *(Invited Paper)*
Author(s): **Justin R. Sperling**, **Baptiste Poursat**, **Daniel Osborne**, **Badri Aekbote**, **Greig Govenlock**, **Omar Hersi,** Univ. of Glasgow (United Kingdom); **Anthony Perri**, **Chad Sipperley**, **Rudi Schick,** Spraying Systems Co. (United States); **William T. Sloan**, **Caroline Gauchotte-Lindsay**, **William J. Peveler, Alasdair W. Clark,** Univ. of Glasgow (United Kingdom)

13310-28 • 9:50 AM - 10:05 AM
Microplastic detection in water using a tapered fiber tip sensor
Author(s): **Wajeeha Rizwan**, **Muhammad Noor-ul-Amin Nazir, M. Imran Cheema,** Lahore Univ. of Management Sciences (Pakistan)

Coffee Break 10:05 AM - 10:25 AM

SESSION 6: ADVANCEMENTS IN QUANTUM CASCADE LASERS AND PHOTONICS FOR SENSING

26 January 2025 • 10:25 AM - 12:15 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Katy Roodenko**, Max-IR Labs., LLC (United States)

13310-29 • 10:25 AM - 11:10 AM
Quantum Cascade lasers for sensing (Keynote Presentation)
Author(s): **Jérôme Faist,** ETH Zurich (Switzerland)

13310-30 • 11:10 AM - 11:35 AM
Quantum Cascade lasers in 2025: sensing applications, new methods and latest developments *(Invited Paper)*
Author(s): **Olivier Landry**, **Mickaèl Nehlig**, **Richard Maulini, Antoine Müller,** Alpes Lasers SA (Switzerland)

13310-31 • 11:35 AM - 12:00 PM
Integrated photonics circuits as transducers for refractive index sensing *(Invited Paper)*
Author(s): **Daniela Tomasetig**, **Jesus Hernan Mendoza-Castro**, **Silvia Schobesberger**, **Alicja Dabrowska**, **Giovanna Ricchiuti,** Technische Univ. Wien (Austria); **Artem S. Vorobev**, **Liam O'Faolain,** Munster Technological Univ. (Ireland); **Bernhard Lendl,** Technische Univ. Wien (Austria)

13310-32 • 12:00 PM - 12:15 PM
Long-term stability from adaptive auto-calibration in mid-infrared sensing instruments
Author(s): **Al Alexis**, **Kayla Jones, Mohammad A. Khan,** Delaware State Univ. (United States)

Lunch Break 12:15 PM - 1:45 PM

SESSION 7: CUTTING-EDGE FIBER AND CHIP TECHNOLOGIES FOR BIOMEDICAL APPLICATIONS

26 January 2025 • 1:45 PM - 3:15 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Yuji Matsuura**, Tohoku Univ. (Japan)

13310-33 • 1:45 PM - 2:00 PM
Lab-in-a-fiber device for automated selective cell picking
Author(s): **Harish Achar Vasant,** KTH Royal Institute of Technology (Sweden); **Timothy Gibbon,** RISE Research Institutes of Sweden AB (Sweden); **Joao Varela**, **Oana Tudoran**, **Walter Margulis**, **Aman Russom, Fredrik Laurell,** KTH Royal Institute of Technology (Sweden)

13310-34 • 2:00 PM - 2:15 PM
Lab on fiber technology for loco-regional therapy in oncology
Author(s): **Anna Aliberti,** Univ. degli Studi del Sannio (Italy), CeRICT scrl (Italy); **Tania Mariastella Caputo**, **Chiara Mulè,** Univ. degli Studi del Sannio (Italy); **Angela Maria Cusano,** CeRICT scrl (Italy); **Gaia Maria Berruti,** Univ. degli Studi del Sannio (Italy); **Martino Giaquinto,** Univ. degli Studi di Salerno (Italy); **Alberto Micco,** CeRICT scrl (Italy); **Marco Consales**, **Armando Ricciardi,** Univ. degli Studi del Sannio (Italy); **Andrea Cusano,** Univ. degli Studi del Sannio (Italy), CeRICT scrl (Italy)

13310-35 • 2:15 PM - 2:30 PM
Mass manufacturable scintillation-based optical fiber dosimeters for brachytherapy
Author(s): **Jürgen Van Erps**, **Agnieszka Gierej**, **Tigran Baghdasaryan,** Vrije Univ. Brussel (Belgium); **Michael Martyn**, **Peter Woulfe,** Galway Clinic (Ireland); **Owen McLaughlin**, **Kevin Prise**, **Geraldine Workman,** Queen's Univ. Belfast (United Kingdom); **Sinead O'Keeffe,** Univ. of Limerick (Ireland); **Kurt Rochlitz**, **Sergey Verlinski,** Vrije Univ. Brussel (Belgium); **Agnese Giaz**, **Romualdo Santoro**, **Massimo Caccia,** Univ. degli Studi dell'Insubria (Italy); **Francis Berghmans,** Vrije Univ. Brussel (Belgium)

13310-36 • 2:30 PM - 2:45 PM
Squeezing out the secondary structure information of proteins: a combined circular dichroism infrared-spectroscopy approach
Author(s): **Shilpa Vijayakumar**, **Georg Ramer,** Technische Univ. Wien (Austria); **Andreas Schwaighofer,** Takeda Austria GmbH (Austria); **Anna de Juan**, **Rodrigo Rocha de Oliveira,** Univ. de Barcelona (Spain); **Bernhard Lendl,** Technische Univ. Wien (Austria)

13310-37 • 2:45 PM - 3:00 PM
Integrated microscope on a chip with nanoseconds resolution
Author(s): **Andrea Ciceri,** Politecnico di Milano (Italy); **Giacomo Corrielli**, **Roberto Osellame**, **Francesca Bragheri,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Petra Paiè,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13310-38 • 3:00 PM - 3:15 PM
XYZ optical inception for defects in bonded polymeric dental restorations: CP-OCT observation
Author(s): **Turki A. Bakhsh,** King Abdulaziz Univ. (Saudi Arabia)

Coffee Break 3:15 PM - 3:35 PM

PANEL DISCUSSION: REGULATORY PATHWAYS AND MARKET STRATEGIES FOR OPTICAL TECHNOLOGIES STARTUPS

26 January 2025 • 3:35 PM - 5:20 PM | Moscone South, Room 212 (Level 2)

Join the Optical Fibers and Sensors for Medical Diagnostics, Treatment and Environmental Applications XXV conference for this panel discussion. Navigating a complex regulatory landscape and developing effective market entry strategies are critical challenges for startups in the optical technologies sector. This panel will bring together experts from regulatory agencies, industry leaders, and experienced entrepreneurs to discuss unique regulatory pathways and commercialization strategies for optical innovations in the biomedical field. Attendees will gain insights into the U.S. FDA approval process and the latest trends in regulatory science that impact optical technologies. In addition, this session will provide guidance on market access strategies, such as engaging with key opinion leaders and leveraging partnerships for distribution and commercialization. The goal of this panel is to discuss practical tools and share knowledge to help startups successfully bring their optical innovations to market.

Moderators:
Katy Roodenko, Max-IR Labs., LLC
Israel Gannot, Tel Aviv Univ.

Panelists:
Viacheslav G. Artyushenko, art photonics GmbH
Mathias Belz, Lytegate GmbH
Ilko K. Ilev, U.S. Food and Drug Administration
Devinder Saini, Molex, LLC
Gary Spingarn, Hamamatsu Corp.
James Clarkin, WEINERT Fiber Optics GmbH

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13310-63 • 5:30 PM - 7:00 PM
Line-field full-field OCT system with 200 mm scanning width for defect inspection of plastic samples
Author(s): **Seung Seok Lee**, **Hyun Sung Kim**, **Hye Jun Ma,** Chosun Univ. (Korea, Republic of); **Kyung Won Kim,** A1tech Co., Ltd. (Korea, Republic of); **Eun-Seo Choi,** Chosun Univ. (Korea, Republic of)

13310-64 • 5:30 PM - 7:00 PM
Amplification of measurement range in chirped spectral domain interferometry with a stretched CFBG
Author(s): **Hyun Sung Kim**, **Seung Seok Lee, Eun-Seo Choi,** Chosun Univ. (Korea, Republic of)

13310-65 • 5:30 PM - 7:00 PM
Femtosecond laser enhanced Rayleigh backscattering on high attenuation fiber for liquid level sensing
Author(s): **Kehao Zhao**, **Qirui Wang**, **Shuda Zhong**, **Sheng Huang, Kevin P. Chen,** Univ. of Pittsburgh (United States)

13310-66 • 5:30 PM - 7:00 PM
Time-resolved fiber optic Raman spectroscopy using a CMOS SPAD array
Author(s): **Caitlin Tye,** Heriot-Watt Univ. (United Kingdom); **Katjana Ehrlich,** Univ. of California, Davis (United States); **András Kufcsák**, **Andrew Green**, **Calum Ross,** Heriot-Watt Univ. (United Kingdom); **Robert Henderson,** The Univ. of Edinburgh (United Kingdom); **Michael Tanner,** Heriot-Watt Univ. (United Kingdom)

13310-67 • 5:30 PM - 7:00 PM
Development of a resonator-type optically pumped atomic magnetometer
Author(s): **Taisei Kobayashi**, **Hiroshi Kumagai**, **Shun Takeda, Tomohiro Kosuge,** Kitasato Univ. Graduate School of Medical Sciences (Japan)

13310-68 • 5:30 PM - 7:00 PM
Intrusion detection and classification using machine learning in fiber optic perimeter system
Author(s): **Amit Pandey,** CSIR CSIO (India), Fiber Optic Sensing Solutions Pvt. Ltd. (India); **Hitesh Mehta,** Fiber Optic Sensing Solutions Pvt. Ltd. (India); **Parth Manish Thapliyal,** Stony Brook Univ. (United States)

13310-69 • 5:30 PM - 7:00 PM
Optical fibers sensors functionalized with metal-organic framework for gas detection of propofol
Author(s): **Sergiy Korposh**, **Sandor Erdody**, **Evandro Castaldelli**, **Andrea Laybourn**, **Begum Tokay**, **Stephen Morgan,** The Univ. of Nottingham (United Kingdom); **Sihai Yang**, **Jiangnan Li, Martin Schroder,** The Univ. of Manchester (United Kingdom)

13310-70 • 5:30 PM - 7:00 PM
Optical comb interrogation of structured FBGs for physiological pressure sensing
Author(s): **Malhar A. Nagar,** Politecnico di Torino (Italy); **Minghao Wei**, **Prince Anandarajah,** Dublin City Univ. (Ireland); **Aleksandra Kaszubowska-Anandarajah,** Trinity College Dublin (Ireland); **Nadia G. Boetti,** Fondazione Links (Italy); **Davide Janner,** Politecnico di Torino (Italy)

13310-71 • 5:30 PM - 7:00 PM
A liquid level sensor using distributed phase detection with optical frequency domain reflectometry
Author(s): **Isey Meka, Yonas Muanenda,** Scuola Superiore Sant'Anna (Italy)

13310-72 • 5:30 PM - 7:00 PM
ML-based classification and information-theoretic metrics of instrument drift in laser-based sensing
Author(s): **Zayna Juracka**, **Al Alexis, Mohammad A. Khan,** Delaware State Univ. (United States)

13310-73 • 5:30 PM - 7:00 PM
Modeling and fabrication of long period grating using ultrafast laser point by point writing
Author(s): **Mason Obery**, **Devyn Duryea, Nirmala Kandadai,** Oregon State Univ. (United States)

13310-74 • 5:30 PM - 7:00 PM
Optimization of wideband multimode circulators for improved multimode fiber-based sensing
Author(s): **Audrey Laurence,** Castor Optics, Inc. (Canada); **Joseph Lamarre,** Castor Optics, Inc. (Canada), Polytechnique Montréal (Canada); **Lucas Majeau,** Castor Optics, Inc. (Canada); **Caroline Boudoux,** Polytechnique Montréal (Canada), Castor Optics, Inc. (Canada); **Kathy Beaudette,** Castor Optics, Inc. (Canada)

13310-75 • 5:30 PM - 7:00 PM
Fiber optic lossy mode resonance sensors for chemical sensing
Author(s): **Sukanya Choudhary**, **Flavio Esposito,** Univ. degli Studi di Napoli Parthenope (Italy); **Lucia Sansone**, **Michele Giordano,** Consiglio Nazionale delle Ricerche (Italy); **Stefania Campopiano, Agostino Iadicicco,** Univ. degli Studi di Napoli Parthenope (Italy)

13310-61 • 5:30 PM - 7:00 PM
Simultaneous measurement of temperature and strain of a single fiber Bragg grating sensor based on machine learning
Author(s): **Byeongkwon Choi**, **Ji Su Kim**, **Soyeon Ahn**, **Sung Yoon Cho**, **Min Su Kim**, **Jaehyun Yoo, Min Yong Jeon,** Chungnam National Univ. (Korea, Republic of)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 8: ADVANCED OPTICAL SENSING AND SIGNAL PROCESSING TECHNIQUES

27 January 2025 • 8:25 AM - 9:55 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Justin R. Sperling**, Univ. of Glasgow (United Kingdom)

13310-39 • 8:25 AM - 8:40 AM
Design and evaluation of a real-time signal processing and event extraction scheme in a long-range distributed acoustic sensor
Author(s): **Abdusomad Nur, Yonas Seifu Muanenda,** Scuola Superiore Sant'Anna (Italy)

13310-40 • 8:40 AM - 8:55 AM
Experimental Earthquake Early Detection through Polarization Changes in Intelligent Optical Networks
Author(s): **Hasan Awad,** Politecnico di Torino (Italy); **Stefano Straullu,** Fondazione Links (Italy); **Fehmida Usmani,** National University of Computer & Emerging Sciences (Pakistan); **Emanuele Virgillito,** Politecnico di Torino (Italy); **Rudi Bratovich,** SM Optics S.r.l. (Italy); **Francesco Aquilino,** Fondazione Links (Italy); **Roberto Proietti, Vittorio Curri,** Politecnico di Torino (Italy)

13310-41 • 8:55 AM - 9:10 AM
Ultra-sensitive humidity resistant gas sensing of nitric oxide using microtoroid optical resonators
Author(s): **Yinchao Xu,** The Univ. of Arizona (United States); **Allison Stanko**, **Chloe Cerione**, **Trevor Lohrey,** Caltech (United States); **Euan McLeod,** The Univ. of Arizona (United States); **Brian Stoltz,** Caltech (United States); **Judith Su,** The Univ. of Arizona (United States)

13310-42 • 9:10 AM - 9:25 AM
Toward sensitivity-enhanced fiber-optic vibration measurement through deflection amplification structure
Author(s): **Qi Zhang**, **Yang Wang**, **Yi Huang**, **Xiaobei Zhang, Tingyun Wang,** Shanghai Univ. (China)

13310-43 • 9:25 AM - 9:40 AM
Mid-infrared frequency comb cavity ringdown to simultaneously measure weakest and strongest absorption features over ultra-broadband coverage
Author(s): **Qizhong Liang, Jun Ye,** JILA (United States), National Institute of Science and Technology (United States), Univ. of Colorado Boulder (United States)

13310-44 • 9:40 AM - 9:55 AM
Cavity attenuated phase shift fiber optical sensor for humidity detection
Author(s): **Saqlain Tariq Sahi, M. Imran Cheema,** Lahore Univ. of Management Sciences (Pakistan)

Coffee Break 9:55 AM - 10:25 AM

SESSION 9: INNOVATIONS IN PLASMONIC AND PHOTONIC SENSING TECHNOLOGIES

27 January 2025 • 10:25 AM - 11:10 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Justin R. Sperling**, Univ. of Glasgow (United Kingdom)

13310-46 • 10:25 AM - 10:40 AM
Highly thermal tunable propagating surface plasmons on supported novel metamaterials
Author(s): **Tatjana Gric,** Vilnius Gediminas Technical Univ. (Lithuania); **Edik U. Rafailov,** Aston Univ. (United Kingdom)

13310-76 • 10:40 AM - 10:55 AM
High-resolution distributed optical fiber system for spectrophotometric analysis of liquids
Author(s): **Gianluca Persichetti**, **Genni Testa, Romeo Bernini,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy)

13310-48 • 10:55 AM - 11:10 AM
Photonic integrated circuits for rapid sensing of biomolecules
Author(s): **Stijn Jooken**, **Pieter Neutens**, **Olivia Gevers**, **Anabel De Proft**, **Tim Steylaerts**, **Lisa Tripodi**, **Pol Van Dorpe**, **Finub J. Shirley**, **Niels Verellen, Hemant Kumar Tyagi,** imec (Belgium)

Lunch Break 11:10 AM - 12:40 PM

SESSION 10: INNOVATIVE OPTICAL AND SENSOR TECHNOLOGIES IN BIOMEDICAL APPLICATIONS

27 January 2025 • 12:40 PM - 1:55 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **James P. Clarkin**, WEINERT Fiber Optics GmbH (United States); **Ilko K. Ilev**, U.S. Food and Drug Administration (United States)

13310-49 • 12:40 PM - 12:55 PM
Extracting the combined confocal and fall-off function from multiple OCT A-scans by basis functions
Author(s): **Daniel J. Phan,** Vanderbilt Univ. (United States); **Martin C. Were**, **Jörn-Hendrik Weitkamp,** Vanderbilt Univ. Medical Ctr. (United States); **Audrey K. Bowden,** Vanderbilt Univ. (United States)

13310-50 • 12:55 PM - 1:10 PM
Development and validation of a pulse wave velocity monitoring device
Author(s): **Weliton Marques Ribeiro dos Santos**, **Maria José Pontes,** Univ. Federal do Espírito Santo (Brazil); **Paulo Fernando da Costa Antunes**, **Cátia Sofia Jorge Leitão,** Univ. de Aveiro (Portugal); **Camilo Arturo Rodriguez Díaz,** Univ. Federal do Espírito Santo (Brazil)

13310-51 • 1:10 PM - 1:25 PM
High resolution wearable FBG-based sensing device for cardiac rate and blood pressure monitoring
Author(s): **Kehao Zhao**, **Guangqun Ma**, **Zekun Wu**, **Qirui Wang**, **Shuda Zhong, Kevin P. Chen,** Univ. of Pittsburgh (United States)

13310-52 • 1:25 PM - 1:40 PM
Accuracy comparison for prosthesis activation using a commercial sEMG sensor and an FMG sensor based on FBG and 3D-printing
Author(s): **Felipe Ramirez Cortes,** Univ. Federal do Espírito Santo (Brazil); **María Gaitán-Padilla,** UFES (Brazil); **Marcelo Eduardo Vieira Segatto,** Univ. Federal do Espírito Santo (Brazil); **Maria J. Pontes,** UFES (Brazil); **Carlos A. Cifuentes,** Bristol Robotics Lab. (United Kingdom); **Camilo Arturo Rodríguez Díaz,** Univ. Federal do Espírito Santo (Brazil)

13310-53 • 1:40 PM - 1:55 PM
Temperature and flow rate measurements with FBG sensors embedded in microfluidic devices
Author(s): **Kehao Zhao**, **Zekun Wu**, **Guangqun Ma**, **Qirui Wang, Kevin P. Chen,** Univ. of Pittsburgh (United States)

Coffee Break 1:55 PM - 2:15 PM

SESSION 11: ADVANCED SPECTROSCOPY AND ISRU TECHNOLOGIES FOR SPACE EXPLORATION

27 January 2025 • 2:15 PM - 4:00 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Katy Roodenko**, Max-IR Labs., LLC (United States)

13310-54 • 2:15 PM - 2:40 PM
Fiber-based time-domain spectroscopy: an emerging alternative to Raman and FTIR spectroscopy in space exploration or environmental studies? *(Invited Paper)*
Author(s): **Michael Gensch,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

13310-55 • 2:40 PM - 3:05 PM
An overview of Lunar ISRU architectures and systems *(Invited Paper)*
Author(s): **Desmond O'Connor,** NASA Johnson Space Ctr. (United States)

13310-56 • 3:05 PM - 3:20 PM
Integrated LIBS and mid-infrared spectroscopy of lunar regolith *(Invited Paper)*
Author(s): **Mohammad A. Khan**, **Al Alexis, Yuriy Markushin,** Delaware State Univ. (United States)

13310-57 • 3:20 PM - 3:45 PM
Halide materials for biomedical sensors and in-space manufacturing *(Invited Paper)*
Author(s): **Dmitry S. Starodubov,** DSTAR Communications Inc. (United States)

13310-104 • 3:45 PM - 4:00 PM
In-situ resource utilization (ISRU): Using optical fibers to produce H2O2, H2 or other resources from water *(Invited Paper)*
Author(s): **Paul Westerhoff**, **Han Fu**, **Nora Shapiro**, **Junli Wang, Jirapat Ananpattarachai,** Arizona State Univ. (United States)

Coffee Break 4:00 PM - 4:20 PM

SESSION 12: ADVANCED FIBER OPTIC SENSORS FOR ENVIRONMENTAL AND INDUSTRIAL MONITORING

27 January 2025 • 4:20 PM - 5:20 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Mathias Belz**, Lytegate GmbH (Germany)

13310-58 • 4:20 PM - 4:35 PM
Dashing through the snow: a preliminary study of snow using time-domain diffuse optics
Author(s): **Vamshi Damagatla**, **Luca Gentile**, **Marco Bottaro**, **Martino Boneschi**, **Pietro Razzauti**, **Matteo Tommasini**, **Paolo M Ossi, Antonio Pifferi,** Politecnico di Milano (Italy)

13310-59 • 4:35 PM - 4:50 PM
Mitigation of high x-ray dose radiation-induced attenuation in optical fibers at 15 K: effect of cumulative dose
Author(s): **Fernando Solis Fernandez**, **Bart M. Ludbrook**, **Joe Schuyt,** Paihau-Robinson Research Institute (New Zealand); **Bill Trompetter,** GNS Science (New Zealand); **Dominic A. Moseley**, **Shahna M. Haneef, Rod A. Badcock,** Paihau-Robinson Research Institute (New Zealand)

13310-60 • 4:50 PM - 5:05 PM
Pd-Polymer composite coated fiber optic hydrogen sensor with humidity resistance
Author(s): **Tulika Khanikar**, **Dolendra Karki**, **Yang-Duan Su, Paul Ohodnicki,** Univ. of Pittsburgh (United States)

13310-62 • 5:05 PM - 5:20 PM
All-optical system for the continuous pH monitoring of aqueous solutions
Author(s): **Chiara Bellezza Prinsi**, **Leonardo Iannucci,** Politecnico di Torino (Italy); **Ritjola Kulluri,** ALITE (Italy); **Massimo Olivero**, **Sabrina Grassini**, **Alberto Vallan, Guido Perrone,** Politecnico di Torino (Italy)

CONFERENCE CO-SPONSORS

CONFERENCE 13311

Optical Biopsy XXIII: Toward Real-Time Spectroscopic Imaging and Diagnosis

27 - 29 January 2025 | Moscone South, Room 211 (Level 2)

Conference Chair(s): **Robert R. Alfano,** The City College of New York (United States); **Angela B. Seddon,** The Univ. of Nottingham (United Kingdom); **Lingyan Shi,** Univ. of California, San Diego (United States)

Conference Co-Chair(s): **Binlin Wu,** Southern Connecticut State Univ. (United States)

Program Committee: **Isha Behl,** Trinity College Dublin (Ireland); **Amir Gandjbakhche,** National Institutes of Health (United States); **Israel Gannot,** Johns Hopkins Univ. (United States), Tel Aviv Univ. (Israel); **Zhiwei Huang,** National Univ. of Singapore (Singapore); **Nicusor V. Iftimia,** Physical Sciences Inc. (United States); **Igor V. Meglinski,** Aston Univ. (United Kingdom); **Sangeeta Murugkar,** Carleton Univ. (Canada); **Marcelo Saito Nogueira,** Tyndall National Institute (Ireland); **Yang Pu,** Light Research, Inc. (United States); **Milind Rajadhyaksha,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Gennady B. Shvets,** Cornell Univ. (United States); **Ganesan Singaravelu,** Anna Univ., Chennai (India); **Lihong V. Wang,** Caltech (United States); **Min Xu,** Hunter College (United States); **Anna N. Yaroslavsky,** Univ. of Massachusetts Lowell (United States); **Siavash Yazdanfar,** Corning Incorporated (United States)

Saturday 25 January 2025

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)

Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13311-44 • 5:30 PM - 7:00 PM
Wall proximity effect on microparticles observed via dynamic laser speckle analysis
Author(s): **Vahid Abbasian,** Washington Univ. in St. Louis (United States); **Vahideh Farzam Rad,** Institute for Advanced Studies in Basic Sciences (Ireland); **Arash Darafsheh,** Washington Univ. in St. Louis (United States); **Humberto Cabrera,** The Abdus Salam International Ctr. for Theoretical Physics (Italy)

13311-45 • 5:30 PM - 7:00 PM
Extraction-free monitoring of single-cell microbial oil synthesis and turnover using Raman spectroscopy and imaging
Author(s): **Jiro Karlo, Surya Pratap Singh,** Indian Institute of Technology Dharwad (India)

13311-46 • 5:30 PM - 7:00 PM
Mathematical method for enhancing biochemical information in micro-FTIR images of histopathological slides
Author(s): **Thiago Pereira**, **Eloah Almeida,** UNIFESP (Brazil); **Daniela Peres**, **Daniela F. T. Silva**, **Gleice Germano**, **Denise Zezell,** Instituto de Pesquisas Energéticas e Nucleares (Brazil); **Luciano Bachmann,** Univ. de São Paulo (Brazil)

13311-47 • 5:30 PM - 7:00 PM
Development of NIR LED rotating light source for multispectral imaging under laparoscope
Author(s): **Seiya Hayashi,** Tokyo Univ. of Science (Japan); **Toshihiro Takamatsu,** National Institute of Advanced Industrial Science and Technology (Japan); **Naoto Kakuta,** Tokyo Univ. of Science (Japan); **Nariaki Okamoto,** National Cancer Ctr. Hospital East (Japan); **Shintaro Arakaki,** National Cancer Ctr. Hospital East (Japan), Univ. of the Ryukyus (Japan); **Hiroshi Takemura,** Tokyo Univ. of Science (Japan)

13311-49 • 5:30 PM - 7:00 PM
Texture-analysis classification of intraductal carcinoma of the prostate using multimodal nonlinear optical imaging
Author(s): **Justin R. Gagnon**, **Christian H. Allen,** Carleton Univ. (Canada); **Mame-Kany Diop,** CRCHUM (Canada); **Frédérick Dallaire**, **Frédéric Leblond,** Polytechnique Montréal (Canada); **Dominique Trudel,** CRCHUM (Canada); **Sangeeta Murugkar,** Carleton Univ. (Canada)

13311-50 • 5:30 PM - 7:00 PM
Enhancing cancer detection accuracy in liquid biopsies using spatial Raman spectroscopy
Author(s): **Rebecca Mayer**, **Yifei Gu**, **Andrew Birkeland, Randy Carney,** Univ. of California, Davis (United States)

13311-51 • 5:30 PM - 7:00 PM
Advanced preprocessing and analysis techniques for enhanced Raman spectroscopy data interpretation
Author(s): **Mykyta Kizilov**, **Vsevolod Cheburkanov**, **Joseph Harrington, Vladislav Yakovlev,** Texas A&M Univ. (United States)

Monday 27 January 2025

OPENING REMARKS: OPTICAL BIOPSY XXIII: TOWARD REAL-TIME SPECTROSCOPIC IMAGING AND DIAGNOSIS

27 January 2025 • 8:00 AM - 8:20 AM | Moscone South, Room 211 (Level 2)
Join Optical Biopsy XXIII: Toward Real-Time Spectroscopic Imaging and Diagnosis conference in their opening ceremony.

SESSION 1: RAMAN OPTICAL BIOPSY I

27 January 2025 • 8:20 AM - 10:00 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Binlin Wu**, Southern Connecticut State Univ. (United States); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom)

13311-1 • 8:20 AM - 9:00 AM
Biophotonics meets AI: transforming cancer and infection diagnostics (Keynote Presentation)
Author(s): **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

13311-2 • 9:00 AM - 9:40 AM
Miniaturized fiberoptic Raman techniques for in vivo cancer diagnosis and post-treatment follow-up in clinical settings (Keynote Presentation)
Author(s): **Zhiwei Huang,** National Univ. of Singapore (Singapore)

13311-3 • 9:40 AM - 10:00 AM
Mobile SRS imaging for real-time histological assessment in bladder cancer
Author(s): **Maximilian Brinkmann**, **Anke Bonse**, **Ramon Droop**, **Felix Neumann**, **Steffen Ullmann**, **Thomas Würthwein**, **Niklas Lüpken**, **Sven Dobner, Tim Hellwig,** Refined Laser Systems GmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: RAMAN OPTICAL BIOPSY II

27 January 2025 • 10:30 AM - 12:30 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Kathleen M. Gough**, Univ. of Manitoba (Canada); **Yang Pu**, Light Research, Inc. (United States)

13311-4 • 10:30 AM - 11:10 AM
Label-free profiling of the tumor immune microenvironment via metasurface-driven surface enhanced Raman spectroscopy (Keynote Presentation)
Author(s): **Jennifer A. Dionne**, **Kai Chang**, **Mamatha Serasanambati, Amanda Kirane,** Stanford Univ. (United States)

13311-5 • 11:10 AM - 11:30 AM
Advanced imaging technique for visualizing interrelated metabolic reactions of subcellular organelles in aging and disease: super-resolution multimodal imaging
Author(s): **Hongje Jang**, **Yajuan Li**, **Zhi Li, Lingyan Shi,** Univ. of California, San Diego (United States)

13311-6 • 11:30 AM - 11:50 AM
Characterization of bone marrow cells for prognosis prediction of multiple myeloma using Raman spectroscopy with optimal discriminant model
Author(s): **Yusuke Oshima,** Univ. of Toyama (Japan), Oita Univ. (Japan); **Akinori Taketani**, **Shota Yonezawa**, **Takayuki Haruki**, **Akinori Wada**, **Tsutomu Sato, Keiichi Koizumi,** Univ. of Toyama (Japan)

13311-7 • 11:50 AM - 12:10 PM
Folate-targeted nanoparticles as drug carriers enhancing the efficiency of 5-Fluorouracil in colorectal cancer cells
Author(s): **Xu Li**, **Gabriel Giardina**, **Arno Krause**, **Zewen Jiang,** Medizinische Univ. Wien (Austria); **Veronika Huntošová,** Pavol Jozef Šafárik Univ. in Košice (Slovakia); **Wolfgang Drexler**, **Marco Andreana, Angelika Unterhuber,** Medizinische Univ. Wien (Austria)

13311-8 • 12:10 PM - 12:30 PM
Digital SERS counting of single enzyme biomarkers
Author(s): **Jun Ando**, **Kazue Murai**, **Ikuko Takahashi**, **Tatsuya Iida, Rikiya Watanabe,** RIKEN (Japan)

Lunch Break 12:30 PM - 2:00 PM

SESSION 3: MID OR NEAR-INFRARED SPECTROSCOPY FOR OPTICAL BIOPSY

27 January 2025 • 2:00 PM - 4:50 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Markus Brandstetter**, Research Ctr. for Non Destructive Testing GmbH (Austria)

13311-9 • 2:00 PM - 2:40 PM
Identification of at-risk prostate cancer patients using Fourier Transform Infrared Spectroscopy and Machine Learning (Keynote Presentation)
Author(s): **Dougal Ferguson,** Photon Science Institute, University of Manchester (United Kingdom), Department of Chemical Engineering , School of Engineering, University of Manchester (United Kingdom); **Ashwin Sachdeva,** Division of Cancer Sciences (United Kingdom), Department of Surgery (United Kingdom); **Claire A. Hart,** Division of Cancer Sciences, University of Manchester (United Kingdom); **Diego F. Sanchez,** Cancer Research UK Manchester Institute (United Kingdom); **Pedro Oliveira,** Department of Pathology, The Christie Hospital NHS Foundation Trust (United Kingdom); **Mick Brown,** Division of Cancer Sciences (United Kingdom); **Noel Clarke,** Department of Surgery, The Christie Hospital NHS Foundation Trust (United Kingdom); **Peter Gardner,** The Univ. of Manchester (United Kingdom)

13311-10 • 2:40 PM - 3:00 PM
Lung cancer detection in a high-risk screening cohort using machine learning-assisted ATR-FTIR spectroscopy of serum
Author(s): **David J. Rowe,** Univ. of Southampton (United Kingdom); **S. L. Hill,** Univ. of Southampton (United Kingdom), Univ. Hospital Southampton NHS Foundation Trust (United Kingdom); **Victoria M. Goss,** Univ. of Southampton (United Kingdom); **Alexander Hicks,** Portsmouth Hospitals NHS Trust (United Kingdom); **Phillip A. J. Crosbie,** The Univ. of Manchester (United Kingdom); **Matthew E. J. Callister,** The Leeds Teaching Hospitals NHS Trust (United Kingdom); **Peter W. M. Johnson, Goran Z. Mashanovich,** Univ. of Southampton (United Kingdom)

13311-11 • 3:00 PM - 3:20 PM **(CANCELLED)**
Unified vibrational spectroscopy and mass spectrometry for multimodal bioimaging
Author(s): **Shiyue Liu**, **Jianrong Qiu**, **Maddy Parsons**, **Vincenzo Abbate**, **Ka Lung Andrew Chan, Mads S. Bergholt,** King's College London (United Kingdom)

13311-12 • 3:20 PM - 3:40 PM
Real-time assessment of graft oxygenation and perfusion using spectral imaging for improved outcome in esophageal cancer surgery
Author(s): **Jens De Winne,** Univ. Gent (Belgium), imec (Belgium); **Danilo Babin**, **Hiêp Luong,** Univ. Gent (Belgium); **Siri Luthman,** imec (Belgium); **Elke Van Daele**, **Hanne Vanommeslaeghe,** UZ Gent (Belgium); **Wim Ceelen,** Experimental Surgery Lab, Univ. Gent (Belgium)

13311-13 • 3:40 PM - 4:00 PM
Intelligent functional near-infrared spectroscopy for schizophrenia and bipolar disorder assessment
Author(s): **Chun-Yeh Wang,** National Yang Ming Chiao Tung Univ. (Taiwan); **Po-Han Chou,** Dr. Chou's Mental Health Clinic (Taiwan); **Chang-Yi Li, Chia-Wei Sun,** National Yang Ming Chiao Tung Univ. (Taiwan)

13311-14 • 4:00 PM - 4:20 PM
Development of VIS to 1600 nm hyperspectral imaging laparoscope system for visualization of deep tissue
Author(s): **Toshihiro Takamatsu,** National Institute of Advanced Industrial Science and Technology (Japan); **Naoto Kakuta**, **Seiya Hayashi,** Tokyo Univ. of Science (Japan); **Shintaro Arakaki,** National Cancer Ctr. Hospital East (Japan), Univ. of the Ryukyus (Japan); **Nariaki Okamoto,** National Cancer Ctr. Hospital East (Japan); **Hiroshi Takemura,** Tokyo Univ. of Science (Japan)

13311-15 • 4:20 PM - 4:50 PM
Mid-infrared liquid biopsy: can we see more by looking at less *(Invited Paper)*
Author(s): **Boris Mizaikoff,** Univ. Ulm (Germany), Hahn-Schickard (Germany)

Coffee Break 4:50 PM - 5:20 PM

SESSION 4: PHOTOACOUSTIC SPECTROSCOPY

27 January 2025 • 5:20 PM - 6:50 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Binlin Wu**, Southern Connecticut State Univ. (United States)

13311-16 • 5:20 PM - 6:00 PM
Photoacoustic, light-speed, and quantum imaging (Keynote Presentation)
Author(s): **Lihong V. Wang,** Caltech (United States)

13311-17 • 6:00 PM - 6:30 PM
Imaging guide stem cells and gene therapy for retinal diseases *(Invited Paper)*
Author(s): **Phuc Nguyen**, **Wei Qian**, **Yeachan Lee**, **Dongshan Yang**, **Fahim Abigail**, **Xueding Wang, Yannis Paulus,** Univ. of Michigan (United States)

13311-18 • 6:30 PM - 6:50 PM
Imaging visually evoked hemodynamic response in the cortical and subcortical regions in free-moving mice with photoacoustic tomography
Author(s): **Guan Xu**, **Kai-Wei Chang**, **Xueding Wang, Kwoon Wong,** Univ. of Michigan (United States)

Tuesday 28 January 2025

SESSION 5: VIBRATIONAL PHOTOTHERMAL MICROSCOPY

28 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Peter Gardner**, The Univ. of Manchester (United Kingdom)

13311-19 • 8:00 AM - 8:40 AM
Vibrational photothermal microscopy: from 0 and 1, 10, and 100 (Keynote Presentation)
Author(s): **Ji-Xin Cheng,** Boston Univ. (United States)

13311-20 • 8:40 AM - 9:10 AM
Towards an early diagnostic for Alzheimer disease through multi-modal spectroscopic evaluation of buccal cells *(Invited Paper)*
Author(s): **Kathleen M. Gough**, **Rinuk 'Limurn**, **David Hartry,** Univ. of Manitoba (Canada); **Chalapathi Gajjela**, **Rohith Reddy,** Univ. of Houston (United States); **Sabine Mai**, **Darryl Dyck,** Univ. of Manitoba (Canada); **Mustafa Kansiz, Craig B Prater,** Photothermal Spectroscopy Corp. (United States)

13311-21 • 9:10 AM - 9:40 AM
Label-free nano- and microplastics detection in mammalian tissue samples by photothermal infrared spectroscopy *(Invited Paper)*
Author(s): **Verena Karl,** Research Ctr. for Non Destructive Testing GmbH (Austria); **Kristina Duswald,** Research Ctr. for Non Destructive Testing GmbH (Austria), CBmed GmbH (Austria); **Verena Pichler,** CBmed GmbH (Austria), Univ. Wien (Austria); **Tanja Limberger**, **Verena Kopatz,** CBmed GmbH (Austria), Medizinische Univ. Wien (Austria); **Christian Pacher-Deutsch,** CBmed GmbH (Austria); **Vanessa Stadlbauer-Köllner,** Medizinischen Univ. Graz (Austria), CBmed GmbH (Austria); **Angela Horvath,** CBmed GmbH (Austria); **Elisabeth Gruber,** Medizinische Univ. Wien (Austria); **Lukas Kenner,** CBmed GmbH (Austria), Medizinische Univ. Wien (Austria); **Markus Brandstetter,** Research Ctr. for Non Destructive Testing GmbH (Austria), CBmed GmbH (Austria)

Coffee Break 9:40 AM - 10:10 AM

SESSION 6: NOVEL APPROACHES TO OPTICAL BIOPSY I

28 January 2025 • 10:10 AM - 12:40 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Binlin Wu**, Southern Connecticut State Univ. (United States); **Alexander Doronin**, Victoria Univ. of Wellington (New Zealand)

13311-22 • 10:10 AM - 10:50 AM
Label-free two-photon morphofunctional tissue imaging for precision diagnosis and treatment (Keynote Presentation)
Author(s): **Irene Georgakoudi,** Dartmouth College (United States); **Mihaela Balu**, **Anand Ganesan**, **Jessica Shiu,** Univ. of California, Irvine (United States); **Christopher Polleys,** Tufts Univ. (United States); **Nima Najafi-Ghalehlou**, **Matthew Lindley,** Dartmouth College (United States); **Hong-Thao Thieu, Elizabeth Genega,** Tufts Medical Ctr. (United States)

13311-23 • 10:50 AM - 11:20 AM
Evaluating metastatic melanoma with optical pump-probe microscopy *(Invited Paper)*
Author(s): **Martin C. Fischer,** Duke Univ. (United States)

13311-24 • 11:20 AM - 11:40 AM
Structures in liquids probed by terahertz Raman scattering
Author(s): **Binlin Wu,** Southern Connecticut State Univ. (United States); **Baolong Yu**, **Gurpal Singh,** The City College of New York (United States); **Robert R. Alfano,** The City Univ. of New York (United States)

13311-25 • 11:40 AM - 12:00 PM
New optical biopsy of tissue using terahertz Raman spectroscopy
Author(s): **Binlin Wu,** Southern Connecticut State Univ. (United States); **Michael Pena,** The City College of New York (United States); **Robert R. Alfano,** The City Univ. of New York (United States)

13311-26 • 12:00 PM - 12:20 PM
Guiding epidurals with optical feedback
Author(s): **Ge V. Zhu**, **HuaLei Zhang**, **Gopi N. Maguluri,** Physical Sciences Inc. (United States); **Thomas Simoupolos,** Beth Israel Deaconess Medical Ctr. (United States); **Nicusor Iftimia,** Physical Sciences Inc. (United States)

13311-27 • 12:20 PM - 12:40 PM
Deep-learning assisted biopsy guidance using optical coherence tomography imaging
Author(s): **Shelley HuaLei Zhang**, **Gopi N. Maguluri**, **John P. Grimble**, **Michael Primrose,** Physical Sciences Inc. (United States); **Poonam Yadav**, **Rahul A. Sheth,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Nicusor Iftimia,** Physical Sciences Inc. (United States)

Lunch Break 12:40 PM - 2:10 PM

SESSION 7: NOVEL APPROACHES TO OPTICAL BIOPSY II

28 January 2025 • 2:10 PM - 4:00 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Guan Xu**, Univ. of Michigan Kellogg Eye Ctr. (United States); **Jian Zhao**, Massachusetts Institute of Technology (United States)

13311-28 • 2:10 PM - 2:50 PM
Tailoring speckle statistics for bioimaging application (Keynote Presentation)
Author(s): **Hui Cao,** Yale Univ. (United States)

13311-29 • 2:50 PM - 3:20 PM
Cuffless blood pressure measurements using speckle contrast optical spectroscopy: Progress towards a long-standing goal of biomedicine *(Invited Paper)*
Author(s): **Darren M. Roblyer,** Boston Univ. (United States)

13311-30 • 3:20 PM - 3:40 PM
Femtosecond optical Kerr effect in tissues: a new optical biopsy method
Author(s): **Robert R. Alfano, Sandra Mamani,** The City College of New York, The City Univ. of New York (United States)

13311-31 • 3:40 PM - 4:00 PM
Universal model for higher harmonic generation driven by E(t) from optical and NIR femtosecond laser pulses using the optical Kerr effect with response time < 1fs for n2 to give odd HHG and n1 even HHG and for generating for the attosecond and zeptosecond pulses
Author(s): **Robert R. Alfano,** The City Univ. of New York (United States)

Coffee Break 4:00 PM - 4:30 PM

SESSION 8: NOVEL APPROACHES TO OPTICAL BIOPSY III

28 January 2025 • 4:30 PM - 5:40 PM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Binlin Wu**, Southern Connecticut State Univ. (United States); **Guan Xu**, Univ. of Michigan Kellogg Eye Ctr. (United States)

13311-33 • 4:30 PM - 5:00 PM
Time-course molecular diagnosis with fluorescent metabolomics *(Invited Paper)*
Author(s): **Tzu-Ming Liu,** Univ. of Macau (Macao, China)

13311-34 • 5:00 PM - 5:20 PM
Two photon diagnosis of dermatological biopsies, analysis of 100 patients
Author(s): **Connor M. Heckman**, **Chi Z. R. Huang**, **Vincent D. Ching-Roa,** Univ. of Rochester (United States); **Sherrif F. Ibrahim,** Rochester Dermatologic Surgery (United States); **Bruce R. Smoller,** Univ. of Rochester Medical Ctr. (United States); **Michael G. Giacomelli,** Univ. of Rochester (United States)

13311-35 • 5:20 PM - 5:40 PM
Exploring polycrystalline microstructure of blood films using 3D Mueller matrix imaging
Author(s): **Igor V. Meglinski,** Aston Univ. (United Kingdom)

Wednesday 29 January 2025

SESSION 9: FLUORESCENCE MICROSCOPY AND IMAGING FOR OPTICAL BIOPSY I

29 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Lingyan Shi**, Univ. of California, San Diego (United States); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom)

13311-37 • 8:30 AM - 9:10 AM
Nonlinear microscopy for real time histology and cancer surgical guidance (Keynote Presentation)
Author(s): **James G. Fujimoto,** Massachusetts Institute of Technology (United States)

13311-39 • 9:10 AM - 9:30 AM
Label-free super-multiplex multiphoton imaging microscopy
Author(s): **Geng Wang,** Northwestern Univ. (United States)

13311-40 • 9:30 AM - 9:50 AM
Label-free hyperspectral nonlinear optical microscopy
Author(s): **Alejandro De la Cadena**, **Carlos A. Renteria**, **Kayvan F. Tehrani**, **Kevin K. D. Tan**, **Janet E. Sorrells**, **Edita Aksamitiene, Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 10: FLUORESCENCE MICROSCOPY AND IMAGING FOR OPTICAL BIOPSY II

29 January 2025 • 10:20 AM - 11:10 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Lingyan Shi**, Univ. of California, San Diego (United States); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom)

13311-41 • 10:20 AM - 10:50 AM
4D fluorescent imaging of mitochondria and insulin secretion enabled by gentle dyes *(Invited Paper)*
Author(s): **Zhixing Chen,** Peking Univ. (China)

13311-43 • 10:50 AM - 11:10 AM
Kidney tumor classification using multiphoton microscopy and deep learning
Author(s): **Joseph Neumann**, **Yulei Pang,** Southern Connecticut State Univ. (United States); **Manu Jain,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Sushmita Mukherjee,** Weill Cornell Medicine (United States); **Binlin Wu,** Southern Connecticut State Univ. (United States)

CLOSING REMARKS: OPTICAL BIOPSY XXIII: TOWARD REAL-TIME SPECTROSCOPIC IMAGING AND DIAGNOSIS

29 January 2025 • 11:10 AM - 11:30 AM | Moscone South, Room 211 (Level 2)
Session Chair(s): **Binlin Wu**, Southern Connecticut State Univ. (United States); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Lingyan Shi**, Univ. of California, San Diego (United States)
Join the Optical Biopsy XXIII: Toward Real-Time Spectroscopic Imaging and Diagnosis conference for their closing ceremony.

CONFERENCE 13312

Microfluidics, BioMEMS, and Medical Microsystems XXIII

26 - 27 January 2025 | Moscone South, Room 204 (Level 2)

Conference Chair(s): **Bastian E. Rapp,** Univ. of Freiburg (Germany); **Colin Dalton,** Univ. of Calgary (Canada)

Program Committee: **Bonnie L. Gray,** Simon Fraser Univ. (Canada); **Jaione Tirapu-Azpiroz,** IBM Research - Brazil (Brazil); **Holger Becker,** microfluidic ChipShop GmbH (Germany); **Yolanda Fintschenko,** Daybreak Labs (United States); **Hayden K. Taylor,** Univ. of California, Berkeley (United States); **Julian Thiele,** Leibniz-Institut für Polymerforschung Dresden e.V. (Germany)

Sunday 26 January 2025

SESSION 1: MICROFLUIDICS

26 January 2025 • 9:20 AM - 10:20 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Colin Dalton**, Univ. of Calgary (Canada)

13312-1 • 9:20 AM - 9:40 AM
Innovative liquid flat-jet system for microfluidic applications in vacuum
Author(s): **Gerd Marowsky,** Advanced Microfluidic Systems GmbH (Germany); **Florian Wieduwilt,** Advanced Microfluidic Systems GmbH (Germany), Institut für Nanophotonik Göttingen e.V. (Germany); **Jonathan Holburg,** Institut für Nanophotonik Göttingen e.V. (Germany); **Leonie Lakemann, Stephan Figul,** Advanced Microfluidic Systems GmbH (Germany)

13312-3 • 9:40 AM - 10:00 AM
Electrophoresis in viscoelastic fluids: towards novel drug-delivery systems
Author(s): **Sebastian Uppapalli**, **Irfan Ali Mohammad, Jayasri Dontabhaktuni,** Mahindra Univ. (India)

13312-4 • 10:00 AM - 10:20 AM
Multi dimensional laser induced fluorescent and microfluidic valve system based combinational antibiotics susceptibility screening and sub 5 minute pathogen identification
Author(s): **Lai Wei**, **Sayuni Dharmasena**, **Fangchi Shao**, **Jiyuan Yang**, **Arman Mirmiran**, **Sixuan Li**, **Kuangwen Hsieh, Jeff Tza-Huei Wang,** Johns Hopkins Univ. (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 2: MICROFABRICATION I

26 January 2025 • 10:50 AM - 12:20 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Bastian E. Rapp**, Univ. of Freiburg (Germany)

13312-36 • 10:50 AM - 11:20 AM
An overview of Ga-based liquid metal research at NeptunLab: from microactuators to heavy metal ion sensors *(Invited Paper)*
Author(s): **Pegah Pezeshkpour**, **Sagar Bhagwat**, **Frederik Kotz-Helmer, Bastian E. Rapp,** Univ. of Freiburg (Germany)

13312-6 • 11:20 AM - 11:40 AM
Micro-device manufacturing, a collaborative journey through advanced technologies in glass laser micro-fabrication, electroforming, and injection moulding
Author(s): **Marek Krehel,** 3D AG (Switzerland); **Andrea Lovera,** FEMTOPrint (Switzerland); **Magnus Kristiansen,** FHNW University of Applied Science and Arts Northwestern Switzerland (Switzerland)

13312-7 • 11:40 AM - 12:00 PM
Mechanically induced subsurface crack channels for micro- and nanofluidics
Author(s): **Sho Itoh**, **Hayate Kanaya**, **Souta Matsusaka, Hirofumi Hidai,** Chiba Univ. (Japan)

13312-8 • 12:00 PM - 12:20 PM

Capillary stamping using two-photon polymerization (2PP) 3D printed stamps with hollow microneedle arrays
Author(s): **Ali Usama**, **Peilong Hou**, **Pegah Pezeshkpour, Bastian E. Rapp,** Univ. of Freiburg (Germany)

Lunch Break 12:20 PM - 1:50 PM

SESSION 3: OPTOFLUIDICS

26 January 2025 • 1:50 PM - 2:50 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Bonnie L. Gray**, Simon Fraser Univ. (Canada)

13312-10 • 1:50 PM - 2:10 PM
3D printed microfluidics for cell analysis using digital holographic microscopy
Author(s): **Delaney K. Sanborn**, **Nicholas Bravo-Frank, Jiarong Hong,** Univ. of Minnesota, Twin Cities (United States)

13312-11 • 2:10 PM - 2:30 PM
Progress and advances in the development of a label-free optofluidic platform based on quantitative phase digital holographic microscopy and microfluidics for the identification of human disease-specific cell phenotypes
Author(s): **Erik Bélanger**, **Gabrielle Jess**, **Jean-Honoré Laurent**, **Corentin Soubeiran**, **Céline Larivière-Loiselle**, **Sara Mattar**, **Niraj Patel**, **Zahra Yazdani-Najafabadi**, **Mohamed Haouat**, **Johan Chaniot**, **Jodie Llinares**, **Émile Rioux-Pellerin**, **Marie-Ève Crochetière**, **Jean-Xavier Giroux,** Ctr. de Recherche CERVO (Canada); **Antoine Allard,** Univ. Laval (Canada); **Patrick Desrosiers, Pierre Marquet,** Ctr. de Recherche CERVO (Canada)

13312-12 • 2:30 PM - 2:50 PM
Optimizing Raman modalities in PDMS-based microfluidic devices for cancer detection and prognostic applications
Author(s): **Tommy Brasseur**, **Thomas Gervais, Frédéric Leblond,** Polytechnique Montréal (Canada), CRCHUM (Canada)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: MICROFABRICATION II

26 January 2025 • 3:20 PM - 4:50 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Julian Thiele**, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany)

13312-13 • 3:20 PM - 3:50 PM
Laser-patterned paper-based microfluidics for affordable point-of-care testing *(Invited Paper)*
Author(s): **Collin L. Sones,** Univ. of Southampton (United Kingdom)

13312-15 • 3:50 PM - 4:10 PM
Advances in manufacturing next generation neurostimulation, cardiac rhythm management, and electrophysiology mapping catheter electrodes via femtosecond laser hierarchical surface restructuring
Author(s): **Shahram Amini,** Pulse Technologies, Inc. (United States), Univ. of Connecticut (United States); **Sina Shahbazmohamadi**, **Hongbin Choi**, **Alexander Blagojevic**, **Pouya Tavousi**, **Nicholas May**, **Matthew Maniscalco,** Univ. of Connecticut (United States); **Wesley Seche,** Pulse Technologies, Inc. (United States)

13312-16 • 4:10 PM - 4:30 PM
Sticker micromolds for low-cost rapid-fabrication of polymer and textile-based biomedical devices
Author(s): **Bonnie L. Gray,** Simon Fraser Univ. (Canada); **Chelsey Currie,** Chimeric Solutions (Canada)

13312-28 • 4:30 PM - 4:50 PM
3D printed sacrificial templates for volumetric additive manufacturing of bioderived hydrogels with high-resolution vasculatures
Author(s): **Isabel F. Arias Ponce**, **Sijia Huang, Maxim Shusteff,** Lawrence Livermore National Lab. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 5: APPLICATIONS I

27 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Pegah Pezeshkpour**, Univ. of Freiburg (Germany)

13312-35 • 8:00 AM - 8:30 AM
Microfluidic multiparameter measurement systems: current status and future perspective *(Invited Paper)*
Author(s): **Joost C. Lötters,** Univ. Twente (Netherlands), Innovative Sensor Technology AG (Switzerland)

13312-17 • 8:30 AM - 8:50 AM
Dielectric waveguide ring resonator based biosensor for dielectric fluid spectroscopy in the THz domain
Author(s): **Kristof Dausien**, **Paulami Das**, **Ilona Rolfes**, **Jan Barowski**, **Martin Hoffmann, Christian Schulz,** Ruhr-Univ. Bochum (Germany)

13312-18 • 8:50 AM - 9:10 AM
Enhanced point of care detection of urinary tract infections via microfluidic enrichment and photothermal sensing
Author(s): **Yasaman Ghazi**, **Arsalan Nikdoost**, **Derek Hayden**, **Pouya Rezai, Nima Tabatabaei,** York Univ. (Canada)

13312-19 • 9:10 AM - 9:30 AM
Rapid Prototyping of Microfluidic On-chip Valves and Pumps for Biomedical Applications
Author(s): **Zekun Wu**, **Ravikumar Krishnamurthy**, **Guangqun Ma**, **Kehao Zhao**, **Shuda Zhong**, **Guangyin Zhang**, **Qirui Wang**, **Ipsita Banerjee, Kevin Chen,** Univ. of Pittsburgh (United States)

13312-20 • 9:30 AM - 9:50 AM
Miniaturizable printed microfluidics chemiluminescence system for ATP detection in water
Author(s): **Giuseppe Emanuele Capuano,** Istituto per la Microelettronica e Microsistemi, Consiglio Nazionale delle Ricerche (CNR - IMM) (Italy); **Domenico Corso**, **Roberta Agata Farina,** Istituto per la Microelettronica e Microsistemi (Italy); **Gianni Pezzotti Escobar,** Consiglio Nazionale delle Ricerche (Italy); **Giuseppe Andrea Screpis,** Università degli Studi di Messina (Italy); **Maria Anna Coniglio,** Università degli Studi di Catania (Italy); **Sebania Libertino,** Istituto per la Microelettronica e Microsistemi (Italy)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: MEDICAL DEVICES

27 January 2025 • 10:20 AM - 11:50 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Collin L. Sones**, Univ. of Southampton (United Kingdom)

13312-21 • 10:20 AM - 10:50 AM
Wire bonded solid metal microneedles: a versatile platform technology for transdermal drug delivery and biosensing *(Invited Paper)*
Author(s): **Kazim Haider,** Univ. of Calgary (Canada); **Thomas Lijnse,** Univ. College Dublin (Ireland); **Lisa van de Panne**, **Catherine Betancourt Lee**, **Alec Lamb, Colin Dalton,** Univ. of Calgary (Canada)

13312-22 • 10:50 AM - 11:10 AM
A reusable, wireless, battery-free, non-invasive sweat cortisol sensor
Author(s): **Shingirirai Chakoma**, **Xiaochang Pei**, **Jerome Rajendran**, **Anita Ghandehari**, **Jorge Alfonso Tavares Negrete, Rahim Esfandyarpour,** Univ. of California, Irvine (United States)

13312-23 • 11:10 AM - 11:30 AM
Battery-free wearable sensing system enhanced by machine learning for monitoring stress levels
Author(s): **Xiaochang M. Pei**, **Anita Ghandehari**, **Jerome Rajendran**, **Shingirirai Chakoma**, **Jorge Alfonso Tavares Negrete, Rahim Esfandyarpour,** Univ. of California, Irvine (United States)

13312-24 • 11:30 AM - 11:50 AM
Fabrication of a flexible capacitive touch screen based on silver nanowires
Author(s): **Ahmed Hamza**, **Priyanka Buduru**, **Pegah Pezeshkpour, Bastian E. Rapp,** Univ. of Freiburg (Germany)

Lunch Break 11:50 AM - 1:20 PM

SESSION 7: APPLICATIONS II

27 January 2025 • 1:20 PM - 2:20 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Bastian E. Rapp**, Univ. of Freiburg (Germany)

13312-26 • 1:20 PM - 1:40 PM
A 3D printed microfluidic worm sorting device
Author(s): **Alex Peters**, **Aaron Putzke, Philip Measor,** Whitworth Univ. (United States)

13312-27 • 1:40 PM - 2:00 PM
OCT-based monitoring of artificial collagen membranes during mechanical stimulation
Author(s): **Jonas Golde**, **Yvo Schöps**, **Stephan Becker**, **Stephan Behrens,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Gloria Seidel,** Westsächsische Hochschule Zwickau (Germany); **Florian Schmieder, Frank Sonntag,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13312-29 • 2:00 PM - 2:20 PM
Impedance-based biosensor for rapid detection and identification of Salmonella in turkey products
Author(s): **Mohammed Almalaysha**, **Keara Allen**, **Kamran Bashir Taas,** Univ. of Missouri (United States); **Anna Carlson,** Cargill, Inc. (United States); **Amit Morey,** Auburn Univ. (United States); **Kate E. Trout**, **Shuping Zhang, Mahmoud F. Almasri,** Univ. of Missouri (United States)

Coffee Break 2:20 PM - 2:35 PM

SESSION 8: APPLICATIONS III

27 January 2025 • 2:35 PM - 3:55 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Ali Usama**, Univ. of Freiburg (Germany)

13312-33 • 2:35 PM - 2:55 PM
Effect of flexible substrate Young's modulus on vibration transmission of micro-epidermal actuators
Author(s): **Raaha Kumaresan,** Rowan Univ. (United States); **Enosh Lim, Mohammad J. Moghimi,** Wake Forest Univ. School of Medicine (United States)

13312-25 • 2:55 PM - 3:15 PM
Highly flexible, precise dielectrophoretic, AI image analysis enabled sorting of cells in a microfluidic system
Author(s): **Erik Beckert**, **Norbert Danz**, **Falk Kemper,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Volker Bruns,** Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany); **Michael Schmück-Henneresse,** Charité Universitätsmedizin Berlin (Germany); **Michaela Benz**, **Julia Hetzel,** Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany); **Thomas Schoenfelder,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Sarah Schulenberg,** Charité Universitätsmedizin Berlin (Germany); **Rosalie Kletzander,** Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany); **Michael Kirschbaum**, **Felix Pfisterer**, **Tobias Gerlach, Neus Godino,** Fraunhofer-Institut für Zelltherapie und Immunologie, Institutsteil Bioanalytik und Bioprozesse (Germany)

13312-34 • 3:15 PM - 3:35 PM
Microneedles with phenylboronic acid-containing polymer and carbon nanotubes for interstitial fluid glucose measurements
Author(s): **Young Bin Choy,** Seoul National Univ. College of Medicine (Korea, Republic of)

13312-9 • 3:35 PM - 3:55 PM
Towards on-chip integration of a silicon photonic microfluidic thermal flow rate sensor on a silicon-on-insulator process
Author(s): **Kithmin Wickremasinghe**, **Samantha M. Grist**, **Mohammed A. Al-Qadasi**, **Sheri J. Chowdhury**, **Ben Cohen-Kleinstein**, **Stephen Kioussis**, **Karyn Newton**, **Kowsar Heydari**, **Karen C. Cheung**, **Lukas Chrostowski, Sudip Shekhar,** The Univ. of British Columbia (Canada)

SESSION 9: PANEL DISCUSSION AND AWARDS CEREMONY: MICROFLUIDICS, BIOMEMS, AND MEDICAL MICROSYSTEMS XXIII

27 January 2025 • 3:55 PM - 5:25 PM | Moscone South, Room 204 (Level 2)

Join this panel to discuss current trends in microfluidics, bioMEMS, and medical microsystems. This session will also include an award ceremony for the Microfluidics, BioMEMS, and Medical Microsystems XXIII conference.

Moderators:
Bastian Rapp, University of Freiburg

Panelists:
Colin Dalton, University of Calgary
Bonnie L. Gray, Simon Fraser University
Julian Thiele, Leibniz-Institut für Polymerforschung Dresden e.V.

This panel is part of the Microfluidics, BioMEMS, and Medical Microsystems XXIII conference.

Event Details

FORMAT: Panel discussion followed by audience Q&A and awards ceremony.
MENU: Coffee, decaf, and tea will be available outside the presentation room before the session.
SETUP: Classroom and theater style seating.

CONFERENCE CO-SPONSORS

CONFERENCE 13313

Biophotonics in Exercise Science, Sports Medicine, Health Monitoring Technologies, and Wearables VI

25 - 26 January 2025 | Moscone South, Room 210 (Level 2)

Conference Chair(s): **Babak Shadgan,** The Univ. of British Columbia (Canada); **Amir H. Gandjbakhche,** National Institutes of Health (United States)

Program Committee: **Afrouz A. Anderson,** National Institutes of Health (United States); **Guy D. Dumont,** The Univ. of British Columbia (Canada); **Takafumi Hamaoka,** Tokyo Medical Univ. (Japan); **Andrew J. Macnab,** The Univ. of British Columbia (Canada); **Thien Nguyen,** National Institutes of Health (United States); **Robert V. Warren,** Hamamatsu Ventures (United States)

Saturday 25 January 2025

SESSION 1: OPTICS IN EXERCISE SCIENCE

25 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Babak Shadgan**, The Univ. of British Columbia (Canada); **Takafumi Hamaoka**, Tokyo Medical Univ. (Japan)

13313-1 • 8:00 AM - 8:20 AM
Cerebral responses to resistance training under different loads assessed with functional near-infrared spectroscopy
Author(s): **Giovani G. Martins**, **Guilherme J. Silva**, **Erick P Lucena**, **Andres Q. Soto**, **Sergio L. Novi**, **Marco C. Uchida,** Univ. of Campinas (Brazil); **Rickson C. Mesquita,** Univ. of Birmingham (United Kingdom)

13313-2 • 8:20 AM - 8:40 AM
Evaluating the level of muscle contraction by near-infrared spectroscopy a potential application for scaling muscle spasm
Author(s): **Mehdi Nouri Zadeh**, **Babak Shadgan**, **Kishore Mulpuri**, **Yekta Saremi**, **Amir Rad**, **Iman Amani Tehrani, Maria Juricic,** The Univ. of British Columbia (Canada)

13313-3 • 8:40 AM - 9:00 AM
Cricket bowling action sensor based on multimode-single mode-multimode fiber interferometer
Author(s): **Ubaid Ullah, M. Imran Cheema,** Lahore Univ. of Management Sciences (Pakistan)

13313-4 • 9:00 AM - 9:20 AM
Exploring muscle activity with a novel NV-based sensor
Author(s): **Leonardo Gizzi,** Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA (Germany); **Robert Rölver,** Q.ANT GmbH (Germany); **Animesh Ranjan,** Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA (Germany); **Justus Marquetand,** Universitätsklinikum Tübingen (Germany), Hertie-Institut für Klinische Hirnforschung (Germany), Univ. Stuttgart (Germany); **Thanh-Duc Nguyen**, **Verena Kopp,** Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA (Germany); **Katharina Jag-Lauber,** Q.ANT GmbH (Germany); **Markus Siegel,** Universitätsklinikum Tübingen (Germany); **Okan Avci, Urs Schneider,** Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA (Germany)

13313-5 • 9:20 AM - 9:40 AM
Advancing athletic performance monitoring: sport-related biomarkers detection and analysis in human biofluids using Raman spectroscopy
Author(s): **Romane Le Roy Pépin,** Polytechnique Montréal (Canada), Ctr. Hospitalier de l'Univ. de Montréal (Canada); **Elisa Dufault-Quintana**, **Coline Guillaumond**, **Antoine Noé**, **Esmat Zamani**, **Fredo Dallaire**, **Juliette Selb**, **Katherine Ember, Frédéric Leblond,** Polytechnique Montréal (Canada), CRCHUM (Canada)

Coffee Break 9:40 AM - 10:10 AM

SESSION 2: OPTICAL DIAGNOSIS

25 January 2025 • 10:10 AM - 11:40 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Amir H. Gandjbakhche**, National Institutes of Health (United States); **Babak Shadgan**, The Univ. of British Columbia (Canada)

13313-6 • 10:10 AM - 10:30 AM
Utilizing near-infrared spectroscopy to monitor and assess muscle spasticity in children with cerebral palsy undergoing Botox treatment, a feasibility study
Author(s): **Mehdi Nouri Zadeh**, **Maria Juricic**, **Jocelyn Begin**, **Kishore Mulpuri, Babak Shadgan,** The Univ. of British Columbia (Canada)

13313-33 • 10:30 AM - 11:20 AM
Development and testing of a wearable laser speckle device for detection of postpartum hemorrhage (Keynote Presentation)
Author(s): **Christine M. O'Brien,** Washington Univ. in St. Louis (United States)

13313-36 • 11:20 AM - 11:40 AM
Tissue perfusion index: a novel non-invasive optical metric for monitoring regional tissue perfusion
Author(s): **Iman Amani Tehrani**, **Sadra Khosravi**, **Zahra Askari**, **Amir Parham Pirhadi Rad**, **Shadi Momtahen**, **Babak Shadgan, Shahbaz Askari,** The Univ. of British Columbia (Canada)

Lunch Break 11:40 AM - 1:10 PM

SESSION 3: OPTICAL SIGNALS AT BEDSIDE

25 January 2025 • 1:10 PM - 2:50 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Robert V. Warren**, Hamamatsu Corp. (United States)

13313-7 • 1:10 PM - 1:30 PM
The use of near infrared spectroscopy as a wearable to monitor blood pressure continuously
Author(s): **Thien Nguyen**, **Asma Sodager**, **Soongho Park, Amir Gandjbakhche,** National Institutes of Health (United States)

13313-8 • 1:30 PM - 1:50 PM
High-quality photoplethysmography signals using a new non-contact method
Author(s): **Sarai Dominguez Hernandez, Gonzalo Páez,** Centro de Investigaciones en Óptica, A.C. (Mexico)

13313-9 • 1:50 PM - 2:10 PM
Using LLMs to diagnose cardiovascular diseases from PPG signals
Author(s): **Luis E. Huallparimachi Saire**, **Michael A. Alvarez Navarro, Heidy H. Sierra-Gil,** Univ. de Puerto Rico Mayagüez (United States)

13313-10 • 2:10 PM - 2:30 PM
A TBP DICOM format for total-body scanner-independent lesion evolution detection
Author(s): **Minghao Xue**, **Wei-Lun Huang,** Johns Hopkins Univ. (United States); **Davood Tashayyod,** Lumo Imaging LLC (United States); **Jun Kang,** The Johns Hopkins Hospital (United States); **Amir Gandjbakhche,** National Institutes of Health (United States); **Mehran Armand,** Univ. of Arkansas (United States)

13313-11 • 2:30 PM - 2:50 PM
Simulated breathing patterns classification using two-stream convolutional neural network for monitoring of respiratory disease patients
Author(s): **Jinho Park**, **Thien Nguyen**, **Soongho Park**, **Brian Hill,** National Institutes of Health (United States); **Babak Shadgan,** The Univ. of British Columbia (Canada); **Amir Gandjbakhche,** National Institutes of Health (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: EXPERIMENTAL BIOPHOTONICS

25 January 2025 • 3:20 PM - 4:40 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Thien Nguyen**, National Institutes of Health (United States); **Takafumi Hamaoka**, Tokyo Medical Univ. (Japan)

13313-12 • 3:20 PM - 3:40 PM
Thigh Cuff Release-Induced Repeated Acute Hypotension and Cerebral Oxygenation Recovery
Author(s): **Atsuhiro Tsubaki**, **Hyuga Kojima**, **Hajime Tamiya**, **Keishi Hayao,** Niigata Univ. of Health and Welfare (Japan); **Toshimi Sato,** Fukushima Medical Univ. (Japan); **Ryota Imai,** Uonuma Kikan Hospital (Japan); **Soshi Samejima,** Univ. of Washington (United States); **Kentaro Iwata,** Kobe City Medical Ctr. General Hospital (Japan); **Shinichiro Morishita,** Fukushima Medical Univ. (Japan)

13313-13 • 3:40 PM - 4:00 PM
Development of an optical technology-based sensor and deep learning models to estimate user-interaction forces in smart walkers
Author(s): **Daniel E. Garcia A.**, **Marcelo Eduardo Vieira Segatto**, **Anselmo Frizera Neto,** UFES (Brazil); **Carlos A. Cifuentes,** Bristol Robotics Lab., Univ. of the West of England (United Kingdom); **Camilo A. R. Diaz,** UFES (Brazil)

13313-14 • 4:00 PM - 4:20 PM
Neural effects of acute physical activity on posture-cognitive dual-tasks: a pilot fNIRS study
Author(s): **Wan-Chun Su**, **Tony George**, **Thien Nguyen**, **Marc Bornstein, Amir Gandjbakhche,** National Institutes of Health (United States)

13313-15 • 4:20 PM - 4:40 PM
Investigation into relevant factors of seasonal variation in brown adipose tissue vascular density in humans
Author(s): **Sayuri Fuse-Hamaoka**, **Miyuki Kuroiwa,** Tokyo Medical Univ. (Japan); **Yuka Ishida**, **Kazuhiro Nakayama,** The Univ. of Tokyo (Japan); **Yuko Kurosawa**, **Ryotaro Kime, Takafumi Hamaoka,** Tokyo Medical Univ. (Japan)

Coffee Break 4:40 PM - 5:10 PM

SESSION 5: CLINICAL BIOPHOTONICS

25 January 2025 • 5:10 PM - 6:10 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Afrouz A. Anderson**, National Institutes of Health (United States); **Thien Nguyen**, National Institutes of Health (United States)

13313-16 • 5:10 PM - 5:30 PM
Effects of Fowler's and semi-Fowler's patient posture on fNIRS neuromonitoring data
Author(s): **Seth B. Crawford**, **Daniel X. Liu, Audrey K. Bowden,** Vanderbilt Univ. (United States)

13313-17 • 5:30 PM - 5:50 PM
The non-invasive diagnostic modality for the detection of oral squamous cell carcinoma by an infrared sensor (feasibility study)
Author(s): **Shahrzad Rahimizadeh Nahavandi,** Dental (Canada); **Arghavan Tonkaboni**, **Soheila Manifar**, **Mohammad Javad Kharrazi Fard**, **Mohammad Shirkhoda,** Tehran Univ. of Medical Sciences (Iran, Islamic Republic of); **Amir Parham Pirhadi Rad,** The Univ. of British Columbia (Canada)

13313-18 • 5:50 PM - 6:10 PM
Stress biomarker test for athletes with portable optical detector and functionalized quantum dots
Author(s): **Anusha Kishore**, **Arun Mathew Varughese**, **Carsten Zeilinger, Bernhard Roth,** Leibniz Univ. Hannover (Germany)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 6: OPTICS FOR VITAL SIGN MONITORING

26 January 2025 • 8:20 AM - 10:55 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Amir H. Gandjbakhche**, National Institutes of Health (United States); **Afrouz A. Anderson**, National Institutes of Health (United States)

13313-19 • 8:20 AM - 8:40 AM
Three methods for extracting respiratory rate from speckle plethysmography
Author(s): **Maartje Hoogeveen**, **Ilde Lorato**, **Jorge Herranz Olazábal**, **Evelien Hermeling, John Morales,** imec (Netherlands)

13313-20 • 8:40 AM - 9:00 AM
Quantifying consistency in tissue oxygenation across anatomical landmarks in healthy individuals through near-infrared spectroscopy
Author(s): **Amir Parham Pirhadi Rad**, **Vincent Levandier**, **Mehdi Nourizadeh**, **Kiana Jahanshahi, Babak Shadgan,** The Univ. of British Columbia (Canada)

13313-21 • 9:00 AM - 9:20 AM
Prediction of cardiovascular vital signs using laser speckle flow index signals from a wireless wearable device
Author(s): **Francesca Bonetta-Misteli**, **Madison P. Carlgren**, **Folaolowashewa Shofu**, **Toi Collins**, **Todd Pavek**, **Antonina Frolova**, **Leonid Shmuylovich**, **Peinan Zhao, Christine M. O'Brien,** Washington Univ. in St. Louis (United States)

13313-22 • 9:20 AM - 9:40 AM
Phasor-based hyperspectral thermal imaging for contactless vital sign detection
Author(s): **Dingding Han**, **Corey Zheng**, **Zhi Ling, Shu Jia,** Georgia Institute of Technology (United States)

13313-23 • 9:40 AM - 10:00 AM
Development of deep learning models for motion artifact mitigation in wearable PPG devices
Author(s): **Matthew Lee,** Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada); **Yuan Gao**, **Chris McIntosh,** Ted Rogers Ctr. for Heart Research (Canada), Toronto General Hospital Research Institute (Canada); **Daniel Franklin,** Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada); **Jonathan Wu,** Ted Rogers Ctr. for Heart Research (Canada), Univ. of Toronto (Canada)

13313-34 • 10:00 AM - 10:20 AM
Development of an accurate, non-invasive method for rapid in vivo hydration assessment of marathon runners using high-wavenumber raman spectroscopy.
Author(s): **Richard Liao**, **Alexandria G. Cousart**, **Alec B. Walter**, **Trevor Voss**, **Anna S. Rourke-Funderburg,** Vanderbilt Univ. (United States); **Savanna N. Knight**, **Lynnsey R. Bowling**, **Trace A. Dominy**, **Eric K. O'Neal,** Univ. of North Alabama (United States); **Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States)

13313-35 • 10:20 AM - 10:40 AM
An experimental model for the photon depth statistics of re-emitted near-infrared light
Author(s): **Arshdeep Khurana**, **Alireza Khodavandi, Babak Shadgan,** The Univ. of British Columbia (Canada)

13313-38 • 10:40 AM - 10:55 AM
Biophotonics at the national institute of biomedical imaging and bioengineering
Author(s): **Afrouz A. Anderson,** National Institutes of Health (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13313-24 • 5:30 PM - 7:00 PM
Flacara: future of dermoscopy
Author(s): **Zhiyou Liu**, **Davood Tashayyod,** Lumo Imaging LLC (United States); **Daniel Mathew,** Johns Hopkins Univ. (United States); **Alejandro Martin Gomez,** Univ. of Arkansas (United States)

13313-25 • 5:30 PM - 7:00 PM
A simple hemoglobin phantom model for simulating a photoplethysmography pulse
Author(s): **Sophia Fronckowiak**, **Vinh Nguyen Du Le, Elizabeth Badolato,** The Univ. of Alabama in Huntsville (United States)

13313-26 • 5:30 PM - 7:00 PM
Action research on the integration of panoramic VR interactive teaching materials into emergency nursing for vocational school students
Author(s): **Mei-Fang Chen,** National Tainan Junior College of Nursing (Taiwan); **Chun-Chin Tsai,** Southern Taiwan Univ. of Science & Technology (Taiwan); **Chia-Shan Wu,** National Tainan Junior College of Nursing (Taiwan); **Ting-Wei Chen,** Fooyin Univ. (Taiwan); **Meng-Hui Hung,** National Tainan Junior College of Nursing (Taiwan)

13313-31 • 5:30 PM - 7:00 PM
Development of intelligent low-power portable device for vitals monitoring using fingertip-based optical sensor
Author(s): **Afzaal Ahmad**, **Muhammad Zakir Khan**, **Muhammad Zubair, Qammer Abbasi,** Univ. of Glasgow (United Kingdom)

13313-32 • 5:30 PM - 7:00 PM
Affixed transmission speckle analysis as a continuous non-invasive monitoring tool for sickle cell disease
Author(s): **Eric Gallagher**, **Helen E. Parker**, **Timothy Quang,** Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States); **Dianna Lovins**, **Dina S. Parekh**, **Ingrid Frey**, **Ruth Pierre-Charles**, **Anna Conrey**, **Swee Lay Thein,** National Heart, Lung, and Blood Institute (United States); **Bruce J. Tromberg,** Eunice Kennedy Shriver National Institute of Child Health and Human Development (United States), National Institute of Biomedical Imaging and Bioengineering (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13314

Optical Tomography and Spectroscopy of Tissue XVI

27 - 28 January 2025 | Moscone South, Room 213 (Level 2)

Conference Chair(s): **Sergio Fantini,** Tufts Univ. (United States); **Paola Taroni,** Politecnico di Milano (Italy)

Program Committee: **Erin M. Buckley,** Wallace H. Coulter Dept. of Biomedical Engineering at Emory Univ. (United States), Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Institute of Technology (United States); **Regine Choe,** Univ. of Rochester (United States); **Anabela Da Silva,** Institut Fresnel, CNRS, Aix Marseille Univ, Centrale Méditerranée (France); **Hamid Dehghani,** The Univ. of Birmingham (United Kingdom); **Mamadou Diop,** Western Univ. (Canada); **Amir H. Gandjbakhche,** National Institutes of Health (United States); **Sylvain Gioux,** Intuitive Surgical (Switzerland); **Andreas H. Hielscher,** New York Univ. (United States); **Shudong Jiang,** Thayer School of Engineering at Dartmouth (United States); **Jana M. Kainerstorfer,** Carnegie Mellon Univ. (United States); **Hiroshi Kawaguchi,** National Institute of Advanced Industrial Science and Technology (Japan); **Anand T. N. Kumar,** Massachusetts Eye and Ear (United States); **Frederic Leblond,** CRCHUM (Canada); **Mark J. Niedre,** Northeastern Univ. (United States); **Thomas D. O'Sullivan,** Univ. of Notre Dame (United States); **Antonio Pifferi,** Politecnico di Milano (Italy); **Valentina Quaresima,** Univ. degli Studi dell'Aquila (Italy); **Darren M. Roblyer,** Boston Univ. (United States); **Ilias Tachtsidis,** Univ. College London (United Kingdom); **Yukio Ueda,** Hamamatsu Photonics K.K. (Japan); **Anna N. Yaroslavsky,** Univ. of Massachusetts Lowell (United States); **Quing Zhu,** Washington Univ. in St. Louis (United States)

Sunday 26 January 2025

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
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Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13314-41 • 5:30 PM - 7:00 PM
Asymmetric self-calibrating method for accurate cerebral oximetry
Author(s): **Leila Motamed Jahromi**, **Dirk Grosenick,** Physikalisch-Technische Bundesanstalt (Germany); **Alexander von Lühmann, Lin Yang,** NIRx Medical Technologies, LLC (Germany)

13314-42 • 5:30 PM - 7:00 PM
Rytov approximation in diffuse optics: physical interpretation and applications
Author(s): **Angelo Sassaroli**, **Giles Blaney,** Tufts Univ. (United States); **Fabrizio Martelli,** Univ. degli Studi di Firenze (Italy); **Sergio Fantini,** Tufts Univ. (United States)

13314-58 • 5:30 PM - 7:00 PM
Imaging Dynamic Targets through Scattering Media with Chip-Scale Ultra-High Density Diffuse Optical Tomography
Author(s): **Ning Zhang,** Brown Univ. (United States); **Quan Zhang,** Massachusetts General Hospital (United States), Harvard Medical School (United States); **Arto Nurmikko,** Brown Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 1: THEORY, MONTE CARLO, MACHINE LEARNING, AND PHANTOMS

27 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Andreas H. Hielscher**, New York Univ. (United States)

13314-1 • 8:00 AM - 8:20 AM
Open-source 2D multispectral forward and inverse solver of the radiative transfer equation
Author(s): **Alejandro Martínez de Ternero**, **Jaime Sancho**, **Manuel Villa**, **Alberto Martín-Pérez**, **Guillermo Vazquez**, **Pedro L. Cebrián**, **Gonzalo Rosa**, **Pallab Suthradhar**, **Miguel Chavarrías**, **Eduardo Juárez , César Sanz,** Univ. Politécnica de Madrid (Spain)

13314-2 • 8:20 AM - 8:40 AM
Simple and versatile analytical model for continuous-wave fluorescence in multilayered turbid media under the diffusion approximation
Author(s): **Héctor A. García,** Univ. of Wisconsin-Madison (United States), CIFICEN (UNCPBA - CICPBA - CONICET) (Argentina); **Madhusudan B. Kulkarni,** Univ. of Wisconsin-Madison (United States); **Brian W. Pogue,** Univ. of Wisconsin-Madison (United States), Dartmouth College (United States)

13314-3 • 8:40 AM - 9:10 AM
Extending application limits of scaling relations for time-resolved Monte Carlo simulations in diffuse optics *(Invited Paper)*
Author(s): **Lorenzo Spinelli**, **Andrea Farina,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Antonio Pifferi**, **Alessandro Torricelli,** Politecnico di Milano (Italy); **Angelo Sassaroli,** Tufts Univ. (United States); **Fabrizio Martelli,** Univ. degli Studi di Firenze (Italy)

13314-4 • 9:10 AM - 9:30 AM
Direct application of deep learning for diffuse optical tomography
Author(s): **Aapo Peräkorpi,** Datrix S.p.A. (Italy), Politecnico di Milano (Italy); **Matteo Bregonzio,** Datrix S.p.A. (Italy); **Gianluca Valentini,** Politecnico di Milano (Italy), Consiglio Nazionale delle Ricerche (Italy); **Giovanna Tramontin,** Consiglio Nazionale delle Ricerche (Italy), Politecnico di Milano (Italy); **Andrea Farina,** Consiglio Nazionale delle Ricerche (Italy)

13314-5 • 9:30 AM - 9:50 AM
Self-supervised hybrid neural network to achieve quantitative bioluminescence tomography in vivo for cancer research
Author(s): **Beichuan Deng**, **Zhishen Tong**, **Xiangkun Xu,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Hamid Dehghani,** Univ. of Birmingham (United Kingdom); **Ken Kang-Hsin Wang,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

13314-6 • 9:50 AM - 10:10 AM
Absorption properties of chromophores and light scatterers in tissue-mimicking phantoms
Author(s): **Eileen Oh**, **Redwan Haque**, **Rasa Eskandari,** Western Univ. (Canada); **Mamadou Diop,** Lawson Health Research Institute (Canada)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: SPECTROSCOPY AND IMAGING OF TISSUE

27 January 2025 • 10:40 AM - 12:30 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Mamadou Diop**, Western Univ. (Canada)

13314-7 • 10:40 AM - 11:10 AM
Wearable monitor for the assessment of tissue water fraction as a marker of edema development *(Invited Paper)*
Author(s): **Shakeeb Habash**, **Ailis Muldoon**, **Marco Renna**, **Mitchell B. Robinson**, **So Hyun Chung**, **Maria Angela Franceschini, Stefan A. Carp,** Massachusetts General Hospital (United States)

13314-8 • 11:10 AM - 11:30 AM
Comparison of frequency domain optical tomography with ultrasound imaging in the classification of joints of systemic lupus erythematosus patients
Author(s): **Alessandro Marone,** New York Univ. (United States); **Leila Khalili,** Columbia Univ. Irving Medical Ctr. (United States); **Moegammad A. Bardien,** New York Univ. (United States); **Wei Tang,** Columbia Univ. Irving Medical Ctr. (United States); **Stephen H. K. Kim,** New York Univ. (United States); **Anca D. Askanase,** Columbia Univ. Medical Ctr. (United States); **Andreas H. Hielscher,** New York Univ. (United States)

13314-9 • 11:30 AM - 11:50 AM
Broadband shortwave infrared spectroscopy in biological tissue
Author(s): **Thao T. Pham**, **Diana Suciu**, **Lina Lin Wei, Darren Roblyer,** Boston Univ. (United States)

13314-10 • 11:50 AM - 12:10 PM
Simple forward model of noncontact diffuse reflectance spectroscopy in a center-illuminated-area-detection geometry for measuring myoglobin forms in retail beef
Author(s): **Nafiseh Farahzadi**, **Daqing Piao, Ranjith Ramanathan,** Oklahoma State Univ. (United States)

13314-11 • 12:10 PM - 12:30 PM
Broadband frequency domain near infrared spectroscopy for monitoring hemodialysis in kidney disease
Author(s): **Diana Suciu**, **Thao Pham**, **Lina Lin Wei,** Boston Univ. (United States); **Vipul Chitalia,** Boston Medical Ctr. (United States); **Darren Roblyer,** Boston Univ. (United States)

Lunch Break 12:30 PM - 2:00 PM

SESSION 3: OXIMETRY AND SPECTROSCOPY OF MUSCLE

27 January 2025 • 2:00 PM - 3:40 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Jana M. Kainerstorfer**, Carnegie Mellon Univ. (United States)

13314-12 • 2:00 PM - 2:20 PM
Non-invasive optical measurements of skeletal muscle hemodynamics: contributions of adipose and bone tissues
Author(s): **Fatemeh Tavakoli**, **Angelo Sassaroli**, **Jodee Frias**, **Giles Blaney, Sergio Fantini,** Tufts Univ. (United States)

13314-13 • 2:20 PM - 2:40 PM
Effects of epidermal pigmentation on the accuracy of hyperspectral versus commercial near-infrared spectroscopy tissue oximeters
Author(s): **Sophie Niculescu**, **Rasa Eskandari**, **Natalie Li, Mamadou Diop,** Western Univ. (Canada)

13314-16 • 2:40 PM - 3:00 PM
Noncontact assessment of oxymyoglobin changes in beef during retail display using diffuse reflectance spectroscopy in a new configuration
Author(s): **Daqing Piao**, **Nafiseh Farahzadi**, **Anuj Sharma**, **Morgan Pfeiffer**, **Gretchen Mafi, Ranjith Ramanathan,** Oklahoma State Univ. (United States)

13314-14 • 3:00 PM - 3:20 PM
A preliminary investigation of dual-ratio pulse oximetry and the effect of skin tone
Author(s): **Giles Blaney**, **Jodee Frias**, **Fatemeh Tavakoli**, **Angelo Sassaroli, Sergio Fantini,** Tufts Univ. (United States)

13314-15 • 3:20 PM - 3:40 PM
Development of an optical sensor for real-time monitoring of hemodynamic parameters in ECMO settings
Author(s): **Osama Elgabori**, **William B. Scammon**, **Kelly R. Strong**, **Keith Cook, Jana M. Kainerstorfer,** Carnegie Mellon Univ. (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 4: SFDI AND DIFFUSE REFLECTANCE

27 January 2025 • 4:10 PM - 6:00 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Quing Zhu**, Washington Univ. in St. Louis (United States)

13314-17 • 4:10 PM - 4:40 PM
Structured light imaging mesoscopy to assess skin involvement in scleroderma *(Invited Paper)*
Author(s): **Aarohi M. Mehendale,** Boston Univ. (United States); **Mahsa Parsanasab,** Univ. of California, Irvine (United States); **Kavon Karrobi,** Boston Univ. (United States); **Vasan Venugopalan,** Univ. of California, Irvine (United States); **Darren Roblyer,** Boston Univ. (United States)

13314-20 • 4:40 PM - 5:00 PM
Structured Light Imaging Mesoscopy for detection of embedded morphological changes in superficial tissues
Author(s): **Mahsa Parsanasab,** Univ. of California, Irvine (United States); **Aarohi Mehendale,** Boston Univ. (United States); **Kavon Karrobi,** Boston University (United States); **Darren Roblyer,** Boston Univ. (United States); **Vasan Venugopalan,** Univ. of California, Irvine (United States)

13314-18 • 5:00 PM - 5:20 PM
Computational defocus correction in spatial frequency domain imaging
Author(s): **Dylan Dao**, **Jie Jiao**, **Lindsay Kuramoto, Ofer Levi,** Univ. of Toronto (Canada)

13314-19 • 5:20 PM - 5:40 PM
Speckle noise reduction in coherent spatial frequency domain imaging
Author(s): **Jie Jiao**, **Sidy Ndiongue**, **Dylan Dao**, **Maria A. Betty**, **Lindsay Kuramoto, Ofer Levi,** Univ. of Toronto (Canada)

13314-21 • 5:40 PM - 6:00 PM
Investigating chromophore changes in bruised skin In vivo using diffuse reflectance spectroscopy and Monte Carlo simulation
Author(s): **Ting You Liu**, **Kung-Bin Sung,** National Taiwan Univ. (Taiwan); **Szu-Yu Chen, Tzu-Yang Hsu,** National Central Univ. (Taiwan)

Tuesday 28 January 2025

SESSION 5: TIME-DOMAIN METHODS AND APPLICATIONS

28 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Antonio Pifferi**, Politecnico di Milano (Italy)

13314-22 • 8:00 AM - 8:20 AM
Spatial resolution of parameterized temporal data in ℓ0-norm based time-domain diffuse optical tomography (td-dot)
Author(s): **Lara Pinar**, **Andreas H. Hielscher, Stephen Kim,** New York Univ. (United States)

13314-23 • 8:20 AM - 8:40 AM
Multiplying the number of effective channels in time-domain single-photon counting applications
Author(s): **Abhirami Krishnan**, **Elisabetta Avanzi**, **Laura Di Sieno**, **Alberto Dalla Mora**, **Antonio Pifferi, Ilaria Bargigia,** Politecnico di Milano (Italy)

13314-24 • 8:40 AM - 9:00 AM
Compressive illumination architecture for hyperspectral time-resolved near-infrared tissue spectroscopy
Author(s): **Natalie C. Li, Mamadou Diop,** Western Univ. (Canada)

13314-25 • 9:00 AM - 9:20 AM
Large source-detector distance time-resolved measurements to probe adult lungs non-invasively
Author(s): **Giulia Maffeis**, **Nicola Serra**, **Alessandro Bossi**, **Elisabetta Avanzi**, **Rinaldo Cubeddu**, **Alberto D. Dalla Mora**, **Laura Di Sieno**, **Antonio Pifferi, Paola Taroni,** Politecnico di Milano (Italy)

13314-26 • 9:20 AM - 9:40 AM
Measurement of placental depth during time domain NIRS using deep learning
Author(s): **Jack Highton**, **Frédéric Lange**, **Musa Talati,** Univ. College London (United Kingdom); **Dimitrios Airantzis,** Univ. College London (United Kingdom), Univ. of London (United Kingdom); **Temisan Ilwuke,** Univ. College London (United Kingdom); **Uzair Hakim,** University College London (United Kingdom); **Danial Chitnis,** Univ. College London (United Kingdom); **Niccole Ranaei-Zamani**, **Anna L. David**, **Dimitrios Siassakos**, **Rosalind Aughwane**, **Sara Hillman**, **Olayinka Kowobari**, **Subhabrata Mitra,** EGA Institute for Women's Health, Univ. College London (United Kingdom); **Ilias Tachtsidis,** Univ. College London (United Kingdom)

13314-27 • 9:40 AM - 10:00 AM
Modeling of time domain diffuse Raman spectroscopy in a two-layer medium
Author(s): **Alessandro Bossi**, **Valerio Gandolfi**, **Andrea Farina**, **Ilaria Bargigia**, **Antonio Pifferi,** Politecnico di Milano (Italy); **Stefan Šušnjar,** SpectraCure AB (Sweden); **Federico Tommasi**, **Lorenzo Fini**, **Naseer Kammalamuriyil, Fabrizio Martelli,** Univ. degli Studi di Firenze (Italy)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: BREAST IMAGING

28 January 2025 • 10:30 AM - 12:40 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Stefan A. Carp**, Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

13314-28 • 10:30 AM - 11:00 AM
Reduction of benign breast biopsies using adjunct US-guided diffuse optical tomography *(Invited Paper)*
Author(s): **Quing Zhu,** Washington Univ. in St. Louis (United States)

13314-29 • 11:00 AM - 11:20 AM
Prospective study of quantitative broadband diffuse optical spectroscopy for differential diagnosis of suspicious breast lesions
Author(s): **Ana Flavia Borges de Almeida Barreto**, **Roy Stillwell**, **Chris Campbell**, **Alicia Y. Wei**, **Ola Abdalsalam,** Univ. of Notre Dame (United States); **Alice M. Police,** Northwell Health, Inc. (United States); **Thomas D. O'Sullivan,** Univ. of Notre Dame (United States)

13314-30 • 11:20 AM - 11:40 AM
Multimodal deep convolutional neural network based optical tomographic image reconstruction for enhanced contrast recovery in small breast lesions
Author(s): **Bin Deng**, **Christopher P. Bridge, Stefan A. Carp,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States), Harvard Medical School (United States)

13314-31 • 11:40 AM - 12:00 PM
A dual-transformer model for assessing pathological complete response in breast cancer
Author(s): **Quing Zhu, Yun Zou,** Washington Univ. in St. Louis (United States)

13314-32 • 12:00 PM - 12:20 PM
Errors induced by partial pathlength variations due to mammographic compression in dynamic diffuse optical breast imaging
Author(s): **Kaiser Niknam**, **Mannu Bardhan Paul**, **Anthony Donaldson, Mini Das,** Univ. of Houston (United States)

13314-33 • 12:20 PM - 12:40 PM
Improving the quality of diffuse optical tomography reconstruction with APU-Net: an attention-based physical U-Net model
Author(s): **Minghao Xue,** Washington Univ. in St. Louis (United States)

Lunch Break 12:40 PM - 2:10 PM

SESSION 7: BRAIN I

28 January 2025 • 2:10 PM - 3:40 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Lorenzo Spinelli**, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13314-34 • 2:10 PM - 2:40 PM
Optical biomarkers for sepsis-related microcirculatory impairment *(Invited Paper)*
Author(s): **Rasa Eskandari**, **Stephanie Milkovich**, **Farah Kamar**, **Daniel Goldman**, **Donald Welsh**, **Christopher G. Ellis, Mamadou Diop,** Western Univ. (Canada)

13314-35 • 2:40 PM - 3:00 PM
Reproducibility of a hybrid time-resolved NIRS/DCS system: towards daily cerebral metabolism monitoring in the ICU
Author(s): **Farah Kamar**, **Saeed Samaei**, **Rasa Eskandari**, **Leena N. Shoemaker**, **Daniel Milej**, **Mamadou Diop, Keith St. Lawrence,** Western Univ. (Canada)

13314-36 • 3:00 PM - 3:20 PM
Monte Carlo simulations of time-of-flight resolved blood flow index: times-of-flight beyond 1 ns permit selective measurement of pulsatile cerebral blood flow
Author(s): **Dominic Hill**, **Alex Antrobus**, **Rachel Prudden**, **Stella Avtzi**, **Anurag Behera**, **Octave Etard**, **Yuqian Zhang**, **Alexandra Tran-Van-Minh**, **Alexander Ruesch**, **Dawid Borycki**, **Matthew T. Valley, Robert J. Cooper,** CoMind Technologies Ltd. (United Kingdom)

13314-37 • 3:20 PM - 3:40 PM
Dual-slope near-infrared spectroscopy for selective sensitivity to cerebral hemodynamics
Author(s): **Jodee Frias**, **Giles Blaney**, **Fatemeh Tavakoli**, **Angelo Sassaroli, Sergio Fantini,** Tufts Univ. (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 8: BRAIN II

28 January 2025 • 4:10 PM - 5:20 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Hamid Dehghani**, Univ. of Birmingham (United Kingdom)

13314-38 • 4:10 PM - 4:40 PM
NeuroDOT: a Matlab and Python toolbox for diffuse optical tomographic brain mapping *(Invited Paper)*
Author(s): **Emma L. Speh**, **Yash Thacker**, **Ari Segel**, **Daniel Marcus**, **Muriah Wheelock, Adam T. Eggebrecht,** Washington Univ. in St. Louis (United States)

13314-39 • 4:40 PM - 5:00 PM
High framerate FD-fNIRS for auditory-inspired speech hemodynamic response function
Author(s): **Biao Zheng**, **Hamid Dehghani, Hyojin Park,** Univ. of Birmingham (United Kingdom)

13314-40 • 5:00 PM - 5:20 PM
Experimental evidence for anisotropic diffusion of light in white matter tissue
Author(s): **Ernesto Pini,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Danila Di Meo,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Irene Costantini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Michele Sorelli,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Alexander Gatto**, **Henrik Schäfer,** Sony Europe B.V. (Germany); **Francesco Saverio Pavone,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Diederik Sybolt Wiersma,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ricerca Metrologica (Italy); **Lorenzo Pattelli,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ricerca Metrologica (Italy)

CONFERENCE 13315

Visualizing and Quantifying Drug Distribution in Tissue IX

25 January 2025 | Moscone South, Room 205 (Level 2)

Conference Chair(s): **Kin Foong Chan,** Simpson Interventions, Inc. (United States); **Conor L. Evans,** Wellman Ctr. for Photomedicine (United States)

Program Committee: **Zane A. Arp,** U.S. Food and Drug Administration (United States); **Eric G. Solon,** Madrigal Pharmaceuticals, Inc. (United States); **Alex J. Walsh,** Texas A&M Univ. (United States); **Cristina L. Zavaleta,** The Univ. of Southern California (United States)

Saturday 25 January 2025

SESSION 1: PHARMACOKINETIC AND PHARMACODYNAMIC TOMOGRAPHY: IN VIVO AND TRANSLATIONAL RESEARCH

25 January 2025 • 8:25 AM - 9:20 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States); **Kin F. Chan**, Simpson Interventions (United States)

13315-1 • 8:25 AM - 8:35 AM
Visualizing and quantifying drugs in tissue
Author(s): **Conor L. Evans,** Wellman Ctr. for Photomedicine (United States)

13315-3 • 8:35 AM - 8:55 AM
Monitoring the delivery of tazarotene into human sebaceous glands using Stimulated Raman spectroscopy (SRS) microscope
Author(s): **Ting Chean Khoo,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Univ. (United States)

13315-5 • 8:55 AM - 9:20 AM
Cell-to-clinic label-free multimodal optical imaging for visualizing drug delivery, distribution, and dynamics in cells and tissues *(Invited Paper)*
Author(s): **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

Coffee Break 9:20 AM - 9:40 AM

SESSION 2: PHARMACOKINETIC AND PHARMACODYNAMIC TOMOGRAPHY IN EX VIVO AND IN VITRO RESEARCH

25 January 2025 • 9:40 AM - 11:35 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Kin F. Chan**, Simpson Interventions (United States); **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States)

13315-6 • 9:40 AM - 10:05 AM
Combining vibrational and fluorescence microscopies with mass spectrometry imaging for visualization of drug delivery *(Invited Paper)*
Author(s): **Natalie Belsey**, **Dimitrios Tsikritsis**, **Camilla Dondi**, **Jean-Luc Vorng**, **Alex Dexter, Mike Shaw,** National Physical Lab. (United Kingdom)

13315-7 • 10:05 AM - 10:30 AM
Antibody-dye conjugates highlight MUC16 expression in pancreatic PDX tumor models. *(Invited Paper)*
Author(s): **Aaron M. Mohs**, **Evie G. Ehrhorn, Kathryn M. Muilenburg,** Univ. of Nebraska Medical Ctr. (United States)

13315-8 • 10:30 AM - 10:55 AM
Raman-active polymers for drug-delivery and quantification *(Invited Paper)*
Author(s): **Yanqing Han**, **Ellen Poot**, **Annabel Black**, **Spyros Letsios**, **Martin Lee**, **Valerie G. Brunton, Alison N. Hulme,** The Univ. of Edinburgh (United Kingdom)

13315-9 • 10:55 AM - 11:15 AM

Label-free imaging of topical drugs based on multivariate analysis and sparse spectral sampling stimulated Raman scattering (S4RS) microscopy
Author(s): **Dandan Tu**, **Jackson Riseman**, **Yuxiao Wei,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Univ. (United States); **Priyanka Ghosh**, **Sameersingh G. Raney**, **Markham C. Luke,** U.S. Food and Drug Administration (United States); **Conor L. Evans,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Univ. (United States)

13315-10 • 11:15 AM - 11:35 AM
Antibody-to-imaging pipeline to monitor target engagement in breast tumors
Author(s): **Margarida M. Barroso**, **Amit Verma**, **Cay Sherry,** Albany Medical College (United States); **Nanxue Yuan**, **Vikas Pandey,** Rensselaer Polytechnic Institute (United States); **Tynan Young,** City of Hope (United States); **John Williams,** City of Hope Beckman Research Institute (United States); **Xavier Intes,** Rensselaer Polytechnic Institute (United States)

Lunch Break 11:35 AM - 1:05 PM

SESSION 3: NOVEL MODEL AND SCREENING TOOLS FOR DRUG DEVELOPMENT

25 January 2025 • 1:05 PM - 1:50 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Ting Chean Khoo**, Wellman Ctr. for Photomedicine (United States)

13315-11 • 1:05 PM - 1:30 PM
Applications of simultaneous label-free autofluorescence multiharmonic microscopy technique in drug development programs *(Invited Paper)*
Author(s): **Aneesh Alex,** GlaxoSmithKline (United States); **Kayvan F. Tehrani,** Eleuthra Photonics Inc. (United States); **Terrence Roh,** GlaxoSmithKline (United States); **Jindou Shi,** Univ. of Illinois (United States); **Remben Talaban,** GlaxoSmithKline (United Kingdom); **Hyundae Hong,** GlaxoSmithKline (United States); **Mantas Žurauskas,** Univ. of Illinois (United States); **Minh Doan,** GlaxoSmithKline (United States); **Steve R. Hood,** GlaxoSmithKline (United Kingdom); **Prabhakar Pandian,** GlaxoSmithKline (United States); **Stephen A. Boppart,** Univ. of Illinois (United States); **Reid M. Groseclose,** GlaxoSmithKline (United States)

13315-13 • 1:30 PM - 1:50 PM
Assessment of anti-cancer drugs in 3D in vitro models using OCT-derived quantitative metrics
Author(s): **Gavrielle R. Untracht**, **Othilia Wagner,** Technical Univ. of Denmark (Denmark); **Jan Kaminski**, **Katrine Hommelhoff Jensen,** Alexandra Institute A/S (Denmark); **Boye Schnack Nielsen**, **Kim Holmstrøm,** Bioneer A/S (Denmark); **Peter E. Andersen,** Technical Univ. of Denmark (Denmark)

Coffee Break 1:50 PM - 2:10 PM

SESSION 4: PANEL DISCUSSION: VISUALIZING AND QUANTIFYING DRUG DISTRIBUTION IN TISSUE

25 January 2025 • 2:10 PM - 2:55 PM | Moscone South, Room 205 (Level 2)
Join the Visualizing and Quantifying Drug Distribution in Tissue IX conference for a panel discussion on the future of pharmacokinetic and pharmacodynamic technologies in academia and industry.

Moderators:
Conor Evans, Wellman Ctr. for Photomedicine
Kin F. Chan, Simpson Interventions

Panelists:
Eric G. Solon, Madrigal Pharmaceuticals, Inc.
Stephen A. Boppart , Beckman Institute for Advanced Science and Technology
Aneesh Alex, GlaxoSmithKline

SESSION 5: ADVANCED METHODS IN PK AND PD IMAGING

25 January 2025 • 2:55 PM - 5:10 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Kin F. Chan**, Simpson Interventions (United States); **Conor L. Evans**, Wellman Ctr. for Photomedicine (United States)

13315-15 • 2:55 PM - 3:20 PM
Intracellular NAD+ regulation from microneedles *(Invited Paper)*
Author(s): **Yousuf Mohammed**, **Masood Ali**, **David Liu,** The Univ. of Queensland (Australia); **Tushar Kumeria,** The Univ. of New South Wales (Australia); **Sarika Namjoshi,** The Univ. of Queensland (Australia); **Heather A. E. Benson,** Curtin Univ. (Australia)

13315-16 • 3:20 PM - 3:45 PM
Aggregation-induced DNA fluorescence for the label-free detection of programmed necrosis *(Invited Paper)*
Author(s): **Yiling Hu, Tzu-Ming Liu,** Univ. of Macau (Macao, China)

13315-17 • 3:45 PM - 4:05 PM
New depths of cutaneous pharmacokinetic tomography: adaptive optics integrated with stimulated Raman scattering microscopy
Author(s): **Saara Luna,** Harvard Univ. (United States), Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States)

13315-18 • 4:05 PM - 4:25 PM
Multiscale photoacoustic imaging of drugs
Author(s): **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13315-19 • 4:25 PM - 4:45 PM
Analyzing drug delivery and efficacy in a murine model of traumatic brain injury imaged with 3D open-top light-sheet microscopy
Author(s): **Qinghua Han**, **David R. Brenes**, **Jonathan T. C. Liu**, **Suzie Pun**, **Nathan White, Drew L. Sellers,** Univ. of Washington (United States)

13315-20 • 4:45 PM - 5:10 PM
Quantifying receptor occupancy of molecular therapy in vivo *(Invited Paper)*
Author(s): **Kimberley S. Samkoe,** Thayer School of Engineering at Dartmouth (United States); **Yichen Feng,** Dartmouth College (United States); **Cody Rounds,** Illinois Institute of Technology (United States); **Sassan Hodge,** Thayer School of Engineering at Dartmouth (United States); **Kenneth Tichauer,** Illinois Institute of Technology (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

CONFERENCE 13316

Optical Diagnostics and Sensing XXV: Toward Point-of-Care Diagnostics

27 - 28 January 2025 | Moscone South, Room 304 (Level 3)

Conference Chair(s): **Gerard L. Coté,** Texas A&M Univ. (United States); **Justin S. Baba,** Vanderbilt Univ. (United States)

Program Committee: **Zane A. Arp,** U.S. Food and Drug Administration (United States); **Justin S. Baba,** Vanderbilt Univ. (United States); **Brent D. Cameron,** The Univ. of Toledo (United States); **Hatice Ceylan Koydemir,** Texas A&M Univ. (United States); **Blaž Cugmas,** Univ. of Latvia (Latvia); **H. Michael Heise,** Fachhochschule Südwestfalen (Germany); **Kristen C. Maitland,** Chan Zuckerberg Initiative (United States); **Michael J. McShane,** Texas A&M Univ. (United States); **Timothy J. Muldoon,** Univ. of Arkansas (United States); **Aydogan Ozcan,** Univ. of California, Los Angeles (United States); **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Babak Shadgan,** International Collaboration On Repair Discoveries (Canada)

Monday 27 January 2025

SESSION 1: DIFFUSE SPECKLE FOR BLOOD FLOW APPLICATIONS

27 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Gerard L. Coté**, Texas A&M Univ. (United States)

13316-1 • 8:00 AM - 8:20 AM
Correlating stroke risk with non-invasive tracing of brain blood dynamic via a portable speckle contrast optical spectroscopy laser device
Author(s): **Yu Xi Huang, Simon Mahler,** Caltech (United States)

13316-2 • 8:20 AM - 8:40 AM
Wearable pulse-mode fiber-free diffuse speckle contrast flowmetry (PM-DSCF) sensor for deep cerebral blood flow measurements
Author(s): **Chaebeom Yeo**, **Chowdhury Azimul Haque, Guoqiang Yu,** Univ. of Kentucky (United States)

13316-3 • 8:40 AM - 9:00 AM
Six-channel laser device for cerebral blood flow and volume measurement with potential application in traumatic brain injury detection
Author(s): **Simon Mahler**, **Yu Xi Huang, Changhuei Yang,** Caltech (United States)

13316-4 • 9:00 AM - 9:20 AM
Wearable fiber-free optical sensor for continuous monitoring of cerebral blood flow (CBF) responses to intracranial pressure (ICP) elevations in rats
Author(s): **Pegah N. Safavi**, **Chaebeom Yeo**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13316-5 • 9:20 AM - 9:40 AM
Quantitative estimation of blood loss volume using laser speckle flow index signals from a wireless wearable device
Author(s): **Francesca Bonetta-Misteli**, **Toi Collins**, **Todd Pavek**, **Madison P. Carlgren**, **Antonina Frolova**, **Leonid Shmuylovich**, **Peinan Zhao, Christine M. O'Brien,** Washington Univ. in St. Louis (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 2: DIFFUSE SPECKLE FOR BLOOD FLOW IMAGING AND BLOOD FLOW APPLICATIONS

27 January 2025 • 10:10 AM - 11:30 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Justin S. Baba**, Vanderbilt Univ. (United States)

13316-6 • 10:10 AM - 10:30 AM
Speckle contrast optical spectroscopy improves cuffless blood pressure estimation compared to photoplethysmography
Author(s): **Ariane Garrett**, **Byungchan Kim,** Boston Univ. (United States); **Nil Z. Gurel**, **Edbert Sie,** Meta (United States); **David Boas, Darren Roblyer,** Boston Univ. (United States)

13316-7 • 10:30 AM - 10:50 AM
Full-field amplitude speckle decorrelation angiography: a simple and cost-effective technique for skin microvascular imaging
Author(s): **Giulia Mansutti**, **Martin Villiger,** Massachusetts General Hospital (United States); **Brett E. Bouma,** Massachusetts General Hospital (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Néstor Uribe-Patarroyo,** Massachusetts General Hospital (United States)

13316-8 • 10:50 AM - 11:10 AM
Noninvasive and continuous monitoring of cerebral blood flow (CBF) responses to intermittent hypoxia (IH) in neonatal rats
Author(s): **Pegah N. Safavi**, **Chowdhury Azimul Haque**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13316-9 • 11:10 AM - 11:30 AM
Blood flow detection system based on diffused speckle comparative analysis
Author(s): **Ting Li, Chenxi Yang,** Chinese Academy of Medical Sciences & Peking Union Medical College (China)

Lunch Break 11:30 AM - 1:00 PM

SESSION 3: PULSE OXIMETRY WITH SKIN TONE VARIATIONS

27 January 2025 • 1:00 PM - 2:20 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Gerard L. Coté**, Texas A&M Univ. (United States)

13316-11 • 1:00 PM - 1:20 PM
Development of a melanin-inclusive reflective pulse oximeter model for equitable performance tested in a large animal model undergoing hypoxia: pilot study
Author(s): **Megh H. Rathod,** Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada); **Samantha Unger,** Univ. of Toronto (Canada); **Heather J. Ross,** Univ. Health Network (Canada), Univ. of Toronto (Canada); **Leo Shmuylovich**, **Mitchell Pet,** Washington Univ. School of Medicine in St. Louis (United States); **Daniel Franklin,** Univ. of Toronto (Canada), Ted Rogers Ctr. for Heart Research (Canada)

13316-12 • 1:20 PM - 1:40 PM
Leveraging the naturally occurring spotted pigmentation of Hampshire swine to assess the impact of skin pigmentation on pulse oximeters and other light-based medical devices
Author(s): **Mitchel Pet**, **Amanda Westman**, **Anmol Jarang**, **Michael Butler**, **Joe Ribaudo,** Washington Univ. School of Medicine in St. Louis (United States); **Megh Rathod**, **Daniel Franklin,** Univ. of Toronto (Canada); **Maurice Retout**, **Jesse Jokerst,** Univ. of California, San Diego (United States); **Leonid Shmuylovich,** Washington Univ. School of Medicine in St. Louis (United States)

13316-13 • 1:40 PM - 2:00 PM
Improving noninvasive fetal pulse oximetry using N-layer analysis techniques for extraction of deep layer absorption change from silicon-based phantoms
Author(s): **Lane E. Breshears**, **Martin Debreczeny**, **Neil Ray,** Raydiant Oximetry, Inc. (United States); **Katarzyna Komolibus,** Tyndall National Institute (Ireland)

13316-14 • 2:00 PM - 2:20 PM
Examining the potential of short-wave infrared wavelengths to minimize bias in wearable health monitoring
Author(s): **Melissa J. Watt**, **Thomas R. Else**, **Ran Tao**, **Janek Gröhl, Sarah E. Bohndiek,** Univ. of Cambridge (United Kingdom)

Coffee Break 2:20 PM - 2:50 PM

SESSION 4: NEAR INFRARED IMAGING AND SPECTROSCOPY APPLICATIONS

27 January 2025 • 2:50 PM - 4:50 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Justin S. Baba**, Vanderbilt Univ. (United States)

13316-15 • 2:50 PM - 3:10 PM
Assessing inflammation in the proximal interphalangeal joints of systemic lupus erythematosus patients with a flexible optical imaging system
Author(s): **Moegammad A. Bardien**, **Alessandro Marone,** New York Univ. (United States); **Leila Khalili**, **Wei Tang,** Columbia Univ. (United States); **Stephen H. K. Kim**, **Anca D. Askanase, Andreas H. Hielscher,** New York Univ. (United States)

13316-16 • 3:10 PM - 3:30 PM
Non-invasive detection of craniosynostosis using SWIR imaging for real-time evaluation
Author(s): **Brandon Lee,** Princeton University (United States), Children's National Hospital (United States); **Bo Ning,** Children's National Hospital (United States); **Richard J. Cha,** Children's National Hospital (United States), The George Washington Univ. (United States)

13316-17 • 3:30 PM - 3:50 PM
Machine learning-enhanced wavelength detection for point-of-care optical devices in tissue oxygenation and peripheral arterial disease assessment
Author(s): **Vedanshi Patel**, **John Hanks, Amir Tofighi Zavareh,** Texas A&M Univ. (United States)

13316-18 • 3:50 PM - 4:10 PM
Development of a wearable short-wave infrared photoplethysmography sensor to non-invasively detect and monitor hemodilution during postpartum hemorrhage
Author(s): **Hannah Gruensfelder,** Washington Univ. in St. Louis (United States); **Kimberly Branan,** Texas A&M Univ. (United States); **Folaoluwashewa G. Shofu**, **Francesca Bonetta-Misteli**, **Shilpita Mitra-Behura**, **George Mitrev**, **Antonina Frolova,** Washington Univ. in St. Louis (United States); **Justin McMurray,** Texas A&M Univ. (United States); **Leonid Shmuylovich,** Washington Univ. in St. Louis (United States); **Gerard Coté,** Texas A&M Univ. (United States); **Christine M. O'Brien,** Washington Univ. in St. Louis (United States)

13316-19 • 4:10 PM - 4:30 PM
Preliminary study to validate the use of dynamic optical spectroscopy to monitor oxygen saturation changes in the carotid artery
Author(s): **Nisha Maheshwari**, **Lokesh Sharma**, **Stephen H. K. Kim**, **Alessandro Marone,** New York Univ. (United States); **Albert Favate,** NYU Grossman School of Medicine (United States); **Andreas Hielscher,** New York Univ. (United States)

13316-20 • 4:30 PM - 4:50 PM
wearable health monitoring system using multispectral sensing with visible and near-infrared light
Author(s): **Dongsheng Li, Ting Li,** Chinese Academy of Medical Sciences & Peking Union Medical College (China)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13316-36 • 5:30 PM - 7:00 PM
Spatially multiplexed glucose, oxygen, and temperature sensing through synthetic tissue phantoms
Author(s): **Brian Ko**, **Ridhi Pradhan,** Texas A&M Univ. (United States); **Artem Goncharov**, **Zoltan Gorocs,** Univ. of California, Los Angeles (United States); **Ajmal Ajmal**, **Andres Rodriguez**, **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Aydogan Ozcan,** Univ. of California, Los Angeles (United States); **Michael J. McShane,** Texas A&M Univ. (United States)

13316-37 • 5:30 PM - 7:00 PM
In vivo bone health assessment across a broad age range using photoacoustic and quantitative ultrasound (PAQUS)
Author(s): **Zhanpeng Xu,** Univ. of Michigan (United States); **Duane Kaufman**, **Rich Hogle,** IF, LLC (United States); **Kenneth Kozloff,** Univ. of Michigan (United States); **Rich Morris,** IF, LLC (United States); **Xueding Wang,** Univ. of Michigan (United States)

13316-38 • 5:30 PM - 7:00 PM
Tissue curvature correction of irregular surfaces in NIRS imaging using Monte Carlo simulation
Author(s): **Himaddri Shakhar Roy**, **Charles P. Policard**, **Kacie Kaile, Anuradha Godavarty,** Florida International Univ. (United States)

13316-39 • 5:30 PM - 7:00 PM
Localized surface plasmon resonance biosensing for the detection of antigen-85 protein for active tuberculosis diagnosis
Author(s): **Charles P. Maphanga**, **Sinegugu Nzuza**, **Sipho Chauke**, **Mabotse Tjale**, **Saturnin Ombinda-Lemboumba, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

13316-40 • 5:30 PM - 7:00 PM
Exploiting surface plasmon resonance and aptasensors for enhanced tuberculosis diagnostics
Author(s): **Mabotse Tjale**, **Charles Maphanga**, **Saturnin Ombinda-Lemboumba**, **Sipho Chauke**, **Sinegugu Nzuza, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

13316-41 • 5:30 PM - 7:00 PM
Fluorescence based optical diagnostic of caries: toward a point of care device
Author(s): **Priscilla C.B. V. Souza**, **Andrea M. R. Gomes**, **Alyson J. A. Carvalho,** Univ. Federal de Pernambuco (Brazil); **Victoria G. Queiroz,** Univ. de Pernambuco (Brazil); **Pedro H. S. Sena**, **José R. M. Silva,** Ctr. Univ. Tabosa de Almeida (Brazil); **Debora H. S. Brito**, **Aronita Rosenblatt**, **Denise V. Santos,** Univ. de Pernambuco (Brazil); **Patricia L. A. Nascimento,** Univ. de Pernambuco (Brazil), Ctr. Univ. Tabosa de Almeida (Brazil); **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil); **Cláudia C.B. O. Mota,** Ctr. Univ. Tabosa de Almeida (Brazil), Univ. de Pernambuco (Brazil)

13316-42 • 5:30 PM - 7:00 PM
Integration of single photon avalanche detector (SPAD) on a CMOS nano fluidic platform for fluorescence labeled single biomolecules detection and imaging
Author(s): **Ahmed Zikrallah**, **Jaehwan Kim,** Massachusetts Institute of Technology (United States); **Danielius Kramnik,** Univ. of California, Berkeley (United States); **Rajeev J. Ram,** Massachusetts Institute of Technology (United States)

13316-43 • 5:30 PM - 7:00 PM
highly ordered self-assembled monolayer of nanoparticles film as a SERS-active substrate for quantitative acute myocardial infarction diagnosis
Author(s): **Yen-Pei Lin,** National Central Univ. (Taiwan); **I-Hsuan Chou,** National Tsing Hua Univ. (Taiwan); **E-Ping Tsai**, **Sanskruti Swain**, **Ting Yi Lin**, **Yun-Jung Ting**, **Hsing-Ying Lin, Chen-Han Huang,** National Central Univ. (Taiwan)

13316-44 • 5:30 PM - 7:00 PM
Single-molecule DNA diagnostics enhanced by image processing and digital PCR on track-etched membrane
Author(s): **Yun-Jung Ting,** National Central Univ. (Taiwan); **I-Hsuan Chou,** National Central Univ. (Taiwan), National Tsing Hua Univ. (Taiwan); **E-Ping Tsai**, **Yen-Pei Lin**, **Sanskruti Swain,** National Central Univ. (Taiwan); **Hsing-Ying Lin,** National Tsing Hua Univ. (Taiwan); **Ting-Yi Lin, Chen-Han Huang,** National Central Univ. (Taiwan)

13316-45 • 5:30 PM - 7:00 PM
Fluorescence lifetime spectroscopy of hemoglobin
Author(s): **Vsevolod Cheburkanov**, **Mykyta Kizilov, Vladislav Yakovlev,** Texas A&M Univ. (United States)

13316-46 • 5:30 PM - 7:00 PM
Compact band-pass Raman spectroscopy unlocks non-invasive continuous glucose monitoring
Author(s): **Arianna Bresci**, **Youngkyu Kim,** Massachusetts Institute of Technology (United States), Apollon Inc. (United States); **Miyeon Jue,** Apollon Inc. (Korea, Republic of); **Peter T. C. So, Jeon Woong Kang,** Massachusetts Institute of Technology (United States)

13316-55 • 5:30 PM - 7:00 PM
Toward a 'wear-and-forget' long-term biosensing platform based on upconversion luminescent nanomaterials
Author(s): **Kiang Wei Kho**, **Gavin Byrne**, **Sanathana Konugolu,** Tyndall National Institute (Ireland); **Jean de Souza Matias,** Univ. College Cork (Ireland); **Walter Messina**, **Simon Riou, Stefan Andersson-Engels,** Tyndall National Institute (Ireland)

13316-57 • 5:30 PM - 7:00 PM
Integrating SERS with machine learning for efficient clinical differentiation of SARS-CoV2 Variants using label-free Silver nanorods (LF-AgNRs) fabricated with GLAD
Author(s): **Sneha Senapati**, **Arvind Kaushik, J.P. Singh,** Indian Institute of Technology Delhi (India)

13316-58 • 5:30 PM - 7:00 PM
Detection of Mycobacterium tuberculosis in human saliva using Raman spectroscopy
Author(s): **Alec B. Walter**, **Luke Whitehead**, **Amelia Taylor, Andrea K. Locke,** Vanderbilt Univ. (United States)

13316-60 • 5:30 PM - 7:00 PM
The dermocytoscope: a breakthrough application specific endocytoscope (ASEC) for affordable and portable skin cancer diagnostics
Author(s): **FengQing Sun,** Everest Imaging, LLC (United States); **Chengshui Chen,** Quzhou People's Hospital, The Quzhou Affiliated Hospital of Wenzhou Medical Univ. (China); **Feng Lin,** Everest Imaging, LLC (United States); **Lefu Chen,** Nassau Univ. Medical Ctr. (United States); **Yang Yang Li,** City Univ. of Hong Kong (Hong Kong, China); **Jianhong Zhang**, **Lingyan Shen**, **Yihong Wu,** Everest Imaging, LLC (United States); **Jiaru Shi,** The First Affiliated Hospital of Wenzhou Medical Univ. (China); **Yuting Zhang,** Quzhou People's Hospital, The Quzhou Affiliated Hospital of Wenzhou Medical Univ. (China); **Hongkun Li,** City Univ. of Hong Kong (Hong Kong, China); **Yuting Lin,** Quzhou People's Hospital (China)

13316-24 • 5:30 PM - 7:00 PM
3D-printed microfluidic platforms integrating bioorthogonal magneto-plasmonic nanoclusters for analytes separation and SERS-biosensing
Author(s): **Greta Feregotto,** Consiglio Nazionale delle Ricerche (CNR) (Italy); **Claudia Capitini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Martino Calamai,** Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Beatrice Muzzi,** Istituto di Chimica dei Composti OrganoMetallici (Italy); **Francesco Saverio Pavone,** Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Caterina Dallari**, **Caterina Credi,** Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Francesco Mattii,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

Tuesday 28 January 2025

SESSION 5: RAMAN AND SURFACE ENHANCED RAMAN FOR IN VITRO DIAGNOSTICS AND MONITORING

28 January 2025 • 9:00 AM - 10:00 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Gerard L. Coté**, Texas A&M Univ. (United States)

13316-21 • 9:00 AM - 9:20 AM
Enhancing safety for infusion treatment in oncology through a data-driven multisensory approach based on optical methods
Author(s): **Florian Wieduwilt,** Institut für Nanophotonik Göttingen e.V. (Germany), Univ. Kassel (Germany); **Jan Geweke**, **Fabian Merker-Müller,** Institut für Nanophotonik Göttingen e.V. (Germany); **Helen Linxweiler**, **Rita Marina Heeb,** Johannes Gutenberg Univ. Mainz (Germany); **Georgios Ctistis, Hainer Wackerbarth,** Institut für Nanophotonik Göttingen e.V. (Germany)

13316-25 • 9:20 AM - 9:40 AM
Amplification-free direct plasmonic biosensing of dysregulated circulating miRNAs for rapid disease detection
Author(s): **Aidan Canning**, **Tyler Vasse, Tuan Vo-Dinh,** Duke Univ. (United States)

13316-26 • 9:40 AM - 10:00 AM
SERS sensor for ultrasensitive detection of lung disease-specific synthetic breath biomarkers
Author(s): **Marissa Morales**, **Aashini Shah**, **Aditya Garg**, **Jia Dong**, **Daniel Kim**, **Heather Fleming**, **Sangeeta Bhatia, Loza Tadesse,** Massachusetts Institute of Technology (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: IN VITRO OPTICAL DIAGNOSTIC AND MONITORING APPROACHES

28 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Justin S. Baba**, Vanderbilt Univ. (United States)

13316-27 • 10:30 AM - 10:50 AM
Comprehensive coagulation profiling in patients with iCoagLab using 3D passive microfluidic cartridges
Author(s): **Daniel Hoare**, **Chloe Melville**, **Nathaniel Hai, Seemantini Nadkarni,** Massachusetts General Hospital, Harvard Medical School (United States)

13316-28 • 10:50 AM - 11:10 AM
High throughput evanescent-wave biosensor for the early-stage detection of biomarkers in liquid biopsies
Author(s): **Caterina Dallari,** Istituto Nazionale di Ottica (Italy); **Laura Perego,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Lucia Gardini**, **Caterina Credi,** Istituto Nazionale di Ottica (Italy); **Francesco S. Pavone,** Univ. degli Studi di Firenze (Italy)

13316-29 • 11:10 AM - 11:30 AM
Evaluation of antigen-85 protein using surface plasmon resonance for active tuberculosis diagnosis
Author(s): **Charles Maphanga**, **Sinegugu Nzuza**, **Sipho Chauke**, **Mabotse Tjale**, **Saturnin Ombinda-Lemboumba, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

13316-30 • 11:30 AM - 11:50 AM
Evaluation of aptamer-based optical biosensing for TB diagnostics
Author(s): **Mabotse Tjale**, **Charles Maphanga**, **Saturnin Ombinda-Lemboumba**, **Sipho Chauke**, **Sinegugu Nzuza, Patience Mthunzi-Kufa,** Council for Scientific and Industrial Research (South Africa)

Lunch Break 11:50 AM - 1:20 PM

SESSION 7: NEAR INFRARED AND THERMAL MONITORING FOR BIOMEDICAL APPLICATIONS

28 January 2025 • 1:20 PM - 3:20 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Gerard L. Coté**, Texas A&M Univ. (United States)

13316-31 • 1:20 PM - 1:40 PM
Low-cost parallax-free coaligned thermal and visible imaging with a visible/near-infrared and long-wave infrared beamsplitter
Author(s): **Aizitiaili Abulikemu,** Washington Univ. School of Medicine in St. Louis (United States); **Samuel Achilefu,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Leonid Shmuylovich,** Washington Univ. School of Medicine in St. Louis (United States)

13316-59 • 1:40 PM - 2:00 PM
Development of point of care thermographic imaging assessments of peripheral perfusion in scleroderma subjects
Author(s): **Sarah Wood**, **Tracy Frech,** Vanderbilt Univ. Medical Ctr. (United States); **Justin S. Baba,** Vanderbilt Univ. (United States)

13316-32 • 2:00 PM - 2:20 PM
Non-invasive monitoring of diabetic foot ulcers healing process by using optical-thermal imaging techniques
Author(s): **Fernando Chiwo**, **Daniela Leizaola**, **Stephanie Amaro**, **Maria Hernández,** Florida International Univ. (United States); **Renato Sousa,** Adventist Health White Memorial (United States); **Jose P. Ponce,** Adventist Health White Memorial (United States); **Stanley Mathis,** Adventist Health White Memorial (United States), Clemente Clinical Research (United States); **David G. Armstrong,** The Univ. of Southern California (United States); **Anuradha Godavarty,** Florida International Univ. (United States)

13316-33 • 2:20 PM - 2:40 PM
Curvature correction in near-infrared spectroscopy for diabetic foot ulcers: a phantom study
Author(s): **Himaddri Shakhar Roy**, **Charles P. Policard, Anuradha Godavarty,** Florida International Univ. (United States)

13316-34 • 2:40 PM - 3:00 PM
Objective assessment of clinical debridement and healing status of diabetic foot ulcers using a smartphone-based NIRS device
Author(s): **Daniela Leizaola**, **Linh Cao**, **Kacie Kaile**, **Maria H. Hernandez,** Florida International Univ. (United States); **Renato Sousa**, **Jose P. Ponce,** Adventist Health White Memorial (United States); **Stanley Mathis,** Adventist Health White Memorial (United States), Clemente Clinical Research (United States); **David G. Armstrong,** Keck School of Medicine of USC (United States); **Wensong Wu, Anuradha Godavarty,** Florida International Univ. (United States)

13316-35 • 3:00 PM - 3:20 PM
Development and validation of a melanin correction factor for a smartphone-based NIRS optical imaging device
Author(s): **Daniela Leizaola**, **Maria H. Hernandez**, **Divina Campbell, Anuradha Godavarty,** Florida International Univ. (United States)

CONFERENCE 13317

Optical Interactions with Tissue and Cells XXXVI

25 - 26 January 2025 | Moscone South, Room 160 (Upper Mezz)

Conference Chair(s): **Norbert Linz,** Univ. zu Lübeck (Germany); **Joel N. Bixler,** Air Force Research Lab. (United States)

Conference Co-Chair(s): **Alex J. Walsh,** Texas A&M Univ. (United States)

Program Committee: **Rainer J. Beck,** Heriot-Watt Univ. (United Kingdom); **Randolph Glickman,** The Univ. of Texas Health Science Ctr. at San Antonio (United States); **Bennett L. Ibey,** Air Force Research Lab. (United States); **Steven L. Jacques,** Univ. of Washington (United States); **Beop-Min Kim,** Korea Univ. (Korea, Republic of); **Alexander J. Makowski,** Sciton, Inc. (United States); **Patience T. Mthunzi-Kufa,** CSIR National Laser Ctr. (South Africa)

Saturday 25 January 2025

SESSION 1: NOVEL IMAGING METHODS FOR VISUALIZING OPTICAL INTERACTIONS WITH TISSUES AND CELLS

25 January 2025 • 8:20 AM - 10:00 AM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Alex J. Walsh**, Texas A&M Univ. (United States)

13317-1 • 8:20 AM - 8:40 AM
A comparative study on laser tissue ablation using 3 µm sources
Author(s): **Tugba Temel**, **Yu Wang**, **Ronan A. Battle**, **Daniel Simon**, **Yuchen Xiang**, **Stefania M. Stavrakaki**, **Timothy H. Runcorn**, **Zoltan Takats, Robert T. Murray,** Imperial College London (United Kingdom)

13317-2 • 8:40 AM - 9:00 AM
Imaging of shock wave and cavitation bubble dynamics in laser-induced ablation in liquids with ultrahigh spatiotemporal resolution

Author(s): **Norbert Linz**, **Sebastian Freidank**, **Xiao-Xuan Liang, Alfred Vogel,** Univ. zu Lübeck (Germany)

13317-3 • 9:00 AM - 9:20 AM
Estimation of ablation dynamics using single-shot 3D imaging at 1 million frames per second
Author(s): **Maria A. Troyanova-Wood,** SAIC (United States); **Gary D. Noojin, Joel N. Bixler,** Air Force Research Lab. (United States)

13317-4 • 9:20 AM - 9:40 AM
Precision interaction of femtosecond lasers with subcellular compartments
Author(s): **Seohee Ma,** Purdue Univ. (United States); **Bin Dong,** Purdue Univ. (United States), Purdue Univ. Institute for Cancer Research (United States); **Shivam Mahapatra**, **Matthew Clark,** Purdue Univ. (United States); **Chi Zhang,** Purdue Univ. (United States), Purdue Univ. Institute for Cancer Research (United States), Purdue Institute of Inflammation, Immunology, and Infectious Disease (United States)

13317-5 • 9:40 AM - 10:00 AM
Laser-induced cavitation detection with a miniature probe based on Doppler optical coherence tomography
Author(s): **Yuchen Song**, **Wei Jin, Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: ADVANCED NUMERICAL METHODS FOR MODELING LIGHT TISSUE INTERACTION

25 January 2025 • 10:30 AM - 12:20 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Joel N. Bixler**, Air Force Research Lab. (United States)

13317-6 • 10:30 AM - 11:00 AM
Hybrid Monte Carlo and machine learning solution for quantitative assessment of light wave localization in turbid media *(Invited Paper)*
Author(s): **Alexander Doronin,** Victoria Univ. of Wellington (New Zealand)

13317-7 • 11:00 AM - 11:20 AM
Non-invasive optical monitoring of human spine lesion: a Monte Carlo modeling study of photon migration
Author(s): **Faguang Wang, Ting Li,** Chinese Academy of Medical Sciences & Peking Union Medical College (China)

13317-8 • 11:20 AM - 11:40 AM
Rapidly accelerated numerical solvers using operator networks for performing laser-tissue optothermal simulations
Author(s): **Aditya Roy**, **Andrew DuPlissis**, **Biswajit Mishra, Adela Ben-Yakar,** The Univ. of Texas at Austin (United States)

13317-9 • 11:40 AM - 12:00 PM
Improving quantifying tissue optical properties of human heads in vivo by combining CW-NIRS and TR-NIRS
Author(s): **Chien-Jung Chiu**, **Ting-Yi Kuo**, **Tzu-Chia Kao**, **Chi-Hsiang Chuang, Kung-Bin Sung,** National Taiwan Univ. (Taiwan)

13317-10 • 12:00 PM - 12:20 PM
Laser speckles simulation for laser speckle contrast imaging
Author(s): **Marion Barbeau**, **Nienke Kempers**, **Jac Romme, Evelien Hermeling,** imec (Netherlands)

Lunch Break 12:20 PM - 1:50 PM

SESSION 3: NUMERICAL APPROACHES SIMULATING LASER-TISSUE INTERACTIONS AND RESPONSE

25 January 2025 • 1:50 PM - 3:40 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Joel N. Bixler**, Air Force Research Lab. (United States)

13317-11 • 1:50 PM - 2:20 PM
Evaluation of laser ablation-induced thermal damage by computational simulation of light and heat transfer in tissue with dynamic optical properties model *(Invited Paper)*
Author(s): **Yu Shimojo,** Osaka Metropolitan Univ. (Japan); **Takahiro Nishimura,** Osaka Univ. (Japan); **Daisuke Tsuruta, Toshiyuki Ozawa,** Osaka Metropolitan Univ. (Japan)

13317-12 • 2:20 PM - 2:40 PM
Framework for distributed computation of GPU-based MC simulations to build a large machine learning skin training data set
Author(s): **Vincent S. Zoutenbier**, **Thijs P. R. van der Knaap,** TNO (Netherlands); **Arjen Amelink,** TNO (Netherlands), Vrije Univ. Amsterdam (Netherlands)

13317-13 • 2:40 PM - 3:00 PM
A unified computational and experimental approach to determine laser safety of liver tissue
Author(s): **Johnny Junior Arroyo Barboza**, **Jiaxin Zhang, Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13317-14 • 3:00 PM - 3:20 PM
4D Minecraft cell models from label-free optical imaging
Author(s): **Kevin K. Tan,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Tianyu Wu,** Univ. of Illinois (United States); **Zane R. Thornburg,** Beckman Institute for Advanced Science and Technology (United States), Cancer Ctr. at Illinois (United States); **David J. Whang**, **Gokul Sriramasubramanian**, **Stephen A. Taylor,** Univ. of Illinois (United States); **Martin Gruebele**, **Zaida Luthey-Schulten,** The NSF Science and Technology Ctr. for Quantitative Cell Biology, Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Stephen A. Boppart,** Ctr. for Label-free Imaging and Multiscale Biophotonics, Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States)

13317-58 • 3:20 PM - 3:40 PM
Application of Physics Informed Neural Networks to Directed Energy Bioeffects
Author(s): **Jenny Farmer,** The Univ. of North Carolina at Charlotte (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 4: MECHANISMS OF PULSED LASER ABLATION

25 January 2025 • 4:10 PM - 5:30 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Alexander J. Makowski**, Sciton, Inc. (United States)

13317-15 • 4:10 PM - 4:30 PM
Ultrashort laser pulses for precision ablation of cancerous tissue
Author(s): **Rainer J. Beck**, **Ioannis Bitharas,** Heriot-Watt Univ. (United Kingdom); **Thomas I. Maisey**, **Ryan K. Mathew,** Univ. of Leeds (United Kingdom); **Andrew J. Moore,** Heriot-Watt Univ. (United Kingdom); **James Moor**, **David G. Jayne,** Univ. of Leeds (United Kingdom); **Robert R. Thomson, Jonathan D. Shephard,** Heriot-Watt Univ. (United Kingdom)

13317-16 • 4:30 PM - 4:50 PM
Imaging the mechanisms and thermal effects of tissue ablation using annular beam for microbiopsy
Author(s): **Brian Lee,** The Univ. of Texas at Austin (United States); **Gary D. Noojin,** Air Force Research Lab. (United States); **Jacob C. Baker**, **Sapun H. Parekh,** The Univ. of Texas at Austin (United States); **Joel N. Bixler,** Air Force Research Lab. (United States); **James W. Tunnell,** The Univ. of Texas at Austin (United States)

13317-17 • 4:50 PM - 5:10 PM
Damage assessment and histological analysis of suprathreshold near-infrared laser exposures to skin in the Yucatan mini pig
Author(s): **Morgan Schmidt**, **Semih Kumru**, **Gary D. Noojin,** Air Force Research Lab. (United States); **Michael P. DeLisi**, **Amanda Tijerina, Amanda M. Peterson,** SAIC (United States)

13317-18 • 5:10 PM - 5:30 PM
Preliminary results for calibration-free laser-induced breakdown spectroscopy (CF-LIBS) for the elemental analysis of biological samples
Author(s): **Edith Böhmer**, **Laetitia Sophie Degelmann**, **Dongqin Ni**, **Florian Klämpfl, Michael Schmidt,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: OPTICAL PROPERTIES OF TISSUES AND CELLS

26 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **R. Lyle Hood**, The Univ. of Texas at San Antonio (United States)

13317-55 • 8:40 AM - 9:00 AM
Resting State Photon Emissions from the Pupil of the Human Eye
Author(s): **Erik S. Viirre,** Univ. of California, San Diego (United States); **Thomas Furness,** Ratlab LLC (United States); **Lu Tian,** Stanford Univ. (United States); **Ross Melville**, **Lesley Chan, Matthew Cook,** Ratlab LLC (United States)

13317-19 • 9:00 AM - 9:20 AM
Rapid measurement of scattering coefficient and anisotropy from tissue using an image sensor
Author(s): **Glenn H. Chapman,** Simon Fraser Univ. (Canada); **Salomé Osorio Muñoz,** Univ. de Antioquia (Colombia); **Pierre M. Lane,** Simon Fraser Univ. (Canada)

13317-20 • 9:20 AM - 9:40 AM
Establishing a causal link between the physiologic range of skin chromophore concentrations and physiologically relevant regions of CIELAB color space
Author(s): **Maysoon Harunani**, **Mutian Shen**, **Zohar Nussinov, Leonid Shmuylovich,** Washington Univ. in St. Louis (United States)

13317-54 • 9:40 AM - 10:00 AM
Analytical methods for solving heat distributions and estimating transient pressures in laser-irradiated biological tissue
Author(s): **George R. Grow**, **Jacob Hardenburger**, **E. Duco Jansen, Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: NOVEL APPLICATIONS OF LASERS AND LIGHT IN BIOMEDICINE I

26 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Norbert Linz**, Univ. zu Lübeck (Germany)

13317-24 • 10:30 AM - 11:00 AM
Leveraging AI and computational methods for translational biophysics *(Invited Paper)*
Author(s): **Tinen L. Iles,** Univ. of Minnesota, Twin Cities (United States)

13317-25 • 11:00 AM - 11:20 AM
Laser coagulation of blood vessels at 454 nm wavelength for neurosurgical interventions: occlusion rates, process dynamics and thermal damage
Author(s): **Christina Giesen**, **Elisa Jarry**, **Achim Lenenbach, Lazar Bochvarov,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13317-26 • 11:20 AM - 11:40 AM
Supervised IR-laser-based bone surgery for stenosis decompression
Author(s): **Jaryi Lippek**, **Björn Spoida**, **Tilman Barke**, **Michelle Müller**, **Sonja Johannsmeier, Tammo Ripken,** Laser Zentrum Hannover e.V. (Germany)

13317-27 • 11:40 AM - 12:00 PM
Enabling tissue ablation studies with high pulse energy variable pulse length laser
Author(s): **Brett H. Hokr**, **Jordan Jones**, **Julia Triche**, **Craig Robin**, **Gary D. Noojin, Joel N. Bixler,** EO Solutions LLC (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 7: NOVEL APPLICATIONS OF LASERS AND LIGHT IN BIOMEDICINE II

26 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Oscar R. Benavides**, Texas A&M Univ. (United States)

13317-28 • 1:30 PM - 1:50 PM
Evaluating the effects of pulsed infrared light on dendritic spines of cortical neurons in vitro
Author(s): **Jacob Hardenburger**, **Mona Gerges**, **Bryan Millis,** Vanderbilt Univ. (United States); **Bryan Gamboa**, **Joel N. Bixler,** Air Force Research Lab. (United States); **Christopher Valdez,** The Univ. of Texas Health Science Ctr. at San Antonio (United States); **E. Duco Jansen, Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States)

13317-29 • 1:50 PM - 2:10 PM
Laser-generated microcavitation bubbles for mechanobiological studies in 3D tissue constructs
Author(s): **Rahul Sreedasyam**, **Bryce Wilson**, **Patricia R. Ferrandez**, **Tianhao Wu**, **Elliot Botvinick, Vasan Venugopalan,** Univ. of California, Irvine (United States)

13317-30 • 2:10 PM - 2:30 PM
Application of nanosecond mid-infrared lasers in mass spectrometry imaging of intact proteins
Author(s): **Alexander Wainwright**, **Khaled Madhoun,** Univ. of Toronto (Canada); **Pei Su**, **Samuel E. Janisse,** Northwestern Univ. (United States); **Yigit Ozan Aydin,** Univ. of Toronto (Canada); **Jared Otto Kafader**, **Neil L. Kelleher,** Northwestern Univ. (United States); **R.J. Dwayne Miller,** Univ. of Toronto (Canada)

13317-31 • 2:30 PM - 2:50 PM
Whispering gallery mode laser: towards the deep and turbid tissue optical sensing
Author(s): **Dongqin Ni**, **Florian Klämpfl**, **Michael Schmidt, Martin Hohmann,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13317-32 • 2:50 PM - 3:10 PM
In vitro analysis on the interaction between cell culture medium and blue LED light
Author(s): **Giada Magni**, **Martina Banchelli**, **Leonardo Ciaccheri**, **Marina Mazzoni**, **Barbara Adinolfi**, **Lucia Cavigli**, **Andrea Barucci**, **Roberto Pini, Francesca Rossi,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: ULTRAFAST LASER PHENOMENA IN CELLS AND TISSUE

26 January 2025 • 3:40 PM - 5:10 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Norbert Linz**, Univ. zu Lübeck (Germany)

13317-33 • 3:40 PM - 4:10 PM
Nonlinear dynamics of femtosecond laser interaction with the central nervous system in zebrafish *(Invited Paper)*
Author(s): **Soyeon Jun**, **Hanieh Fattahi**, **Daniel Wehner**, **Andreas Herbst**, **Kilian Scheffter**, **Nora John, Julia Kolb,** Max-Planck-Institut für die Physik des Lichts (Germany)

13317-34 • 4:10 PM - 4:30 PM
Biological mechanism of retinal damage from exposure to the supercontinuum generated by a NIR femtosecond laser
Author(s): **Xomalin G. Peralta**, **Joseph E. Clary**, **Amanda M. Peterson**, **Matthew J. Macasadia**, **Harvey M. Hodnett**, **Maximillian V. Hart,** SAIC (United States); **Amanda J. Tijerina,** Conceptual MindWorks, Inc. (United States); **Gary D. Noojin**, **Semih Kumru**, **Francesco J. Echeverria**, **Charles Schwarten**, **Emily M. Corbin, Emily N. Boice,** Air Force Research Lab. (United States)

13317-35 • 4:30 PM - 4:50 PM
Simultaneous photo-uncaging of ATP and monitoring of calcium wave propagation in zebrafish
Author(s): **Bin Dong**, **Chi Zhang**, **Shelly G. Tan**, **Qing Deng**, **Robert M. Everly, Mark Carlsen,** Purdue Univ. (United States)

13317-36 • 4:50 PM - 5:10 PM
Ocular dose response from exposure to a Q-switched laser at a central wavelength of 1645 nm
Author(s): **Joseph Chue-Sang**, **Joseph E. Clary**, **Xomalin G. Peralta**, **Maximillian V. Hart,** SAIC (United States); **Amanda J. Tijerina,** Conceptual MindWorks, Inc. (United States); **Matthew J. Macasadia,** SAIC (United States); **Emily N. Boice,** Air Force Research Lab. (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13317-38 • 5:30 PM - 7:00 PM
Polarization-driven dynamic laser speckle analysis for characterizing breast cancer cells
Author(s): **Vahid Abbasian,** Washington Univ. in St. Louis (United States); **Vahideh Farzam Rad,** Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); **Davoud Ahmadvand,** Iran Univ. of Medical Sciences (Iran, Islamic Republic of); **Arash Darafsheh,** Washington Univ. in St. Louis (United States)

13317-39 • 5:30 PM - 7:00 PM
Multiarmed microscope for delivering concurrent NIR and VIS lasers to cultured cells in a controlled environment
Author(s): **Jin B. Ha,** Univ. of the Incarnate Word (United States); **Nathaniel J. Pope,** SAIC (United States); **Gary D. Noojin, Michael L. Denton,** Air Force Research Lab. (United States)

13317-41 • 5:30 PM - 7:00 PM
Structure of tendon causes highly anisotropic optical properties and transport
Author(s): **Alexa Nazarian,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States); **Steven L. Jacques,** Univ. of Washington (United States); **Joshua Tam,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); **Sandra J. Shefelbine,** Northeastern Univ. (United States); **R. Rox Anderson,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States)

13317-42 • 5:30 PM - 7:00 PM
Spatially selective picosecond laser disruption of melanosomes using wavefront shaping
Author(s): **Yu Shimojo,** Osaka Metropolitan Univ. (Japan); **Takahiro Nishimura,** Osaka Univ. (Japan); **Daisuke Tsuruta, Toshiyuki Ozawa,** Osaka Metropolitan Univ. (Japan)

13317-43 • 5:30 PM - 7:00 PM
Experimental verification of a melanosome destruction threshold-based model for depth-selective laser treatment of pigmented skin lesions: A phantom study
Author(s): **Gakuto Takeda,** Osaka Univ. (Japan); **Yu Shimojo,** Graduate School of Medicine, Osaka Metropolitan Univ. (Japan); **Takahiro Nishimura,** Osaka Univ. (Japan)

13317-44 • 5:30 PM - 7:00 PM
Differentiable rendering for 3-dimensional reconstruction of laser-induced tissue ablation
Author(s): **Enrique De Alba**, **Kevin Phan**, **Brett Hokr,** EO Solutions LLC (United States); **Joel N. Bixler,** Air Force Research Lab. (United States); **Michael DeLisi,** SAIC (United States)

13317-45 • 5:30 PM - 7:00 PM
Phototoxicity quantification by microtubule polymerization dynamics
Author(s): **Shivam Mahapatra**, **Seohee Ma**, **Bin Dong, Chi Zhang,** Purdue Univ. (United States)

13317-46 • 5:30 PM - 7:00 PM
The relationship between local mitochondrial functions and cell responses revealed by real-time precision opto-control
Author(s): **Seohee Ma**, **Shivam Mahapatra**, **Gil Gonzalez,** Purdue Univ. (United States); **Bin Dong,** Purdue Univ. (United States), Purdue Univ. Institute for Cancer Research (United States); **Chi Zhang,** Purdue Univ. (United States), Purdue Univ. Institute for Cancer Research (United States), Purdue Institute of Inflammation, Immunology, and Infectious Disease (United States)

13317-56 • 5:30 PM - 7:00 PM
Unraveling the complex nature of optical nonlinearity in water-for biophotonics applications
Author(s): **Sreekanth Perumbilavil,** Nanyang Technological Univ. (Singapore); **Suchand Sandeep C. S.,** Manipal Academy of Higher Education (India); **Murukeshan Vadakke Matham,** Nanyang Technological Univ. (Singapore)

13317-57 • 5:30 PM - 7:00 PM
Investigating variability of high wavenumber Raman spectroscopy in superficial tissues
Author(s): **Benjamin J. Estes**, **Trevor Voss**, **Richard Liao**, **Alexandria Cousart, Anita Mahadevan-Jansen,** Vanderbilt Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 9: OPTICAL INTERACTIONS WITH TISSUE AND CELLS BEST PAPER AWARDS CEREMONY

27 January 2025 • 1:15 PM - 1:45 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Norbert Linz**, Univ. zu Lübeck (Germany); **Joel N. Bixler**, Air Force Research Lab. (United States)
Join the Optical Interactions with Tissue and Cells XXXVI conference as they honor the recipient of the Best Paper Award.

CONFERENCE 13318

Dynamics and Fluctuations in Biomedical Photonics XXII

25 - 26 January 2025 | Moscone South, Room 304 (Level 3)

Conference Chair(s): **Valery V. Tuchin,** Saratov State Univ. (Russian Federation), Tomsk State Univ. (Russian Federation), Institute of Precision Mechanics and Control of the RAS (Russian Federation); **Martin J. Leahy,** Univ. of Galway (Ireland); **Ruikang K. Wang,** Univ. of Washington (United States)

Program Committee: **Walter C.P.M. Blondel,** Univ. de Lorraine (France); **Wei R. Chen,** The Univ. of Oklahoma (United States); **Joseph P. Culver,** Washington Univ. School of Medicine in St. Louis (United States); **Turgut Durduran,** ICFO - Institut de Ciències Fotòniques (Spain); **Ling Fu,** Huazhong Univ. of Science and Technology (China); **Ekaterina I. Galanzha,** Univ. of Arkansas for Medical Sciences (United States); **Michael W. Jenkins,** Case Western Reserve Univ. (United States); **Jana M. Kainerstorfer,** Carnegie Mellon Univ. (United States); **Brendan F. Kennedy,** Harry Perkins Institute of Medical Research (Australia); **Sean J. Kirkpatrick,** Michigan Technological Univ. (United States); **Jürgen M. Lademann,** Charité Universitätsmedizin Berlin (Germany); **Kirill V. Larin,** Univ. of Houston (United States); **Irina V. Larina,** Baylor College of Medicine (United States); **Peng Li,** Zhejiang Univ. (China); **Qian Liu,** Hainan Univ. (China); **Zhenhe Ma,** Northeastern Univ. at Qinhuangdao (China); **Teemu S. Myllylä,** Univ. of Oulu (Finland); **Andrew M. Rollins,** Case Western Reserve Univ. (United States); **Inga Saknite,** Vanderbilt Univ. Medical Ctr. (United States), Univ. of Latvia (Latvia); **Melissa C. Skala,** Morgridge Institute for Research (United States); **Vladislav Toronov,** Toronto Metropolitan Univ. (Canada); **Anna N. Yaroslavsky,** Univ. of Massachusetts Lowell (United States); **Zeev Zalevsky,** Bar-Ilan Univ. (Israel); **Azhar Zam,** New York Univ. Abu Dhabi (United Arab Emirates); **Vladimir P. Zharov,** Univ. of Arkansas for Medical Sciences (United States); **Chao Zhou,** Washington Univ. in St. Louis (United States); **Dan Zhu,** Huazhong Univ. of Science and Technology (China)

Saturday 25 January 2025

SESSION 1: CELL, TISSUE, AND ORGAN DYNAMICS I

25 January 2025 • 10:10 AM - 12:00 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Sean J. Kirkpatrick**, Michigan Technological Univ. (United States)

13318-1 • 10:10 AM - 10:40 AM
Optical tomography study of stressed plants dynamics: a path to understand sound emitted by plants *(Invited Paper)*
Author(s): **Albert Claude Boccara**, **Viacheslav Mazlin**, **Samer Alhaddad,** Institut Langevin (France); **Martine Boccara,** Muséum national d'Histoire naturelle (France), Ecole Normale Supérieure (France)

13318-2 • 10:40 AM - 11:00 AM
Identification of intracellular motion type and its parameter from dynamic optical coherence tomography signals
Author(s): **Shumpei Fujimura,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Rion Morishita**, **Yuanke Feng, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13318-3 • 11:00 AM - 11:20 AM
The comprehensive simulation framework of dynamic optical coherence tomography for the investigation on intratissue dynamics
Author(s): **Yuanke Feng**, **Fujimura Shumpei**, **Yiheng Lim**, **Thitiya Seesan**, **Rion Morishita,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Pradipta Mukherjee,** Univ. of Tsukuba (Japan), Indian Institute of Technology Delhi (India); **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13318-8 • 11:20 AM - 11:40 AM
Speckle fluctuation reveals multiscale dynamics of microparticles in fibrin scaffolds in a model of Staphylococcus aureus infection
Author(s): **Nichaluk Leartprapun**, **Anton Deti**, **Nathaniel Hai, Seemantini K. Nadkarni,** Massachusetts General Hospital (United States)

13318-31 • 11:40 AM - 12:00 PM
The diffuse spectral response of skin in vivo to deformation based on hyperspectral imaging
Author(s): **Zongze Huo**, **Boyang Ji**, **Shibing Wang**, **Linan Li**, **Chuanwei Li, Zhiyong Wang,** Tianjin Univ. (China)

Lunch Break 12:00 PM - 1:30 PM

SESSION 2: CELL, TISSUE, AND ORGAN DYNAMICS II

25 January 2025 • 1:30 PM - 2:40 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Sean J. Kirkpatrick**, Michigan Technological Univ. (United States)

13318-4 • 1:30 PM - 2:00 PM
Tissue optical clearing for 3D imaging of whole organs *(Invited Paper)*
Author(s): **Dan Zhu,** Huazhong Univ. of Science and Technology (China)

13318-6 • 2:00 PM - 2:20 PM
Integration of nonlinear optical microscopy with computational models for analysis of the morphological and metabolic dynamics of live mitochondria
Author(s): **Kideog Bae,** Beckman Institute for Advanced Science and Technology (United States), NSF Science and Technology Ctr. for Quantitative Cell Biology, Univ. of Illinois (United States); **Edita Aksamitiene,** Beckman Institute for Advanced Science and Technology (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States), NSF Science and Technology Center for Quantitative Cell Biology, Univ. of Illinois (United States)

13318-7 • 2:20 PM - 2:40 PM
Deep monitoring of bacterial biofilm growth at the air-liquid interface with optical coherence interference
Author(s): **Louise Roels**, **Maxime Ardré, Olivier Thouvenin,** Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France)

Coffee Break 2:40 PM - 3:10 PM

SESSION 3: NIRS, DCS, AND DIFFUSE METHODS

25 January 2025 • 3:10 PM - 5:35 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Martin J. Leahy**, Univ. of Galway (Ireland)

13318-30 • 3:10 PM - 3:55 PM
Pushing the frontier of the clinical applications of non-invasive deep-tissue blood flow monitoring with laser speckle statistics (Keynote Presentation)
Author(s): **Turgut Durduran,** ICFO - Institut de Ciències Fotòniques (Spain)

13318-10 • 3:55 PM - 4:15 PM
Toward efficient signal extraction for deep tissue blood flow using parallelized diffuse correlation spectroscopy
Author(s): **Melissa M. Wu**, **Lucas Kreiss,** Duke Univ. (United States); **Michael Wayne**, **Claudio Bruschini**, **Edoardo Charbon, Roarke Horstmeyer,** EPFL (Switzerland)

13318-12 • 4:15 PM - 4:35 PM **(CANCELLED)**
MW FlexNIRS: Wearable, low-cost, LED-based, multi-wavelength NIRS oximeter for cytochrome c oxidase recovery in neonates
Author(s): **Nikola Otic,** Boston Univ. (United States); **Mitchell B. Robinson,** Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital (United States); **Zachary Starkweather**, **Kuan-Cheng Wu,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); **Emily M. Herzberg,** Massachusetts General Hospital (United States); **Maria Angela Franceschini, Marco Renna,** Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital (United States)

13318-13 • 4:35 PM - 4:55 PM
Multi-wavelength, pathlength selective, interferometric diffuse correlation spectroscopy
Author(s): **Mitchell B. Robinson**, **Marco Renna**, **Maria Angela Franceschini, Stefan A. Carp,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

13318-9 • 4:55 PM - 5:15 PM
Time-of-flight-resolved interferometric speckle contrast optical spectroscopy (TOF-resolved iSCOS)
Author(s): **Klaudia Nowacka**, **Michał Dąbrowski, Dawid Borycki,** International Ctr. for Translational Eye Research (Poland)

13318-14 • 5:15 PM - 5:35 PM
Comparing concurrent measurements of human cerebral blood flow changes using speckle contrast optical spectroscopy and diffuse correlation spectroscopy
Author(s): **Tom Y. Cheng,** Boston Univ. (United States); **Mitchell B. Robinson**, **Marco Renna,** Massachusetts General Hospital (United States); **Byungchan Kim**, **David A. Boas,** Boston Univ. (United States); **Stefan A. Carp,** Massachusetts General Hospital (United States); **Xiaojun Cheng,** Boston Univ. (United States); **Maria Angela Franceschini,** Massachusetts General Hospital (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 4: DYNAMIC AND ANGIOGRAPHIC OCT/OCTA I

26 January 2025 • 9:00 AM - 10:00 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Martin J. Leahy**, Univ. of Galway (Ireland)

13318-15 • 9:00 AM - 9:20 AM
Dynamic 3D imaging of outgrowth formation from ovarian cancer spheroid with optical coherence tomography
Author(s): **Aleese Mukhamedjanova**, **Sadaf Farsinejad**, **Marcin Iwanicki, Shang Wang,** Stevens Institute of Technology (United States)

13318-16 • 9:20 AM - 9:40 AM
In vivo OCT imaging of ovarian cancer outgrowth in the mouse model
Author(s): **Huan Han**, **Aleese Mukhamedjanova,** Stevens Institute of Technology (United States); **Denise C. Connolly,** Fox Chase Cancer Ctr. (United States); **Marcin Iwanicki, Shang Wang,** Stevens Institute of Technology (United States)

13318-17 • 9:40 AM - 10:00 AM
Non-invasive in vivo imaging of human skin cancer tissue using nanosensitive optical coherence tomography
Author(s): **Eanna Johnston**, **Rajib Dey**, **Sergey Alexandrov,** Univ. of Galway (Ireland); **Jack Kelly**, **Sine Phelan,** Galway Univ. Hospitals (Ireland); **Martin Leahy,** Univ. of Galway (Ireland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: DYNAMIC AND ANGIOGRAPHIC OCT/OCTA II

26 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Irina V. Larina**, Baylor College of Medicine (United States)

13318-18 • 10:30 AM - 10:50 AM
Machine learning-based optimization of photodynamic therapy for human skin affected by malignant melanoma: a Monte Carlo study and 3D renderings
Author(s): **Elena Vasilieva**, **Ilya Vladyko,** Victoria Univ. of Wellington (New Zealand); **Vladislav Yakovlev,** Texas A&M Univ. (United States); **Alexander Doronin,** Victoria Univ. of Wellington (New Zealand)

13318-19 • 10:50 AM - 11:10 AM
High-contrast dynamic optical coherence tomography (OCT) by speckle-preserving OCT noise reducer based on UNet3+
Author(s): **Hsin-Jou Wang,** National Yang Ming Chiao Tung Univ. (Taiwan); **Thitiya Seesan**, **Shuichi Makita**, **Rion Morishita**, **Ibrahim Abd El-Sadek**, **Yusong Liu,** Univ. of Tsukuba (Japan); **Chia-Wei Sun,** National Yang Ming Chiao Tung Univ. (Taiwan); **Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13318-20 • 11:10 AM - 11:30 AM
Superior image enhancement of OCTA using a three-dimensional C-scan-based generation adversarial network with synthetic input
Author(s): **Jingjiang Xu,** Foshan Univ. (China)

13318-21 • 11:30 AM - 11:50 AM
The investigation of blood flow-induced uncertainty in the measurement of birefringent properties using polarization sensitive OCT
Author(s): **Jian Liu**, **Yaping Shi**, **Zhaoyu Gong**, **Jingjiang Xu, Ruikang Wang,** Univ. of Washington (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 6: DYNAMIC AND ANGIOGRAPHIC OCT/OCTA III

26 January 2025 • 1:20 PM - 3:10 PM | Moscone South, Room 304 (Level 3)
Session Chair(s): **Azhar Zam**, New York Univ. Abu Dhabi (United Arab Emirates); **Ruikang K. Wang**, Univ. of Washington (United States); **Peng Li**, Zhejiang Univ. (China)

13318-22 • 1:20 PM - 1:50 PM
Investigation of developmental defects of zebrafish embryos caused by alcohol consumption using optical coherence microscopy
(Invited Paper)
Author(s): **Mohammad Dehshiri**, **Manmohan Singh**, **Alexander W. Schill, Kirill V. Larin,** Univ. of Houston (United States)

13318-23 • 1:50 PM - 2:10 PM
Assessing the effects of prenatal cannabinoid consumption on fetal brain vasculature utilizing optical coherence angiography
Author(s): **Jessica Gutierrez**, **Manmohan Singh,** Univ. of Houston (United States); **Rajesh Miranda,** Texas A&M Univ. (United States); **Kirill Larin,** Univ. of Houston (United States)

13318-24 • 2:10 PM - 2:30 PM
Deep learning-assisted image analysis for dynamic assessment of mouse oviduct biomechanics
Author(s): **Tianqi Fang**, **Huan Han**, **Aleese Mukhamedjanova, Shang Wang,** Stevens Institute of Technology (United States)

13318-25 • 2:30 PM - 2:50 PM
Dynamic full-field optical coherence tomography to measure photosensitivity
Author(s): **Nathaniel Norberg**, **Tual Monfort**, **Salvatore Azzollini**, **Julia Granier,** Institut de la Vision (France); **Olivier Thouvenin,** Institut Langevin (France); **Kate Grieve,** Institut de la Vision (France), Ctr. Hospitalier National d'Opthalmologie des Quinze-Vingts, Institut National de la Santé et de la Recherche Médicale (France)

13318-34 • 2:50 PM - 3:10 PM
Enhancing Retinal Image Clarity: Denoising Fundus and OCT Images Using Advanced U-Net Deep Learning in Biomedical Photonics
Author(s): **Jitindra Fartiyal**, **Pedro De Carvalho Sourza**, **Yasmin Whayeb,** Aston Univ. (United Kingdom); **Matteo Bregonzio,** DATRIX SpA (Italy); **James Wolffsohn, Sergei G. Sokolovski,** Aston Univ. (United Kingdom)

13318-26 • 3:10 PM - 3:30 PM
Transocular detection of premotor Parkinson's disease via retinal neurovascular coupling through functional OCT angiography
Author(s): **Peng Li, Kaiyuan Liu,** Zhejiang Univ. (China)

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13318-27 • 5:30 PM - 7:00 PM
Time-of-flight-resolved parallel interferometric near-infrared spectroscopy (piNIRS) with a fast two-dimensional camera
Author(s): **Michał Dąbrowski**, **Dawid Borycki, Klaudia Nowacka,** International Ctr. for Translational Eye Research (Poland)

13318-35 • 5:30 PM - 7:00 PM
Modeling the spatiotemporal statistics of laser speckles using stochastic differential equation.
Author(s): **Soumyajit Sarkar**, **Murali K.**, **Anindita Chandra**, **Susweta Das, Hari M. Varma,** Indian Institute of Technology Bombay (India)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13318-5
High-resolution infrared thermography reveals real-time axillary sweat gland activity for advanced physiological insights
Author(s): **Tochukwu Ofoegbuna,** Colgate-Palmolive Co. (United States); **Abmael H. Oliveira**, **Mark C. Pierce,** Rutgers, The State Univ. of New Jersey (United States); **Shyamala Pillai, Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States)

CONFERENCE 13319

Photons Plus Ultrasound: Imaging and Sensing 2025

26 - 29 January 2025 | Moscone South, Room 205 (Level 2)

CONFERENCE CO-SPONSORS

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Conference Chair(s): **Alexander A. Oraevsky,** TomoWave Labs, Inc. (United States); **Lihong V. Wang,** Caltech (United States)

Program Committee: **Mark A. Anastasio,** Univ. of Illinois (United States); **Paul C. Beard,** Univ. College London (United Kingdom); **A. Claude Boccara,** Institut Langevin (France); **Peter Burgholzer,** Research Ctr. for Non Destructive Testing GmbH (Austria); **Ben T. Cox,** Univ. College London (United Kingdom); **Stanislav Y. Emelianov,** Georgia Institute of Technology (United States); **Rinat O. Esenaliev,** The Univ. of Texas Medical Branch (United States); **Song Hu,** Washington Univ. in St. Louis (United States); **Miya Ishihara,** National Defense Medical College (Japan); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Changhui Li,** Peking Univ. (China); **Pai-Chi Li,** National Taiwan Univ. (Taiwan); **Srivalleesha Mallidi,** Tufts Univ. (United States); **Srirang Manohar,** Univ. of Twente (Netherlands); **Vasilis Ntziachristos,** Helmholtz Zentrum München GmbH (Germany); **Günther Paltauf,** Karl-Franzens-Univ. Graz (Austria); **Ivan M. Pelivanov,** Univ. of Washington (United States); **Daniel Razansky,** Univ. Zürich (Switzerland); **Xueding Wang,** Univ. of Michigan (United States); **Meng Yang,** Peking Union Medical College Hospital (China); **Roger J. Zemp,** Univ. of Alberta (Canada); **Qifa Zhou,** The Univ. of Southern California (United States); **Quing Zhu,** Washington Univ. in St. Louis (United States)

Sunday 26 January 2025

OPENING REMARKS

26 January 2025 • 8:30 AM - 8:35 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Lihong V. Wang**, Caltech (United States); **Alexander A. Oraevsky**, TomoWave Laboratories, Inc. (United States)
Introduction to the Photons Plus Ultrasound: Imaging and Sensing 2025 conference.

SESSION 1: CLINICAL IMAGING

26 January 2025 • 8:35 AM - 10:35 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Lihong V. Wang**, Caltech (United States); **Alexander A. Oraevsky**, TomoWave Laboratories, Inc. (United States)

13319-60 • 8:35 AM - 8:50 AM
Image analysis of patient data from the hybrid photoacoustic-ultrasound tomography system PAM3
Author(s): **Rianne Bulthuis**, **Bruno De Santi,** Univ. Twente (Netherlands); **Felix Lucka,** Ctr. Wiskunde & Informatica (Netherlands); **Jeroen Veltman,** Hospital Group Twente (Netherlands); **Margreet van der Schaaf,** Medisch Spectrum Twente (Netherlands); **Hendrik Messal,** The Netherlands Cancer Institute (Netherlands), Oncode Institute (Netherlands); **Mariël Brinkhuis,** LabPON Laboratorium Pathologie Oost-Nederland (Netherlands); **Ben Cox,** Univ. College London (United Kingdom); **Srirang Manohar,** Univ. Twente (Netherlands)

13319-108 • 8:50 AM - 9:05 AM
Integrating machine learning with panoramic photoacoustic computed tomography for improved breast lesion analysis
Author(s): **Xin Tong**, **Cindy Z. Liu**, **Yilin Luo,** Caltech (United States); **Li Lin,** Caltech (United States), Zhejiang Univ. (China); **Jessica Dzubnar**, **Marta Invernizzi,** City of Hope Comprehensive Cancer Ctr. (United States); **Yide Zhang**, **Rui Cao**, **Peng Hu,** Caltech (United States); **Jaclene Torres**, **Armine Kasabyan**, **Lily Lai**, **Lisa Yee,** City of Hope Comprehensive Cancer Ctr. (United States); **Lihong V. Wang,** Caltech (United States)

13319-1 • 9:05 AM - 9:20 AM
Dual-wavelength photoacoustic sentinel lymph node imaging
Author(s): **Jonas Riksen**, **Teun Schurink**, **Dirk Grünhagen**, **Francis Kalloor Joseph, Gijs van Soest,** Erasmus MC (Netherlands)

13319-2 • 9:20 AM - 9:35 AM
A single-motor system for 3D spiral photoacoustic and ultrasound imaging of rectal cancer in vivo
Author(s): **Sanskar Thakur**, **Sitai Kou**, **Haolin Nie**, **Ahmed Eltahir**, **William Chapman, Quing Zhu,** Washington Univ. in St. Louis (United

States)

13319-3 • 9:35 AM - 9:50 AM
Multispectral photoacoustic analysis of intraplaque hemorrhage in human carotids
Author(s): **Minsik Sung**, **Sunghun Nam,** Pohang Univ. of Science and Technology (Korea, Republic of); **Sun Oh Kim**, **Jong-il Park,** Yeungnam Univ. Medical Ctr. (Korea, Republic of); **Dongyoung Jung**, **Moongyu Han,** Pohang Univ. of Science and Technology (Korea, Republic of); **Byullee Park,** Sungkyunkwan Univ. (Korea, Republic of); **Ung Kim,** Yeungnam Univ. Medical Ctr. (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-4 • 9:50 AM - 10:05 AM
Physics-based skin color bias correction for equitable photoacoustic imaging
Author(s): **Thomas R. Else,** Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); **Christine Loreno,** ACED Clinic Cambridge, Early Cancer Institute, Univ. of Cambridge (United Kingdom); **Janek Gröhl,** Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); **Alice Groves,** ACED Clinic Cambridge, Early Cancer Institute, Univ. of Cambridge (United Kingdom); **Amit Roshan,** Cancer Research UK Cambridge Institute (United Kingdom), Cambridge Univ. Hospitals NHS Foundation Trust (United Kingdom); **Sarah E. Bohndiek,** Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom)

13319-6 • 10:05 AM - 10:20 AM
Identifying prostate cancer using a translational needle photoacoustic sensing probe in human subjects
Author(s): **Linyu Ni**, **Hyeonwoo Kim**, **Chandy Ellimoottil**, **John Wei**, **Jay Guo**, **Aaron Udager**, **Xueding Wang, Guan Xu,** Univ. of Michigan (United States)

13319-7 • 10:20 AM - 10:35 AM
Deciphering the spectra of breast cancer in multispectral optoacoustic tomography
Author(s): **Maximilian Bader,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany); **Benedict E. Mc Larney,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Katja Pinker,** Memorial Sloan-Kettering Cancer Ctr. (United States), Columbia Univ. (United States); **Jan Grimm,** Memorial Sloan-Kettering Cancer Ctr. (United States), Weill Cornell Medicine (United States); **Dominik Jüstel,** Helmholtz Zentrum München GmbH (Germany), Technische Univ. München (Germany); **Vasilis Ntziachristos,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany)

Coffee Break 10:35 AM - 11:05 AM

SESSION 2: SMALL-ANIMAL IMAGING: MICROSCOPY

26 January 2025 • 11:05 AM - 12:05 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Chulhong Kim**, Pohang Univ. of Science and Technology (Korea, Republic of); **Song Hu**, Washington Univ. in St. Louis (United States)

13319-9 • 11:05 AM - 11:20 AM
Head-mounted photoacoustic microscopy for multi-parametric cerebrovascular imaging in freely behaving mice
Author(s): **Khadijeh Mardani,** Washington Univ. in St. Louis (United States); **Youngseop Lee,** Northwestern Univ. (United States); **Ziang Feng,** Washington Univ. in St. Louis (United States); **Hao F. Zhang**, **Cheng Sun,** Northwestern Univ. (United States); **Song Hu,** Washington Univ. in St. Louis (United States)

13319-10 • 11:20 AM - 11:35 AM
Longitudinal monitoring of tumor cell migration and angiogenesis in the biomaterial scaffold in vivo
Author(s): **Zhanpeng Xu**, **Ian Schrack**, **Guillermo Escalona**, **Chenshuo Ma**, **Tianqu Zhai**, **Wei Zhang**, **Lonnie Shea, Xueding Wang,** Univ. of Michigan (United States)

13319-11 • 11:35 AM - 11:50 AM
Photoacoustic microscopy for assessing the potency of topical corticosteroids in live animals
Author(s): **Donggyu Kim**, **Joongho Ahn**, **Jin Young Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Seung Ah Yoo**, **Ji Hyun Lee,** Seoul St. Mary's Hospital (Korea, Republic of); **Priyanka Ghosh**, **Markham C. Luke,** U.S. Food and Drug Administration (United States); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-12 • 11:50 AM - 12:05 PM
Imaging flow dynamics in aqueous veins during intraocular pressure regulation
Author(s): **Linyu Ni**, **Wei Zhang**, **Alexus Warchock**, **Kayla Podlewski**, **Wonsuk Kim,** Univ. of Michigan (United States); **Sayoko Moroi,** The Ohio State Univ. Wexner Medical Ctr. (United States); **Alan Argento, Guan Xu,** Univ. of Michigan (United States)

Lunch Break 12:05 PM - 1:35 PM

SESSION 3: SMALL-ANIMAL IMAGING: TOMOGRAPHY

26 January 2025 • 1:35 PM - 3:20 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Paul C. Beard**, Univ. College London (United Kingdom); **Daniel Razansky**, Univ. Zürich (Switzerland)

13319-13 • 1:35 PM - 1:50 PM
Label-free photoacoustic computed tomography of visually evoked responses in cortical and subcortical regions in free-moving mice
Author(s): **Guan Xu**, **Kai-Wei Chang**, **Xueding Wang, Kwoon Wong,** Univ. of Michigan (United States)

13319-14 • 1:50 PM - 2:05 PM
Ultrasound computed tomography with a rotating scanner: towards whole-body small animal imaging with a planar Fabry-Pérot sensor
Author(s): **Alissa Silva**, **Michael Brown**, **Nam Trung Huynh**, **Khoa Pham,** Univ. College London (United Kingdom); **Olumide Ogunlade,** Univ. of Birmingham (United Kingdom), Univ. College London (United Kingdom); **Edward Zhang**, **Paul C. Beard, Ben Cox,** Univ. College London (United Kingdom)

13319-15 • 2:05 PM - 2:20 PM
Assessing mitochondrial transplantation therapies of liver injuries using longitudinal photoacoustics
Author(s): **Avinash Mukkala**, **Ori Rotstein,** St. Michael's Hospital (Canada), Univ. of Toronto (Canada); **Eno Hysi,** St. Michael's Hospital (Canada)

13319-16 • 2:20 PM - 2:35 PM
Multiparametric transcranial photoacoustic imaging after photothrombotic stroke
Author(s): **Jiwoong Kim**, **Joo Young Kweon**, **Seongwook Choi**, **Hyunseo Jeon**, **Jinge Yang**, **Minsik Sung**, **Chulhong Kim, Yong Joo Ahn,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-17 • 2:35 PM - 2:50 PM
Real-time spectroscopic photoacoustic/ultrasound (PAUS) imaging integrated on a commercial scanner
Author(s): **Ruibo Shang,** Univ. of Washington (United States); **Peter Lorraine**, **L. Scott Smith**, **Heather Chan,** GE HealthCare (United States); **Vattanary Tevy**, **Ivan Pelivanov, Matthew O'Donnell,** Univ. of Washington (United States)

13319-18 • 2:50 PM - 3:05 PM
Real-time volumetric dose mapping during electron beam FLASH radiation therapy
Author(s): **Wei Zhang,** Univ. of Michigan Medical School (United States); **Ibrahim Oraiqat,** Moffitt Cancer Ctr. (United States); **Dale Litzenberg,** Univ. of Michigan Medical School (United States); **Glebys Gonzalez,** Moffitt Cancer Ctr. (United States); **Yaocai Huang**, **Madhumithra S. Karthikesh,** Univ. of Michigan Medical School (United States); **Jiyhe Koo**, **Christopher Tichacek,** Moffitt Cancer Ctr. (United States); **Sarah Dykstra,** Univ. of Michigan Medical School (United States); **Eduardo Moros**, **Issam El Naqa, Xueding Wang,** Moffitt Cancer Ctr. (United States)

13319-19 • 3:05 PM - 3:20 PM
Photoacoustic monitoring of lung injuries
Author(s): **Rajiv Sanwal**, **Hikaru Kurosawa**, **Warren L. Lee, Eno Hysi,** St. Michael's Hospital (Canada), Univ. of Toronto (Canada)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: PHANTOM AND CONTRAST AGENT

26 January 2025 • 3:50 PM - 5:05 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Srirang Manohar**, Univ. Twente (Netherlands); **Stanislav Y. Emelianov**, Georgia Institute of Technology (United States)

13319-20 • 3:50 PM - 4:05 PM
Hybrid photoacoustic and ultrasound tomography in PAM3: ground truth validation
Author(s): **Esther Bosman,** Univ. Twente (Netherlands); **Felix Lucka,** Ctr. Wiskunde & Informatica (Netherlands); **Rianne Bulthuis**, **Bruno De Santi,** Univ. Twente (Netherlands); **Ben Cox,** Univ. College London (United Kingdom); **Srirang Manohar,** Univ. Twente (Netherlands)

13319-21 • 4:05 PM - 4:20 PM
Molecular-targeted photoacoustic and fluorescence imaging in a pre-clinical head and neck cancer model
Author(s): **Mohammad A. Saad,** Massachusetts General Hospital (United States); **Marvin Xavierselvan**, **Allison Sweeney,** Tufts Univ. (United States); **Derek A. Allen,** Massachusetts General Hospital (United States); **Srivalleesha Mallidi,** Tufts Univ. (United States); **Tayyaba Hasan,** Massachusetts General Hospital (United States)

13319-22 • 4:20 PM - 4:35 PM
Targeted, polymersome-encapsulated indocyanine green J-aggregates for clinically translatable molecular photoacoustic imaging
Author(s): **Konstantin V. Sokolov**, **Ananthakrishnan Jeevarathinam,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Mohammed R. Kawelah,** The Univ. of Texas at Austin (United States); **Claire E. Jones,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Aasim F. Hussain,** The Univ. of Texas at Austin (United States); **Cayla A. Wood,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Alexander E. Marras**, **Thomas M. Truskett,** The Univ. of Texas at Austin (United States); **Richard R. Bouchard,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Keith P. Johnston,** The Univ. of Texas at Austin (United States)

13319-23 • 4:35 PM - 4:50 PM
A novel near-infrared photoacoustic nanoscale contrast agent platform
Author(s): **Shrishti Singh,** George Mason Univ. (United States); **Dylan J. Lawrence,** PhotoSound Technologies, Inc. (United States); **Parag V. Chitnis, Remi Veneziano,** George Mason Univ. (United States)

13319-24 • 4:50 PM - 5:05 PM
Volumetric optoacoustic temperature mapping in photothermal therapy with silica-coated gold nanorods
Author(s): **Eva Remlova,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland); **Alexander Jessernig**, **Marcus Bammel,** ETH Zurich (Switzerland); **Daniil Nozdriukhin,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland); **Yi Chen**, **Oscar Cipolato,** ETH Zurich (Switzerland); **Xose Luis Dean-Ben,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland); **Inge Herrmann,** ETH Zurich (Switzerland); **Daniel Razansky,** ETH Zurich (Switzerland), Univ. Zürich (Switzerland)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
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MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13319-82 • 5:30 PM - 7:00 PM
Voltage-sensitive dye-based photoacoustic imaging visualization of whole brain electrodynamics
Author(s): **Weiran Pang,** The Hong Kong Polytechnic Univ. (Hong Kong, China); **Liming Nie,** Southern Medical Univ. (China); **Puxiang Lai,** The Hong Kong Polytechnic Univ. (Hong Kong, China)

13319-83 • 5:30 PM - 7:00 PM
Longitudinal assessment of human inflammatory arthritis by automatic ultrasound and photoacoustic multi-modality imaging
Author(s): **Xiaorui Peng,** Univ. of Michigan (United States); **Grigorios Karageorgos**, **Jianwei Qiu**, **Soumya Ghose,** GE Research (United States); **Zhanpeng Xu,** Univ. of Michigan (United States); **Zhaoyuan Yang**, **Aaron Dentinger,** GE Research (United States); **Siddarth Ragupathi**, **Janggun Jo**, **Nada Abdulaziz,** Univ. of Michigan (United States); **Girish Gandikota,** Univ. of Michigan (United States); **Guan Xu,** Univ. of Michigan (United States); **David Mills,** GE Research (United States); **Xueding Wang,** Univ. of Michigan (United States)

13319-84 • 5:30 PM - 7:00 PM
Fibrous cap polarimetry characterization for atherosclerosis by using dichroism-sensitive PAM
Author(s): **Hongsung An**, **Yong-Jae Lee,** Pusan National Univ. (Korea, Republic of); **Eunwoo Park**, **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13319-85 • 5:30 PM - 7:00 PM
Quantitative ultrasound and photoacoustic investigations of red blood cell aggregation and oxygen saturation in the human radial artery
Author(s): **Tae-Hoon Bok,** St. Michael's Hospital (Canada), Institute for Biomedical Engineering, Science and Technology (Canada); **Michael C. Kolios,** Toronto Metropolitan Univ. (Canada), St. Michael's Hospital (Canada), Institute for Biomedical Engineering, Science and Technology (Canada); **Eno Hysi,** Univ. of Toronto (Canada), St. Michael's Hospital (Canada), Institute for Biomedical Engineering, Science and Technology (Canada)

13319-86 • 5:30 PM - 7:00 PM
Transparent highly sensitive buckled dome etalon ultrasound transducers
Author(s): **Isaak J. Meadus**, **Roger Zemp, Mahyar Ghavami,** Univ. of Alberta (Canada)

13319-87 • 5:30 PM - 7:00 PM
Augmented encoder-decoder network based on self-attention for photoacoustic reconstruction
Author(s): **Xiaohan Chang**, **Lingbo Cai**, **Jianlei Wang**, **Hongyang Dong**, **Xian Zhao,** Shandong Univ. (China); **Jing Han,** China Univ. of Mining and Technology (China); **Chun Wang,** Shandong Univ. (China)

13319-88 • 5:30 PM - 7:00 PM
Picosecond excitation and generation of photoacoustic waves in composites of graphene
Author(s): **Daniele Vella,** Univ. of Ljubljana (Slovenia); **Diogo A. Pereira,** Univ. de Coimbra (Portugal); **Ales Mrzel**, **Damjan Vengust**, **Aljaž Drnovšek,** Jožef Stefan Institute (Slovenia); **Luis G. Arnaut**, **Carlos Serpa,** Univ. de Coimbra (Portugal); **Matija Jezeršek,** Univ. of Ljubljana (Slovenia)

13319-89 • 5:30 PM - 7:00 PM
Assessment of ovarian lesions using parametric and radiomic analysis of co-registered ultrasound-photoacoustic tomographic images
Author(s): **Yixiao Lin, Quing Zhu,** Washington Univ. in St. Louis (United States)

13319-90 • 5:30 PM - 7:00 PM
Photoacoustic histology of human liver cancers: virtual staining, segmentation, and classification via interconnected deep learning
Author(s): **Chiho Yoon**, **Eunwoo Park**, **Sampa Misra**, **Jin Young Kim**, **Jin Woo Baik,** Pohang Univ. of Science and Technology (Korea, Republic of); **Kwang Gi Kim,** Gachon Univ. (Korea, Republic of); **Chan Kwon Jung,** The Catholic Univ. of Korea (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-91 • 5:30 PM - 7:00 PM
Laser diode-based transmission mode photoacoustic microscopy
Author(s): **Haneul Lee, Joon-Mo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13319-92 • 5:30 PM - 7:00 PM
Photoacoustic spectroscopy for in vivo sensing collagen remodeling of tumor extracellular matrix modulated by cancer-associated fibroblasts
Author(s): **Jiayan Li,** Tongji Univ. (China); **Lu Bai,** Shanghai Medical College, Fudan Univ. (China), Fudan Univ. Shanghai Cancer Ctr. (China); **Junmei Cao,** Tongji Univ. (China); **Wenxiang Zhi,** Shanghai Medical College, Fudan Univ. (China), Fudan Univ. Shanghai Cancer Ctr. (China); **Qian Cheng,** Tongji Univ. (China)

13319-93 • 5:30 PM - 7:00 PM
Magnetically triggered nanoparticle chains: a facile strategy for enhanced photothermal conversion and photoacoustic imaging
Author(s): **Jiayan Li,** Tongji Univ. (China); **Chang Xu,** Tongji Univ. (China), Shanghai East Hospital (China); **Junmei Cao,** Tongji Univ. (China); **Yu Cheng,** Tongji Univ. (China), Shanghai East Hospital (China); **Qian Cheng,** Tongji Univ. (China)

13319-94 • 5:30 PM - 7:00 PM
Liver necrotic mapping using diffusing illumination photoacoustic imaging
Author(s): **Shang Gao**, **Yanobo Hua,** Worcester Polytechnic Institute (United States); **Sharath K Bhagavatula**, **Guigen Liu**, **Oliver Jonas,** Brigham and Women's Hospital, Harvard Medical School (United States); **Haichong K. Zhang,** Worcester Polytechnic Institute (United States)

13319-95 • 5:30 PM - 7:00 PM
Fine tuning of optical resonance wavelength of surface-micromachined optical ultrasound transducer arrays for single wavelength light source readout
Author(s): **Zhiyu Yan**, **Cheng Fang, Jun Zou,** Texas A&M Univ. (United States)

13319-96 • 5:30 PM - 7:00 PM
Spatial offset pump-probe imaging of photoacoustic and photothermal fields at optical resolution
Author(s): **Guo Chen**, **Yuhao Yuan**, **Ji-Xin Cheng, Chen Yang,** Boston Univ. (United States)

13319-97 • 5:30 PM - 7:00 PM
Compact optical-resolution photoacoustic microscopy using a large-diameter focused ring transducer and GRIN illumination optics
Author(s): **Jin Young Youm, Joon-Mo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13319-98 • 5:30 PM - 7:00 PM
Widely tunable Raman fiber laser for hyperspectral photoacoustic imaging
Author(s): **Abhigyan Goswami**, **Swathi Padmanabhan**, **Sarthak Dash**, **Jaya Prakash, V. R. Supradeepa,** Indian Institute of Science, Bengaluru (India)

13319-99 • 5:30 PM - 7:00 PM
Test tools and methods for quantifying the impact of epidermal melanin on photoacoustic image quality
Author(s): **Julian Peterhansl**, **Edouard Coussoux**, **Rutradarshini Asokan,** iThera Medical GmbH (Germany); **Christoph Dehner,** iThera Medical GmbH (Germany), Helmholtz Zentrum München GmbH (Germany); **Braden Eliason, Ledia Lilaj,** iThera Medical GmbH (Germany)

13319-100 • 5:30 PM - 7:00 PM
Characterizing single airborne droplets using photoacoustic sensing and acoustic levitation
Author(s): **Omar Nusrat**, **Eric Strohm, Michael C. Kolios,** Toronto Metropolitan Univ. (Canada)

13319-103 • 5:30 PM - 7:00 PM
Recognizing and understanding artifacts in photoacoustic imaging
Author(s): **Max T. Rietberg,** Multi-Modality Medical Imaging, Tech Med Centre, University of Twente (Netherlands); **Janek Gröhl,** Cancer Research UK Cambridge Institute, Univ. of Cambridge (United Kingdom); **Thomas R. Else**, **Sarah E. Bohndiek,** Cancer Research UK Cambridge Institute (United Kingdom), Univ. of Cambridge (United Kingdom); **Srirang Manohar,** Univ. Twente (Netherlands); **Ben Cox,** Univ. College London (United Kingdom)

13319-105 • 5:30 PM - 7:00 PM
Improving LED-based photoacoustic image quality using an optimized deconvolution technique
Author(s): **Ryuhei Ogawa,** Univ. of Tsukuba (Japan); **Naoto Sato**, **Atsushi Saito,** Cyberdyne, Inc. (Japan); **Mithun Kuniyil Ajith Singh,** Cyberdyne, Inc. (Netherlands); **Hiroaki Kawamoto,** Univ. of Tsukuba (Japan); **Yoshiyuki Sankai,** Cyberdyne, Inc. (Japan)

13319-106 • 5:30 PM - 7:00 PM
Influence of skin tone on target size detectability in photoacoustic breast imaging
Author(s): **Rhea D. Rasquinha,** Brown Univ. (United States); **Mardava R. Gubbi, Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13319-107 • 5:30 PM - 7:00 PM
Optical absorption measurement of biological tissues using ultrasound-induced light deflection
Author(s): **Keisuke Kodama**, **Takuya Koyama**, **Yusuke Oshima, Takashi Katagiri,** Univ. of Toyama (Japan)

13319-109 • 5:30 PM - 7:00 PM
Multiband-spectral photoacoustic microscopy for in-vivo visualization of a subcutaneous tumor using small organic dyes
Author(s): **Tomohiro Ishikawa**, **Ryo Shintate**, **Manami Miyashita,** National Defense Medical College (Japan); **Takeshi Hirasawa,** Nagaoka Univ. of Technology (Japan); **Takafumi Kasai**, **Yasuteru Urano,** The Univ. of Tokyo (Japan); **Miya Ishihara,** National Defense Medical College (Japan)

13319-194 • 5:30 PM - 7:00 PM
Whole-body imaging of mice with dual-modal spiral volumetric optoacoustic and ultrasound (SVOPUS) tomography
Author(s): **Sandeep Kumar Kalva,** Indian Institute of Technology Bombay (India)

13319-102 • 5:30 PM - 7:00 PM
Photoacoustic microscopy and optical coherence tomography longitudinal tracking human pluripotent stem cell derived retinal pigment epithelium cell treatment retinal degeneration diseases
Author(s): **Phuc Nguyen,** Wilmer Eye Institute, The Johns Hopkins Univ. School of Medicine (United States); **Xueding Wang,** Univ. of Michigan (United States); **Yannis Paulus,** Wilmer Eye Institute, The Johns Hopkins Univ. School of Medicine (United States); **Fahim Abigail, Wei Qian,** Univ. of Michigan (United States)

Monday 27 January 2025

SESSION 5: ADVANCES IN ULTRASOUND DETECTION I

27 January 2025 • 8:30 AM - 9:45 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Guenther Paltauf**, Karl-Franzens-Univ. Graz (Austria); **Ivan M. Pelivanov**, Univ. of Washington (United States)

13319-25 • 8:30 AM - 8:45 AM
Developing whispering-gallery optical microprobes for ultrasound sensing
Author(s): **Jialve Sun,** Peking Univ. (China), Yangtze Delta Institute of Optoelectronics (China); **Mengyue Zhang,** Peking Univ. (China); **Shengfei Feng,** Capital Normal Univ. (China); **Changhui Li,** Peking Univ. (China)

13319-26 • 8:45 AM - 9:00 AM
Large area, compact size, sensitive, and broadband polymer-based micro ring array acoustic detector for the photoacoustic tomography
Author(s): **Hyeonwoo Kim**, **Wei-Kuan Lin**, **Linyu Ni**, **Xueding Wang**, **L. Jay Guo, Guan Xu,** Univ. of Michigan (United States)

13319-27 • 9:00 AM - 9:15 AM
Fast photoacoustic tomography using compressed sensing for parallel interrogation of a Fabry-Perot ultrasound sensor
Author(s): **Thomas J. Allen**, **Paul C. Beard, Edward Zhang,** Univ. College London (United Kingdom)

13319-28 • 9:15 AM - 9:30 AM
Nanofabrication of polymer micro-ring resonator on a soft substrate as a flexible ultrasonic detector
Author(s): **Xiangchen Xu**, **Youngseop Lee, Cheng Sun,** Northwestern Univ. (United States)

13319-29 • 9:30 AM - 9:45 AM
Extremely sensitive integrated photonic ultrasound transducers; modelling and experimental validation
Author(s): **Sabiju Valiya Valappil**, **Martin Verweij,** Technische Univ. Delft (Netherlands); **Maurits van der Heiden**, **Peter Harmsma**, **Anne Maaike Gerritsma**, **Robert Altmann, Paul van Neer,** TNO (Netherlands)

Coffee Break 9:45 AM - 10:15 AM

SESSION 6: ADVANCES IN ULTRASOUND DETECTION II

27 January 2025 • 10:15 AM - 11:15 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Roger J. Zemp**, Univ. of Alberta (Canada); **Peter Burgholzer**, Research Ctr. for Non Destructive Testing GmbH (Austria)

13319-30 • 10:15 AM - 10:30 AM
Two-photon polymerization-based polymer whispering-gallery-mode microresonators for photoacoustic microscopy
Author(s): **Shengyun Ji**, **Shuo Yang**, **Jiaxiao Han**, **Ziang Feng**, **Zhuoying Wang, Song Hu,** Washington Univ. in St. Louis (United States)

13319-31 • 10:30 AM - 10:45 AM
Polymer micro-ring resonator arrays-based ultrasonic detector arrays for parallel ultrasound detection
Author(s): **Youngseop Lee**, **Roman Kuranov**, **Xiangchen Xu**, **Hao F. Zhang, Cheng Sun,** Northwestern Univ. (United States)

13319-32 • 10:45 AM - 11:00 AM
A flexible system model for real-world OMUS-based photoacoustics
Author(s): **Kathleen Vunckx**, **Lisa Tripodi**, **Jesu K. Spurgen**, **Klara Volckaert**, **Hilde Jans, Xavier Rottenberg,** imec (Belgium)

13319-33 • 11:00 AM - 11:15 AM
The detection challenge in photoacoustic imaging: how close are we to the ultimate limits of detection sensitivity
Author(s): **James A. Guggenheim,** Univ. of Birmingham (United Kingdom); **Paul C. Beard,** Univ. College London (United Kingdom)

Lunch Break 11:15 AM - 12:45 PM

SESSION 7: BEST PAPER COMPETITION I

27 January 2025 • 12:45 PM - 2:45 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Rinat O. Esenaliev**, The Univ. of Texas Medical Branch (United States); **Quing Zhu**, Washington Univ. in St. Louis (United States)

13319-34 • 12:45 PM - 1:00 PM
Unsupervised inter-domain transformation from label-free mid-infrared photoacoustic microscopy to confocal fluorescence microscopy
Author(s): **Eunwoo Park**, **Sampa Misra**, **Dong Gyu Hwang**, **Chiho Yoon**, **Joongho Ahn**, **Donggyu Kim**, **Jinah Jang, Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-35 • 1:00 PM - 1:15 PM
Real-time photoacoustic and ultrasound 3D imaging
Author(s): **Changhui Li**, **Yu Sun**, **Qiang Fu**, **Yibing Wang, Shuang Li,** Peking Univ. (China)

13319-36 • 1:15 PM - 1:30 PM
Numerical mouse phantoms for multispectral dynamic contrast-enhanced photoacoustic computed tomography
Author(s): **Refik Mert Cam**, **Hsuan-Kai Huang,** Univ. of Illinois (United States); **Luke Lozenski,** Washington Univ. in St. Louis (United States); **Seonyeong Park,** Univ. of Illinois (United States); **Umberto E. Villa,** The Univ. of Texas at Austin (United States); **Mark A. Anastasio,** Univ. of Illinois (United States)

13319-37 • 1:30 PM - 1:45 PM
Quantification of optical absorption from preclinical photoacoustic images with semi-supervised deep learning
Author(s): **Janek Gröhl**, **Ellie V. Bunce**, **Thomas R. Else, Sarah E. Bohndiek,** Cancer Research UK Cambridge Institute (United Kingdom)

13319-38 • 1:45 PM - 2:00 PM
High-performance photoacoustic and ultrasound endoscopy through transparent ultrasound transducer: in-vivo preclinical study of live pigs
Author(s): **Jaewoo Kim**, **Dasom Heo**, **Seonghee Cho**, **Mingyu Ha**, **Joongho Ahn**, **Minsu Kim**, **Jeongwoo Park,** Pohang Univ. of Science and Technology (Korea, Republic of); **Da Hyun Jung,** Severance Hospital (Korea, Republic of); **Hyung Ham Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Hee Man Kim,** Severance Hospital (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-39 • 2:00 PM - 2:15 PM
Ionizing radiation acoustic imaging for 3D dose mapping with proton beam therapy
Author(s): **Wei Zhang,** Univ. of Michigan Medical School (United States); **Ibrahim Oraiqat,** Moffitt Cancer Ctr. (United States); **Jiyeon Park,** Univ. of Florida Proton Therapy Institute (United States); **Glebys Gonzalez,** Moffitt Cancer Ctr. (United States); **Yaocai Huang,** Univ. of Michigan Medical School (United States); **Perry Johnson,** Univ. of Florida Proton Therapy Institute (United States); **Issam El Naqa,** Moffitt Cancer Ctr. (United States); **Xueding Wang,** Univ. of Michigan Medical School (United States)

13319-40 • 2:15 PM - 2:30 PM
A clinical pilot study of ionizing radiation acoustic imaging for mapping radiation dose deposition deep into patient liver during radiation therapy
Author(s): **Wei Zhang**, **Dale Litzenberg**, **Yaocai Huang**, **Scott Hadley**, **Kaiwei Chang,** Univ. of Michigan Medical School (United States); **Ibrahim Oraiqat,** Moffitt Cancer Ctr. (United States); **Sarah Dykstra,** Univ. of Michigan Medical School (United States); **Eduardo Moros,** Moffitt Cancer Ctr. (United States); **Man Zhang**, **Paul L. Carson**, **Kyle C. Cuneo,** Univ. of Michigan Medical School (United States); **Issam El Naqa,** Moffitt Cancer Ctr. (United States); **Xueding Wang,** Univ. of Michigan Medical School (United States)

13319-41 • 2:30 PM - 2:45 PM
Enhancing linearly-sparse array photoacoustic imaging with model-based deep learning technique
Author(s): **Souradip Paul,** Univ. of Illinois (India); **Shensheng Zhao, Yun-Sheng Chen,** Univ. of Illinois (United States)

Coffee Break 2:45 PM - 3:15 PM

SESSION 8: BEST PAPER COMPETITION II

27 January 2025 • 3:15 PM - 5:00 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Vasilis Ntziachristos**, Helmholtz Zentrum München GmbH (Germany); **Xueding Wang**, Univ. of Michigan (United States)

13319-42 • 3:15 PM - 3:30 PM
Optimizing light delivery to perform teleoperative photoacoustic-guided hysterectomy
Author(s): **Gareth C. Keene, Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13319-43 • 3:30 PM - 3:45 PM
Benchmarking deep learning-based reconstruction in photoacoustic computed tomography with clinically relevant synthetic datasets
Author(s): **Panpan Chen**, **Hsuan-Kai Huang**, **Seonyeong Park,** Univ. of Illinois (United States); **Umberto E. Villa,** The Univ. of Texas at Austin (United States); **Mark A. Anastasio,** Univ. of Illinois (United States)

13319-44 • 3:45 PM - 4:00 PM
Simultaneous multispectral photoacoustic and ultrasound 3D automated breast scanner for breast cancer detection
Author(s): **Sinyoung Park**, **Minsik Sung**, **Hyunhee Kim**, **Ki jong Lee,** Pohang Univ. of Science and Technology (Korea, Republic of); **Eun-Yeong Park,** KAIST (Korea, Republic of); **Yongseok Cho**, **Jungyung Lee**, **Namsun Paik,** SM Christianity Hospital (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-45 • 4:00 PM - 4:15 PM
Imaging of perforators for flap surgery guidance using the Fabry Perot photoacoustic scanner
Author(s): **Nam Trung Huynh**, **Ali Alabdullah**, **Rehman Ansari**, **Edward Zhang,** Univ. College London (United Kingdom); **Ahmed Mohamed Yaseen Ali**, **Muholan Kanapathy**, **Afshin Mosahebi,** The Royal Free Hospital (United Kingdom); **Paul C. Beard,** Univ. College London (United Kingdom)

13319-46 • 4:15 PM - 4:30 PM
Development of arrays of highly sensitive plano-concave optical micro-resonator sensors for photo-acoustic imaging applications
Author(s): **Sankhyabrata Bandyopadhyay**, **David Martin Sanchez**, **Edward Zhang**, **James A. Guggenheim, Paul C. Beard,** Univ. College London (United Kingdom)

13319-47 • 4:30 PM - 4:45 PM
Long-term noninvasive-labeling tracking and monitoring stem cell viability in vivo eye using a multimodal photoacoustic, optical coherence tomography, and fluorescence imaging system
Author(s): **Sumin Park,** University of Michigan (United States); **Van Phuc Nguyen,** Univ. of Michigan (United States); **Wei Qian,** IMRA America, Inc. (United States); **Jeff Folz**, **Xueding Wang, Yannis Paulus,** Univ. of Michigan (United States)

13319-48 • 4:45 PM - 5:00 PM
Predicting outcomes of kidney transplantation using quantitative ultrasound and photoacoustics
Author(s): **Sarah J. Dykstra,** St. Michael's Hospital (Canada); **Jihye Baek,** Stanford Univ. (United States); **Alexander Koven**, **Xiaolin He,** St. Michael's Hospital (Canada); **Michael C. Kolios,** Toronto Metropolitan Univ. (Canada); **Kevin J. Parker,** Univ. of Rochester (United States); **Darren A. Yuen,** St. Michael's Hospital (Canada); **Eno Hysi,** St. Michael's Hospital (Canada), Univ. of Toronto (Canada)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13319-110 • 5:30 PM - 7:00 PM
Ionizing radiation acoustic and ultrasound dual-modality imaging for 3D visualization of dose on anatomical structure
Author(s): **Yaocai Huang,** Univ. of Michigan (United States); **Ibrahim Oraiqat,** Moffitt Cancer Ctr. (United States); **Dale Litzenberg**, **Madhumithra S. Karthikesh,** Univ. of Michigan (United States); **Glebys Gonzalez,** Moffitt Cancer Ctr. (United States); **Scott Hadley,** Univ. of Michigan (United States); **Christopher Tichacek**, **Eduardo Moros,** Moffitt Cancer Ctr. (United States); **Man Zhang**, **Paul L. Carson,** Univ. of Michigan (United States); **Kyle C. Cuneo**, **Wei Zhang,** Univ. of Michigan (United States); **Issam El Naqa,** Moffitt Cancer Ctr. (United States); **Xueding Wang,** Univ. of Michigan (United States)

13319-111 • 5:30 PM - 7:00 PM
Automatic quantification of 3D ultrasound and photoacoustic imaging biomarkers for assessment of human inflammatory arthritis
Author(s): **Xiaorui Peng,** Univ. of Michigan (United States); **Grigorios Karageorgos**, **Jianwei Qiu**, **Soumya Ghose,** GE Research (United States); **Zhanpeng Xu,** Univ. of Michigan (United States); **Zhaoyuan Yang**, **Aaron Dentinger,** GE Research (United States); **Siddarth Ragupathi**, **Janggun Jo**, **Nada Abdulaziz,** Univ. of Michigan (United States); **Girish Gandikota**, **Guan Xu,** Univ. of Michigan (United States); **David Mills,** GE Research (United States); **Xueding Wang,** Univ. of Michigan (United States)

13319-112 • 5:30 PM - 7:00 PM
Sparse Structural Similarity Index (S3IM): a new full reference image quality metric for photoacoustic imaging
Author(s): **Francis Kalloor Joseph,** Erasmus MC (Netherlands)

13319-113 • 5:30 PM - 7:00 PM
A high-performance transparent electrode for transparent ultrasonic transducers made of high-permittivity materials.
Author(s): **Minsu Kim**, **Heesoo Kim**, **Seonghee Cho**, **Dasom Heo**, **Hyung Ham Kim, Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-114 • 5:30 PM - 7:00 PM
Characterization and evaluation of blood-mimicking dye phantoms for photoacoustic oximetry
Author(s): **Yong Zhou,** U.S. Food and Drug Administration (United States); **Zixin Wang,** Univ. of California, San Diego (United States); **Keith A. Wear**, **Joshua Pfefer,** U.S. Food and Drug Administration (United States); **Jesse V. Jokerst,** Univ. of California, San Diego (United States); **William Vogt,** U.S. Food and Drug Administration (United States)

13319-115 • 5:30 PM - 7:00 PM
Deep learning powered image restoration in single element scanning imaging
Author(s): **Yuon Song**, **Yongjae Jeong, Jeesu Kim,** Pusan National Univ. (Korea, Republic of)

13319-116 • 5:30 PM - 7:00 PM
Photoacoustic computed tomography of prostate tumors in small animal models
Author(s): **Lingbo Cai**, **Xiaohan Chang**, **Jianlei Wang**, **Hongyang Dong,** Shandong Univ. (China); **Guang Deng,** TomoWave Suzhou Medical Imaging Co., Ltd. (China); **Xian Zhao,** Shandong Univ. (China); **Jing Han,** China Univ. of Mining and Technology (China); **Chun Wang,** Shandong Univ. (China)

13319-117 • 5:30 PM - 7:00 PM
Enhanced photoacoustic imaging through scattering media with photoacoustic-guided wavefront shaping
Author(s): **Xuan Liu**, **Wenfeng Xia**, **Sébastien Ourselin, Tianrui Zhao,** King's College London (United Kingdom)

13319-118 • 5:30 PM - 7:00 PM
Joint reconstruction of multiple initial pressures and the speed of sound in photoacoustic tomography
Author(s): **Miika Suhonen,** Univ. of Eastern Finland (Finland); **Felix Lucka,** Centrum Wiskunde and Informatica (Netherlands); **Aki Pulkkinen,** Univ. of Eastern Finland (Finland); **Simon Arridge**, **Ben Cox,** Univ. College London (United Kingdom); **Tanja Tarvainen,** Univ. of Eastern Finland (Finland)

13319-119 • 5:30 PM - 7:00 PM
Non-invasive diagnosis of hypopigmentary disorders using photoacoustic imaging
Author(s): **Minseong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Ju Hee Han,** Seoul St. Mary's Hospital (Korea, Republic of); **Junho Ahn,** Pohang Univ. of Science and Technology (Korea, Republic of); **Esther Kim**, **Chul Hwan Bang**, **Ji Hyun Lee,** Seoul St. Mary's Hospital (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Wonseok Choi,** The Catholic Univ. of Korea (Korea, Republic of)

13319-120 • 5:30 PM - 7:00 PM
Vascular Changes in MCAO Stroke Mouse Models Using Photoacoustic Microscopy Imaging
Author(s): **Chenshuo Ma**, **Enming Su**, **Geoffrey Murphy**, **Daniel Lawrence, Xueding Wang,** Univ. of Michigan (United States)

13319-121 • 5:30 PM - 7:00 PM
Photoacoustic imaging for efficient dataset automation in deep learning aided ultrasound-guided needle tracking
Author(s): **Katherine Gisi, Manojit Pramanik,** Iowa State Univ. of Science and Technology (United States)

13319-123 • 5:30 PM - 7:00 PM
High-resolution lymphography with multispectral photoacoustic microscopy
Author(s): **Thanh Dat Le,** Chonnam National Univ. Hwasun Hospital (Korea, Republic of); **Yong-Jae Lee**, **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of); **Changho Lee,** Chonnam National Univ. Hwasun Hospital (Korea, Republic of)

13319-124 • 5:30 PM - 7:00 PM
Lipid/Collagen selective PA imaging with dual wavelength fiber laser
Author(s): **Yong-Jae Lee**, **Hongsung An,** Pusan National Univ. (Korea, Republic of); **Jihwan Kim**, **Ju Han Lee,** The Univ. of Seoul (Korea, Republic of); **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

13319-125 • 5:30 PM - 7:00 PM
Wavelength-dependent photoacoustic imaging of goat eyes for enhanced visualization of ocular structures
Author(s): **Deepayan Samanta**, **Swathi S**, **Arijit Paramanick**, **Aiswarya K.S., M Suheshkumar Singh,** Indian Institute of Science Education and Research Thiruvananthapuram (India)

13319-126 • 5:30 PM - 7:00 PM
Tunable wavelength and repetition rate 1200-nm pulsed SRS fiber amplifier
Author(s): **Seongjin Bak,** Pusan National Univ. (Korea, Republic of); **David Veysset,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); **Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of); **Brett E. Bouma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital (United States), Harvard Medical School (United States); **Hwidon Lee,** Pusan National Univ. (Korea, Republic of)

13319-127 • 5:30 PM - 7:00 PM
Multispectral NIR-II photoacoustic microscopy using compact custom all-fiber amplifier
Author(s): **David Veysset,** Massachusetts General Hospital (United States); **Seongjin Bak**, **Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of); **Brett E. Bouma,** Massachusetts General Hospital (United States); **Hwidon Lee,** Pusan National Univ. (Korea, Republic of)

13319-128 • 5:30 PM - 7:00 PM
Exploring uncertainty quantification for photoacoustic image reconstruction and quantitative oxygenation mapping
Author(s): **Silvia Seoni,** Politecnico di Torino (Italy); **Roberto M. Scardigno,** Politecnico di Bari (Italy); **Bruna Cotrufo**, **Massimo Salvi,** Politecnico di Torino (Italy); **Antonio Brunetti**, **Andrea Guerriero,** Politecnico di Bari (Italy); **Giulia Rotunno,** Politecnico di Torino (Italy); **Domenico Buongiorno,** Politecnico di Bari (Italy); **Alberto Vallan**, **Filippo Molinari, Kristen Meiburger,** Politecnico di Torino (Italy)

13319-129 • 5:30 PM - 7:00 PM
Fresh tissue tumor imaging using MetaLASE with simultaneous structural and metabolic contrast
Author(s): **Brendon S. Restall**, **Nathaniel J. M. Haven**, **Matthew T. Martell**, **Joy Wang, Roger J. Zemp,** Univ. of Alberta (Canada)

13319-130 • 5:30 PM - 7:00 PM
DataLab: a MATLAB-based toolbox for analyzing and processing LED-based photoacoustic and ultrasound imaging data
Author(s): **Mithun Kuniyil Ajith Singh,** Cyberdyne, Inc. (Netherlands); **Naoto Sato**, **Fumiyuki Ichihashi, Yoshiyuki Sankai,** Cyberdyne, Inc. (Japan)

13319-131 • 5:30 PM - 7:00 PM
Non-invasive simultaneous assessment of therapy-induced tumor microenvironmental changes in collagen and vasculature with photoacoustic imaging
Author(s): **Andrew Langley**, **Allison Sweeney**, **Christopher Nguyen**, **Skye Edwards**, **Deeksha Sankepalle, Srivalleesha Mallidi,** Tufts Univ. (United States)

13319-132 • 5:30 PM - 7:00 PM
Variable gain amplifier-based signal processing circuit for dual-mode photoacoustic and ultrasonic microscopy
Author(s): **Minjae Kim, Joon-Mo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13319-133 • 5:30 PM - 7:00 PM
Linear array thermoacoustic imaging for neonatal brain imaging
Author(s): **Md Tarikul Islam**, **Juliana B. Lara**, **Ravi Prakash**, **Laura McGuire**, **Fady T. Charbel**, **Amanda P. Siegel**, **Danilo Erricolo**, **James Lin,** Univ. of Illinois Chicago (United States); **Juri G. Gelovani,** Wayne State Univ. (United States); **Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-134 • 5:30 PM - 7:00 PM
Hemorrhages detection using AI-powered transcranial photoacoustic imaging
Author(s): **Kamran Avanaki**, **Loïc Saint-Martin, Juliana B. Lara,** Univ. of Illinois Chicago (United States)

13319-135 • 5:30 PM - 7:00 PM
Anisotropic skull model using ultrasound phase velocities for enhanced photoacoustic imaging
Author(s): **Hossein Khodavirdi,** Illinois Institute of Technology (United States); **Loïc Saint-Martin,** Univ. of Illinois Chicago (United States); **Ankit Srivastava,** Illinois Institute of Technology (United States); **Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-136 • 5:30 PM - 7:00 PM
Reconstruction-based optical-resolution photoacoustic microscopy for the combination of fast galvo scanning and focused ultrasound detection
Author(s): **Guenther Paltauf**, **Daniel Toader, Robert Nuster,** Karl-Franzens-Univ. Graz (Austria)

13319-137 • 5:30 PM - 7:00 PM
Automatic muscle segmentation for the diagnosis of peripheral artery disease using multispectral optoacoustic tomography
Author(s): **Moritz Schillinger**, **Maja Schlereth,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Gaspard Boraud**, **Guillaume Zahnd**, **Christoph Dehner,** iThera Medical GmbH (Germany); **Yi Li**, **Julius Kempf**, **Milenko Caranovic**, **Briain Haney**, **Ulrich Rother,** Universitätsklinikum Erlangen (Germany), Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Katharina Breininger,** Julius-Maximilians-Univ. Würzburg (Germany)

13319-188 • 5:30 PM - 7:00 PM
Wireless ultra-compact handheld dual mode ultrasound and photoacoustic imaging
Author(s): **Vijitha Periyasamy**, **Avishek Das, Manojit Pramanik,** Iowa State Univ. of Science and Technology (United States)

13319-190 • 5:30 PM - 7:00 PM
Real-time photoacoustic multi-projection imaging with camera-based ultrasound detection
Author(s): **Robert Nuster, Guenther Paltauf,** Karl-Franzens-Univ. Graz (Austria)

13319-192 • 5:30 PM - 7:00 PM
Compact fiber optic laser ultrasound by using high power diode lasers for biomedical applications
Author(s): **Miguel Sánchez Rodas,** Univ. Carlos III de Madrid (Spain); **Alexander Oraevsky,** TomoWave Laboratories, Inc. (United States); **Horacio Lamela,** Univ. Carlos III de Madrid (Spain)

Tuesday 28 January 2025

SESSION 9: MACHINE LEARNING: DEVELOPMENTS AND APPLICATIONS I

28 January 2025 • 8:45 AM - 9:45 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Mark A. Anastasio**, Univ. of Illinois (United States); **Srivalleesha Mallidi**, Tufts Univ. (United States)

13319-49 • 8:45 AM - 9:00 AM
Deep-learning diffractive photoacoustic tomography (DL-DPAT)
Author(s): **Phuong Tran,** The Univ. of North Carolina at Chapel Hill (United States), Duke Univ. (United States); **Tri Vu**, **Luca Menozzi**, **Anthony DiSpirito, Junjie Yao,** Duke Univ. (United States)

13319-50 • 9:00 AM - 9:15 AM
Experimental validation of learning-based compensation for skull-induced aberrations in transcranial photoacoustic computed tomography
Author(s): **Hsuan-Kai Huang**, **Joseph Kuo,** Univ. of Illinois (United States); **Yang Zhang**, **Yousuf Aborahama**, **Manxiu Cui**, **Karteekeya Sastry,** Caltech (United States); **Seonyeong Park,** Univ. of Illinois (United States); **Umberto E. Villa,** The Univ. of Texas at Austin (United States); **Lihong V. Wang,** Caltech (United States); **Mark A. Anastasio,** Univ. of Illinois (United States)

13319-52 • 9:15 AM - 9:30 AM
A spectroscopy-based machine learning framework on photoacoustic imaging data for automatic 3D delineation of melanoma tumors
Author(s): **Aboma Merdasa**, **Alice Fracchia**, **Magne Stridh**, **Jenny Hult**, **Patrik Edén**, **Victor Olariu, Malin Malmsjö,** Lund Univ. (Sweden)

13319-53 • 9:30 AM - 9:45 AM
Deep learning filtered back projection for photoacoustic tomography
Author(s): **Chao Tian**, **Songde Liu,** Univ. of Science and Technology of China (China); **Junjun Sun,** Institute of Artificial Intelligence, Hefei Comprehensive National Science Center (China)

Coffee Break 9:45 AM - 10:15 AM

SESSION 10: MACHINE LEARNING: DEVELOPMENTS AND APPLICATIONS II

28 January 2025 • 10:15 AM - 11:15 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Albert Claude Boccara**, Institut Langevin (France); **Mark A. Anastasio**, Univ. of Illinois (United States)

13319-54 • 10:15 AM - 10:30 AM
Transfer learning for grading images in photoacoustic imaging using deep learning
Author(s): **Leonie D. Bois**, **Wytse Kraal**, **Fleur Dolmans**, **Brandon Li,** Univ. of Amsterdam (Netherlands); **Janek Grohl,** Univ. of Cambridge (United Kingdom); **Francis K. Joseph,** Erasmus MC (Netherlands); **Navchetan Awasthi,** Univ. of Amsterdam (Netherlands)

13319-55 • 10:30 AM - 10:45 AM
Deep learning-based one-shot model for photoacoustic image reconstruction
Author(s): **Jago Muhlehner,** Univ. of Amsterdam (Netherlands); **Sowmya Chandramoorthy,** Verasonics, Inc. (Netherlands); **Francis K. Joseph,** Erasmus MC (Netherlands); **Navchetan Awasthi,** Univ. of Amsterdam (Netherlands)

13319-56 • 10:45 AM - 11:00 AM
Stiffness matrix-based physics-constrained neural network for transcranial photoacoustic imaging
Author(s): **Ya Gao**, **Junmei Cao,** Tongji Univ. (China); **Weijiang Xu,** Univ. Polytechnique Hauts-de-France (France), INSA (France); **Qian Cheng,** Tongji Univ. (China)

13319-57 • 11:00 AM - 11:15 AM
3D handheld ultrasound and spectroscopic photoacoustic imaging enabled by deep-learning and visual odometry
Author(s): **Deeksha Sankepalle**, **Avijit Paul, Srivalleesha Mallidi,** Tufts Univ. (United States)

Lunch Break 11:15 AM - 1:00 PM

SESSION 11: SIGNAL AND IMAGE PROCESSING

28 January 2025 • 1:00 PM - 2:30 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Guenther Paltauf**, Karl-Franzens-Univ. Graz (Austria); **Ivan M. Pelivanov**, Univ. of Washington (United States)

13319-58 • 1:00 PM - 1:15 PM
Gradient-free joint reconstruction of initial pressure distribution and wave speeds estimation in transcranial photoacoustic computed tomography
Author(s): **Hsuan-Kai Huang,** Univ. of Illinois (United States); **Umberto E. Villa,** The Univ. of Texas at Austin (United States); **Lihong V. Wang,** Caltech (United States); **Mark A. Anastasio,** Univ. of Illinois (United States)

13319-59 • 1:15 PM - 1:30 PM
Compensating for the spatial impulse response in 3D photoacoustic computed tomography using a learned data space restoration method
Author(s): **Kaiyi Yang**, **Seonyeong Park**, **Hsuan-Kai Huang,** Univ. of Illinois (United States); **Umberto E. Villa,** The Univ. of Texas at Austin (United States); **Mark A. Anastasio,** Univ. of Illinois (United States)

13319-61 • 1:30 PM - 1:45 PM
Velocity-based filtering approach to photoacoustic-guided hysterectomy demonstrated with a human cadaver
Author(s): **Nethra Venkatayogi,** Johns Hopkins Univ. (United States); **Karen Wang,** The Johns Hopkins Univ. School of Medicine (United States); **Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States)

13319-62 • 1:45 PM - 2:00 PM
Information-theoretical limits for image reconstruction in photoacoustics
Author(s): **Peter Burgholzer,** Research Ctr. for Non Destructive Testing GmbH (Austria); **Markus Haltmeier,** Univ. Innsbruck (Austria)

13319-63 • 2:00 PM - 2:15 PM
GPU-accelerated filtered back-projection algorithm for ultrafast photoacoustic image reconstruction
Author(s): **Songde Liu**, **Zhijian Tan, Chao Tian,** Univ. of Science and Technology of China (China)

13319-64 • 2:15 PM - 2:30 PM
Precise and efficient model-based optoacoustic reconstruction for real-time clinical imaging
Author(s): **Christoph Dehner,** iThera Medical GmbH (Germany), Helmholtz Zentrum München GmbH (Germany); **Ledia Lilaj,** iThera Medical GmbH (Germany); **Vasilis Ntziachristos,** Helmholtz Zentrum München GmbH (Germany), Technische Univ. München (Germany); **Guillaume Zahnd,** iThera Medical GmbH (Germany), Helmholtz Zentrum München GmbH (Germany); **Dominik Jüstel,** Helmholtz Zentrum München GmbH (Germany), Technische Univ. München (Germany)

Coffee Break 2:30 PM - 3:00 PM

SESSION 12: ADVANCES IN MICROSCOPY

28 January 2025 • 3:00 PM - 4:15 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Chulhong Kim**, Pohang Univ. of Science and Technology (Korea, Republic of); **Lihong V. Wang**, Caltech (United States)

13319-65 • 3:00 PM - 3:15 PM
Integrated two-photon and photoacoustic microscopy for neurovascular imaging
Author(s): **Jiaxiao Han,** Washington Univ. in St. Louis (United States); **Youngseop Lee,** Northwestern Univ. (United States); **Ziang Feng**, **Keran Yang**, **Allison Martinez**, **Jin-Moo Lee**, **Adam Kepecs,** Washington Univ. in St. Louis (United States); **Hao F. Zhang**, **Cheng Sun,** Northwestern Univ. (United States); **Song Hu,** Washington Univ. in St. Louis (United States)

13319-66 • 3:15 PM - 3:30 PM
Large-field-of-view optical-resolution optoacoustic microscopy using a stationary silicon-photonics acoustic detector in both reflection and transmission configurations
Author(s): **Tamar Harary**, **Michael Nagli**, **Nathan Suleymanov**, **Ilya Goykhman, Amir Rosenthal,** Technion-Israel Institute of Technology (Israel)

13319-67 • 3:30 PM - 3:45 PM
High spatiotemporal resolution photoacoustic microscopy based on miniature ultrasound transducer
Author(s): **Chengbo Liu,** Shenzhen Institute of Advanced Technology (China)

13319-68 • 3:45 PM - 4:00 PM
High-speed handheld photoacoustic microscopic probe through high-frequency transparent ultrasound transducer and fiber scanner
Author(s): **Mingyu Ha**, **Jaewoo Kim**, **Seonghee Cho**, **Dasom Heo**, **Minsu Kim**, **Joongho Ahn, Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-69 • 4:00 PM - 4:15 PM
Optical-resolution photoacoustic tomography through highly scattering layers using the optical memory effect
Author(s): **Benjamin Keenlyside,** Univ. of Birmingham (United Kingdom); **Arnon A.B.,** Univ. of Birmingham (United Kingdom), Univ. Twente (Netherlands); **Ivo Vellekoop,** Univ. Twente (Netherlands); **James A. Guggenheim,** Univ. of Birmingham (United Kingdom), Univ. College London (United Kingdom)

SESSION 13: ADVANCES IN ENDOSCOPY

28 January 2025 • 4:15 PM - 5:15 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Lihong V. Wang**, Caltech (United States); **Paul C. Beard**, Univ. College London (United Kingdom)

13319-70 • 4:15 PM - 4:30 PM
Functional photoacoustic fiberscope with 3D-printed optics
Author(s): **Shuo Yang**, **Shengyun Ji**, **Jingwei Ling**, **Ziang Feng**, **Larry Atakora-Amaniampong,** Washington Univ. in St. Louis (United States); **Xiaobin Yi**, **Yong Wang,** Washington Univ. School of Medicine in St. Louis (United States); **Song Hu,** Washington Univ. in St. Louis (United States)

13319-71 • 4:30 PM - 4:45 PM
Braided catheter-based 2.4 mm diameter photoacoustic endoscopic mini-probe
Author(s): **Jin Young Youm, Joon-Mo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13319-72 • 4:45 PM - 5:00 PM
Characterizing intestinal obstructions with a photoacoustic-ultrasound balloon catheter: studies with animals and human subjects in vivo
Author(s): **Yaocai Huang**, **Laura Johnson**, **Xueding Wang**, **Peter Higgins, Guan Xu,** Univ. of Michigan (United States)

13319-73 • 5:00 PM - 5:15 PM
Characterizing obstructive intestinal strictures using spectroscopic photoacoustic imaging
Author(s): **Xiaorui Peng**, **Laura Johnson**, **Linyu Ni**, **Peter Higgins**, **Xueding Wang, Guan Xu,** Univ. of Michigan (United States)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the poster session on Tuesday evening with all LASE conferences and the BiOS conference on Photons Plus Ultrasound: Imaging and Sensing. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13319-138 • 6:00 PM - 8:00 PM
Fundamental investigation into the appearance of blood vessels in photoacoustic imaging
Author(s): **Toshitaka Agano,** AG Consulting (Japan)

13319-139 • 6:00 PM - 8:00 PM
Multimodal PA/US imaging for oxygen saturation quantification in human carotid in vivo
Author(s): **Sunghun Nam**, **Minsik Sung,** Pohang Univ. of Science and Technology (Korea, Republic of); **Seonoh Kim**, **Jong-il Park,** Yeungnam Univ. Medical Ctr. (Korea, Republic of); **Dongyoung Jung**, **Moongyu Han,** Pohang Univ. of Science and Technology (Korea, Republic of); **Byullee Park,** Sungkyunkwan Univ. (Korea, Republic of); **Ung Kim,** Yeungnam Univ. Medical Ctr. (Korea, Republic of); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13319-140 • 6:00 PM - 8:00 PM
Non-contact laser ultrasound imaging of phantoms using optical speckle-tolerant pulsed laser vibrometer
Author(s): **ChenChia Wang**, **Feng Jin**, **Sudhir Trivedi**, **Mark Goncharovsky**, **Deepak Patel**, **Irwin Wang,** Brimrose Corp. of America (United States); **Gary P. Zientara,** U.S. Army Research Institute of Environmental Medicine (United States); **Hyunwoo Song**, **Jeeun Kang**, **Emad Boctor, Jacob B. Khurgin,** Johns Hopkins Univ. (United States)

13319-141 • 6:00 PM - 8:00 PM
High-frequency linear array photoacoustic imaging of subcutaneous tumor environment using small organic dyes
Author(s): **Ryo Shintate**, **Tomohiro Ishikawa**, **Manami Miyashita,** National Defense Medical College (Japan); **Takeshi Hirasawa,** Nagaoka Univ. of Technology (Japan); **Takafumi Kasai**, **Yasuteru Urano,** The Univ. of Tokyo (Japan); **Miya Ishihara,** National Defense Medical College (Japan)

13319-142 • 6:00 PM - 8:00 PM
Dual illumination handheld photoacoustic imaging system with light emitting diode and pulsed laser diode
Author(s): **Vijitha Periyasamy**, **Avishek Das, Manojit Pramanik,** Iowa State Univ. of Science and Technology (United States)

13319-143 • 6:00 PM - 8:00 PM
Functional ultrasound and photoacoustic imaging system for vasculature analysis
Author(s): **Ninjbadgar Tsedendamba** , **Dongyoung Jo,** Pusan National Univ. (Korea, Republic of); **Wonseok Choi,** The Catholic University (Korea, Republic of); **Jeesu Kim,** Pusan National Univ. (Korea, Republic of)

13319-145 • 6:00 PM - 8:00 PM
PACT image reconstruction: from sinograms to images using neural networks
Author(s): **Xie Hui,** Nanyang Technological Univ. (Singapore); **Praveenbalaji Rajendran,** Harvard Medical School (United States); **Tong Ling,** Nanyang Technological Univ. (Singapore); **Manojit Pramanik,** Iowa State Univ. of Science and Technology (United States)

13319-147 • 6:00 PM - 8:00 PM
Nanosecond pulsed light-emitting diode (LED)-based photoacoustic computed tomography
Author(s): **Avishek Das, Manojit Pramanik,** Iowa State Univ. of Science and Technology (United States)

13319-148 • 6:00 PM - 8:00 PM
Widely-tunable SRS fiber amplifier in 1.7 µm region for multispectral photoacoustic microscopy
Author(s): **Sang Min Park**, **Seongjin Bak,** Pusan National Univ. (Korea, Republic of); **Gyeong Hun Kim,** Massachusetts General Hospital, Harvard Medical School (United States); **Soon-Woo Cho,** Duke Univ. (United States); **Brett E. Bouma,** Massachusetts General Hospital, Harvard Medical School (United States); **Chang-Seok Kim, Hwidon Lee,** Pusan National Univ. (Korea, Republic of)

13319-149 • 6:00 PM - 8:00 PM
Non-contact PA imaging based on external cavity laser sensor with phase sensitivity manipulation
Author(s): **Won Tae Choe**, **Sang Min Park,** Pusan National Univ. (Korea, Republic of); **Hansol Jang,** Agency for Defense Development (Korea, Republic of); **Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13319-150 • 6:00 PM - 8:00 PM
Analysis of photoacoustic waveforms to evaluate vascular stenosis
Author(s): **Yoshihisa Yamaoka,** Komatsu Univ. (Japan); **Kaisei Ohba**, **Takashi Kaneko,** Saga Univ. (Japan); **Miharu Ando, Yukimi Endo,** Komatsu Univ. (Japan)

13319-151 • 6:00 PM - 8:00 PM
Prognosis value of photoacoustic imaging in rheumatoid arthritis
Author(s): **Huazhen Liu, Meng Yang,** Peking Union Medical College Hospital (China)

13319-152 • 6:00 PM - 8:00 PM
Dual-modal photoacoustic/ultrasound imaging for preoperative prediction of HER2-over/low/zero-expressing breast cancer and TNBC: a prospective multicenter study
Author(s): **Jiang Ji**, **Ming Wang**, **Huazhen Liu, Meng Yang,** Peking Union Medical College Hospital (China)

13319-153 • 6:00 PM - 8:00 PM
Polydopamine coated manganese oxides (Mn3O4) for synergetic ROS-scavenging/oxygen-enrichment/photothermal therapy in rheumatoid arthritis
Author(s): **Huazhen Liu, Meng Yang,** Peking Union Medical College Hospital (China)

13319-155 • 6:00 PM - 8:00 PM
A pilot study on the use of high-frequency photoacoustic imaging for quantitative human skin vasculature analysis
Author(s): **Bruna Cotrufo**, **Alberto Vallan**, **Silvia Seoni**, **Giacinto Luigi Cerone**, **Alberto Botter**, **Filippo Molinari, Kristen M. Meiburger,** Politecnico di Torino (Italy)

13319-156 • 6:00 PM - 8:00 PM
Deep-tissue high-frame rate photoacoustic imaging with portable laser diode and high-gain receiver
Author(s): **Mithun Kuniyil Ajith Singh,** Cyberdyne, Inc. (Netherlands); **Gijs Van Soest, Francis Kalloor Joseph,** Erasmus MC (Netherlands)

13319-158 • 6:00 PM - 8:00 PM
Enhancing reconstruction accuracy in linear array photoacoustic computed tomography using least square reverse time migration
Author(s): **Ravi Prakash,** Univ. of Illinois Chicago (United States); **Hossein S. Aghamiry,** Univ. Côte d'Azur (France); **Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-159 • 6:00 PM - 8:00 PM
Fast and ultrawide multispectral photoacoustic microscopy of mouse brain in-vivo
Author(s): **Mohsin Zafar, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-160 • 6:00 PM - 8:00 PM
Evaluation of algorithms to decompose signals in MS PAM
Author(s): **Amir Khansari**, **Seyed M. Ranjbaran**, **Mohsin Zafar**, **Mohammad J. Beirami, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-161 • 6:00 PM - 8:00 PM
Improving ultrasound brain image quality with enhanced diffusion U-ResNet
Author(s): **Deepika Aggrawal**, **Juliana B. Lara**, **Md Tarikul Islam**, **Dan Schonfeld, Kamran Avanaki,** Univ. of Illinois Chicago (United States)

13319-162 • 6:00 PM - 8:00 PM
Nano-pulsed laser therapy (NPLT) for enhancing neural stem cell (NSC) resilience to tau oligomers
Author(s): **Kevin J. Johnson**, **Auston C. Grant**, **Adam Trupp**, **Jamal Saada**, **Rakez Kayed**, **Rinat O. Esenaliev, Maria-Adelaide Micci,** The Univ. of Texas Medical Branch (United States)

13319-163 • 6:00 PM - 8:00 PM
Nano-pulsed laser therapy (NPLT) system for therapy of traumatic brain injury patients
Author(s): **Jamal Saada**, **Maria-Adelaide Micci, Rinat O. Esenaliev,** The Univ. of Texas Medical Branch (United States)

13319-164 • 6:00 PM - 8:00 PM
Characterizing detectors for photoacoustic imaging
Author(s): **James A. Guggenheim,** Univ. of Birmingham (United Kingdom); **Paul C. Beard,** Univ. College London (United Kingdom)

13319-165 • 6:00 PM - 8:00 PM
Transcranial photoacoustic imaging with ICG J-aggregates for imaging blood-brain barrier leak following LPS and blood transfusion induced neuroinflammation
Author(s): **Filip J. Bodera,** Toronto Metropolitan Univ. (Canada); **Samuel Jensen,** Univ. of Toronto (Canada); **Shrishti Singh**, **Remi Veneziano**, **Parag V. Chitnis,** George Mason Univ. (United States); **Mark J. McVey,** The Hospital for Sick Children (SickKids) (Canada); **Michael C. Kolios,** Toronto Metropolitan Univ. (Canada)

13319-51 • 6:00 PM - 8:00 PM
Enhancing signal-to-noise ratio in LED-based photoacoustic imaging using deep learning
Author(s): **Farrukh Barratov,** Univ. of Amsterdam (Netherlands); **Praveenbalaji Rajendran,** Harvard Univ. (United States); **Mithun Kuniyil A. Singh,** Cyberdyne, Inc. (Netherlands); **Francis K. Joseph,** Erasmus MC (Netherlands); **Navchetan Awasthi,** Univ. of Amsterdam (Netherlands)

Wednesday 29 January 2025

SESSION 14: QUANTITATIVE IMAGING

29 January 2025 • 8:30 AM - 9:30 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Alexander A. Oraevsky**, TomoWave Laboratories, Inc. (United States); **Mark A. Anastasio**, Univ. of Illinois (United States)

13319-74 • 8:30 AM - 8:45 AM
Three-dimensional segmentation and quantification of vascular networks in photoacoustic tomography
Author(s): **Jiaqi Zhu**, **Nam Trung Huynh,** Univ. College London (United Kingdom); **Olumide Ogunlade,** Univ. of Birmingham (United Kingdom); **Paul C. Beard,** Univ. College London (United Kingdom)

13319-75 • 8:45 AM - 9:00 AM
Predicting the effectiveness of chemotherapy based on photoacoustic pH imaging of tumor acidosis
Author(s): **Janggun Jo**, **Jeff Folz**, **Maria E. Gonzalez**, **Ahmad Eido**, **Roberta Caruso**, **Celina Kleer, Xueding Wang,** Univ. of Michigan (United States)

13319-76 • 9:00 AM - 9:15 AM
Quantitative photoacoustic imaging using fluence marker: algorithm comparison and experimental validation
Author(s): **Mervenur Akkus**, **Anjali Thomas**, **Sowmiya Chandramoorthi**, **Gijs van Soest, Francis Kalloor Joseph,** Erasmus MC (Netherlands)

13319-77 • 9:15 AM - 9:30 AM
Quartz-enhanced photoacoustics with fiber-feedback optical parametric oscillators: fingerprinting a trace gas at ppm-level within seconds
Author(s): **Simon Angstenberger**, **Moritz Floess**, **Luca Schmid**, **Pavel Ruchka**, **Tobias Steinle, Harald Giessen,** Univ. Stuttgart (Germany)

SESSION 15: NOVEL SYSTEM INCLUDING WAVEFRONT SHAPING

29 January 2025 • 9:30 AM - 10:30 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Meng Yang**, Peking Union Medical College Hospital (China)

13319-189 • 9:30 AM - 9:45 AM
Performance characterization of a high-power, compact, low-cost and high-efficiency two-color VCSEL subsystem for photoacoustic imaging
Author(s): **Braden Eliason**, **Antonia Longo**, **Christoph Dehner**, **Ledia Lilaj,** iThera Medical GmbH (Germany); **Stephan Gronenborn,** TRUMPF Photonic Components GmbH (Germany); **Cynthia Klett,** iThera Medical GmbH (Germany); **Alexander Weigl,** TRUMPF Photonic Components GmbH (Germany); **Dominik Dörich**, **Uwe Malzahn,** iC-Haus GmbH (Germany); **Guillaume Zahnd**, **Josef Konradl, Patrick Leisching,** iThera Medical GmbH (Germany)

13319-78 • 9:45 AM - 10:00 AM
Neuromelanin imaging of brain organoids using metalens-based photoacoustic microscopy with extended depth-of-field
Author(s): **Byullee Park**, **Aleksandr Barulina**, **Elena Barulina,** Sungkyunkwan Univ. (Korea, Republic of); **Dong Kyo Oh,** Pohang Univ. of Science and Technology (Korea, Republic of); **Soomin Park,** Sungkyunkwan Univ. (Korea, Republic of); **Hyunjun Kye**, **Jeesu Kim,** Pusan National Univ. (Korea, Republic of); **Jong-Chan Park,** Sungkyunkwan Univ. (Korea, Republic of); **Junsuk Rho,** Pohang Univ. of Science and Technology (Korea, Republic of); **Inki Kim,** Sungkyunkwan Univ. (Korea, Republic of)

13319-79 • 10:00 AM - 10:15 AM
Ultrasound light waveguiding to increase fluorescence of a hidden target
Author(s): **Maxim N. Cherkashin**, **Volodymyr Rohovets**, **Carsten Brenner**, **Georg Schmitz, Martin R. Hofmann,** Ruhr-Univ. Bochum (Germany)

13319-80 • 10:15 AM - 10:30 AM
Acoustic vortex-based dynamic lens for light focusing and steering
Author(s): **Chia-Wen Hu**, **Zong-Han Hsieh**, **Chung-Han Huang**, **Meng-Lin Li, Chih-Kuang Yeh,** National Tsing Hua Univ. (Taiwan)

Coffee Break 10:30 AM - 11:00 AM

SESSION 16: PANEL DISCUSSION: TRANSLATION RESEARCH

29 January 2025 • 11:00 AM - 11:30 AM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Lihong V. Wang**, Caltech (United States); **Alexander A. Oraevsky**, TomoWave Laboratories, Inc. (United States)
Join the Photons Plus Ultrasound: Imaging and Sensing conference to discuss translation research.

Moderators:
Lihong Wang, Caltech
Alexander A. Oraevsky, TomoWave Laboratories, Inc.

Panelists:
Chulhong Kim, Optiecho
Bryan Clingman, Seno Medical
Meng Yang, Union Medical College Hospital
William Vogt, FDA

SESSION 17: AWARDS CEREMONY: PHOTONS PLUS ULTRASOUND: IMAGING AND SENSING 2025

29 January 2025 • 11:30 AM - 12:00 PM | Moscone South, Room 205 (Level 2)
Session Chair(s): **Lihong V. Wang**, Caltech (United States); **Alexander A. Oraevsky**, TomoWave Laboratories, Inc. (United States)
Join the Photons Plus Ultrasound: Imaging and Sensing conference is celebrating the best papers.

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13319-154
Deep learning-based photoacoustic image reconstruction using a single-element low-frequency PMUT
Author(s): **Arijit Paramanick,** Indian Institute of Science Education and Research Thiruvananthapuram (India); **Kaustav Roy,** Indian Institute of Science (India); **Deepayan Samanta**, **Tathagata Das,** Indian Institute of Science Education and Research Thiruvananthapuram (India); **Rudra Pratap,** Indian Institute of Science (India); **Suheshkumar Singh,** Indian Institute of Science Education and Research Thiruvananthapuram (India)

CONFERENCE 13320

Biomedical Light Scattering XV

25 January 2025 | Moscone South, Room 101 (Level 1 Lobby)

Conference Chair(s): **Adam Wax,** Duke Univ. (United States); **Vadim Backman,** Northwestern Univ. (United States)

Program Committee: **Nada N. Boustany,** Rutgers, The State Univ. of New Jersey (United States); **Stephen A. Boppart,** Univ. of Illinois (United States); **Dirk J. Faber,** Academisch Medisch Ctr. (Netherlands); **Mary-Ann Mycek,** Univ. of Michigan (United States); **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States); **Brian W. Pogue,** Thayer School of Engineering at Dartmouth (United States); **Le Qiu,** Beth Israel Deaconess Medical Ctr. (United States)

Saturday 25 January 2025

SESSION 1: OCT AND LOW COHERENCE SCATTERING

25 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Adam P. Wax**, Duke Univ. (United States)

13320-1 • 8:00 AM - 8:30 AM
Combined angle-resolved low-coherence interferometry and optical coherence tomography of the human retina *(Invited Paper)*
Author(s): **David A. Miller**, **Hillel Price**, **Wan Wang, Adam Wax,** Duke Univ. (United States)

13320-2 • 8:30 AM - 8:50 AM
Normalizing dynamic light scattering (phase-decorrelation OCT) measurements in the cornea for varying hydration state using differential absorption
Author(s): **Brecken J. Blackburn**, **Michael Jenkins,** Case Western Reserve Univ. (United States); **William J. Dupps,** Cleveland Clinic (United States); **Andrew M. Rollins,** Case Western Reserve Univ. (United States)

13320-3 • 8:50 AM - 9:10 AM
A hybrid particle-wave Monte Carlo model for OCT giving a two orders of magnitude increase in speed
Author(s): **Gijs Buist**, **Johannes de Boer,** Vrije Univ. Amsterdam (Netherlands); **Arjen Amelink,** Vrije Univ. Amsterdam (Netherlands), TNO (Netherlands)

13320-4 • 9:10 AM - 9:30 AM
Holographic OCT detects disruptions in intracellular dynamics by viral infections of living tissue
Author(s): **Dawith Lim**, **Shivani Mahajan**, **Fernanda da Cunha**, **John Turek**, **Michael R. Ladisch, David D. Nolte,** Purdue Univ. (United States)

13320-5 • 9:30 AM - 10:00 AM
Measuring particle diffusion in multiple scattering media using dynamic light scattering optical coherence tomography *(Invited Paper)*
Author(s): **Jeroen Kalkman, Konstantine Cheishvili,** Technische Univ. Delft (Netherlands)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: CLINICAL AND PRE-CLINICAL

25 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Vadim Backman**, Northwestern Univ. (United States)

13320-6 • 10:30 AM - 11:00 AM
The impact of skin tone on photoacoustic imaging: observations and phantoms for modeling *(Invited Paper)*
Author(s): **Jesse V. Jokerst,** Univ. of California, San Diego (United States)

13320-7 • 11:00 AM - 11:20 AM
Optical analysis of biomarkers from chromatin-sensitive partial wave spectroscopic imaging
Author(s): **Ali Daneshkhah**, **Emily M. Pujada**, **Andrew S. Chang,** Northwestern Univ. (United States); **Jianan Lin,** NanoCytomics LLC (United States); **Sravya Prabhala**, **Rachel Ye,** Northwestern Univ. (United States); **Hariharan Subramanian,** NanoCytomics LLC (United States); **Ankit**

Bharat, Northwestern Univ. (United States); **Hemant K. Roy,** Baylor College of Medicine (United States); **Vadim Backman,** Northwestern Univ. (United States)

13320-8 • 11:20 AM - 11:40 AM
Ultra-thin three-wavelength SFDI endoscope for early cancer detection
Author(s): **Maria Cristina Cortes Salas**, **Rafael Fuentes-Dominguez, George Gordon,** The Univ. of Nottingham (United Kingdom)

13320-9 • 11:40 AM - 12:10 PM
Single cell angular scattering of organelles: bridging the gap between simple models and experimental data *(Invited Paper)*
Author(s): **Andrew J. Berger,** Univ. of Rochester (United States); **Kaitlin J Dunn,** DIOPTIC Inc (United States); **Alex Matlock,** Massachusetts Institute of Technology (United States); **George Funkenbusch,** Duke Univ. (United States); **Zahid Yaqoob,** Boston Univ. (United States); **Peter C. So,** Massachusetts Institute of Technology (United States)

Lunch Break 12:10 PM - 1:10 PM

SESSION 3: NOVEL TECHNIQUES

25 January 2025 • 1:10 PM - 3:35 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Adam P. Wax**, Duke Univ. (United States)

13320-10 • 1:10 PM - 1:40 PM
Strategies for mesoscale imaging of complex and scattering biomedical specimens *(Invited Paper)*
Author(s): **Liam M Rooney,** Univ. of Strathclyde (United Kingdom); **Beatrice Bottura,** CRUK Scotland Institute (United Kingdom); **Katherine J Baxter,** Univ. of Strathclyde (United Kingdom); **Ana R Pereira**, **Manuel Simoes,** University of Porto (Portugal); **Eliana Battistella,** Univ. of Strathclyde (United Kingdom); **Robert J Francis,** NIBSC (United Kingdom); **Rebecca E McHugh,** University of Glasgow (United Kingdom); **Jay Christopher,** Univ. of Strathclyde (United Kingdom); **Andrew J Roe,** University of Glasgow (United Kingdom); **Ralf Bauer, Gail McConnell,** Univ. of Strathclyde (United Kingdom)

13320-11 • 1:40 PM - 2:25 PM
Brillouin light scattering anisotropy microscopy (Keynote Presentation)
Author(s): **Kareem Elsayad,** Medizinische Univ. Wien (Austria)

13320-12 • 2:25 PM - 2:45 PM
Total internal reflection-based nearfield illumination for label-free high-contrast imaging of biological samples
Author(s): **Anuj Saxena**, **Sunil Bhatt**, **Sathi Das**, **Anjika Kumari**, **Anand Kumar**, **Satish Kumar Dubey,** Indian Institute of Technology Delhi (India); **Balpreet Singh Ahluwalia,** UiT The Arctic Univ. of Norway (Norway); **Dalip Singh Mehta,** Indian Institute of Technology Delhi (India)

13320-13 • 2:45 PM - 3:05 PM
SERS-based simultaneous multi-biomarkers sensing for precision diagnosis of lung cancer
Author(s): **Dongkwon Seo, Yeonho Choi,** Korea Univ. (Korea, Republic of)

13320-14 • 3:05 PM - 3:35 PM
Development of dark-field light scattering imaging technology with deep learning for nanoscale exosome analysis *(Invited Paper)*
Author(s): **Nebras Mohamed**, **Qiao Liu, Xuantao Su,** Shandong Univ. (China)

Coffee Break 3:35 PM - 4:05 PM

SESSION 4: SPECKLE IMAGING

25 January 2025 • 4:05 PM - 5:25 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Dirk J. Faber**, Scinvivo B.V. (Netherlands)

13320-15 • 4:05 PM - 4:25 PM
Lensless and focused MESI geometries utilizing an optical fiber bundle
Author(s): **Logan Parker**, **James Tunnell**, **Andrew Dunn**, **Qingwei Fang, Shaun Engelmann,** The Univ. of Texas at Austin (United States)

13320-16 • 4:25 PM - 4:45 PM
Fluorescence imaging through scattering media with robust matrix factorization
Author(s): **Zijun Gao**, **Zhi Ling**, **Wenhao Liu**, **Keyi Han**, **Xuanwen Hua, Shu Jia,** Georgia Institute of Technology (United States)

13320-17 • 4:45 PM - 5:05 PM
DMD-based programmable scanning diffuse speckle contrast imaging (PS-DSCI) of cerebral blood flow
Author(s): **Faezeh Akbari**, **Fatemeh Hamedi**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13320-18 • 5:05 PM - 5:25 PM
Intensity-modulated wide-field imaging for characterizing intensity dynamics
Author(s): **Qingwei Fang**, **Hengfa Lu**, **Alankrit Tomar, Andrew Dunn,** The Univ. of Texas at Austin (United States)

SESSION 5: MODELING

25 January 2025 • 5:25 PM - 6:05 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Le Qiu**, Beth Israel Deaconess Medical Ctr. (United States)

13320-20 • 5:25 PM - 5:45 PM
Simulation of constant amplitude light refocusing through scattering media by optical phase conjugation
Author(s): **Sheng-Chun Yao**, **Jake W. Liu, Snow H. Tseng,** National Taiwan Univ. (Taiwan)

13320-19 • 5:45 PM - 6:05 PM
Wavelength-resolved morphology-related fluctuations in tissue scattering coefficient can be masked by corresponding spectral variations in tissue anisotropy
Author(s): **Robert H. Wilson,** Univ. of Dayton (United States); **Colleen L. Flanagan, Mary-Ann Mycek,** Univ. of Michigan (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13320-22 • 5:30 PM - 7:00 PM
Diffuse fluorescence tomography for photodynamic therapy of tumors
Author(s): **Stefan Šušnjar,** SpectraCure AB (Sweden); **M. Daniyal Ghauri,** Tyndall National Institute (Ireland); **Björn Thomasson,** SpectraCure AB (Sweden); **Sanathana Konugolu Venkata Sekar**, **Stefan Andersson-Engels,** Tyndall National Institute (Ireland); **Johannes Swartling,** SpectraCure AB (Sweden); **Nina Reistad,** Lund Univ. (Sweden)

13320-23 • 5:30 PM - 7:00 PM
Improved depth sensitivity in tissue blood flow measurements using 1064 nm laser in speckle contrast diffuse correlation tomography (scDCT)
Author(s): **Fatemeh Hamedi**, **Faezeh Akbari**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13320-24 • 5:30 PM - 7:00 PM
Side-by-side comparison of highly parallelized vs. 'traditional' avalanche photodiode detection in diffuse correlation spectroscopy
Author(s): **Tara M. Urner,** Emory Univ. (United States), Georgia Institute of Technology (United States); **Melissa M. Wu,** Duke Univ. (United States); **Tisha Boodooram,** Emory Univ. (United States), Georgia Institute of Technology (United States); **Michael A. Wayne,** EPFL (Switzerland); **Lucas Kreiss,** Duke Univ. (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Roarke Horstmeyer,** Duke Univ. (United States); **Erin M. Buckley,** Emory Univ. (United States), Georgia Institute of Technology (United States)

13320-25 • 5:30 PM - 7:00 PM
Monte Carlo modelling of Raman signal enhancement using power-efficient Apple processors
Author(s): **Ilya Vladyko**, **Alexander Doronin,** Victoria Univ. of Wellington (New Zealand); **Vladislav Yakovlev,** Texas A&M Univ. (United States)

13320-26 • 5:30 PM - 7:00 PM
Evaluation of light propagation characteristics on generative adversarial network-generated refractive structures of inhomogeneous turbid media
Author(s): **Jirawit Jiracheewee, Takahiro Nishimura,** Osaka Univ. (Japan)

13320-27 • 5:30 PM - 7:00 PM
Microscopic analytical solution to the anisotropic diffusion equation
Author(s): **Ernesto Pini,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Fabrizio Martelli,** Univ. degli Studi di Firenze (Italy); **Giacomo Mazzamuto,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari, Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Alexander Gatto**, **Henrik Schäfer,** Sony Europe B.V. (Germany); **Diederik S. Wiersma,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari, Univ. degli Studi di Firenze (Italy); **Lorenzo Pattelli,** Istituto Nazionale di Ricerca Metrologica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

13320-28 • 5:30 PM - 7:00 PM
Rules for Monte Carlo simulations through anomalous heterogeneous media
Author(s): **Federico Tommasi,** Univ. degli Studi di Firenze (Italy); **Lorenzo Pattelli,** Istituto Nazionale di Ricerca Metrologica (Italy); **Stefano Cavalieri**, **Lorenzo Fini**, **Michela Paolucci**, **Ernesto Pini,** Univ. degli Studi di Firenze (Italy); **Angelo Sassaroli,** Tufts Univ. (United States); **Fabrizio Martelli,** Univ. degli Studi di Firenze (Italy)

13320-29 • 5:30 PM - 7:00 PM
The ideal angular span to achieve light refocusing in random scattering media using PSTD and optical phase conjugation
Author(s): **Pei-Jie Chen, Snow H. Tseng,** National Taiwan Univ. (Taiwan)

13320-30 • 5:30 PM - 7:00 PM
Tuning the optical properties of a 3D printed skin mimicking phantom to be compatible with tissue properties in the short-wave infrared
Author(s): **Aizitiaili Abulikemu**, **Michael Butler**, **Anmol Jarang**, **Christine O'Brien, Leonid Shmuylovich,** Washington Univ. in St. Louis (United States)

13320-31 • 5:30 PM - 7:00 PM
Optical changes in whole blood vs. glucose concentration
Author(s): **Jared Logan**, **Jared Roth**, **James Harkness**, **Richard Vanfleet**, **Robert Davis**, **William Pitt, Tyler Westover,** Brigham Young Univ. (United States)

13320-32 • 5:30 PM - 7:00 PM
Diffuse reflectance from three-layered biological tissues
Author(s): **Haim Taitelbaum, Elisheva Cohen,** Bar-Ilan Univ. (Israel)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13320-21 • 5:30 PM - 7:00 PM
Liquid flow sensing through dynamic laser speckle analysis
Author(s): **Vahid Abbasian,** Washington Univ. in St. Louis (United States); **Vahideh Farzam Rad,** Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); **Arash Darafsheh,** Washington Univ. in St. Louis (United States); **Humberto Cabrera,** The Abdus Salam International Ctr. for Theoretical Physics (Italy)

CONFERENCE 13321

Optical Elastography and Tissue Biomechanics XII

25 - 26 January 2025 | Moscone South, Room 103 (Level 1 Lobby)

CONFERENCE CO-SPONSORS

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TOPTICA

Conference Chair(s): **Kirill V. Larin,** Univ. of Houston (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States)

Program Committee: **Steven G. Adie,** Cornell Univ. (United States); **Judith S. Birkenfeld,** Instituto de Óptica "Daza de Valdés" (Spain), Spanish National Research Council (Spain); **Stefan Catheline,** Institut National de la Santé et de la Recherche Médicale (France); **Zhongping Chen,** Beckman Laser Institute and Medical Clinic (United States); **Jürgen W. Czarske,** TU Dresden (Germany); **Irina V. Kabakova,** Univ. of Technology, Sydney (Australia); **Brendan F. Kennedy,** The Univ. of Western Australia (Australia); **Sean J. Kirkpatrick,** Michigan Technological Univ. (United States); **Susana Marcos,** Univ. of Rochester (United States), Instituto de Óptica "Daza de Valdés" (Spain); **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States); **Amy L. Oldenburg,** The Univ. of North Carolina at Chapel Hill (United States); **Francesca Palombo,** Univ. of Exeter (United Kingdom); **Ivan M. Pelivanov,** Univ. of Washington (United States); **Jannick P. Rolland,** Univ. of Rochester (United States); **David D. Sampson,** Univ. of Surrey (United Kingdom); **Ian A. Sigal,** Univ. of Pittsburgh (United States); **Peter T. C. So,** Massachusetts Institute of Technology (United States); **Peter Török,** Imperial College London (United Kingdom), Nanyang Technological Univ. (Singapore); **Frédérique Vanholsbeeck,** The Univ. of Auckland (New Zealand); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States); **Seok Hyun A. Yun,** Wellman Ctr. for Photomedicine (United States); **Vladimir Y. Zaitsev,** Institute of Applied Physics of the RAS (Russian Federation); **Jitao Zhang,** Wayne State Univ. (United States); **Qifa Zhou,** The Univ. of Southern California (United States); **Fernando Zvietcovich,** Pontificia Univ. Católica del Perú (Peru)

Saturday 25 January 2025

OPENING REMARKS

25 January 2025 • 8:10 AM - 8:20 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Kirill V. Larin**, Univ. of Houston (United States); **Giuliano Scarcelli**, Univ. of Maryland, College Park (United States)
Optical Elastography and Tissue Biomechanics XII opening introduction and welcome.

SESSION 1: OCE: FUNDAMENTALS, MODELING AND COMPUTATIONAL

25 January 2025 • 8:20 AM - 10:10 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Brendan F. Kennedy**, Harry Perkins Institute of Medical Research (Australia); **Frédérique Vanholsbeeck**, The Univ. of Auckland (New Zealand)

13321-1 • 8:20 AM - 8:50 AM
Continuum mechanics of optical elastography (tutorial) *(Invited Paper)*
Author(s): **Seok-Hyun Andy Yun,** Harvard Medical School (United States), Wellman Ctr. for Photomedicine (United States)

13321-2 • 8:50 AM - 9:10 AM
Quantitative elasticity imaging of elastic modulus and Poisson's ratio using optical coherence elastography
Author(s): **Jiayue Li**, **Ken Foo**, **Rowan W. Sanderson**, **Renate Zilkens,** The Univ. of Western Australia (Australia); **Mireille Hardie,** PathWest Lab. Medicine WA (Australia), Fiona Stanely Hospital (Australia); **Laura Gale,** PathWest Lab. Medicine WA (Australia), Fiona Stanley Hospital (Australia); **Yen Yeow,** Harry Perkins Institute of Medical Research (Australia); **Celia Green,** PathWest Lab. Medicine WA (Australia), Queen Elizabeth II Medical Ctr. (Australia); **Farah Abdul-Aziz,** Hollywood Private Hospital (Australia); **Juliana Hamzah,** Harry Perkins Institute of Medical Research (Australia); **James Stephenson**, **Ammar Tayaran**, **Jose Fernandez**, **Lee Jackson**, **Synn Chin**, **Saud Hamza,** Fiona Stanley Hospital (Australia); **Anmol Rijhumal,** PathWest Lab. Medicine WA (Australia), Fiona Stanley Hospital (Australia); **Christobel M. Saunders,** The Univ. of Melbourne (Australia); **Brendan F. Kennedy,** The Univ. of Western Australia (Australia)

13321-3 • 9:10 AM - 9:30 AM

Comparison of the elastography resolution between shear wave and reverberant optical coherence elastography
Author(s): **Christian Zevallos-Delgado**, **Manmohan Singh**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13321-4 • 9:30 AM - 9:50 AM
A mathematical approach to mitigate the impact of compression waves in shear wave elastography
Author(s): **Hamidreza Asemani**, **Jannick P. Rolland, Kevin J. Parker,** Univ. of Rochester (United States)

13321-5 • 9:50 AM - 10:10 AM
NCi method :a single approach for magnetic resonance, ultrasound, and optical elastography
Author(s): **Nina Dufour**, **Maud Legrand**, **Emmanuel Martins Seromenho,** ICube (France); **Jean-Luc Gennisson,** BioMaps (France); **Simon Chatelin, Amir Nahas,** ICube (France)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: SPECKLE AND INTERFEROMETRIC RHEOLOGY

25 January 2025 • 10:40 AM - 11:40 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Ivan M. Pelivanov**, Univ. of Washington (United States); **Zhongping Chen**, Beckman Laser Institute and Medical Clinic (United States)

13321-6 • 10:40 AM - 11:00 AM
Investigating viscoelastic behavior of soft orthopedic tissues in degenerative joint disease and repair with Speckle rHEologicAl micRoscopy (SHEAR)
Author(s): **Nichaluk Leartprapun**, **Fernando P. Guastaldi**, **Aniket Joshi**, **Mark A. Randolph**, **Robert W. Redmond, Seemantini K. Nadkarni,** Massachusetts General Hospital (United States)

13321-7 • 11:00 AM - 11:20 AM
Laser speckle imaging combined with Noise Correlation inspired method for endoscopic elastography
Author(s): **Maud Legrand**, **Nina Dufour**, **Emmanuel Martins Seromenho**, **Nadia Bahlouli, Amir Nahas,** ICube (France), Univ. de Strasbourg (France)

13321-8 • 11:20 AM - 11:40 AM
Investigating the relationship between fibrin microstructure and blood viscoelasticity in patients with percutaneous ventricular assist pumps
Author(s): **Nathaniel Hai**, **Aniket Joshi**, **Ziqian Zeng,** Wellman Ctr. for Photomedicine (United States); **Dvir Yelin,** Technion-Israel Institute of Technology (Israel); **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

Lunch Break 11:40 AM - 1:25 PM

SESSION 3: KEYNOTE SESSION

25 January 2025 • 1:25 PM - 2:10 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Kirill V. Larin**, Univ. of Houston (United States); **Giuliano Scarcelli**, Univ. of Maryland, College Park (United States)

13321-10 • 1:25 PM - 2:10 PM
Optical micromanipulation in mechanobiology: optical tweezers, scissors, and beyond (Keynote Presentation)
Author(s): **Halina Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

SESSION 4: ACTIVE MICRORHEOLOGY

25 January 2025 • 2:10 PM - 3:10 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Susana Marcos**, Univ. of Rochester (United States); **Sean J. Kirkpatrick**, Michigan Technological Univ. (United States)

13321-11 • 2:10 PM - 2:30 PM
Stromal cell identity affects ECM mechanics both locally and globally and regulates vascular morphogenesis in 3D
Author(s): **Michelle Lanterman,** Univ. of California, Irvine (United States); **Irene Zhang**, **Andrew Putnam,** Univ. of Michigan (United States); **Elliot Botvinick,** Univ. of California, Irvine (United States)

13321-12 • 2:30 PM - 2:50 PM
Probing neutrophil-bacteria interactions and the behavior of engulfed particles with optical tweezers and microrheology
Author(s): **Siwenyue Zhang**, **John M. Girkin,** Durham Univ. (United Kingdom); **Anders Aufderhorst-Roberts,** Univ. of Liverpool (United Kingdom); **A. John Simpson,** Newcastle Univ. (United Kingdom)

13321-13 • 2:50 PM - 3:10 PM
Temperature sweep characterization of gelatin via inertial microcavitation rheometry
Author(s): **Joseph Beckett**, **Bachir A Abeid**, **Jingjing Chen, Jon Estrada,** Univ. of Michigan (United States)

Coffee Break 3:10 PM - 3:30 PM

SESSION 5: OCE: TRANSLATIONAL

25 January 2025 • 3:30 PM - 6:40 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Vladislav V. Yakovlev**, Texas A&M Univ. (United States); **Jannick P. Rolland**, Univ. of Rochester (United States)

13321-14 • 3:30 PM - 4:00 PM
In vivo detection of human corneal stiffness and mechanical anisotropy with high-frequency guided-wave optical coherence elastography *(Invited Paper)*
Author(s): **Xu Feng**, **Guo-Yang Li,** Massachusetts General Hospital (United States); **Roberto Pineda,** Massachusetts Eye and Ear (United States); **Seok-Hyun Andy Yun,** Massachusetts General Hospital (United States)

13321-15 • 4:00 PM - 4:20 PM
Analysis of the biomechanical properties of brain organoid development affected by dolutegravir using reverberant optical coherence elastography
Author(s): **Christian Zevallos-Delgado**, **Taye T. Mekonnen**, **Yogeshwari S. Ambekar,** Univ. of Houston (United States); **Carlo Donato Caiaffa,** Baylor College of Medicine (United States), The Univ. of Texas at Austin (United States); **Manmohan Singh,** Univ. of Houston (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States); **Salavat R. Aglyamov,** Univ. of Houston (United States); **Richard H. Finnell**, **Robert M. Cabrera,** Baylor College of Medicine (United States); **Kirill V. Larin,** Univ. of Houston (United States)

13321-16 • 4:20 PM - 4:40 PM
Compression optical coherence elastography of human prostate
Author(s): **Szymon Tamborski**, **Marta K. Skrok,** Nicolaus Copernicus Univ. (Poland); **Matt S. Hepburn,** Nicolaus Copernicus Univ. (Poland), The Univ. of Western Australia (Australia), Harry Perkins Institute of Medical Research (Australia); **Mateusz Maniewski,** Collegium Medicum Jan Biziel Univ. Hospital (Poland), F. Łukaszczyk Memorial Hospital (Poland); **Marek Zdrenka,** F. Łukaszczyk Memorial Hospital (Poland); **Maciej Szkulmowski,** Nicolaus Copernicus Univ. (Poland); **Adam Kowalewski,** F. Łukaszczyk Memorial Hospital (Poland), Ctr. of Medical Sciences, Univ. of Science and Technology (Poland); **Łukasz Szylberg,** Collegium Medicum Jan Biziel Univ. Hospital (Poland), F. Łukaszczyk Memorial Hospital (Poland); **Brendan F. Kennedy,** Nicolaus Copernicus Univ. (Poland), The Univ. of Western Australia (Australia), Harry Perkins Institute of Medical Research (Australia)

13321-17 • 4:40 PM - 5:00 PM
Application of machine learning for classification of systemic sclerosis based on optical coherence elastography and angiography data
Author(s): **Pavel V. Nikitin**, **Harshdeep S. Chawla**, **Achuth G. Nair**, **Manmohan Singh**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13321-18 • 5:00 PM - 5:20 PM
Micromechanical imaging of breast cancer with optical coherence elastography
Author(s): **Rowan W. Sanderson**, **Ken Y. Foo**, **Renate Zilkens,** BRITElab, Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia); **Isaac Benedetti,** BRITElab, Harry Perkins Institute of Medical Research (Australia); **Mireille Hardie,** PathWest Lab. Medicine WA (Australia), Fiona Stanley Hospital (Australia); **Imogen Boman,** BRITElab, Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia), OncoRes Medical Pty. Ltd. (Australia); **Lee Jackson**, **Jose Cid Fernandez,** Fiona Stanley Hospital (Australia); **Benjamin F. Dessauvagie,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia), The Univ. of Western Australia (Australia), Clinipath Pathology (Australia); **Chris Yeomans**, **Anmol Rijhumal,** PathWest Lab. Medicine WA, Fiona Stanley Hospital (Australia); **Saud Hamza,** Fiona Stanley Hospital (Australia); **Christobel M. Saunders,** The Univ. of Western Australia (Australia), The Univ. of Melbourne (Australia); **Brendan F. Kennedy,** BRITElab, Harry Perkins Institute of Medical Research (Australia), The Univ. of Western Australia (Australia), Nicolaus Copernicus Univ. (Poland)

13321-19 • 5:20 PM - 5:40 PM
In vivo biomechanical imaging of the mouse oviduct
Author(s): **Tianqi Fang**, **Huan Han**, **Aleese Mukhamedjanova, Shang Wang,** Stevens Institute of Technology (United States)

13321-20 • 5:40 PM - 6:00 PM
Polarization-sensitive optical coherence tomography enabled mechanical testing of cartilage under creep load
Author(s): **Darven Murali Tharan**, **Marco Bonesi**, **Daniel Everett**, **Matthew Goodwin**, **Cushla McGoverin,** The Univ. of Auckland (New Zealand), The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand); **Sue McGlashan**, **Ashvin Thambyah,** The Univ. of Auckland (New Zealand); **Frédérique Vanholsbeeck,** The Univ. of Auckland (New Zealand), The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand)

13321-21 • 6:00 PM - 6:20 PM
Perfluorocarbon-modified dyes for optical coherence elastography
Author(s): **Pavel B. Tsitovich,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Maryam Hatami**, **Manmohan Singh**, **Karina Montero,** Univ. of Houston (United States); **Dmitry Nevozhay,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Alexander W. Schill**, **Kirill V. Larin,** Univ. of Houston (United States); **Konstantin V. Sokolov,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

13321-22 • 6:20 PM - 6:40 PM
Assessing the stiffness of intact bone marrow with non-contact optical coherence elastography
Author(s): **Amandeep Singh**, **Manmohan Singh**, **Salavat R. Aglyamov**, **David Mayerich, Kirill V. Larin,** Univ. of Houston (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 6: OCULAR BIOMECHANICS

26 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Steven G. Adie**, Cornell Univ. (United States); **Seemantini K. Nadkarni**, Wellman Ctr. for Photomedicine (United States)

13321-23 • 8:00 AM - 8:30 AM
Motion-tracking Brillouin microscopy for subclinical keratoconus detection *(Invited Paper)*
Author(s): **J. Bradley Randleman,** Cleveland Clinic (United States)

13321-24 • 8:30 AM - 8:50 AM
Spatially resolved reconstruction of corneal in- and out-of-plane elastic moduli with acoustic micro-tapping optical coherence elastography
Author(s): **Gabriel Regnault**, **Agathe Marmin**, **Ruikang K. Wang**, **Tueng T. Shen**, **Matthew O'Donnell, Ivan Pelivanov,** Univ. of Washington (United States)

13321-25 • 8:50 AM - 9:10 AM
Increased compliance of early experimental glaucoma monkey eyes corresponds with increased collagen content and tortuosity in the lamina cribrosa.
Author(s): **Miriam Bohlmann Kunz**, **Bingrui Wang,** Univ. of Pittsburgh (United States); **Juan Reynaud,** Legacy Devers Eye Institute (United States); **Hannah Schilpp**, **Ashley Linton,** Univ. of Pittsburgh (United States); **Brad Fortune,** Legacy Devers Eye Institute (United States); **Ian A. Sigal,** Univ. of Pittsburgh (United States)

13321-26 • 9:10 AM - 9:30 AM
longitudinal biomechanical analysis of the postnatal mouse cornea
Author(s): **Andrew L. Lopez**, **Mohammad Dehshiri**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13321-27 • 9:30 AM - 9:50 AM
Measuring aqueous humor outflow in the aqueous veins
Author(s): **Guan Xu**, **Linyu Ni**, **Wei Zhang**, **Alexus Warchock**, **Kayla Podlewski**, **Wonsuk Kim**, **Xueding Wang**, **Sayoko Moroi, Alan Argento,** Univ. of Michigan (United States)

13321-28 • 9:50 AM - 10:10 AM
3D heartbeat optical coherence elastography to map the elasticity of the cornea after customized crosslinking
Author(s): **Sharon Shajan**, **Achuth Nair**, **Kirill V. Larin**, **Manmohan Singh, Salavat R. Aglyamov,** Univ. of Houston (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: BRILLOUIN ELASTOGRAPHY I

26 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Amy Lynn Oldenburg**, The Univ. of North Carolina at Chapel Hill (United States)

13321-30 • 10:30 AM - 10:50 AM
Full-field Brillouin microscopy based on an imaging Fourier transform spectrometer
Author(s): **Carlo Bevilacqua, Robert Prevedel,** European Molecular Biology Lab. (Germany)

13321-31 • 10:50 AM - 11:10 AM
Principal component analysis for application to Brillouin microscopy data
Author(s): **Hadi Mahmodi**, **Kelly Wooden**, **Chris Poulton, Irina V. Kabakova,** Univ. of Technology Sydney (Australia)

13321-32 • 11:10 AM - 11:30 AM
Coaxial line scanning Brillouin microscopy
Author(s): **Chenjun Shi, Jitao Zhang,** Wayne State Univ. (United States)

13321-29 • 11:30 AM - 12:00 PM
Recent advances in stimulated Brillouin microscopy *(Invited Paper)*
Author(s): **Alberto Bilenca,** Ben-Gurion Univ. of the Negev (Israel)

Lunch Break 12:00 PM - 1:15 PM

SESSION 8: NOVEL METHODS

26 January 2025 • 1:15 PM - 3:05 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Fernando Zvietcovich**, Pontificia Univ. Católica del Perú (Peru); **Jitao Zhang**, Wayne State Univ. (United States)

13321-33 • 1:15 PM - 1:45 PM
Developing a wireless stereoscopic optical palpation probe towards cost effective intraoperative breast cancer detection *(Invited Paper)*
Author(s): **Rhys Jones**, **Qi Fang**, **Ankit Bharakhda**, **Rowan W. Sanderson**, **Renate Zilkens,** The Univ. of Western Australia (Australia); **Christobel M. Saunders,** The Univ. of Western Australia (Australia), The Univ. of Melbourne (Australia), Royal Melbourne Hospital (Australia); **Brendan F. Kennedy,** The Univ. of Western Australia (Australia), Nicolaus Copernicus Univ. (Poland)

13321-34 • 1:45 PM - 2:05 PM
Robotized multimodal fiber-optic OCT system for noncontact for assessment of skin mechanical and functional properties
Author(s): **Agathe Marmin**, **Gabriel Regnault**, **Athira B. S.**, **Ben Anderson**, **Ruikang K. Wang**, **Matthew O'Donnell,** Univ. of Washington (United States); **Tam Pham**, **Russell Ettinger,** Harborview Medical Ctr., Univ. of Washington (United States); **Ivan Pelivanov,** Univ. of Washington (United States)

13321-35 • 2:05 PM - 2:25 PM
Fourier light field imaging for ultra-high speed measurement of exoskeleton deformations in snapping trap-jaw ants
Author(s): **Clare B. Cook**, **Justin Jorge**, **Melody W. Young**, **Sheila Patek, Roarke W. Horstmeyer,** Duke Univ. (United States)

13321-36 • 2:25 PM - 2:45 PM
Single-shot off-axis FF-OCT (SO-FF-OCT) approach used for shear wave elastography assessment of biological tissues
Author(s): **Emmanuel Martins Seromenho**, **Nina Dufour**, **Maud Legrand**, **Jesse Schiffler**, **Hamideh Salehi**, **Vincent Maioli**, **Sybille Facca**, **Nadia Bahlouli, Amir Nahas,** ICube (France)

13321-37 • 2:45 PM - 3:05 PM
Quantitative X-ray elastography of coronary arteries using flexural pulse waves
Author(s): **Sibylle Gregoire,** Lab. of Therapeutic Applications of Ultrasound, INSERM (France); **Gabrielle Laloy Borgna,** Technische Univ. Delft (Netherlands); **Olivier Rouviere,** Hopital Edouard Herriot (France), Hospices Civils de Lyon (France); **Stefan Catheline,** Lab. of Therapeutic Applications of Ultrasound, INSERM (France)

Coffee Break 3:05 PM - 3:30 PM

SESSION 9: BRILLOUIN ELASTOGRAPHY II

26 January 2025 • 3:30 PM - 5:40 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Irina V. Kabakova**, Univ. of Technology Sydney (Australia); **Stefan Catheline**, Lab. of Therapeutic Applications of Ultrasound (France)

13321-38 • 3:30 PM - 4:00 PM
Brillouin spectroscopy for complete elastic stiffnesses of marine sea sponge spicules *(Invited Paper)*
Author(s): **Kristie Koski,** Univ. of California, Davis (United States)

13321-39 • 4:00 PM - 4:20 PM
Rapid motion-tracking Brillouin microscopy for clinical ophthalmology
Author(s): **Justin S. Schumacher**, **Xuewen Zhou, Giuliano Scarcelli,** Univ. of Maryland, College Park (United States)

13321-40 • 4:20 PM - 4:40 PM
Mechanical adaptability of metastatic cells
Author(s): **Chenchen Handler,** Univ. of Maryland, College Park (United States); **Claudia Testi,** Istituto Italiano di Tecnologia (Italy); **Milos Nikolic,** Lewis-Sigler Institute for Integrative Genomics, Princeton Univ. (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States)

13321-43 • 4:40 PM - 5:00 PM
Assessment of changes in zebrafish embryo biomechanical properties due to cold treatment using high-resolution Brillouin microscopy
Author(s): **Sajedeh Saeidi Fard**, **Manmohan Singh**, **Alexander W. Schill**, **Salavat R. Aglyamov**, **Nadine Nijem,** Univ. of Houston (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States); **Arne Lekven, Kirill V. Larin,** Univ. of Houston (United States)

13321-41 • 5:00 PM - 5:20 PM
Longitudinal mechanical imaging of metastatic tumor spheroids using Brillouin microscopy
Author(s): **Karlin Hilai**, **Daniil Grubich**, **Marcus Akrawi**, **Hui Zhu**, **Razanne Zaghloul**, **Chenjun Shi**, **Man Do**, **Dongxiao Zhu, Jitao Zhang,** Wayne State Univ. (United States)

13321-42 • 5:20 PM - 5:40 PM
Mechanobiology of glioblastoma spheroids: evaluation using nanobomb optical coherence elastography and Brillouin microscopy
Author(s): **Maryam Hatami**, **Megan Mendieta**, **Manmohan Singh**, **Sajedeh Saeidi Fard**, **Mohammad Dehshiri**, **Alexander W. Schill,** Univ. of Houston (United States); **Dmitry Nevozhay,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Salavat R. Aglyamov,** Univ. of Houston (United States); **Bulent Ozpolat,** Houston Methodist Research Institute (United States); **Konstantin V. Sokolov,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Yasemin M. Akay**, **Metin Akay, Kirill V. Larin,** Univ. of Houston (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13321-44 • 5:30 PM - 7:00 PM
Development of multimodal SHG, TPEF, and Brillouin scattering microscopy for analyzing skin micromechanics
Author(s): **Naoya Okubo**, **Eiji Hase,** Tokushima Univ. (Japan); **Yuki Ogura,** Shiseido Co., Ltd. (Japan); **Yu Tokizane,** Tokushima Univ. (Japan); **Takeo Minamikawa,** Osaka Univ. (Japan); **Takeshi Yasui,** Tokushima Univ. (Japan)

13321-45 • 5:30 PM - 7:00 PM
Full-field Brillouin microscopy using atomic line monochromator
Author(s): **Yogeshwari S. Ambekar**, **Romanus Hutchins, Giuliano Scarcelli,** Univ. of Maryland, College Park (United States)

13321-46 • 5:30 PM - 7:00 PM
Asynchronous reverberant elastography for corneal elasticity measurements in vivo
Author(s): **Ginger J. Schmidt,** Wellman Ctr. for Photomedicine (United States), Harvard Medical School, Massachusetts General Hospital (United States), Massachusetts Institute of Technology (United States); **David Veysset**, **Ryan McAuley,** Wellman Ctr. for Photomedicine (United States), Harvard Medical School, Massachusetts General Hospital (United States); **Brett E. Bouma,** Wellman Ctr. for Photomedicine (United States), Harvard Medical School, Massachusetts General Hospital (United States), Massachusetts Institute of Technology (United States); **Néstor Uribe-Patarroyo,** Wellman Ctr. for Photomedicine (United States), Harvard Medical School, Massachusetts General Hospital (United States)

13321-47 • 5:30 PM - 7:00 PM
A versatile Brillouin microscope for fast mechanical mapping: from cells to dental enamel
Author(s): **Alban Desoutter**, **Richard Younes,** Univ. de Montpellier (France); **Rémy Vialla,** cnrs (France); **Frédéric Cuisinier,** Univ. de Montpellier (France); **Daphné Autran**, **Soazig Guyomarc'h3,** IRD (France); **Yacine Messat**, **Hamideh Salehi**, **Emmanuel Rousseau, Benoit Ruffle,** Univ. de Montpellier (France)

13321-48 • 5:30 PM - 7:00 PM
Optical clearing enhanced optical coherence elastography of ex vivo mouse brain
Author(s): **Fengyi Zhang,** Univ. of California, Irvine (United States); **Myungju Kim,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Zhikai Zhu,** Univ. of California, Irvine (United States); **Woonggyu Jung,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Zhongping Chen,** Univ. of California, Irvine (United States)

13321-49 • 5:30 PM - 7:00 PM
High-speed stimulated Brillouin spectroscopy enabled by polarization pulling
Author(s): **Jiarui Li**, **Jake R. Rosvold,** Univ. of Maryland, College Park (United States); **Joseph B. Murray**, **Brandon Redding,** U.S. Naval Research Lab. (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States)

13321-50 • 5:30 PM - 7:00 PM
Multimodal optical elastography detects TGF-β-induced alterations in the biomechanical properties of skin scaffolds
Author(s): **Manmohan Singh,** Univ. of Houston (United States); **Taye T. Mekonnen,** Univ. of Houston (United States), The Univ. of Sydney (Australia); **Yogeshwari S. Ambekar,** Univ. of Houston (United States), Univ. of Maryland, College Park (United States); **Christian Zevallos-Delgado**, **Achuth Nair,** Univ. of Houston (United States); **Fernando Zvietcovich,** Univ. of Houston (United States), Pontificia Univ. Católica del Perú (Peru); **Hoda Zarkoob**, **Yi W. Lim**, **Marc Ferrer,** National Institutes of Health (United States); **Salavat R. Aglyamov,** Univ. of Houston (United States); **Giuliano Scarcelli,** Univ. of Maryland, College Park (United States); **Min J. Song,** National Institutes of Health (United States); **Kirill V. Larin,** Univ. of Houston (United States)

13321-51 • 5:30 PM - 7:00 PM
Multimodal optical elastography for characterizing anisotropic self-assembling peptide nanofibers
Author(s): **Manmohan Singh**, **Christian Zevallos-Delgado**, **Sajedeh Saeidi Fard,** Univ. of Houston (United States); **Adam C. Farsheed**, **Jeffrey D. Hartgerink,** Rice Univ. (United States); **Kirill V. Larin,** Univ. of Houston (United States)

13321-52 • 5:30 PM - 7:00 PM
Non-contact reverberant optical coherence elastography using air-coupled ultrasonic transducers
Author(s): **Christian Zevallos-Delgado**, **Taye T. Mekonnen**, **Alexander W. Schill**, **Manmohan Singh**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13321-53 • 5:30 PM - 7:00 PM
The impact of temperature, pH, and numerical aperture on the Brillouin frequency shift
Author(s): **Sajedeh Saeidi Fard**, **Mohammad Dehshiri**, **Manmohan Singh**, **Alexander W. Schill**, **Salavat R. Aglyamov, Kirill V. Larin,** Univ. of Houston (United States)

13321-54 • 5:30 PM - 7:00 PM
Quantifying and optimizing curing parameters for PDMS microfabricated devices using Speckle rHEologicAl micRoscopy (SHEAR)
Author(s): **Anton Deti**, **Nichaluk Leartprapun, Seemantini K. Nadkarni,** Massachusetts General Hospital (United States)

13321-55 • 5:30 PM - 7:00 PM
Experimental characterization of Young's modulus using optical elastography in a soft elastic string
Author(s): **Jiayuan Zhu**, **Stefan Catheline**, **Sibylle Grégoire**, **Frédéric Turquier,** Lab. of Therapeutic Applications of Ultrasound (France); **Aline Bel-Brunon,** CFR / LBMC - Laboratoire de Biomécanique et Mécanique des Chocs (France); **Bruno Giammarinaro,** Lab. of Therapeutic Applications of Ultrasound (France)

13321-65 • 5:30 PM - 7:00 PM
Optimization of VIPA-based Brillouin spectrographs: Insights from numerical simulations
Author(s): **Benoit Rufflé,** Univ. de Montpellier (France), CNRS (France)

13321-72 • 5:30 PM - 7:00 PM
Non-invasive remote assessment of tissue fibrogenesis using Brillouin microscopy
Author(s): **Vsevolod Cheburkanov**, **Mykyta Kizilov**, **Sujeong Jung,** Texas A&M Univ. (United States); **Mikhail Y. Berezin,** Washington Univ. School of Medicine in St. Louis (United States); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States)

13321-71 • 5:30 PM - 7:00 PM
Interrogating the influence of corneal biomechanics on intraocular pressure estimation accuracy using optical coherence elastography
Author(s): **Etsel Suarez**, **Cristian Bocanegra**, **Alonso Cifuentes, Fernando Zvietcovich,** Pontificia Univ. Católica del Perú (Peru)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13322

Polarized Light and Optical Angular Momentum for Biomedical Diagnostics 2025

25 - 26 January 2025 | Moscone South, Room 102 (Level 1 Lobby)

Conference Chair(s): **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Hui Ma,** Tsinghua Univ. Shenzhen International Graduate School (China); **Tatiana Novikova,** Lab. de Physique des Interfaces et des Couches Minces (France)

Conference Co-Chair(s): **Daniel S. Elson,** Imperial College London (United Kingdom); **I. Alex Vitkin,** Princess Margaret Cancer Ctr. (Canada)

Program Committee: **Sophie Brasselet,** Institut Fresnel (France); **Juan Campos,** Univ. Autònoma de Barcelona (Spain); **Russell A. Chipman,** Meta (United States); **Anabela Da Silva,** Institut Fresnel, CNRS, Aix Marseille Univ, Centrale Méditerranée (France); **Thomas A. Germer,** National Institute of Standards and Technology (United States); **Nirmalya Ghosh,** Indian Institute of Science Education and Research Kolkata (India); **Viktor Gruev,** Univ. of Illinois (United States); **George S. D. Gordon,** The Univ. of Nottingham (United Kingdom); **Francois Hache,** Lab. d'Optique et Biosciences (France); **Igor V. Meglinski,** Univ. of Oulu (Finland), Aston Univ. (United Kingdom); **Razvigor Ossikovski,** Lab. de Physique des Interfaces et des Couches Minces (France); **Travis W. Sawyer,** Wyant College of Optical Sciences (United States); **Anna N. Yaroslavsky,** Univ. of Massachusetts Lowell (United States)

Saturday 25 January 2025

SESSION 1: NEW INSTRUMENT DESIGN

25 January 2025 • 8:30 AM - 9:40 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Jessica C. Ramella-Roman**, Florida International Univ. (United States)

13322-1 • 8:30 AM - 9:00 AM
Advances in low noise and asynchronous division of focal plane polarimeters *(Invited Paper)*
Author(s): **Viktor Gruev,** Univ. of Illinois (United States)

13322-2 • 9:00 AM - 9:20 AM
Reconstructing three-dimensional optical anisotropy with tomographic Müller-polarimetric microscopy for structural bioimaging.
Author(s): **Arthur Baroni**, **Yang Chen,** Paul Scherrer Institut (Switzerland); **Leonard Nielsen,** Chalmers Univ. of Technology (Sweden); **Torne Tänzer,** Paul Scherrer Institut (Switzerland), EPFL (Switzerland); **Marianne Liebi,** Paul Scherrer Institut (Switzerland), EPFL (Switzerland), Chalmers Univ. of Technology (Sweden)

13322-3 • 9:20 AM - 9:40 AM
Metasurface polarization optics and instrumentation
Author(s): **Noah A. Rubin**, **Lisa W. Li,** Univ. of California, San Diego (United States); **Aun Zaidi,** Apple Inc. (United States); **Federico Capasso,** Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Philip Oakley**, **Rebecca Schindhelm,** BAE Systems, Inc. (United States); **Roberto Casini,** National Ctr. for Atmospheric Research (United States)

Coffee Break 9:40 AM - 10:30 AM

SESSION 2: THEORY AND COMPUTATIONAL APPROACHES

25 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Hui Ma**, Tsinghua Univ. Shenzhen International Graduate School (China)

13322-5 • 10:30 AM - 10:50 AM
Fast filtering of experimental Mueller matrices compatible with video-rate streaming of polarimetric data
Author(s): **Tatiana Novikova,** Lab. de Physique des Interfaces et des Couches Minces, École Polytechnique, CNRS (France), Institut

Polytechnique de Paris (France), Florida International Univ. (United States); **Alexey Ovchinnikov,** Queens College, The City Univ. of New York (United States); **Gleb Pogudin,** Lab. d'Informatique, École Polytechnique, CNRS (France), Institut Polytechnique de Paris (France); **Jessica C. Ramella-Roman,** Florida International Univ. (United States), Herbert Wertheim College of Medicine, Florida International Univ. (United States)

13322-6 • 10:50 AM - 11:10 AM
Isotropic depolarization filter: outperforming biological samples imaging visualization via polarimetric data processing
Author(s): **Mónica Canabal-Carbia**, **Irene Estévez,** Univ. Autònoma de Barcelona (Spain); **Emilio González-Arnay,** Univ. de La Laguna (Spain); **Ana Sánchez-Ferrón,** Univ. Autònoma de Barcelona (Spain); **José J. Gil,** Univ. de Zaragoza (Spain); **Ignacio Moreno,** Instituto de Bioingeniería, Univ. Miguel Hernández (Spain); **Juan Campos, Ángel Lizana,** Univ. Autònoma de Barcelona (Spain)

13322-8 • 11:10 AM - 11:30 AM
A novel extension of line integral convolution for polarimetry-based tractography: applications in polarization-sensitive optical coherence tomography
Author(s): **Darven Murali Tharan**, **Marco Bonesi**, **Daniel Everett**, **Matthew Goodwin**, **Cushla McGoverin,** The Univ. of Auckland (New Zealand), The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand); **Sue McGlashan**, **Ashvin Thambyah,** The Univ. of Auckland (New Zealand); **Frédérique Vanholsbeeck,** The Univ. of Auckland (New Zealand), The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand)

Lunch Break 11:30 AM - 1:20 PM

SESSION 3: CLINICAL APPLICATIONS OF POLARIMETRY

25 January 2025 • 1:20 PM - 3:00 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Tatiana Novikova**, Lab. de Physique des Interfaces et des Couches Minces (France)

13322-9 • 1:20 PM - 1:40 PM
Validation of handheld polarized hyperspectral imaging probe on intralipid phantom and burned tissue
Author(s): **Jeremy C. Sherey**, **Ling Ma, Baowei Fei,** The Univ. of Texas at Dallas (United States)

13322-10 • 1:40 PM - 2:00 PM
Whole-brain section image reconstruction for deciphering tumor margin using Mueller polarimetry imaging
Author(s): **Romane Gros,** Univ. Bern (Switzerland); **Omar Rodríguez-Núñez,** Inselspital, Univ. Bern (Switzerland); **Stefano Moriconi**, **Richard McKinley,** Support Ctr. for Advanced Neuroimaging, Inselspital, Univ. Bern (Switzerland); **Angelo Pierangelo**, **Tatiana Novikova,** Lab. de Physique des Interfaces et des Couches Minces, École Polytechnique, CNRS (France), Institut Polytechnique de Paris (France); **Jordain Walshon**, **Alicia Steffens**, **Kathleen McCortney**, **Craig Horbinski,** Lou and Jean Malnati Brain Tumor Institute, Feinberg School of Medicine, Northwestern Univ. (United States); **Ekkehard Hewer,** Institut univ. de pathologie, Ctr. Hospitalier Univ. Vaudois (Switzerland); **Erik Vassella,** Institute of Tissue Medicine and Pathology, Univ. Bern (Switzerland); **Philippe Schucht,** Inselspital, Univ. Bern (Switzerland); **Christopher Hahne,** Support Ctr. for Advanced Neuroimaging, Inselspital, Univ. Bern (Switzerland); **Theoni Maragkou,** Institute of Tissue Medicine and Pathology, Univ. Bern (Switzerland)

13322-11 • 2:00 PM - 2:20 PM
Enhanced oral bacterial discrimination by using Mueller matrix polarimetry
Author(s): **Gaurav Sharma,** Hannoversches Zentrum für Optische Technologien, Leibniz Univ. Hannover (Germany); **Katharina Doll-Nikutta**, **Hanna Thoms,** Medizinische Hochschule Hannover (Germany), SIIRI – Safety-integrated and infection-reactive implants, DFG (Germany); **Maria Leilani Torres-Mapa,** Institut für Quantenoptik, Leibniz Univ. Hannover (Germany), SIIRI – Safety-integrated and infection-reactive implants, DFG (Germany); **Bernhard Roth,** Hannoversches Zentrum für Optische Technologien, Leibniz Univ. Hannover (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

13322-12 • 2:20 PM - 2:40 PM
Towards the prediction of spontaneous preterm birth by cervical collagen imaging using polarization sensitive OCT
Author(s): **Frances S. Hooper**, **Dmitry G. Revin**, **Efstratios Theofrastou**, **Niraj K. Soni**, **Rui Yuan**, **Vanessa Hearnden**, **Dilly O. C. Anumba, Stephen J. Matcher,** The Univ. of Sheffield (United Kingdom)

13322-13 • 2:40 PM - 3:00 PM
Multimodal Imaging of Cervical Structures During Pregnancy
Author(s): **JunZhu Pei**, **Ajmal Ajmal**, **Amanda Sanchez**, **Tananant Boonya-Ananta**, **Andres Rodreguez, Jessica C. Ramella-Roman,** Florida International Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: NOVEL APPROACHES

25 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Jessica C. Ramella-Roman**, Florida International Univ. (United States)

13322-14 • 3:30 PM - 3:50 PM
Wide-field depth-gated retardance imaging through self-interference
Author(s): **Lia Gomez-Perez,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Harvard-MIT Health Sciences and Technology, Massachusetts Institute of Technology (United States); **Maximiliano Mariné Durandeau,** Institute for Biological and Medical Engg, Pontificia Univ. Católica de Chile (Chile); **Vicente J. Parot,** Institute for Biological and Medical Engg, Pontificia Univ. Católica de Chile (Chile), Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Brett Bouma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

13322-15 • 3:50 PM - 4:10 PM
Spatio-temporal depolarization patterns from sub-ps reflectance measurements
Author(s): **Ernesto Pini,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Alexander Gatto**, **Henrik Schäfer,** Sony Europe B.V. (Germany); **Diederik Sybolt Wiersma,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari, Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ricerca Metrologica (Italy); **Lorenzo Pattelli,** Istituto Nazionale di Ricerca Metrologica (Italy), European Laboratory for Non-Linear Spectroscopy (Italy)

13322-16 • 4:10 PM - 4:30 PM
Tumor detection by polarization speckle with lasers of differing temporal coherence lengths
Author(s): **Daniel C. Louie,** Univ. Health Network (Canada), The Univ. of British Columbia (Canada); **Carla Kulcsar**, **Hector A. Contreras Sanchez,** Univ. of Toronto (Canada); **Tim K. Lee,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Alex Vitkin,** Univ. Health Network (Canada), Univ. of Toronto (Canada)

13322-17 • 4:30 PM - 4:50 PM
Monte Carlo modeling and experimental terahertz polarimetric imaging of tumor budding due to mie scattering
Author(s): **Erica Heller**, **Kuangyi Xu**, **Zachery B. Harris, M. Hassan Arbab,** Stony Brook Univ. (United States)

13322-18 • 4:50 PM - 5:10 PM
Imaging 3D optic axis orientation with multi-angle polarization-sensitive optical coherence tomography
Author(s): **Maxina Sheft**, **Georgia Jones,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Bhaskara Rao Chintada**, **Néstor Uribe-Patarroyo,** Wellman Ctr. for Photomedicine (United States); **Brett Bouma,** Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13322-26 • 5:10 PM - 5:30 PM
Propagation of light carrying orbital angular momentum through a turbid tissue-like scattering medium
Author(s): **Fatima Khanom**, **Nawal Mohamed,** Aston Univ. (United Kingdom); **Ivan Lopushenko**, **Anton Sdobnov,** Univ. of Oulu (Finland); **Alex Doronin,** Victoria Univ. of Wellington (New Zealand); **Edik Rafailov,** Aston Univ. (United Kingdom); **Aliaksander Bykau,** Univ. of Oulu (Finland); **Igor V. Meglinski,** Aston Univ. (United Kingdom)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: MACHINE LEARNING MODELS

26 January 2025 • 8:50 AM - 10:40 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Hui Ma**, Tsinghua Univ. Shenzhen International Graduate School (China)

13322-29 • 8:50 AM - 9:20 AM
Simplifying polarization-sensitive optical coherence tomography *(Invited Paper)*
Author(s): **Martin Villiger,** Wellman Ctr. for Photomedicine (United States)

13322-20 • 9:20 AM - 9:40 AM
Machine Learning Approach to 3×4 Mueller Polarimetry for Complete Reconstruction of Diagnostic Polarimetric Images of Biological Tissues
Author(s): **Sooyong Chae,** École Polytechnique (France); **Tongyu Huang,** Tsinghua Univ. Shenzhen International Graduate School (China); **Theotim Lucas,** École Polytechnique (France); **Omar Rodríguez-Núñez,** Univ. Bern (Switzerland); **Ajmal Ajmal**, **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Alex Doronin,** Victoria Univ. of Wellington (New Zealand); **Hui Ma,** Tsinghua Univ. (China); **Tatiana Novikova,** École Polytechnique (France)

13322-21 • 9:40 AM - 10:00 AM
Uncertainty-aware Mueller matrix polarimetry using Gaussian process pipeline
Author(s): **Demelza Robinson**, **W. Bastiaan Kleijn,** Victoria Univ. of Wellington (New Zealand); **Tatiana Novikova,** Lab. de Physique des Interfaces et des Couches Minces, École Polytechnique, CNRS (France), Institut Polytechnique de Paris (France); **Alexander Doronin,** Victoria Univ. of Wellington (New Zealand)

13322-23 • 10:00 AM - 10:20 AM
Integrating Mueller matrix imaging and machine learning for pathological applications
Author(s): **Jiachen Wan**, **Yue Yao**, **Tongyu Huang,** Tsinghua Univ. Shenzhen International Graduate School (China); **Hui Wang,** Massachusetts General Hospital/Harvard Medical School (United States); **Hui Ma,** Tsinghua Univ. Shenzhen International Graduate School (China)

13322-19 • 10:20 AM - 10:40 AM
Polarization feature extraction from Mueller matrix images for pathological diagnosis
Author(s): **Hui Ma, Jiachen Wan,** Tsinghua Univ. Shenzhen International Graduate School (China)

Coffee Break 10:40 AM - 11:10 AM

SESSION 6: CLINICAL APPLICATIONS OF POLARIMETRY

26 January 2025 • 11:10 AM - 11:50 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Tatiana Novikova**, Lab. de Physique des Interfaces et des Couches Minces (France)

13322-24 • 11:10 AM - 11:30 AM
Mueller matrix polarimetry for mouse brain tissue analysis
Author(s): **Gaurav Sharma**, **Melbin Siby,** Leibniz Univ. Hannover (Germany); **Jens Pahnke,** Univ. of Oslo (Norway), Institut für Ernährungsmedizin, Lübecker Institut für Experimentelle Dermatologie, Univ. zu Lübeck (Germany), Univ. of Latvia (Latvia); **Bernhard Roth,** Hannoversches Zentrum für Optische Technologien, Leibniz Univ. Hannover (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

13322-25 • 11:30 AM - 11:50 AM
Generated polarization-sensitive optical coherence tomography image using contrastive unpaired translation
Author(s): **Thanh Dat Le,** Chonnam National Univ. Hwasun Hospital (Korea, Republic of); **Yong-Jae Lee**, **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of); **Changho Lee,** Chonnam National Univ. Hwasun Hospital (Korea, Republic of)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of Photonics West 2025.

13322-7
Systematic fusion of polarization indices for improved characterization of complex anisotropic media
Author(s): **Qiaoqi Tang**, **Rui Hao**, **Honghui He, Hui Ma,** Tsinghua Univ. (China)

13322-22 • 8:00 PM - 8:00 PM
Skin tissue classification based on based on Mueller matrix polarization imaging and machine learning
Author(s): **Rui Huang**, **Kaisha Deng**, **Honghui He, Hui Ma,** Tsinghua Univ. (China)

CONFERENCE 13323

Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXIII

27 - 29 January 2025 | Moscone South, Room 312 (Level 3)

Conference Chair(s): **Attila Tarnok,** Univ. Leipzig (Germany); **Jessica P. Houston,** New Mexico State Univ. (United States)

Conference Co-Chair(s): **Xuantao Su,** Shandong Univ. (China)

Program Committee: **Alba Alfonso García,** Univ. of California, Davis (United States); **Vadim Backman,** Northwestern Univ. (United States); **Adela Ben-Yakar,** The Univ. of Texas at Austin (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States); **Kishan Dholakia,** The Univ. of Adelaide (Australia); **Paul M. W. French,** Imperial College London (United Kingdom); **Keisuke Goda,** The Univ. of Tokyo (Japan); **Bo Huang,** Univ. of California, San Francisco (United States); **Jae Youn Hwang,** Daegu Gyeongbuk Institute of Science & Technology (Korea, Republic of); **Charles P. Lin,** Wellman Ctr. for Photomedicine (United States); **Mary-Ann Mycek,** Univ. of Michigan (United States); **Ramesh Raghavachari,** U.S. Food and Drug Administration (United States); **Volker Schweikhard,** Leica Microsystems CMS GmbH (Germany); **Nektarios Tavernarakis,** Foundation for Research and Technology-Hellas (Greece), Univ. of Crete (Greece); **Sebastian Wachsmann-Hogiu,** McGill Univ. (Canada); **Elena V. Zagaynova,** Privolzhsky Research Medical Univ. (Russian Federation)

Monday 27 January 2025

SESSION 1: CYTOMICS

27 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-1 • 10:30 AM - 11:00 AM
On-chip flow cytometry using integrated photonics *(Invited Paper)*
Author(s): **Stijn Jooken**, **Kirill Zinoviev**, **Gunay Yurtsever**, **Koen de Wijs**, **Anabel De Proft**, **Zeinab Jafari**, **Ana Lebanov**, **Gaudhaman Jeevanandam,** imec (Belgium); **Mateusz Kotyrba**, **Erwin Gorjup,** Sarcura GmbH (Austria); **Jelle Fondu**, **Liesbet Lagae**, **Sarah Libbrecht**, **Pol Van Dorpe, Niels Verellen,** imec (Belgium)

13323-2 • 11:00 AM - 11:20 AM
Impact of active alignment on long-term pointing stability of laser engine in flow cytometry
Author(s): **Anna Essaulova**, **Sergei Kühn**, **Petteri Uusimaa, Kostiantyn Nechay,** Modulight Corp. (Finland)

13323-3 • 11:20 AM - 11:40 AM
Deep learning-based Cancer Cell Classification using Morphological and Topological Organelle Features
Author(s): **Harrison J. Yee,** Rensselaer Polytechnic Institute (United States); **Megan Bouyea**, **Joshua Goldwag**, **John M. Lamar,** Albany Medical College (United States); **Xavier Intes**, **Uwe Kruger**, **Stefan T Radev,** Rensselaer Polytechnic Institute (United States); **Margarida Barroso,** Albany Medical College (United States)

13323-4 • 11:40 AM - 12:00 PM
High-power UV DPSSL emitting at 349 nm for high-throughput flow cytometry
Author(s): **Vincent Paeder**, **Kostiantyn Nechay**, **Anna Essaulova, Petteri Uusimaa,** Modulight Corp. (Finland)

Lunch Break 12:00 PM - 1:30 PM

SESSION 2: INTRAVITAL IMAGING

27 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-5 • 1:30 PM - 2:00 PM

Advanced in-vivo imaging through implantable micro-optics integrated on a miniaturized imaging window *(Invited Paper)*
Author(s): **Alessandra Nardini,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy), Univ. del Salento (Italy); **Claudi Conci**, **Marco Grassi**, **Behjat Sadat Kariman,** Politecnico di Milano (Italy); **Mario Marini,** Univ. degli Studi di Milano-Bicocca (Italy); **Margaux Bouzin,** Univ. degli Studi di Milano Bicocca (Italy); **Maddalena Collini,** Univ. degli Studi di Milano-Bicocca (Italy); **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giulio Nicola Felice Cerullo**, **Manuela Teresa Raimondi,** Politecnico di Milano (Italy); **Giuseppe Chirico,** Univ. degli Studi di Milano-Bicocca (Italy); **Rebeca Martínez Vázquez,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13323-6 • 2:00 PM - 2:20 PM
Intravital three-photon microscopy of bone marrow skull channels
Author(s): **Kamdin Mirsanaye**, **Clemens Alt**, **Charlotte Muse**, **Abiramy Karunendiran,** Harvard Medical School (United States), Massachusetts General Hospital (United States); **Judith Runnels,** Massachusetts General Hospital (United States); **Michael A. Moskowitz,** Harvard Medical School (United States), Massachusetts General Hospital (United States); **Matthias Nahrendorf,** Harvard Medical School (United States), Massachusetts General Hospital (United States), Universitätsklinikum Würzburg (Germany); **Charles P. Lin,** Harvard Medical School (United States), Massachusetts General Hospital (United States)

13323-7 • 2:20 PM - 2:40 PM
In vivo dynamic 3D imaging of the mouse oviduct to assess the transport of preimplantation embryos toward pregnancy
Author(s): **Huan Han**, **Tianqi Fang**, **Aleese Mukhamedjanova, Shang Wang,** Stevens Institute of Technology (United States)

13323-8 • 2:40 PM - 3:00 PM
Intravital imaging and manipulation of the bone marrow stromal network
Author(s): **Montgomery L. Whalen,** Univ. of Rochester Medical Ctr. (United States), Optimax Systems, Inc. (United States); **Cih-Li Hong,** Univ. of Rochester Medical Ctr. (United States); **Abiramy Karunendiran**, **Juwell W. Wu,** Wellman Ctr. for Photomedicine (United States), Ctr. for Systems Biology (United States); **Shu-Chi Yeh,** Univ. of Rochester Medical Ctr. (United States); **Charles P. Lin,** Wellman Ctr. for Photomedicine (United States), Ctr. for Systems Biology (United States), Massachusetts General Hospital (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: RAMAN IMAGING TECHNIQUES WITH CELLS AND TISSUES

27 January 2025 • 3:30 PM - 4:50 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-9 • 3:30 PM - 3:50 PM
High-speed SRS imaging for monitoring EMT-induced metabolic and morphological changes of cells
Author(s): **Anke Bonse**, **Thomas Würthwein**, **Ramon Droop**, **Felix Neumann,** Refined Laser Systems GmbH (Germany); **Eva Doepker**, **Juergen Schnekenburger**, **Björn Kemper,** Biomedizinisches Technologiezentrum (Germany); **Tim Hellwig, Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

13323-10 • 3:50 PM - 4:10 PM
Vibrational tag coupled Raman imaging for visualizing biosynthesis pathways in action
Author(s): **Jiro Karlo, Surya Pratap Singh,** Indian Institute of Technology Dharwad (India)

13323-11 • 4:10 PM - 4:30 PM
B-Raman: an open-source, versatile platform for automated Raman microspectroscopy sample analysis
Author(s): **Alvaro Fernandez Galiana,** Univ. of Oxford (United Kingdom), Imperial College London (United Kingdom); **Simon Vilms Pedersen,** Univ. of Southern Denmark (Denmark), Imperial College London (United Kingdom); **Molly M. Stevens,** Univ. of Oxford (United Kingdom), Imperial College London (United Kingdom)

13323-12 • 4:30 PM - 4:50 PM
Chemical imaging reveals metabolite distribution in tissues using Raman microspectroscopy
Author(s): **Chun-Chin Wang**, **Seema Bachoo**, **Ellie V. Bunce**, **Mariam-Eleni Oraiopoulou**, **Thomas R. Else,** Cancer Research UK Cambridge Institute (United Kingdom); **Marlous Kamp,** Utrecht Univ. (Netherlands); **Vincent Zecchini,** Cambridge Institute of Therapeutic Immunology & Infectious Disease, Univ. of Cambridge (United Kingdom); **Jessica Mansfield**, **Nick Stone**, **Julian Moger,** Univ. of Exeter (United Kingdom); **Désirée Schatton**, **Christian Frezza,** Univ. zu Köln (Germany); **Sarah E. Bohndiek,** Cancer Research UK Cambridge Institute (United Kingdom)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13323-40 • 5:30 PM - 7:00 PM
Hyperspectral imaging for counterfeit identification : distinguishing the spectral signatures of inks
Author(s): **Stéphane Marcet, Siamak Kashi,** Photon Etc. Inc. (Canada)

13323-41 • 5:30 PM - 7:00 PM
Research of fetal nucleated red blood cell (fNRBCs) sorting using hyperspectral imaging technology
Author(s): **Yuan Tzu Ou Yang, Tseng Fan-Gang,** National Tsing Hua Univ. (Taiwan)

13323-42 • 5:30 PM - 7:00 PM
Sensing biofilm development with optical tweezers
Author(s): **Craig Steed**, **Julia Robertson**, **Simon Swift,** The Univ. of Auckland (New Zealand); **Frederique Vanholsbeeck, Cushla McGoverin,** The Univ. of Auckland (New Zealand), The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand)

13323-43 • 5:30 PM - 7:00 PM
Automated 3D quantitative cyto- and myeloarchitectural analysis of human brain fluorescence microscopy reconstructions
Author(s): **Michele Sorelli**, **Danila Di Meo**, **Samuel Bradley**, **Josephine Ramazzotti**, **Beatrice Lorenzon**, **Franco Cheli**, **Laura Perego,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Giacomo Mazzamuto**, **Irene Costantini, Francesco S. Pavone,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica (Italy), Univ. degli Studi di Firenze (Italy)

13323-44 • 5:30 PM - 7:00 PM
Beyond the lens: transforming light sheet fluorescence microscopy through stochastic elegance and iterative image refinement
Author(s): **Tathagata Das**, **Aiswarya K.S., M Suheshkumar Singh,** Indian Institute of Science Education and Research Thiruvananthapuram (India)

Tuesday 28 January 2025

SESSION 4: OPTICAL DEVICES AND ANALYSIS TECHNIQUES

28 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Xuantao Su**, Shandong Univ. (China)

13323-13 • 8:30 AM - 9:00 AM
Optical transparent packages for implantable devices *(Invited Paper)*
Author(s): **Lin Du,** The Ohio State Univ. (United States); **Yixiao Ding**, **Han Hao**, **Andrew G. Richardson,** Univ. of Pennsylvania (United States); **Jingjing Zhao,** Huazhong Univ. of Science and Technology (China); **Jan Van der Spiegel**, **Firooz Aflatouni,** Univ. of Pennsylvania (United States); **Timothy H. Lucas,** The Ohio State Univ. (United States); **Mark G. Allen,** Univ. of Pennsylvania (United States)

13323-14 • 9:00 AM - 9:20 AM
Probing deep histological segmentation models to identify specific performance boundaries
Author(s): **Eddie M. Gil**, **Michael P. DeLisi,** SAIC (United States), Air Force Research Lab. (United States); **Joel N. Bixler,** Air Force Research Lab. (United States); **James E. Parker,** General Dynamics Information Technology (United States); **Wiliam B Voorhees,** Air Force Research Lab. (United States)

13323-15 • 9:20 AM - 9:40 AM
Automated classification of HER2 score via deep learning and pyramid sampling
Author(s): **Xilin Yang**, **Sahan Selcuk**, **Bijie Bai**, **Yijie Zhang**, **Yuzhu Li**, **Musa Aydin**, **Aras Firat Unal**, **Aditya Gomatam**, **Zhen Guo,** UCLA Samueli School of Engineering (United States); **Morgan Darrow,** Univ. of California, Davis (United States); **Goren Kolodney,** Bnai Zion Medical Ctr. (Israel); **Karine Altan**, **Tal Keidar Haran,** Hadassah Hebrew Univ. Medical Ctr. (Israel); **Nir Pillar, Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13323-17 • 9:40 AM - 10:00 AM
An innovative VIS-SWIR hyperspectral camera for tissue characterization
Author(s): **Fabrizio Preda**, **Marta Ghirardello**, **Antonio Perri,** NIREOS s.r.l. (Italy); **Lorenzo Vinco, Dario Polli,** NIREOS s.r.l. (Italy), Politecnico di Milano (Italy)

Coffee Break 10:00 AM - 10:30 AM

SESSION 5: LABEL-FREE TECHNIQUES

28 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-18 • 10:30 AM - 11:00 AM
Real-time label-free dynamic imaging of extracellular vesicles in live tissues *(Invited Paper)*
Author(s): **Hongming Fan**, **Jaena Park**, **Wei-Chun Kao**, **Edita Aksamitiene**, **Eric J. Chaney**, **Marni D. Boppart, Stephen A. Boppart,** Univ. of Illinois (United States)

13323-19 • 11:00 AM - 11:20 AM
FluoMALDI imaging of the immune response for label-free in situ identification of phagocytes in Francisella novicida-infected mouse tissues
Author(s): **Tae-Hun Hahm**, **Kristine Glunde,** The Johns Hopkins Univ. School of Medicine (United States); **Alison Scott,** Univ. of Maryland, Baltimore (United States)

13323-20 • 11:20 AM - 11:40 AM
AutoMitoNetwork: software for quantitative mitochondrial network analysis using label-free autofluorescence images for cell classification
Author(s): **Shannon Handley**, **Ayad Anwer**, **Aline Knab**, **Akanksha Bhargava, Ewa Goldys,** The Univ. of New South Wales (Australia)

13323-21 • 11:40 AM - 12:00 PM
Comparative analysis of autofluorescence enhancement and MALDI imaging in the FluoMALDI pipeline using different matrix application methods: sublimation versus spraying
Author(s): **Tae-Hun Hahm**, **Wanyue Wang,** The Johns Hopkins Univ. School of Medicine (United States); **Maxime Siegler,** Johns Hopkins Univ. (United States); **Dalton Brown**, **Cole Johnson**, **Caitlin M. Tressler**, **Scot Kuo, Kristine Glunde,** The Johns Hopkins Univ. School of Medicine (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: APPLICATIONS OF OCT

28 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-22 • 1:30 PM - 2:00 PM
Diffractive-optics-based structured illuminations in biomedical microscopy: applications in imaging flow cytometry and optical coherence tomography *(Invited Paper)*
Author(s): **Jingjing Zhao,** Huazhong Univ. of Science and Technology (China); **Yong Han**, **Lingqi Jiang,** Tsinghua Univ. (China); **Lin Du,** The Ohio State Univ. (United States); **Attila Tárnok,** Univ. Leipzig (Germany); **Adam de la Zerda,** Stanford Univ. (United States); **Zheng You,** Huazhong Univ. of Science and Technology (China)

13323-23 • 2:00 PM - 2:20 PM
Optical coherence tomography (OCT) as a new tool for xenograft development assessment: automated radiomics on OCT/OCT-angiography data of an in ovo xenograft model derived from colorectal cancer liver metastasis
Author(s): **Fabian Placzek**, **Katarína Benčurová**, **Khashayar Memarpour**, **Laszlo Papp**, **Markus Mitterhauser**, **Wolfgang Drexler**, **Theresa Balber, Rainer A. Leitgeb,** Medizinische Univ. Wien (Austria)

13323-24 • 2:20 PM - 2:40 PM
In vivo macrophage tracking of newts during lens regeneration with OCT and confocal laser scanning microscopy multimodal imaging system
Author(s): **Weihao Chen**, **Hui Wang**, **Katia Del Rio-Tsonis**, **Sophie Ratvasky**, **Jose Raul Perez Estrada**, **Erika Grajales Esquivel, Georgios Tsissios,** Miami Univ. (United States)

13323-25 • 2:40 PM - 3:00 PM
Two-photon control of melanopsin activation in cell culture and intrinsically photosensitive retinal ganglion cells (ipRGCs)
Author(s): **Carlos A. Renteria**, **Jiho Kahng**, **Brian E. Tibble**, **Rishyashring R. Iyer**, **Jindou Shi**, **Eric J. Chaney**, **Edita Aksamitiene, Stephen A. Boppart,** Univ. of Illinois (United States)

13323-26 • 3:00 PM - 3:20 PM
OCTA of newts during tissue regeneration
Author(s): **Weihao Chen**, **Hui Wang**, **Katia Del Rio-Tsonis**, **Jose Raul Perez Estrada**, **Sophie Ratvasky, Erika Grajales Esquivel,** Miami Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 7: SPECTRAL APPROACHES

28 January 2025 • 3:50 PM - 5:30 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-27 • 3:50 PM - 4:10 PM
A naturally brighter approach to colorectal cancer detection
Author(s): **Rebecca Tang-Holmes**, **William J. Bond**, **Naga S. Annamdevula**, **Maria Verde**, **Debanjan Chakroborty**, **Michele Schuler**, **Thomas C. Rich**, **Na Gong**, **Chandrani Sarkar, Silas J. Leavesley,** Univ. of South Alabama (United States)

13323-28 • 4:10 PM - 4:30 PM
Design of Multiplexed, Live Cell Imaging Experiments Using Excitation Scan-Based Hyperspectral Imaging Microscopy
Author(s): **Naga S. Annamdevula**, **Rebecca Tang-Holmes**, **Robert LeDoux**, **Taylor Jackson**, **Peyton Baker**, **Andrea Britain**, **Thomas C. Rich, Silas J. Leavesley,** Univ. of South Alabama (United States)

13323-29 • 4:30 PM - 4:50 PM
Multispectral pulse-sampling fluorescence lifetime imager for high-speed large-scale tissue imaging
Author(s): **Xuhui Liu**, **Julien Bec**, **Xiangnan Zhou, Laura Marcu,** Univ. of California, Davis (United States)

13323-30 • 4:50 PM - 5:10 PM
Non-invasive characterization of hBM-MSCs using autofluorescence multispectral imaging: future growth and pluripotency
Author(s): **Jared Campbell**, **Abbas Habibalahi**, **Adnan Agha**, **Shannon Handley**, **Aline Knab**, **Xiaohu Xu**, **Akanksha Bhargava**, **Zhilin Lei**, **Max Mackevicius**, **Yuan Tian**, **Saabah Mahbub**, **Ayad Anwer,** The Univ. of New South Wales (Australia); **Stan Gronthos,** The Univ. of Adelaide (Australia), South Australian Health and Medical Research Institute (Australia); **Shane Grey,** The Univ. of New South Wales (Australia), Garvan Institute of Medical Research (Australia); **Lindsay Wu**, **Robert Gilchrist, Ewa Goldys,** The Univ. of New South Wales (Australia)

13323-31 • 5:10 PM - 5:30 PM
Power scalable speckle-free multi-wavelength light engine for super-resolution microscopy
Author(s): **Anna Essauolva**, **Sergei Kuehn**, **Visa Kaivosoja**, **Andrei Fedotov, Petteri Uusimaa,** Modulight Corp. (Finland)

Wednesday 29 January 2025

SESSION 8: MANIPULATION AND ANALYSES

29 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-32 • 8:30 AM - 9:00 AM
Real-time precision opto-control of biochemical processes in living systems *(Invited Paper)*
Author(s): **Chi Zhang**, **Bin Dong**, **Shivam Mahapatra**, **Seohee Ma**, **R. Michael Everly**, **Mark S. Carlsen, Matthew Clark,** Purdue Univ. (United States)

13323-33 • 9:00 AM - 9:20 AM
Designing software solutions for infrared chemical imaging and digital pathology
Author(s): **Yen-Ting Liu**, **Kevin Yeh,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Matthew P. Confer**, **Ishaan Sharma,** Beckman Institute for Advanced Science and Technology (United States); **Kianoush Falahkheirkhah**, **Andres C. Orr**, **Ruo-Jing Ho,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Mykolas Tamonis,** Beckman Institute for Advanced Science and Technology (United States); **Rohit Bhargava,** Univ. of Illinois (United States), Cancer Ctr. at Illinois (United States), CZ Biohub Chicago, LLC (United States)

13323-34 • 9:20 AM - 9:40 AM **(CANCELLED)**
Probing electrostatic forces with optical trapping
Author(s): **Will Hardiman**, **Tania Mendonca**, **Amanda J. Wright, Sidahmed Abayzeed,** The Univ. of Nottingham (United Kingdom)

13323-35 • 9:40 AM - 10:00 AM
Simultaneous trapping and optical spectroscopy of single samples using optoelectronic tweezers
Author(s): **Mohammad Asif Zaman**, **Mo Wu**, **Wei Ren, Lambertus Hesselink,** Stanford Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: LIGHT-SHEET APPLICATIONS

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 312 (Level 3)

Session Chair(s): **Jessica P. Houston**, New Mexico State Univ. (United States); **Attila Tárnok**, Univ. Leipzig (Germany); **Xuantao Su**, Shandong Univ. (China)

13323-36 • 10:30 AM - 11:00 AM

Development of lensless light-sheet sources and their application for compact selective plane illumination microscopy (SPIM)
(Invited Paper)

Author(s): **Hiroshi Onodera,** The Univ. of Tokyo (Japan); **Kenji Uehara,** Miyuki Giken Co., Ltd. (Japan); **Takumi Murakami,** Nippon Electric Glass Co., Ltd. (Japan); **Asami Tanaka,** The Univ. of Tokyo (Japan); **Yusuke Morishita,** PhotonTech Innovations Co., Ltd. (Japan); **Junji Yumoto,** The Univ. of Tokyo (Japan), PhotonTech Innovations Co., Ltd. (Japan)

13323-37 • 11:00 AM - 11:20 AM

Optical system design of a high-resolution light-sheet fluorescence microscope for cleared samples

Author(s): **Cristian Baccani,** Gestione SILO S.r.l. (Italy); **Ludovico Silvestri,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Sernesi Laura,** Gestione SILO S.r.l. (Italy); **Giacomo Mazzamuto,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica (Italy); **Vasco Milli,** Gestione SILO S.r.l. (Italy)

13323-38 • 11:20 AM - 11:40 AM

Quantitative analysis of "poorly formed" glands in prostate cancer using 3D pathology with light-sheet microscopy

Author(s): **Kevin W. Bishop**, **Sarah S. L. Chow**, **Lindsey A. Erion Barner**, **Qinghua Han**, **Elena Baraznenok**, **Lydia Lan**, **Gan Gao**, **Robert B. Serafin,** Univ. of Washington (United States); **Priti Lal,** Univ. of Pennsylvania (United States); **Lawrence D. True, Jonathan T. C. Liu,** Univ. of Washington (United States)

13323-39 • 11:40 AM - 12:00 PM

Multiple wavelength sMx-SPIM: an effective microscopy technique for investigating light absorption and photosynthetic efficiency in plants

Author(s): **Aiswarya K.S.**, **Krishna M. Nair**, **Anirban Guha, Mayanglambam Suheshkumar Singh,** Indian Institute of Science Education and Research Thiruvananthapuram (India)

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CONFERENCE 13324

Multiphoton Microscopy in the Biomedical Sciences XXV

26 - 28 January 2025 | Moscone South, Room 301 (Level 3)

Conference Chair(s): **Ammasi Periasamy,** Univ. of Virginia (United States); **Peter T. C. So,** Massachusetts Institute of Technology (United States); **Karsten König,** Univ. des Saarlandes (Germany), JenLab GmbH (Germany)

Program Committee: **Marco Arrigoni,** Light Conversion, UAB (Lithuania); **Margarida Barroso,** Albany Medical College (United States); **Wolfgang Becker,** Becker & Hickl GmbH (Germany); **Paul J. Campagnola,** Univ. of Wisconsin-Madison (United States); **Ji-Xin Cheng,** Boston Univ. (United States); **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy); **Michelle Digman,** Univ. of California, Irvine (United States); **Chen-Yuan Dong,** National Taiwan Univ. (Taiwan); **Kevin W. Eliceiri,** Univ. of Wisconsin-Madison (United States); **Conor L. Evans,** Wellman Ctr. for Photomedicine (United States); **Scott Fraser,** The Univ. of Southern California (United States); **Katsumasa Fujita,** Osaka Univ. (Japan); **Stefan W. Hell,** Max-Planck-Institut für Biophysikalische Chemie (Germany); **Na Ji,** Univ. of California, Berkeley (United States); **Fu-Jen Kao,** National Yang Ming Chiao Tung Univ. (Taiwan); **Sudipta Maiti,** BITS Pilani, Hyderabad Campus (India); **Wei Min,** Columbia Univ. (United States); **Junle Qu,** Shenzhen Univ. (China); **Ian A. Read,** Spectra-Physics, a division of MKS Instruments (United States); **Angelika C. Rueck,** Univ. Ulm (Germany); **Lingyan Shi,** Univ. of California, San Diego (United States); **Klaus Suhling,** King's College London (United Kingdom); **Yuansheng Sun,** ISS, Inc. (United States); **Karissa Tilbury,** The Univ. of Maine (United States); **Murukeshan Vadakke Matham,** Nanyang Technological Univ. (Singapore); **Steven S. Vogel,** National Institutes of Health (United States); **Chris Xu,** Cornell Univ. (United States); **Elena V. Zagaynova,** Privolzhsky Research Medical Univ. (Russian Federation); **Ewa Zarnowska,** Coherent Corp. (United States); **Bernhard Zimmermann,** Carl Zeiss Jena GmbH (Germany)

Sunday 26 January 2025

INTRODUCTION

26 January 2025 • 8:15 AM - 8:30 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Ammasi Periasamy**, Univ. of Virginia (United States)

13324-1 • 8:15 AM - 8:30 AM
Welcome and introduction
Author(s): **Ammasi Periasamy,** Univ. of Virginia (United States)

SESSION 1: KEYNOTE I

26 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Ammasi Periasamy**, Univ. of Virginia (United States)

13324-2 • 8:30 AM - 9:00 AM

Critical properties of the lipid bilayer probed by fluorescence correlation spectroscopy and its variants (Keynote Presentation)
Author(s): **Sudipta Maiti,** BITS Pilani, Hyderabad Campus (India)

13324-3 • 9:00 AM - 9:30 AM
Single-Molecule FRET for structural biology of active membrane proteins (Keynote Presentation)
Author(s): **Michael Börsch,** Universitätsklinikum Jena (Germany)

13324-4 • 9:30 AM - 10:00 AM
Pulse-sampling FLIM in medical applications (Keynote Presentation)
Author(s): **Laura Marcu,** Univ. of California, Davis (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: KEYNOTE II

26 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Peter T. C. So**, Massachusetts Institute of Technology (United States)

13324-5 • 10:30 AM - 11:00 AM
Fluorescence lifetime imaging of immune cell metabolism (Keynote Presentation)
Author(s): **Melissa C. Skala,** Morgridge Institute for Research (United States)

13324-6 • 11:00 AM - 11:30 AM
Dissecting metabolic dynamics in aging and diseases with multimodal nanoscopy (Keynote Presentation)
Author(s): **Lingyan Shi,** Univ. of California, San Diego (United States)

SESSION 3: FCS, FLIM, FRET, AND METABOLISM I

26 January 2025 • 11:30 AM - 12:10 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Angelika C. Rueck**, Univ. Ulm (Germany)

13324-7 • 11:30 AM - 11:50 AM
Comparative studies of metabolic activities of murine breast cancer cells in tumor-like model using two-photon fluorescence lifetime and anisotropy imaging of intrinsic NAD(P)H *(Invited Paper)*
Author(s): **Ahmed A. Heikal,** Univ. of Minnesota Duluth (United States)

13324-8 • 11:50 AM - 12:10 PM
Optical metabolic imaging of humans using two-photon FLIM *(Invited Paper)*
Author(s): **Karsten König,** JenLab GmbH (Germany), Univ. des Saarlandes (Germany)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 4: FCS, FLIM, FRET, AND METABOLISM II

26 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Ahmed A. Heikal**, Univ. of Minnesota Duluth (United States)

13324-9 • 1:30 PM - 1:50 PM
A robust approach in quantifying mitochondria dynamics upon transfer: insights into metabolic changes mitochondrial transfer with FLIM intensity-based image segmentation (FIBIS) algorithm *(Invited Paper)*
Author(s): **Michelle Digman,** Univ. of California, Irvine (United States); **Yu-Kai Huang,** Ellison Institute of Technology (United States)

13324-10 • 1:50 PM - 2:10 PM
Autofluorescence lifetime imaging to identify cancer stem cells from bulk cancer cells *(Invited Paper)*
Author(s): **Alex J. Walsh,** Texas A&M Univ. (United States)

13324-11 • 2:10 PM - 2:30 PM
Label-free, two-photon imaging and transcriptomic studies enable improved metabolic function assessments in living tissues *(Invited Paper)*
Author(s): **Irene Georgakoudi,** Dartmouth College (United States); **Afshin Beheshti,** Institute of Science, Blue Marble Space (United States); **Yuhang Fu,** Dartmouth College (United States); **Elizabeth Genega,** Tufts Medical Ctr. (United States); **David Kaplan**, **Olga Liaudanskaya,** Tufts Univ. (United States); **Matthew Lindley**, **Nima Najafi-Ghalehlou,** Dartmouth College (United States); **Abani Patra**, **Christopher Polleys**, **Maria Savvidou**, **Pramesh Singh,** Tufts Univ. (United States); **Hong-Thao Thieu,** Tufts Medical Ctr. (United States); **Yang Zhang,** Tufts Univ. (United States)

13324-12 • 2:30 PM - 2:50 PM
Probing cellular metabolism and embryo development by Fluorescence Lifetime Microscopy of endogenous biomarkers *(Invited Paper)*
Author(s): **Chiara Stringari**, **Thi Phuong Lien Ung**, **Sophie Escot**, **Pierre Mahou, Emmanuel Beaurepaire,** École Polytechnique, Institut Polytechnique de Paris, CNRS (France), Institut National de la Santé et de la Recherche Médicale (France)

13324-13 • 2:50 PM - 3:10 PM
Advanced metabolic FLIM/PLIM to investigate metabolic pattern developments in various disorders and treatments *(Invited Paper)*
Author(s): **Angelika C. Rueck**, **Johannes Wieland**, **Kirsten Reess**, **Bjorn von Einem, Daniela dos Santos,** Univ. Ulm (Germany)

Coffee Break 3:10 PM - 3:30 PM

SESSION 5: FCS, FLIM, FRET, AND METABOLISM III

26 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Chiara Stringari**, École Polytechnique (France)

13324-14 • 3:30 PM - 3:50 PM
Investigations on mitochondrial energy metabolism in prostate cancer by multiphoton FLIM *(Invited Paper)*
Author(s): **Shagufta Rehman Alam**, **Horst Wallrabe, Ammasi Periasamy,** Univ. of Virginia (United States)

13324-15 • 3:50 PM - 4:10 PM
Metabolic NADH FLIM: precise, turnkey quantitative FLIM, FLIM-FRET and more in zen for the Zeiss LSM980 *(Invited Paper)*
Author(s): **Julius Heitz**, **Lukas Braun**, **Hauke Studier, Wolfgang Becker,** Becker & Hickl GmbH (Germany)

13324-16 • 4:10 PM - 4:30 PM
Envelope spike function and antigenicity by FCS, FRET and FLIM approaches *(Invited Paper)*
Author(s): **Krishanu Ray,** Univ. of Maryland School of Medicine (United States)

13324-17 • 4:30 PM - 4:50 PM
Near infrared fluorescence lifetime FRET imaging at multiscale *(Invited Paper)*
Author(s): **Margarida M. Barroso,** Albany Medical College (United States)

13324-18 • 4:50 PM - 5:10 PM
Computational FLIM of cellular microenvironments *(Invited Paper)*
Author(s): **Kevin W. Eliceiri,** Morgridge Institute for Research (United States); **Jenu Chacko**, **Helen Wilson, Mark Tsuchida,** Univ. of Wisconsin-Madison (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Session Chair(s): **Rupsa Datta**, Morgridge Institute for Research (United States); **Michael Börsch**, Universitätsklinikum Jena (Germany); **Chiara Stringari**, École Polytechnique (France); **Fu-Jen Kao**, National Yang Ming Chiao Tung Univ. (Taiwan)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13324-54 • 5:30 PM - 7:00 PM
Enhanced resolution imaging of autophagosome generation in LC3 mice using two-photon microscopy
Author(s): **Saeed Bohlooli Darian,** Univ. of Ulsan College of Medicine (Korea, Republic of); **Jeongmin Oh, Jun Ki Kim,** Asan Medical Ctr. (Korea, Republic of)

13324-55 • 5:30 PM - 7:00 PM
Multiphoton imaging of advanced glycation end product saturation in tissues
Author(s): **Sohidul Mondal**, **Nasim Kamely, Chen-Yuan Dong,** National Taiwan Univ. (Taiwan)

13324-61 • 5:30 PM - 7:00 PM
Advancements of deeper and faster biomedical imaging: miniaturized Airy illuminator for multiphoton lightsheet microscopy
Author(s): **Madhu Veettikazhy,** DTU Electro (Denmark); **Yanis Taege,** Univ. of Freiburg (Germany); **Adéle Haman**, **Denisse A. Gutiérrez Martínez,** Technical Univ. of Denmark (Denmark); **Tim S. Winter,** Univ. of Freiburg (Germany); **Stefan M. Jensen,** Technical Univ. of Denmark (Denmark); **Sophia L. Stark,** Grintech GmbH (Germany); **Anja L. Borre**, **Lars R. Lindvold,** Technical Univ. of Denmark (Denmark); **Bernhard Messerschmidt,** Grintech GmbH (Germany); **Dominik Marti,** Technical Univ. of Denmark (Denmark); **Çağlar Ataman,** Univ. of Freiburg (Germany); **Peter E. Andersen,** Technical Univ. of Denmark (Denmark)

13324-62 • 5:30 PM - 7:00 PM
Label-free detection and characterization of metabolism in fresh and cryopreserved macrophages
Author(s): **Daniela De Hoyos Canales**, **Linghao Hu, Alex J. Walsh,** Texas A&M Univ. (United States)

13324-63 • 5:30 PM - 7:00 PM
Metabolic analysis of LDHB inhibition in breast cancer using fluorescence lifetime imaging microscopy
Author(s): **Amanda Galloway**, **Blanche Ter Hofstede, Alex J. Walsh,** Texas A&M Univ. (United States)

13324-67 • 5:30 PM - 7:00 PM
Widefield and lightsheet lifetime imaging with a novel SPAD camera
Author(s): **Felix Koberling**, **Johan Hummert**, **Thomas Schönau**, **Max Tillmann**, **Corinna Nock**, **Rainer Erdmann,** PicoQuant GmbH (Germany); **Valentin Dunsing-Eichenauer**, **Claire Chardès**, **Léo Guignard**, **Pierre-François Lenne,** Aix-Marseille Univ. (France), CNRS (France); **Ivan Michel Antolovic,** Pi Imaging Technology SA (Switzerland)

13324-68 • 5:30 PM - 7:00 PM
Super-resolution imaging of mitochondrial dynamics in live zebrafish
Author(s): **Renlong Zhang,** Shenzhen Univ. (China), Clemson Univ. (United States); **Tong Ye,** Clemson Univ. (United States); **Junle Qu,** Shenzhen Univ. (China)

13324-69 • 5:30 PM - 7:00 PM
Deep learning-based de-scattering in two-photon fluorescence microscopy
Author(s): **Xiangcong Xu, Junle Qu,** Shenzhen Univ. (China)

13324-70 • 5:30 PM - 7:00 PM
Enhanced intracellular interaction observation through multi-color super-resolution via deep learning
Author(s): **Qinglin Chen, Junle Qu,** Shenzhen Univ. (China)

13324-71 • 5:30 PM - 7:00 PM
Two-photon fluorescence lifetime imaging microscopy of autofluorescence under cellular differentiation
Author(s): **Hao Chen**, **Julian Najera**, **Alice Burchett**, **Dagmawit M. Geresu**, **Meenal Datta, Scott Howard,** Univ. of Notre Dame (United States)

13324-72 • 5:30 PM - 7:00 PM
3D fluorescence lifetime imaging microscopy of *Drosophila* imaginal wing discs for studying membrane tension
Author(s): **Dagmawit M. Geresu**, **Benjamin Speybroeck**, **Mayesha Sahir Mim**, **Hao Chen**, **Jeremiah Zartman, Scott Howard,** Univ. of Notre Dame (United States)

13324-73 • 5:30 PM - 7:00 PM
Long lifetime distributions as a factor in fluorescence lifetime imaging variability
Author(s): **Helen Wilson**, **Jenu Chacko, Kevin W. Eliceiri,** Univ. of Wisconsin-Madison (United States)

13324-74 • 5:30 PM - 7:00 PM
Thyroid cancer assessment with machine learning-assisted wide-field second harmonic generation microscopy
Author(s): **Yaraslau Padrez**, **Lena Golubewa**, **Igor Timoshchenko,** Ctr. for Physical Sciences and Technology (Lithuania); **Adrian Enache**, **Lucian Eftimie,** Central Emergency Military Hospital, Univ. de Medicina si Farmacie "Carol Davila" din Bucuresti (Romania); **Radu Hristu,** Univ. Politehnica din Bucuresti (Romania); **Danielis Rutkauskas,** Ctr. for Physical Sciences and Technology (Lithuania)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 6: FCS, FLIM, FRET, AND METABOLISM IV

27 January 2025 • 8:15 AM - 9:55 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Michelle Digman**, Univ. of California, Irvine (United States)

13324-19 • 8:15 AM - 8:35 AM
Advanced FLIM and ISM-FLIM analysis options with flexible ROI handling *(Invited Paper)*
Author(s): **Felix Koberling**, **Evangelos Sisamakis**, **Rainer Erdmann**, **Ellen Schmeyer**, **Kamil Bobowski**, **Marcus Sackrow**, **Markus Götz**, **Matthias Patting**, **Stefan Eilers, Fabian Jolmes,** PicoQuant GmbH (Germany)

13324-20 • 8:35 AM - 8:55 AM
Advances in time-resolved fluorescence anisotropy imaging with a time-correlated single photon counting SPAD array *(Invited Paper)*
Author(s): **Klaus Suhling,** King's College London (United Kingdom)

13324-21 • 8:55 AM - 9:15 AM
Leveraging the synergies between multiphoton and fluorescence lifetime imaging microscopy on the Leica STELLARIS platform *(Invited Paper)*
Author(s): **Giulia Ossato,** Leica Microsystems Inc. (United States); **Manuel Kremer**, **Nicolas Camus,** Leica Microsystems CMS GmbH (Germany); **Jason Lin, Haridas Pudavar,** Leica Microsystems Inc. (United States)

13324-22 • 9:15 AM - 9:35 AM
Assessing exposure, toxicity and efficacy of skin products using fluorescence lifetime imaging microscopy *(Invited Paper)*
Author(s): **Yousuf Mohammed**, **David Liu**, **Junpeng Ye, Khanh Phan,** The Univ. of Queensland (Australia)

13324-23 • 9:35 AM - 9:55 AM
Development of an all-in-one two-photon laser scanning microscope integrating FastFLIM and phasor plots for label-free imaging in clinical applications *(Invited Paper)*
Author(s): **Yuansheng Sun**, **Shih-chu "Jeff" Liao, Beniamino Barbieri,** ISS, Inc. (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 7: FCS, FLIM, FRET, AND METABOLISM V

27 January 2025 • 10:25 AM - 12:00 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Alex J. Walsh**, Texas A&M Univ. (United States)

13324-24 • 10:25 AM - 10:45 AM
Metabolic imaging of cell division *(Invited Paper)*
Author(s): **Rupsa Datta**, **Emmanuel Contreras Guzman,** Morgridge Institute for Research (United States); **Kiera M. Sapp,** Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology (United States); **Matthew Vander Heiden,** The Koch Institute for Integrative Cancer Research (United States); **Melissa C. Skala,** Morgridge Institute for Research (United States)

13324-25 • 10:45 AM - 11:00 AM
NADH, FAD and TRP metabolic FLIM: tuneable excitation from 400 nm – 1300 nm for 1p vs. 2p imaging of the same sample area *(Invited Paper)*
Author(s): **Julius Heitz**, **Lukas Braun**, **Hauke Studier, Wolfgang Becker,** Becker & Hickl GmbH (Germany)

13324-26 • 11:00 AM - 11:15 AM
Interleaved gate acquisition: a low-frequency noise-immune approach to wide field FLIM with time-gated SPAD cameras
Author(s): **Paul Mos,** EPFL (Switzerland); **Xavier Michalet**, **Debjit Roy**, **Shimon Weiss,** Univ. of California, Los Angeles (United States); **Claudio Bruschini, Edoardo Charbon,** EPFL (Switzerland)

13324-27 • 11:15 AM - 11:30 AM
Experimental investigation of noise characterization in real-time, multiphoton fluorescence lifetime imaging microscopy
Author(s): **Hao Chen**, **Julian Najera**, **Dagmawit M. Geresu**, **Meenal Datta, Scott Howard,** Univ. of Notre Dame (United States)

13324-28 • 11:30 AM - 11:45 AM
Advancements in label-free optical metabolic in vivo imaging of human skin using multiphoton microscopy
Author(s): **Belen Torrado**, **Suman Ranjit**, **Amanda Durkin**, **Alexander Vallmitjana**, **Nicole Wakida**, **Kathryn Hinchee-Rodriguez**, **Jessica Shiu**, **Anand K. Ganesan, Mihaela Balu,** Univ. of California, Irvine (United States)

13324-51 • 11:45 AM - 12:00 PM
Optothermal tweezers for biological manipulation and CRISPR biosensing
Author(s): **Jiajie Chen**, **Jianxing Zhou**, **Yonghong Shao, Junle Qu,** Shenzhen Univ. (China)

Lunch Break 12:00 PM - 1:30 PM

SESSION 8: TECHNOLOGY DEVELOPMENT I

27 January 2025 • 1:30 PM - 2:35 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Kevin W. Eliceiri**, Univ. of Wisconsin-Madison (United States)

13324-30 • 1:30 PM - 1:50 PM
GelTopo: 3D mapping for correcting structural distortions in expansion microscopy *(Invited Paper)*
Author(s): **Xiaoyu Shi**, **Yinyin Zhuang, Zhao Zhang,** Univ. of California, Irvine (United States)

13324-31 • 1:50 PM - 2:05 PM
Modern applications in multiphoton microscopy
Author(s): **Ian A. Read,** Spectra-Physics, a division of MKS Instruments (United States)

13324-32 • 2:05 PM - 2:20 PM
Innovations in ultrafast lasers for nonlinear microscopy
Author(s): **Mantas Butkus,** Coherent Corp. (United States); **Leigh Graham,** Coherent Corp. (United Kingdom); **Erin Dlugosz,** Coherent Corp. (United States)

13324-33 • 2:20 PM - 2:35 PM
Two-color laser system for 2-photon FLIM
Author(s): **Joseph N. Mastron,** TOPTICA Photonics, Inc. (United States); **Luisa Hofmann, Alexander Jelzow,** TOPTICA Photonics AG (Germany)

POSTER AWARD PRESENTATIONS

27 January 2025 • 2:35 PM - 3:30 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Ammasi Periasamy**, Univ. of Virginia (United States)
Join us for the presentation of the best poster awards.

Coffee Break 3:30 PM - 4:00 PM

SESSION 9: SHG/THG MICROSCOPY

27 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Paul J. Campagnola**, Univ. of Wisconsin-Madison (United States)

13324-34 • 4:00 PM - 4:20 PM
SHG analysis and modeling of collagen fibril architecture via a rigorous wavelength dependent computational model of 3D quasi-phasematching *(Invited Paper)*
Author(s): **Paul J. Campagnola, Emily Shelton,** Univ. of Wisconsin-Madison (United States)

13324-35 • 4:20 PM - 4:35 PM
Quantitative second harmonic generation imaging for differentiating between normal and cancerous thyroid tissue
Author(s): **Orhun Davarci**, **Wesley Poon**, **Hong Zhao**, **Raksha Raghunathan, Stephen Wong,** Houston Methodist Research Institute (United States)

13324-36 • 4:35 PM - 4:50 PM
Instant assessment of lung biopsies using higher harmonic generation microscopy
Author(s): **Sylvia Spies,** Vrije Univ. Amsterdam (Netherlands); **Annick van der Kroef**, **Roel L. J. Verhoeven**, **Erik H. F. M. van der Heijden,** Radboud Univ. Medical Ctr. (Netherlands); **Johannes M. A. Daniels**, **Peter I. Bonta**, **Jouke T. Annema,** Amsterdam UMC (Netherlands); **Marie Louise Groot,** Vrije Univ. Amsterdam (Netherlands)

13324-37 • 4:50 PM - 5:05 PM
Flexible, turn-key lasers for non-linear microscopy
Author(s): **Marco Arrigoni,** Light Conversion-USA (United States); **Jonas Berzinš**, **Lukas Kontenis, Mantvydas Mikulis,** Light Conversion, UAB (Lithuania)

13324-38 • 5:05 PM - 5:20 PM
Beyond the microscope: targeting metabolic regions through FLIM algorithms and phasor pattern segmentation
Author(s): **Daniela N. S. dos Santos**, **Katharina Werner**, **Kirsten Reess**, **Johannes Wieland, Angelika C. Rueck,** Univ. Ulm (Germany)

Tuesday 28 January 2025

SESSION 10: TECHNOLOGY DEVELOPMENT II

28 January 2025 • 8:15 AM - 10:05 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Klaus Suhling**, King's College London (United Kingdom)

13324-41 • 8:15 AM - 8:35 AM
Spatial-temporal modulation super-resolution optical imaging *(Invited Paper)*
Author(s): **Junle Qu, Renlong Zhang,** Shenzhen Univ. (China)

13324-39 • 8:35 AM - 8:55 AM
Compressed 2P-FOCUS microscopy for real-time scattering correction *(Invited Paper)*
Author(s): **Yi Xue,** Univ. of California, Davis (United States)

13324-40 • 8:55 AM - 9:15 AM
Visualizing Drosophila connectome with multi-view light-sheet macro-photography and iterative expansion microscopy *(Invited Paper)*
Author(s): **Fu-Jen Kao,** National Yang Ming Chiao Tung Univ. (Taiwan); **Ann-Shyn Chiang,** National Tsing Hua Univ. (Taiwan); **Scotte Liu,** National Yang Ming Chiao Tung Univ. (Taiwan); **Wei-Kun Chang,** National Tsing Hua Univ. (Taiwan); **Ming-Chin Wu,** National Yang Ming Chiao Tung Univ. (Taiwan); **Ming-Fu Chen,** Taiwan Instrument Research Institute, NARLabs (Taiwan); **Po-Jui Chen**, **Wei-Jei Peng, Yi-Hao Lin,** Taiwan Instrument Research Institute (Taiwan)

13324-42 • 9:15 AM - 9:35 AM
Label-free multimodal femtosecond fiber laser microscopy of organoids with acousto-optic deflectors *(Invited Paper)*
Author(s): **Karsten König,** JenLab GmbH (Germany), Univ. des Saarlandes (Germany); **Aisada König,** JenLab GmbH (Germany); **Florian Weinberger**, **Nancy Shehata,** Universitätsklinikum Hamburg-Eppendorf (Germany); **Krishna Agarwal,** UiT The Arctic Univ. of Norway (Norway); **Martí Duocastella,** Univ. de Barcelona (Spain)

13324-43 • 9:35 AM - 9:50 AM
Review of functional brain imaging with advanced high-power multi-photon microscopy
Author(s): **Robert Riedel**, **Kolja Kolata**, **Michael Schulz**, **Jan Heye Buss**, **Thomas Braatz**, **Issam Abdallah, Hossein Goudarzi,** Class 5 Photonics GmbH (Germany)

13324-44 • 9:50 AM - 10:05 AM
Modulating multimodal nonlinear pulse propagation for deep multimodal nonlinear microscopy
Author(s): **Honghao Cao**, **Kunzan Liu**, **Kasey Shashaty, Sixian You,** Massachusetts Institute of Technology (United States)

Coffee Break 10:05 AM - 10:35 AM

SESSION 11: FCS, FLIM, FRET AND METABOLISM VI

28 January 2025 • 10:35 AM - 11:55 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Fu-Jen Kao**, National Yang Ming Chiao Tung Univ. (Taiwan)

13324-45 • 10:35 AM - 10:55 AM
Effect of surface coating and acidification on the interaction of microplastics with algae *Chlorella sp*. by confocal microscopy and time-resolved imaging *(Invited Paper)*
Author(s): **Alzbeta Marcek Chorvátová,** International Laser Ctr. of SCSTI (Slovakia)

13324-46 • 10:55 AM - 11:10 AM
Label-free characterization of peripheral blood mononuclear cells using autofluorescence imaging
Author(s): **Blanche ter Hofstede**, **Sophie Romero**, **Daniela De Hoyos Canales, Alex J. Walsh,** Texas A&M Univ. (United States)

13324-47 • 11:10 AM - 11:25 AM
Label-free multichannel three-photon microscopy in dermatological imaging
Author(s): **Jiabin Chen**, **Rongguang Liang**, **Clara N. Curiel-Lewandrowski, Delaney Stratton,** The Univ. of Arizona (United States)

13324-48 • 11:25 AM - 11:40 AM
ROI-summed analysis for improved fluorescence lifetime fitting accuracy and precision
Author(s): **Kayvan Samimi**, **Danielle E. Desa**, **Dan L. Pham,** Morgridge Institute for Research (United States); **Melissa C. Skala,** Morgridge Institute for Research (United States), Univ. of Wisconsin-Madison (United States)

13324-50 • 11:40 AM - 11:55 AM
The role of data processing for lifetime image scanning microscopy
Author(s): **Felix Koberling**, **Max Tillmann**, **Matthias Patting, Rainer Erdmann,** PicoQuant GmbH (Germany)

Lunch/Exhibition Break 11:55 AM - 1:25 PM

SESSION 12: TECHNOLOGY DEVELOPMENT III

28 January 2025 • 1:25 PM - 1:55 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Alzbeta Marcek Chorvátová**, International Laser Ctr. of SCSTI (Slovakia)

13324-52 • 1:25 PM - 1:40 PM
Scattering correction for non-linear excitation imaging through implanted micro-optics
Author(s): **Mario Marini**, **Davide Panzeri**, **Luca Presotto**, **Margaux Bouzin**, **Maddalena Collini**, **Laura Sironi,** Univ. degli Studi di Milano-Bicocca (Italy); **Claudio Conci**, **Behjat Sadat Kariman**, **Alessandra Nardini,** Politecnico di Milano (Italy); **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Maria Farsari,** Foundation for Research and Technology-Hellas (Greece); **Manuela Teresa Raimondi,** Politecnico di Milano (Italy); **Nikolaos Kehagias,** Institute of Nanoscience and Nanotechnology, National Ctr. for Scientific Research "Demokritos" (Greece); **Giulio Cerullo,** Politecnico di Milano (Italy); **Konstantina Tourlouki,** Institute of Nanoscience and Nanotechnology (Greece); **Rebeca Martínez Vázquez,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giuseppe G. Chirico,** Univ. degli Studi di Milano-Bicocca (Italy)

13324-53 • 1:40 PM - 1:55 PM
Two-photon imaging of the live mouse brain in the SWIR using an array of SNSPDs
Author(s): **Amr Tamimi,** European Molecular Biology Laboratory (Germany); **Martin Caldarola**, **Niels Noordzij**, **Johannes W.N. Los**, **Antonio Guardini**, **Hugo Kooiman,** Single Quantum B.V. (Netherlands); **Hein Zijlstra,** Single Quantum (Netherlands); **Juan Carlos Boffi**, **Sebastian Hambura**, **Ling Wang**, **Christian Kiesera,** European Molecular Biology Laboratory (Germany); **Andreas Fognini,** Single Quantum B.V. (Netherlands); **Robert Prevedel,** European Molecular Biology Laboratory (Germany)

SESSION 13: TECHNOLOGY DEVELOPMENT IV

28 January 2025 • 1:55 PM - 2:55 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Karsten König**, JenLab GmbH (Germany)

13324-56 • 1:55 PM - 2:10 PM
Mapping awake and anesthetized mouse resting state functional connectivity using large field-of-view two-photon microscopy
Author(s): **Shengxuan Chen**, **Hunter Banks**, **Annie Bice**, **Seana Gaines**, **Jonathan Bumstead, Joseph Culver,** Washington Univ. in St. Louis (United States)

13324-57 • 2:10 PM - 2:25 PM
Investigation of the statistical distribution of noise in fluorescence lifetime imaging microscopy (FLIM) measurements
Author(s): **Dagmawit M. Geresu**, **Hao Chen, Scott Howard,** Univ. of Notre Dame (United States)

13324-58 • 2:25 PM - 2:40 PM
DeepFLR: a self-supervised deep learning framework for robust FLIM signal restoration under photon-starved conditions
Author(s): **Jindou Shi**, **Kevin K. D. Tan**, **Alexander Ho**, **Janet E. Sorrells**, **Rishyashring R. Iyer**, **Eric J. Chaney**, **Darold R. Spillman**, **Marina Marjanovic, Stephen A. Boppart,** Univ. of Illinois (United States)

13324-60 • 2:40 PM - 2:55 PM
Widefield bond-selective super-resolution microscopy by SIM-based mid-infrared photothermal imaging
Author(s): **Delong Zhang,** Zhejiang Univ. (China)

CONFERENCE 13325

Three-Dimensional and Multidimensional Microscopy: Image Acquisition and Processing XXXII

29 - 30 January 2025 | Moscone South, Room 301 (Level 3)

Conference Chair(s): **Thomas G. Brown,** The Institute of Optics, Univ. of Rochester (United States); **Tony Wilson,** Univ. of Oxford (United Kingdom); **Laura Waller,** Univ. of California, Berkeley (United States)

Program Committee: **Martin Booth,** Univ. of Oxford (United Kingdom); **Charles A. DiMarzio,** Northeastern Univ. (United States); **Jonathan T.C. Liu,** Univ. of Washington (United States); **Raimund J. Ober,** Texas A&M Univ. (United States); **Chrysanthe Preza,** The Univ. of Memphis (United States); **Monika Ritsch-Marte,** Medizinische Univ. Innsbruck (Austria); **Zachary J. Smith,** Univ. of Science and Technology of China (China)

Monday 27 January 2025

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13325-9 • 5:30 PM - 7:00 PM
Using a plain glass to produce a super resolution image for the microscopy photography
Author(s): **Po-Jui Chen**, **Yi-Hao Lin**, **Wei-Jei Peng, Ming-Fu Chen,** Taiwan Instrument Research Institute (Taiwan)

Wednesday 29 January 2025

SESSION 1: INSTRUMENTATION AND METHODS I

29 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Thomas G. Brown**, The Institute of Optics, Univ. of Rochester (United States)

13325-1 • 8:40 AM - 9:00 AM
Adaptable multispectral imaging system using Fourier ptychography and spectral filter
Author(s): **Neerja Aggarwal, Laura Waller,** Univ. of California, Berkeley (United States)

13325-2 • 9:00 AM - 9:20 AM
Lock-in amplitude-phase correlations in coherent Raman microscopy: application to lithium ores
Author(s): **Alexander Harper,** Univ. of Ottawa (Canada); **Jonathan Boisvert,** National Research Council Canada (Canada); **Siddarth Shivkumar**, **Leah Frackleton**, **Malcolm Latorre,** Univ. of Ottawa (Canada); **Tassos Grammatikopoulos,** SGS Canada Inc. (Canada); **Adrian Pegoraro,** National Research Council Canada (Canada); **Albert Stolow,** Univ. of Ottawa (Canada)

13325-3 • 9:20 AM - 9:40 AM
Tomographic molecular imaging via deep ultraviolet (UV) microscopy
Author(s): **Case Edmondson**, **Francisco E. Robles,** Georgia Institute of Technology (United States); **Nischita Kaza,** Massachusetts Institute of Technology (United States)

13325-4 • 9:40 AM - 10:00 AM
Multi-pitch miniature GRIN lens for image relay
Author(s): **Yonglin Huang**, **Dhruvkumar Desai**, **Guifang Li,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Song Hu**, **Shuo Yang,** Washington Univ. in St. Louis (United States); **John A.B. Aziz, Bahaa E.A. Saleh,** CREOL, Univ. of Central Florida (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: INSTRUMENTATION AND METHODS II

29 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Laura Waller**, Univ. of California, Berkeley (United States)

13325-5 • 10:30 AM - 10:50 AM
Instant dual-color Fourier light-field microscopy
Author(s): **Wenhao Liu**, **Zhi Ling**, **Shuyi Nie, Shu Jia,** Georgia Institute of Technology (United States)

13325-6 • 10:50 AM - 11:10 AM
Fluorescence microscopy with a single-pixel camera and derivative optical imaging technique
Author(s): **Lino Misoguti**, **Leonardo G. Ferreira**, **Renato M. Moyses,** Univ. de São Paulo (Brazil); **Emerson C. Barbano,** Univ. Federal do Paraná (Brazil)

13325-7 • 11:10 AM - 11:30 AM
Simultaneous bright field and quantitative phase imaging of living cells in flow with a fiber optic digital holographic off-axis Mach-Zehnder interferometer approach
Author(s): **Jian Kim,** Univ. Münster (Germany); **José Á. Picazo Bueno,** Univ. Münster (Germany), Univ. de València (Spain); **Álvaro Barroso**, **Steffi Ketelhut**, **Jürgen Schnekenburger, Björn Kemper,** Univ. Münster (Germany)

13325-8 • 11:30 AM - 11:50 AM
Multiplexed 3D virtual histology in the ocular system
Author(s): **Eric Y. Lu**, **Maryse Lapierre-Landry**, **Made Airanthi K. Widjaja-Adhi**, **Matthew T. McPheeters**, **Andrew M. Rollins**, **Marcin Golczak, Michael W. Jenkins,** Case Western Reserve Univ. (United States)

Lunch/Exhibition Break 11:50 AM - 1:40 PM

SESSION 3: INSTRUMENTATION AND METHODS III

29 January 2025 • 1:40 PM - 3:00 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Martin J. Booth**, Univ. of Oxford (United Kingdom)

13325-10 • 1:40 PM - 2:00 PM
Optical Diffraction Tomography with multiple wavelengths for highly scattering samples
Author(s): **Yunzhe Li**, **Charles Dove, Laura Waller,** Univ. of California, Berkeley (United States)

13325-11 • 2:00 PM - 2:20 PM
Polarization-multiplexed holography for label-free microscopy in nonlinear regime
Author(s): **Marie Fondanèche**, **Serena Goldmann**, **Valentina Krachmalnicoff,** Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France); **Gilles Tessier,** Institut de la Vision, Sorbonne Univ. (France); **Yannick De Wilde,** Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France)

13325-12 • 2:20 PM - 2:40 PM
Label-free imaging of joint condyles with curved surfaces using nonlinear optical microscopy
Author(s): **Meenakshi Mukherji**, **Rebekah Rocha**, **Wan Shen Hee**, **Zhao Zhang**, **Hongming Fan**, **Bruce Z. Gao,** Clemson Univ. (United States); **Ann Foley,** Clemson Univ. (United States), Medical Univ. of South Carolina (United States); **Joseph Carson,** College of Charleston (United States); **Tong Ye,** Clemson Univ. (United States), Medical Univ. of South Carolina (United States)

13325-13 • 2:40 PM - 3:00 PM
Label-free multi-photon super-resolution microscopy by multiplexed single point spread function image acquisition
Author(s): **Kayvan F. Tehrani, Stephen A. Boppart,** Univ. of Illinois (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: EXTENDED DEPTH-OF-FOCUS AND LIGHT-SHEET MICROSCOPY

29 January 2025 • 3:30 PM - 4:30 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Thomas G. Brown**, The Institute of Optics, Univ. of Rochester (United States)

13325-14 • 3:30 PM - 3:50 PM
High speed deep remote focusing for 3D microscopy with adaptive optics
Author(s): **Jingyu Wang,** Univ. of Oxford (United Kingdom)

13325-29 • 3:50 PM - 4:10 PM
Synthetic dipole from a metal tip for single molecule microscopy
Author(s): **Sherry Yi-Ting Feng,** The Institute of Optics, Univ. of Rochester (United States); **Luis A. Alemán-Castañeda,** Aix-Marseille Univ., CNRS (France), Centrale Méditerranée (France), Institut Fresnel (France); **Miguel A. Alonso,** Aix-Marseille Univ. (France), The Institute of Optics, Univ. of Rochester (United States); **Thomas G. Brown,** The Institute of Optics, Univ. of Rochester (United States)

13325-16 • 4:10 PM - 4:30 PM
Extended depth of field in confocal microscopy using a tunable acoustic gradient-index lens
Author(s): **Ajitesh Singh, Patrice Tankam,** Indiana Univ. (United States)

SESSION 5: MULTIDIMENSIONAL IMAGE RECONSTRUCTION AND ANALYSIS

29 January 2025 • 4:30 PM - 5:30 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Thomas G. Brown**, The Institute of Optics, Univ. of Rochester (United States)

13325-17 • 4:30 PM - 4:50 PM
Synthetic data for fluorescence imaging in scattering media by modeling the signal-to-background ratio
Author(s): **Jeffrey Alido**, **Joseph Greene**, **Yujia Xue**, **Guorong Hu**, **Yunzhe Li**, **Mitchell Gilmore**, **Kevin J. Monk**, **Brett T. DiBenedictis**, **Ian G. Davison, Lei Tian,** Boston Univ. (United States)

13325-18 • 4:50 PM - 5:10 PM
A comprehensive approach for uncompromised super-resolution and optical sectioning in image scanning microscopy
Author(s): **Alessandro Zunino**, **Giacomo Garrè**, **Eleonora Perego**, **Sabrina Zappone**, **Mattia Donato, Giuseppe Vicidomini,** Istituto Italiano di Tecnologia (Italy)

13325-19 • 5:10 PM - 5:30 PM
Computational augmentation of full-field optical coherence microscope for a single-shot volumetric cellular-resolution and millimeter-depth imaging
Author(s): **Nobuhisa Tateno,** Univ. of Tsukuba (Japan); **Yue Zhu,** Nanjing Univ. of Science and Technology (China), Univ. of Tsukuba (Japan); **Shuichi Makita**, **Xibo Wang,** Univ. of Tsukuba (Japan); **Ibrahim Abd El-Sadek,** Univ. of Tsukuba (Japan), Damietta Univ. (Egypt); **Rion Morishita**, **Atsuko Furukawa**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

Thursday 30 January 2025

SESSION 6: INNOVATIONS IN MICROSCOPE DESIGN

30 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Thomas G. Brown**, The Institute of Optics, Univ. of Rochester (United States)

13325-20 • 8:40 AM - 9:00 AM
Multi-wavelength confocal interference microscopy for collagen fibril diameter measurement
Author(s): **Eric P. Hall**, **Charles A. DiMarzio, Jeffrey W. Ruberti,** Northeastern Univ. (United States)

13325-21 • 9:00 AM - 9:20 AM
High-resolution fluorescence lifetime imaging microscopy at an affordable price
Author(s): **Lewis A. Wilson,** Heriot-Watt Univ. (United Kingdom), STMicroelectronics (United Kingdom); **Jonathan Leach,** Heriot-Watt Univ. (United Kingdom); **Brent Hearn,** STMicroeletronics (United Kingdom)

13325-22 • 9:20 AM - 9:40 AM
Scanless confocal light sheet microscopy for high-content and high-throughput imaging of cells and microorganisms
Author(s): **Soheila Akbari, Nima Tabatabaei,** York Univ. (Canada)

13325-23 • 9:40 AM - 10:00 AM
Single-shot 3D optical microscope with nanometer longitudinal resolution based on a Linnik interferometer
Author(s): **Sergei V. Anishchik**, **Sarah P. F. Roberts**, **Shannon S Nicley, Marcos Dantus,** Michigan State Univ. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: NEW COMPUTATIONAL MODELS

30 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 301 (Level 3)
Session Chair(s): **Charles A. DiMarzio**, Northeastern Univ. (United States)

13325-24 • 10:30 AM - 10:50 AM
Combining machine learning and Fourier optics for fluorescence microscopy aberration correction
Author(s): **Sean Turner,** Northeastern Univ. (United States), IDEXX Labs., Inc. (United States); **Scott Bender,** IDEXX Labs., Inc. (United States); **Charles A. DiMarzio,** Northeastern Univ. (United States)

13325-25 • 10:50 AM - 11:10 AM
Integration of the plug and play image reconstruction method with a novel tunable structured illumination microscope
Author(s): **Arash Atibi**, **Abdulaziz Alqahtani, Chrysanthe Preza,** The Univ. of Memphis (United States)

13325-26 • 11:10 AM - 11:30 AM
Identification of Alzheimer's disease-related optical signatures in the human retina using optical coherence tomography and weakly supervised deep learning
Author(s): **Jindou Shi**, **Edita Aksamitiene,** Univ. of Illinois (United States); **Peter Stanwell,** The Univ. of Newcastle (Australia); **Guillermo L. Monroy**, **Shonit N. Sharma**, **Jordan W. Marsh**, **Michael S. Tsipursky**, **Darold R. Spillman**, **Marina Marjanovic, Stephen A. Boppart,** Univ. of Illinois (United States)

13325-27 • 11:30 AM - 11:50 AM
Four-dimensional image formation theory generalized from quantum Liouville equation
Author(s): **Naoki Fukutake,** Nikon Corp. (Japan), Univ. of Tsukuba (Japan); **Shuichi Makita, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13325-28 • 11:50 AM - 12:10 PM
Fiber Bragg Grating-Driven Subpixel Jitter Correction for Enhanced SECM Imaging Stability
Author(s): **Jintaek Im,** Harvard Medical School (United States), Massachuestts General Hospital (United States); **Hinnerk Schulz-Hildebrandt**, **Junyoung Kim, Guillermo Tearney,** Harvard Medical School (United States), Massachusetts General Hospital (United States)

CONFERENCE 13326

CONFERENCE CO-SPONSOR

PicoQuant

Single Molecule Spectroscopy and Superresolution Imaging XVIII

25 - 26 January 2025 | Moscone South, Room 307 (Level 3)

Conference Chair(s): **Rainer Erdmann,** PicoQuant GmbH (Germany); **Mike Heilemann,** Goethe-Univ. Frankfurt am Main (Germany); **Felix Koberling,** PicoQuant GmbH (Germany)

Program Committee: **Andrea M. Armani,** The Univ. of Southern California (United States); **Michael Börsch,** Universitätsklinikum Jena (Germany); **Christian Eggeling,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller Univ. Jena (Germany); **Jörg Enderlein,** Georg-August-Univ. Göttingen (Germany); **Paul M. W. French,** Imperial College London (United Kingdom); **Ingo Gregor,** Georg-August-Univ. Göttingen (Germany); **Anna-Karin Gustavsson,** Rice Univ. (United States); **Johan Hofkens,** KU Leuven (Belgium); **Zhen-Li Huang,** Wuhan National Lab. for Optoelectronics (China); **Linnea Olofsson,** PicoQuant Photonics North America, Inc. (United States); **Shimon Weiss,** Univ. of California, Los Angeles (United States); **Andong Xia,** Institute of Chemistry, Chinese Academy of Sciences (China)

Saturday 25 January 2025

OPENING REMARKS

25 January 2025 • 12:40 PM - 12:50 PM | Moscone South, Room 307 (Level 3)

13326-1 • 12:40 PM - 12:50 PM
Welcome remarks
Author(s): **Rainer Erdmann,** PicoQuant GmbH (Germany)

SESSION 1: NEW INSTRUMENTATION AND CHEMICAL/BIOCHEMICAL SENSING

25 January 2025 • 12:50 PM - 1:30 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Rainer Erdmann**, PicoQuant GmbH (Germany)

13326-5 • 12:50 PM - 1:10 PM
Beyond smFRET - NV qubit in nanodiamond for monitoring subunit rotation in single FoF1-ATP synthase
Author(s): **Michael Börsch**, **Iván Pérez**, **Thomas Heitkamp,** Universitätsklinikum Jena (Germany); **Fedor Jelezko,** Univ. Ulm (Germany)

13326-6 • 1:10 PM - 1:30 PM
Advanced calibration and processing of a time-resolved fluorescence spectroscopy system
Author(s): **Anas Gasser,** Amsterdam UMC (Netherlands), Vrije Univ. Brussel (Belgium); **Thomas Lapauw**, **Thomas Van den Dries**, **Hans Ingelberts**, **Maarten Kuijk,** Vrije Univ. Brussel (Belgium); **Maurice Aalders,** Amsterdam UMC (Netherlands)

SESSION 2: FLUORESCENCE CORRELATION TECHNIQUES

25 January 2025 • 1:30 PM - 2:40 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Mike Heilemann**, Goethe-Univ. Frankfurt am Main (Germany)

13326-8 • 1:30 PM - 2:00 PM
Expanding the horizon of fluorescence correlation spectroscopy (FCS) with SPAD arrays: a promising outlook for new applications
(Invited Paper)
Author(s): **Felix Koberling**, **Marcelle Koenig**, **Evangelos Sisamakis**, **Fabian Barachati**, **Johan Hummert,** PicoQuant GmbH (Germany); **Ivan Michel Antolovic,** Pi Imaging Technology SA (Switzerland); **Rainer Erdmann,** PicoQuant GmbH (Germany)

13326-9 • 2:00 PM - 2:20 PM
Advancing the detection threshold of fluorescence lifetime correlation spectroscopy (FLCS) to the sub-picomolar level
Author(s): **Malavika Kayyil Veedu, Jérôme Wenger,** Aix-Marseille Univ., Centrale Méditerranée, Institut Fresnel, CNRS (France)

13326-10 • 2:20 PM - 2:40 PM
Investigating adaptive optics for aberration control in STED and (STED-)FCS microscopy
Author(s): **Julius Trautmann, Christian Eggeling,** Friedrich-Schiller-Univ. Jena (Germany)

Coffee Break 2:40 PM - 3:10 PM

SESSION 3: FLIM AND FRET

25 January 2025 • 3:10 PM - 4:40 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Felix Koberling**, PicoQuant GmbH (Germany)

13326-11 • 3:10 PM - 3:40 PM
Organic multifunctional fluorescent imaging agents *(Invited Paper)*
Author(s): **Andrea M. Armani,** The Univ. of Southern California (United States), Ellison Institute, LLC (United States); **Yasaman Moradi**, **Marko Lilic, Luciana Custer,** The Univ. of Southern California (United States)

13326-13 • 3:40 PM - 4:00 PM
Enhanced contrast mechanisms for live cell structured illumination microscopy via fluorescence lifetime imaging
Author(s): **Henning Ortkrass,** Univ. Bielefeld (Germany); **Raphaël Marchand,** University of Vienna (Austria); **Wolfgang Hübner,** Bielefeld University (Germany); **Silvio Rizzoli,** Georg-August-Univ. Göttingen (Germany); **Thomas Juffmann,** University of Vienna, Faculty of Physics (Austria); **Thomas Huser,** Bielefeld University (Germany)

13326-14 • 4:00 PM - 4:20 PM
High-Speed TCSPC measurements: achieving multi-photon detection per excitation period with near-zero distortion
Author(s): **Gennaro Fratta**, **Piergiorgio Daniele**, **Ivan Labanca**, **Giulia Acconcia, Ivan Rech,** Politecnico di Milano (Italy)

13326-15 • 4:20 PM - 4:40 PM
Single-molecule studies of mCerulean3-linker-mCitrine construct for environmental ionic strength sensing using fluorescence correlation spectroscopy
Author(s): **Ahmed A. Heikal,** Univ. of Minnesota Duluth (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 4: NANO I

26 January 2025 • 8:15 AM - 10:15 AM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Mike Heilemann**, Goethe-Univ. Frankfurt am Main (Germany)

13326-4 • 8:15 AM - 8:35 AM
Quantification of nanocondensates formation at the single molecule level
Author(s): **Emma Sierecki**, **Yann Gambin , Justin Houx,** The Univ. of New South Wales (Australia)

13326-16 • 8:35 AM - 8:55 AM
Toward drift-free super-resolution imaging via displacement analysis of oblique bright-field feature
Author(s): **Hongqiang Ma, Yang Liu,** Univ. of Illinois (United States)

13326-17 • 8:55 AM - 9:15 AM
Video-rate, long-term super-resolution imaging of live samples
Author(s): **Chuan Li, Jerome Mertz,** Boston Univ. (United States)

13326-18 • 9:15 AM - 9:35 AM
DNA spectroscopic photon-localization intrinsic-contrast nanoscopy
Author(s): **Ruyi Gong**, **Geng Wang**, **Nicolas Acosta**, **Yuanzhe Su**, **Wing Shun Li**, **Luay Almassalha, Vadim Backman,** Northwestern Univ. (United States)

13326-19 • 9:35 AM - 9:55 AM
Analyzing spectral heterogeneity of individual fluorophores using DWP-enhanced single-molecule spectroscopy
Author(s): **Wei Hong Yeo**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13326-20 • 9:55 AM - 10:15 AM
Nanotexture enabling computational multiplexing of super-resolved intracellular structures with high fidelity
Author(s): **Gregor J. Gentsch,** Friedrich-Schiller-Univ. Jena (Germany); **Bela T. L. Vogler,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Pablo Carravilla,** Karolinska Institute (Sweden); **Dominic A. Helmerich**, **Teresa Klein,** Julius-Maximilians-Univ. Würzburg (Germany); **Katharina Reglinski,** Friedrich-Schiller-Univ. Jena (Germany); **Markus Sauer,** Julius-Maximilians-Univ. Würzburg (Germany); **Christian Eggeling,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Christian Franke,** Friedrich-Schiller-Univ. Jena (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 5: NANO II

26 January 2025 • 10:45 AM - 12:15 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Rainer Erdmann**, PicoQuant GmbH (Germany)

13326-21 • 10:45 AM - 11:15 AM
SPAD array detector enables large localization range for simple and robust MINFLUX *(Invited Paper)*
Author(s): **Giuseppe Vicidomini**, **Eli Slenders**, **Sanket Patil**, **Marcus Oliver Held, Alessandro Zunino,** Istituto Italiano di Tecnologia (Italy)

13326-22 • 11:15 AM - 11:35 AM
PIC-based STED microscopy using optical beam formers
Author(s): **Alireza Tabatabaei Mashayekh**, **Takin Ghavimi**, **Yuntian Ding**, **Alvaro Moscoso Martir, Jeremy Witzens,** RWTH Aachen Univ. (Germany)

13326-23 • 11:35 AM - 11:55 AM
Integrated photonic chip for structured light pattern generation in microscopy
Author(s): **Paolo Maran,** Politecnico di Milano (Italy); **Petra Paiè,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Alessia Candeo,** Politecnico di Milano (Italy); **Anna Pecorari**, **Abhiram Rajan,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Francesco Ceccarelli**, **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Andrea Bassi,** Politecnico di Milano (Italy); **Francesca Bragheri,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13326-24 • 11:55 AM - 12:15 PM
Quantifying the spatial distribution of post-translational histone modifications using 3D spectroscopic single-molecule localization microscopy
Author(s): **Benjamin Brenner**, **Daniela Matei**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

Lunch/Exhibition Break 12:15 PM - 1:35 PM

SESSION 6: BIOLOGICAL APPLICATION

26 January 2025 • 1:35 PM - 3:25 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Rainer Erdmann**, PicoQuant GmbH (Germany)

13326-25 • 1:35 PM - 2:05 PM
Simplified whole-cell 3D single-molecule super-resolution imaging using long axial-range double-helix point spread functions
(Invited Paper)
Author(s): **Yuya Nakatani,** Rice Univ. (United States); **Scott Gaumer,** Double Helix Optics (United States); **Yoav Shechtman,** Technion-Israel Institute of Technology (Israel); **Anna-Karin Gustavsson,** Rice Univ. (United States)

13326-26 • 2:05 PM - 2:25 PM
Fast and long-term super-resolution STED microscopy of nanostructural cellular dynamics using a neural network
Author(s): **Ashwin Balakrishnan**, **Johanna V. Rahm**, **Alexandra Kaminer**, **Laurell F. Kessler**, **Hans-Dieter Barth, Mike Heilemann,** Goethe-Univ. Frankfurt am Main (Germany)

13326-12 • 2:25 PM - 2:45 PM
New analysis options push the limits of FLIM imaging modalities
Author(s): **Felix Koberling**, **Evangelos Sisamakis**, **Ellen Schmeyer**, **Kamil Bobowski**, **Marcus Sackrow**, **Markus Götz**, **Matthias Patting**, **Stefan Eilers**, **Fabian Jolmes, Rainer Erdmann,** PicoQuant GmbH (Germany)

13326-27 • 2:45 PM - 3:05 PM
Computational advances in optical genome mapping
Author(s): **Yoav Shechtman,** Technion-Israel Institute of Technology (Israel)

13326-28 • 3:05 PM - 3:25 PM
Single molecule fingerprinting applied to the diagnostics of Parkinson's disease
Author(s): **Yann Gambin, Emma S. Sierecki,** The Univ. of New South Wales (Australia)

YOUNG INVESTIGATOR AWARD SESSION

26 January 2025 • 3:25 PM - 3:35 PM | Moscone South, Room 307 (Level 3)

13326-29 • 3:25 PM - 3:35 PM
Young investigator award
Author(s): **Rainer Erdmann,** PicoQuant GmbH (Germany)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13326-2 • 5:30 PM - 7:00 PM
Investigating the effect of proximity in a Gradient-SERS nano/micro-cavity device on the Raman signal intensity
Author(s): **Yaakov R. Tischler**, **Shira Zafran**, **Jacob D. Wolfman**, **Yağmur Reysi Kerse**, **Bruria Schmerling, Shai Rahimipour,** Bar-Ilan Univ. (Israel)

13326-30 • 5:30 PM - 7:00 PM
Towards high-resolution time-resolved spectroscopy using picosecond infrared/green lasers with ultra-narrow spectral linewidth
Author(s): **Vasilii Ustimchik**, **Evgeny Savelyev**, **Anatoly Makarov**, **Evgenii Motorin**, **Andrei Gurovich**, **Andrey Chumachenko,** Ampliconyx Oy (Finland); **Evgenii Gribanov,** CeramOptec SIA (Latvia); **Regina Gumenyuk,** Ampliconyx Oy (Finland), Tampere Univ. (Finland); **Andrey Grishchenko,** CeramOptec SIA (Latvia); **Valery Filippov,** Ampliconyx Oy (Finland)

13326-31 • 5:30 PM - 7:00 PM
Reconstruction of chromatin domain information by spectroscopic single molecule localization microscopy
Author(s): **Ruyi Gong**, **Rivaan Kakkaramadam**, **Wing Shun Li**, **Marcelo Carignano**, **Geng Wang**, **Yuanzhe Su**, **Nicolas Acosta**, **Luay Almassalha, Vadim Backman,** Northwestern Univ. (United States)

13326-32 • 5:30 PM - 7:00 PM
Dual-wedge prism improves spectroscopic single-molecule localization microscopy
Author(s): **Wei Hong Yeo**, **Cheng Sun, Hao F. Zhang,** Northwestern Univ. (United States)

13326-33 • 5:30 PM - 7:00 PM
A self-returning excluded volume polymer model to validate 3D spectroscopic SMLM images of histone modifications
Author(s): **Benjamin Brenner**, **Marcelo Carignano**, **Luay Almassalha**, **Cheng Sun**, **Daniela Matei**, **Vadim Backman**, **Igal Szleifer**, **Hao F. Zhang,** Northwestern Univ. (United States); **Martin Kroger,** ETH Zurich (Germany); **George Rabadi,** Northwestern Univ. (United States)

13326-34 • 5:30 PM - 7:00 PM
High-resolution event time tagger with outstanding timing precision, user selectable trigger methods, and flexible interfacing
Author(s): **Florian Weigert**, **Tino Röhlicke**, **Hans-Jürgen Rahn**, **Nicolai Adelhöfer**, **Torsten Krause**, **Torsten Langer, Michael Wahl,** PicoQuant GmbH (Germany)

13326-35 • 5:30 PM - 7:00 PM **(CANCELLED)**
Universal laser engine enables parallelization of single-molecule detection and FCS
Author(s): **Daniel Schröder,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller-Univ. Jena (Germany); **Philipp Wendelberger,** Friedrich-Schiller-Univ. Jena (Germany); **Christian Eggeling,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller-Univ. Jena (Germany)

13326-36 • 5:30 PM - 7:00 PM
Small SPAD-arrays for confocal fluoresence lifetime imaging
Author(s): **Felix Koberling**, **Max Tillmann**, **Tino Röhlicke**, **Michael Wahl,** PicoQuant GmbH (Germany); **Ivan Michel Antolovic,** Pi Imaging Technology SA (Switzerland); **Uwe Ortmann**, **Valentin Reiter-Scherer, Rainer Erdmann,** PicoQuant GmbH (Germany)

13326-37 • 5:30 PM - 7:00 PM
Adding the fluorescence lifetime dimension to single-molecule localization microscopy with the confocal microscope Luminosa
Author(s): **Felix Koberling**, **Evangelos Sisamakis**, **Maria Loidolt-Krueger,** PicoQuant GmbH (Germany); **Samrat Basak,** Georg-August-Univ. Göttingen (Germany); **Fabio Barachati,** PicoQuant GmbH (Germany); **Roman Tsukanov**, **Oleksii Nevskyi,** Georg-August-Univ. Göttingen (Germany); **Cecilia Zaza**, **Germán Chiarelli**, **Guillermo Acuna,** Univ. de Fribourg (Switzerland); **Jörg Enderlein,** Georg-August-Univ. Göttingen (Germany); **Rainer Erdmann,** PicoQuant GmbH (Germany)

13326-38 • 5:30 PM - 7:00 PM
Development of apical TIRF-illumination super-resolution microscope for cell biology research
Author(s): **Maya Chauhan**, **Jun Hyun Kim**, **Susil Baral,** Illinois State Univ. (United States); **Martin F. Engelke,** The Univ. of Tennessee Knoxville (United States); **Uttam Manna,** Illinois State Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13327

Multiscale Imaging and Spectroscopy VI

25 - 26 January 2025 | Moscone South, Room 305 (Level 3)

Conference Chair(s): **Paul J. Campagnola,** Univ. of Wisconsin-Madison (United States); **Darren M. Roblyer,** Boston Univ. (United States); **Alex J. Walsh,** Texas A&M Univ. (United States)

Program Committee: **Jonathon Quincy Brown,** Tulane Univ. (United States); **Ji-Xin Cheng,** Boston Univ. (United States); **Mini Das,** Univ. of Houston (United States); **Kevin W. Eliceiri,** Univ. of Wisconsin-Madison (United States); **Irene Georgakoudi,** Tufts Univ. (United States); **Yevgenia Kozorovitskiy,** Northwestern Univ. (United States); **Muyinatu A. Lediju Bell,** Johns Hopkins Univ. (United States); **Kristen C. Maitland,** Chan Zuckerberg Initiative (United States); **Srivalleesha Mallidi,** Tufts Univ. (United States); **Narasimhan Rajaram,** Univ. of Arkansas (United States); **Andrew M. Rollins,** Case Western Reserve Univ. (United States); **Melissa C. Skala,** Morgridge Institute for Research (United States)

Saturday 25 January 2025

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

SESSION 1: MULTISCALE SPECTROSCOPY

25 January 2025 • 8:50 AM - 10:10 AM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Melissa C. Skala**, Morgridge Institute for Research (United States)

13327-1 • 8:50 AM - 9:10 AM

Non-contact optical spectroscopy for quantitative measurements of the key metabolic and vascular parameters on small animals in vivo
Author(s): **Md Zahid Hasan**, **Pranto Soumik Saha**, **Jing Yan, Caigang Zhu,** Univ. of Kentucky (United States)

13327-2 • 9:10 AM - 9:30 AM
Comparison of Raman and FTIR spectra of amino-acids
Author(s): **Hacene Boukari**, **Maxine Robinson**, **Maria Carattini-Colon, Shehu-Alimi Elelu,** Delaware State Univ. (United States)

13327-3 • 9:30 AM - 9:50 AM
Label-free monitoring of embryonic development in living colonies by combining Raman spectroscopy and tomographic phase microscopy
Author(s): **Arianna Bresci,** Massachusetts Institute of Technology (United States), APOLLON (United States); **Salvatore Sorrentino,** Politecnico di Milano (Italy); **Koseki J. Kobayashi-Kirschvink,** Massachusetts Institute of Technology (United States); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Peter T. C. So,** Massachusetts Institute of Technology (United States); **Dario Polli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Jeon Woong Kang,** Massachusetts Institute of Technology (United States)

13327-4 • 9:50 AM - 10:10 AM
Coherent Raman imaging reveals molecular profiles of glioblastoma for therapy stratification
Author(s): **Thomas Würthwein**, **Anke Bonse**, **Felix Neumann,** Refined Laser Systems GmbH (Germany); **Eva Döpker,** Biomedizinisches Technologiezentrum, Univ. Münster (Germany); **Ramon Droop**, **Steffen Ullmann,** Refined Laser Systems GmbH (Germany); **Juergen Schnekenburger**, **Björn Kemper,** Biomedizinisches Technologiezentrum, Univ. Münster (Germany); **Tim Hellwig,** Refined Laser Systems GmbH (Germany); **Christoph Sippl**, **Stefan Linsler,** Medizincampus Oberfranken, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: LIGHT AND OPTICS I

25 January 2025 • 10:40 AM - 12:30 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Rupsa Datta**, Morgridge Institute for Research (United States)

13327-5 • 10:40 AM - 11:10 AM
Deep label-free metabolic and harmonic imaging with multimode fiber sources *(Invited Paper)*
Author(s): **Sixian You,** Massachusetts Institute of Technology (United States)

13327-6 • 11:10 AM - 11:30 AM
Modelling and predicting second harmonic generation from protein molecular structure
Author(s): **Chiara Stringari,** École Polytechnique, Institut Polytechnique de Paris, CNRS (France), Institut National de la Santé et de la Recherche Médicale (France); **Bahar Asadipour**, **Emmanuel Beaurepaire**, **Xingjian Zhang**, **Anatole Chessel**, **Pierre Mahou**, **Willy Supatto, Marie-Claire Schanne-Klein,** École Polytechnique (France)

13327-7 • 11:30 AM - 11:50 AM
Fiber-based bi-modal fluorescence detection under visible and two-photon excitation for tissue cancer discrimination
Author(s): **David Rodin**, **Cécile Rimbault**, **Hussein Mehidine**, **Mira sibai,** Lab. de Physique des 2 Infinis Irène Joliot-Curie (France); **Bertrand Devaux, Darine Abi Haidar,** Univ. Paris Cité (France)

13327-8 • 11:50 AM - 12:10 PM
Dynamic single-cell metabolic analysis via a fast custom widefield frequency-domain fluorescence lifetime microscope
Author(s): **Oscar R. Benavides**, **Erin M. Stout**, **Sophie A. Romero**, **Anna Theodossiou**, **Lakhvir Singh, Alex J. Walsh,** Texas A&M Univ. (United States)

13327-9 • 12:10 PM - 12:30 PM
Quantitative assessment of collagen remodeling during murine pregnancy with polarization-resolved second harmonic generation
Author(s): **Jessica C. Ramella-Roman,** Florida International Univ. (United States); **Clothilde Raoux,** Lab. d'Optique et Biosciences, École Polytechnique (France); **Gaël Latour,** Lab. d'Optique et Biosciences, École Polytechnique, Institut Polytechnique de Paris, CNRS (France), Institut National de la Santé et de la Recherche Médicale (France); **Mala Mahendroo,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Marie-Claire Schanne-Klein,** Lab. d'Optique et Biosciences, École Polytechnique, Institut Polytechnique de Paris, CNRS (France), Institut National de la Santé et de la Recherche Médicale (France)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 3: NEW MULTISCALE TECHNOLOGIES I

25 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Alex J. Walsh**, Texas A&M Univ. (United States)

13327-10 • 1:30 PM - 2:00 PM
Engineering low-cost and portable technologies for point-of-care diagnostics *(Invited Paper)*
Author(s): **Hatice Ceylan Koydemir,** Texas A&M Univ. (United States)

13327-11 • 2:00 PM - 2:20 PM
Diffuse reflectance spectroscopy for rapid monitoring of glucose uptake on small animals in vivo
Author(s): **Jing Yan**, **Pranto Soumik Saha**, **Madison Hart, Caigang Zhu,** Univ. of Kentucky (United States)

13327-12 • 2:20 PM - 2:40 PM
Optimal design for wide-field fluorescence imaging
Author(s): **Dogan Tarik Karabay**, **Elise Uyehara, Rajeev J. Ram,** Massachusetts Institute of Technology (United States)

13327-13 • 2:40 PM - 3:00 PM
B-Raman: an open-source, versatile platform for automated brightfield and Raman microspectroscopy
Author(s): **Alvaro Fernandez Galiana,** Univ. of Oxford (United Kingdom), Imperial College London (United Kingdom); **Simon Vilms Pedersen,** Univ. of Southern Denmark (Denmark), Imperial College London (United Kingdom); **Molly M. Stevens,** Univ. of Oxford (United Kingdom), Imperial College London (United Kingdom)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: NEW MULTISCALE TECHNOLOGIES II

25 January 2025 • 3:30 PM - 5:00 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Oscar R. Benavides**, Texas A&M Univ. (United States)

13327-14 • 3:30 PM - 4:00 PM
Multidimensional optical imaging through scattering *(Invited Paper)*
Author(s): **Shwetadwip Chowdhury,** The Univ. of Texas at Austin (United States)

13327-15 • 4:00 PM - 4:20 PM
High spatial sampling snapshot imaging spectrometer enabled by 2-photon polymerization cladded waveguide array for signaling applications
Author(s): **Haimu Cao**, **Tomasz Tkaczyk, Coby McNichols,** Rice Univ. (United States)

13327-16 • 4:20 PM - 4:40 PM
Polarization characterization and validation of laser-based vibrational circular dichroism spectroscopy using digitally referenced detection
Author(s): **Ruo-Jing Ho**, **Kevin Yeh, Rohit Bhargava,** Univ. of Illinois (United States)

13327-17 • 4:40 PM - 5:00 PM
Differential detection SPIFI for enhanced resolution absorption and fluorescence imaging in extrusion manufacturing
Author(s): **Anna Thomas**, **Daniel Scarbrough,** Colorado School of Mines (United States); **Rob Reeves,** Lawrence Livermore National Lab. (United States); **Randy Bartels,** Morgridge Institute for Research (United States); **Jeff Squier,** Colorado School of Mines (United States)

Sunday 26 January 2025

SESSION 5: LIGHT AND DATA

26 January 2025 • 9:00 AM - 10:30 AM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Kayvan Samimi**, Morgridge Institute for Research (United States)

13327-18 • 9:00 AM - 9:30 AM
To be announced *(Invited Paper)*

13327-19 • 9:30 AM - 9:50 AM
Oxygen-sensitive fluorophore-enhanced diffuse optical NIR spectroscopic imaging
Author(s): **Mannu B. Paul**, **Kaiser Niknam, Mini Das,** Univ. of Houston (United States)

13327-20 • 9:50 AM - 10:10 AM
Implementation of a broadband spatial frequency domain imaging system
Author(s): **Ran Tao**, **Isabelle Racicot**, **Janek Gröhl, Sarah E. Bohndiek,** Univ. of Cambridge (United Kingdom), Cancer Research UK Cambridge Institute (United Kingdom)

13327-21 • 10:10 AM - 10:30 AM
Fast, high-density, and depth-sensitive time-resolved laser speckle contrast imaging (TR-LSCI) of cerebral blood flow
Author(s): **Faraneh Fathi**, **Faezeh Akbari**, **Samaneh Rabienia Haratbar**, **Dara Singh**, **Mehrana Mohtasebi,** Univ. of Kentucky (United States); **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 6: MULTISCALE IMAGING FOR CANCER

26 January 2025 • 11:00 AM - 12:50 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Helen Wilson**, Univ. of Wisconsin-Madison (United States)

13327-22 • 11:00 AM - 11:30 AM
New insights for time-domain diffuse optics: instrumentation and approaches *(Invited Paper)*
Author(s): **Laura Di Sieno**, **Antonio Pifferi, Alberto Dalla Mora,** Politecnico di Milano (Italy)

13327-23 • 11:30 AM - 11:50 AM
Optical spectroscopy to characterize the functional changes of tongue tumors under radiation stresses
Author(s): **Pranto Soumik Saha**, **Jing Yan, Caigang Zhu,** Univ. of Kentucky (United States)

13327-24 • 11:50 AM - 12:10 PM
Differential contrast comparison between monochrome and pseudo-H&E fresh tissue imaging to aid diagnosis of gigascale monochromatic tumor margin surface images
Author(s): **Ivan Bozic**, **Madeline R. Behr**, **Carolina Khatib, Jonathon Q. Brown,** Tulane Univ. (United States)

13327-25 • 12:10 PM - 12:30 PM
Real-time multi-resolution digitization and computational analysis of pathology slides for closed-loop hybrid analog-digital clinical pathology review
Author(s): **Max Cooper**, **Cooper Maira**, **Kimberly Ashman**, **Shams Halat**, **Andrew Sholl**, **Carola Wenk,** Tulane Univ. (United States); **Sharon Fox,** Southeast Louisiana Veterans Health Care System (United States); **Brian Summa, Jonathon Q. Brown,** Tulane Univ. (United States)

13327-26 • 12:30 PM - 12:50 PM
Utility of photoacoustic ANnotation TOolkit for Matlab (PHANTOM) in monitoring cancer therapy and predicting response
Author(s): **Allison Sweeney**, **Andrew Langley, Srivalleesha Mallidi,** Tufts Univ. (United States)

Lunch/Exhibition Break 12:50 PM - 1:50 PM

SESSION 7: MULTISCALE IMAGING OF VASCULATURE

26 January 2025 • 1:50 PM - 3:40 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Paul J. Campagnola**, Univ. of Wisconsin-Madison (United States)

13327-27 • 1:50 PM - 2:20 PM
Quantitative imaging and measurement of tissue perfusion with laser speckle *(Invited Paper)*
Author(s): **Ashwin B. Parthasarathy,** Univ. of South Florida (United States)

13327-28 • 2:20 PM - 2:40 PM
Intraoperative optical imaging of tissue hemodynamic variations in mastectomy skin flaps for identifying ischemic/hypoxic tissues
Author(s): **Fatemeh Hamedi**, **Samaneh Rabienia Haratbar**, **Faezeh Akbari**, **Evan Lynch**, **Lei Chen**, **Lesley Wong, Guoqiang Yu,** Univ. of Kentucky (United States)

13327-29 • 2:40 PM - 3:00 PM
Noncontact optical imaging of blood flow and oxygenation distributions in reconstructive skin flaps of rats
Author(s): **Samaneh Rabienia Haratbar**, **Fatemeh Hamedi**, **Faezeh Akbari**, **Faraneh Fathi**, **Mehrana Mohtasebi**, **Dara Singh**, **Xuhui Liu,** Univ. of Kentucky (United States); **Yu Shang,** North Univ. of China (China); **Lesley Wong**, **Lei Chen, Guoqiang Yu,** Univ. of Kentucky (United States)

13327-30 • 3:00 PM - 3:20 PM
Combined structural and molecular zebrafish embryonic imaging on ethanol exposure effects during vasculature development
Author(s): **Md Mobarak Karim**, **Christian Zevallos-Delgado**, **Leah A. Lewis,** Univ. of Houston (United States); **Oscar E. Ruiz,** Baylor College of Medicine (United States); **Manmohan Singh**, **Alexxander W. Schill**, **David Mayerich**, **Arne C. Lekven, Kirill V. Larin,** Univ. of Houston (United States)

13327-31 • 3:20 PM - 3:40 PM
Multiscale 3D imaging of the embryonic heart
Author(s): **Junwoo Suh**, **Jia Fan**, **Stephanie M. Ford**, **Michiko Watanabe**, **Andrew M. Rollins, Michael W. Jenkins,** Case Western Reserve Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13327-32 • 5:30 PM - 7:00 PM
Monitoring of Alzheimer's disease progression in mice brain using photoacoustic and fluorescence dual modality imaging
Author(s): **Chenshuo Ma**, **Tianqu Zhai**, **Wei Zhang**, **Enming Su**, **Geoffrey Murphy**, **Daniel Lawrence, Xueding Wang,** Univ. of Michigan (United States)

13327-33 • 5:30 PM - 7:00 PM
Structured illumination microscopy with DMD based UV laser illumination for large-area and high-resolution imaging
Author(s): **Taerim Yoon,** Pusan National Univ. (Korea, Republic of); **Pil Un Kim,** Production Engineering Research Institute, LG Electronics Inc. (Korea, Republic of); **Heesang Ahn**, **Hokyoung Kang**, **Jin Woo Jang**, **Tae Joong Eom, Kyujung Kim,** Pusan National Univ. (Korea, Republic of)

13327-34 • 5:30 PM - 7:00 PM
Ultra-widefield multimodal microscope using a 250 megapixel sensor
Author(s): **Vrinda Jain,** Rutgers, The State Univ. of New Jersey (United States); **Ben Urban,** Colgate-Palmolive Co. (United States); **Mark C. Pierce,** Rutgers, The State Univ. of New Jersey (United States); **Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States)

13327-36 • 5:30 PM - 7:00 PM
Computational ghost imaging using microwave kinetic inductance detectors for high-resolution, wavelength-resolved bio and medical imaging
Author(s): **Jeremi Grabas**, **John M. Girkin, Kieran S. O'Brien,** Durham Univ. (United Kingdom)

CONFERENCE 13328

Adaptive Optics and Wavefront Control for Biological Systems XI

26 - 27 January 2025 | Moscone South, Room 308 (Level 3)

Conference Chair(s): **Thomas G. Bifano,** Boston Univ. (United States); **Na Ji,** Univ. of California, Berkeley (United States); **Lei Tian,** Boston Univ. (United States)

Program Committee: **Jacopo Bertolotti,** Univ. of Exeter (United Kingdom); **Martin J. Booth,** Univ. of Oxford (United Kingdom); **Wonshik Choi,** Korea Univ. (Korea, Republic of); **Tomáš Čižmár,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Meng Cui,** Purdue Univ. (United States); **Jürgen W. Czarske,** TU Dresden (Germany); **Sylvain Gigan,** Lab. Kastler Brossel (France); **John M. Girkin,** Durham Univ. (United Kingdom); **Benjamin Judkewitz,** Charité Universitätsmedizin Berlin (Germany); **Ori Katz,** The Hebrew Univ. of Jerusalem (Israel); **Peter A. Kner,** The Univ. of Georgia (United States); **Pablo Loza-Alvarez,** ICFO - Institut de Ciències Fotòniques (Spain); **Allard P. Mosk,** Utrecht Univ. (Netherlands); **Nicolas C. Pégard,** The Univ. of North Carolina at Chapel Hill (United States); **Rafael Piestun,** Univ. of Colorado Boulder (United States); **Laura Waller,** Univ. of California, Berkeley (United States); **Monika Ritsch-Marte,** Medizinische Univ. Innsbruck (Austria); **Yi Xue,** Univ. of California, Davis (United States)

Sunday 26 January 2025

SESSION 1: COHERENT OPTICAL ADAPTIVE TECHNIQUES

26 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Thomas G. Bifano**, Boston Univ. (United States)

13328-1 • 8:40 AM - 9:00 AM
Subcellular resolution gigapixel imaging across a centimeter field-of-view using adaptive optics
Author(s): **Kyungjin Park**, **Sangwon Lee**, **Sejin Jung, Jung-Hoon Park,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13328-2 • 9:00 AM - 9:20 AM
Modal adaptive optics for Bessel-focus two-photon fluorescence microscopy
Author(s): **Hyeonggeon Kim**, **Ryan Natan**, **Wei Chen**, **Jiang Lan Fan**, **Amy Winans, Na Ji,** Univ. of California, Berkeley (United States)

13328-3 • 9:20 AM - 9:40 AM
Aberration measurement and correction for ultrafast two-photon fluorescence imaging
Author(s): **Jun Zhu**, **Ryan G. Natan**, **Jian Zhong, Iksung Kang,** Univ. of California, Berkeley (United States); **Iksung Kang, Na Ji,** Univ. of California, Berkeley (United States)

13328-4 • 9:40 AM - 10:00 AM
Deep-tissue high-resolution microscopy employing NIR emission upconversion adaptive optics under continues-wave excitation
Author(s): **Jing Yao**, **Puxiang Lai, Zhipeng Yu,** The Hong Kong Polytechnic Univ. (China)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: WAVEFRONT SHAPING

26 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Thomas G. Bifano**, Boston Univ. (United States)

13328-6 • 10:30 AM - 10:50 AM
Optimization of deformable mirror actuator geometry using machine learning methods
Author(s): **Oleg Soloviev,** Flexible Optical B.V. (Netherlands)

13328-7 • 10:50 AM - 11:10 AM
Miniaturised adaptive optical microscope using compact liquid crystal corrector

Author(s): **Alec Xu**, **Camron Nourshargh**, **Patrick Salter**, **Steve Elston**, **Stephen M. Morris, Martin J. Booth,** Univ. of Oxford (United Kingdom)

13328-8 • 11:10 AM - 11:30 AM
A new SLM technology for fast achromatic and unpolarized wavefront correction
Author(s): **Julien Charton,** Bertin Alpao (France)

13328-9 • 11:30 AM - 11:50 AM
Light-efficient high-speed wavefront shaping
Author(s): **Jose Carlos do Amaral Rocha,** Univ. of Exeter (United Kingdom), The Univ. of Queensland (Australia); **Terry Wright,** The Univ. of Nottingham (United Kingdom); **Unė G. Būtaitė,** Univ. of Exeter (United Kingdom); **Joel Carpenter,** The Univ. of Queensland (Australia); **George S. D. Gordon,** The Univ. of Nottingham (United Kingdom); **David B. Phillips,** Univ. of Exeter (United Kingdom)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 3: IMAGING WITH MULTIMODE FIBERS

26 January 2025 • 1:20 PM - 2:40 PM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Na Ji**, Univ. of California, Berkeley (United States)

13328-10 • 1:20 PM - 1:40 PM
Proximal-end recovery of multimode fiber transmission matrices
Author(s): **Shreyas Bharadwaj,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Massachusetts Institute of Technology (United States); **Gyeong Hun Kim,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Lia Gomez-Perez,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Harvard-MIT Health Sciences and Technology, Massachusetts Institute of Technology (United States); **Shruti Sharma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States); **Brett E. Bouma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

13328-11 • 1:40 PM - 2:00 PM
Towards high-peak-power, deterministic, and flexible light delivery via spontaneous nonlinear localization in highly multimode fibers
Author(s): **Honghao Cao**, **Li-Yu Yu**, **Kunzan Liu, Sixian You,** Massachusetts Institute of Technology (United States)

13328-12 • 2:00 PM - 2:20 PM
Endomicroscopy through a multicore fiber using a static multispectral hologram for wavefront shaping
Author(s): **Jakob Dremel,** TU Dresden (Germany), Else Kröner Fresenius Zentrum für Digitale Gesundheit, TU Dresden (Germany), BIOLAS, TU Dresden (Germany); **Kinga Zolnacz,** TU Dresden (Germany), Wroclaw Univ. of Science and Technology (Poland); **Tom Glosemeyer,** TU Dresden (Germany); **Jürgen Czarske, Robert Kuschmierz,** TU Dresden (Germany), Else Kröner Fresenius Zentrum für Digitale Gesundheit, TU Dresden (Germany), BIOLAS, TU Dresden (Germany)

13328-13 • 2:20 PM - 2:40 PM
Coherence gated imaging through multimode fiber
Author(s): **Gyeong Hun Kim,** Massachusetts General Hospital, Harvard Medical School (United States); **Szu-Yu Lee**, **Shreyas Bharadwaj,** Massachusetts General Hospital, Harvard Medical School (United States), Massachusetts Institute of Technology (United States); **Vicente J. Parot,** Pontificia Univ. Católica de Chile (Chile); **Brett E. Bouma,** Massachusetts General Hospital, Harvard Medical School (United States), Massachusetts Institute of Technology (United States); **Martin Villiger,** Massachusetts General Hospital, Harvard Medical School (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 4: FOCUSING LIGHT THROUGH SCATTERING TISSUES

26 January 2025 • 3:10 PM - 5:10 PM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Martin J. Booth**, Univ. of Oxford (United Kingdom)

13328-14 • 3:10 PM - 3:30 PM
Wavefront corrections over large fields of view via beam cone tomography
Author(s): **Juan David Muñoz-Bolaños**, **Johanes Locher**, **Maria Borozdova**, **Kibum Nam**, **Simon Moser**, **Monika Ritsch-Marte, Alexander Jesacher,** Medizinische Univ. Innsbruck (Austria)

13328-15 • 3:30 PM - 3:50 PM
Structured light-assisted wavefront shaping for enhanced and precise sensing
Author(s): **Nazifa Rumman,** Univ. of Illinois Chicago (United States); **Tianong Wang**, **Pascal Bassène**, **Alex Mavian**, **Edwin Fohtung,** Rensselaer Polytechnic Institute (United States); **Angela Dixon,** Case Western Reserve Univ. (United States); **Thomas Searles,** Univ. of Illinois Chicago (United States); **Moussa N'Gom,** Rensselaer Polytechnic Institute (United States)

13328-16 • 3:50 PM - 4:10 PM
Iterative time reversal guided by absorption nonlinearity for optical focusing into scattering media
Author(s): **Manxiu Cui**, **S. Suleyman Kahraman, Lihong V. Wang,** Caltech (United States)

13328-17 • 4:10 PM - 4:30 PM
Model predictive control of long short-term memory forecasting disturbances for adaptive optics system
Author(s): **Chai-Wei Hsu**, **Wei-Shiuan Huang**, **Feng-Chun Hsu**, **Chun-Yu Lin, Shean-Jen Chen,** National Yang Ming Chiao Tung Univ. (Taiwan)

13328-18 • 4:30 PM - 4:50 PM
Light focusing against tissue dynamics with real-valued intensity transmission matrix
Author(s): **Xuan Liu, Tianrui Zhao,** King's College London (United Kingdom)

13328-19 • 4:50 PM - 5:10 PM
Understanding multi-conjugate wavefront-shaping corrections
Author(s): **Anat Levin, Marina Alterman,** Technion-Israel Institute of Technology (Israel)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13328-5 • 5:30 PM - 7:00 PM
Multiconjugated adaptive optics for volumetric imaging with a two-photon microscope
Author(s): **Antonio Vanzo,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Yin-Tzu Hsieh,** Graduate Institute of Electronics Engineering, National Taiwan Univ. (Taiwan); **Dong-Han Li**, **Pin-Chun Liao,** National Taiwan Univ. (Taiwan); **Jye-Chang Lee,** NTU Molecular Imaging Ctr., National Taiwan Univ. (Taiwan); **Stefano Bonora,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Shi-Wei Chu,** National Taiwan Univ. (Taiwan)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 5: COMPUTATIONAL OPTICAL IMAGING TECHNIQUES

27 January 2025 • 9:00 AM - 11:50 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Shuying Li**, Boston Univ. (United States)

13328-21 • 9:00 AM - 9:20 AM
Accurate computational aberration correction of volumetric optical coherence tomography based on bi-pupil imaging formulation and simultaneous estimation of multiple aberration orders
Author(s): **Shuichi Makita**, **Nobuhisa Tateno**, **Xibo Wang**, **Suzuyo Komeda, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13328-22 • 9:20 AM - 9:40 AM
Wavefront sensing based on aperture masking for microscopy adaptive optics
Author(s): **Yuya Matsuda**, **Noriaki Miura**, **Takatoshi Shibuya,** Kitami Institute of Technology (Japan); **Yosuke Tamada,** Utsunomiya Univ. (Japan); **Masayuki Hattori,** National Astronomical Observatory of Japan (Japan)

13328-23 • 9:40 AM - 10:00 AM
Rapid wavefront shaping using an optical gradient acquisition
Author(s): **Sagi Monin**, **Marina Alterman, Anat Levin,** Technion-Israel Institute of Technology (Israel)

Coffee Break • 10:00 AM - 10:30 AM

13328-24 • 10:30 AM - 10:50 AM **(CANCELLED)**
Towards in-vivo phase tomography using structured light
Author(s): **Aamod Shanker,** Univ. of California, Berkeley (United States); **Arka Majumdar,** Univ. of Washington (United States); **Jesse Schallek,** Univ. of Rochester (United States)

13328-25 • 10:50 AM - 11:10 AM
From associative learning to aberration compensation, how can we build a smart microscope?
Author(s): **Qi Hu**, **Yuyao Xiao**, **Biwei Zhang, Martin J. Booth,** Univ. of Oxford (United Kingdom)

13328-26 • 11:10 AM - 11:30 AM
Two photon adaptive microscopy using Walsh mode based neural network aberration estimation
Author(s): **Yuyao Xiao**, **Qi Hu, Martin Booth,** Univ. of Oxford (United Kingdom)

13328-27 • 11:30 AM - 11:50 AM
Complete characterization of multimode nonlinear-optical quantum processes
Author(s): **Geunhee Gwak**, **Chan Roh**, **Young-Do Yoon,** KAIST (Korea, Republic of); **Myungshik Kim,** Imperial College London (United Kingdom); **Young-Sik Ra,** KAIST (Korea, Republic of)

CONFERENCE 13329

Quantitative Phase Imaging XI

25 - 27 January 2025 | Moscone South, Room 311 (Level 3)

Conference Chair(s): **Yang Liu,** Univ. of Illinois Urbana-Champaign (United States); **YongKeun Park,** KAIST (Korea, Republic of)

Program Committee: **Tatiana Alieva,** Univ. Complutense de Madrid (Spain); **George Barbastathis,** Massachusetts Institute of Technology (United States); **Liangcai Cao,** Tsinghua Univ. (China); **Shwetadwip Chowdhury,** The Univ. of Texas at Austin (United States); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Björn Kemper,** Universitätsklinikum Münster (Germany); **Jerome Mertz,** Boston Univ. (United States); **Aydogan Ozcan,** Univ. of California, Los Angeles (United States); **Demetri Psaltis,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Monika Ritsch-Marte,** Medizinische Univ. Innsbruck (Austria); **Francisco E. Robles,** Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Institute of Technology (United States); **Balpreet Singh Ahluwalia,** UiT The Arctic Univ. of Norway (Norway); **Peter T. C. So,** Massachusetts Institute of Technology (United States); **Laura Waller,** Univ. of California, Berkeley (United States); **Renjie Zhou,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Thomas A. Zangle,** The Univ. of Utah (United States)

Saturday 25 January 2025

WELCOME REMARKS

25 January 2025 • 8:20 AM - 8:25 AM | Moscone South, Room 311 (Level 3)

13329-1 • 8:20 AM - 8:25 AM
Welcome remarks
Author(s): **YongKeun Park,** KAIST (Korea, Republic of)

SESSION 1: METHOD I

25 January 2025 • 8:25 AM - 12:25 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Francisco E. Robles**, Wallace H. Coulter Dept. of Biomedical Engineering at Georgia Institute of Technology (United States)

13329-2 • 8:25 AM - 8:55 AM
Extremely high-throughput live-cell imaging with the multi-camera-array microscope *(Invited Paper)*
Author(s): **Roarke W. Horstmeyer,** Duke Univ. (United States); **Mark Harfouche,** Ramona Optics, Inc. (United States); **Kanghyun Kim**, **Xi Yang**, **Amey Chaware,** Duke Univ. (United States); **Aurélien Bègue, Jed Doman,** Ramona Optics, Inc. (United States)

13329-3 • 8:55 AM - 9:15 AM
Holographic incoherent-light-source quantitative phase imaging: an alternative to holographic tomography
Author(s): **Radim Chmelík**, **Ivana Michalkova**, **Zbynek Dostal**, **Miroslav Duris, Michala Slaba,** Brno Univ. of Technology (Czech Republic)

13329-5 • 9:15 AM - 9:45 AM
Large field-of-view lensless digtal holographic microscopy for cell and tissue imaging *(Invited Paper)*
Author(s): **Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13329-6 • 9:45 AM - 10:15 AM
Nano-object metrology via quantitative phase imaging in super-resolution mode *(Invited Paper)*
Author(s): **Pierre Bon**, **Duc-Minh Ta,** CNRS (France); **Alberto Aguilar,** Agence pour la Valorisation de la Recherche Univ. du Limousin, CNRS (France); **Minh-Chau Nguyen,** CNRS (France)

13329-4 • 10:15 AM - 10:35 AM
Exploiting spatiotemporal priors for motion-resolved computational microscopy
Author(s): **Yunhui Gao, Liangcai Cao,** Tsinghua Univ. (China)

Coffee Break • 10:35 AM - 11:05 AM

13329-7 • 11:05 AM - 11:35 AM
Multi-spectral reflection matrix for ultra-fast 3D label-free microscopy *(Invited Paper)*
Author(s): **Paul Balondrade**, **Victor Barolle**, **Nicolas Guigui**, **Claude Boccara**, **Mathias Fink, Alexandre Aubry,** Institut Langevin (France)

13329-8 • 11:35 AM - 11:55 AM
Enhanced imaging of thick tissues via digital aberration correction using aberration matrix and tilt-tilt correlation in optical memory effect
Author(s): **Chulmin Oh**, **Herve J. Hugonnet**, **Moosung Lee, YongKeun Park,** KAIST (Korea, Republic of)

13329-10 • 11:55 AM - 12:25 PM
3D computational imaging of density and orientation across organelle, cellular, and tissue scales *(Invited Paper)*
Author(s): **Shalin B. Mehta, Talon Chandler,** Chan Zuckerberg Biohub (United States)

Lunch/Exhibition Break 12:25 PM - 2:00 PM

SESSION 2: METHOD II

25 January 2025 • 2:00 PM - 5:30 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Liangcai Cao**, Tsinghua Univ. (China); **Shwetadwip Chowdhury**, The Univ. of Texas at Austin (United States)

13329-11 • 2:00 PM - 2:30 PM
Backscattered phase contrast microscopy for non-invasive blood analysis *(Invited Paper)*
Author(s): **Nicholas J. Durr,** Johns Hopkins Univ. (United States)

13329-12 • 2:30 PM - 2:50 PM
Phase-gradient imaging with coherent oblique back-illumination
Author(s): **Lia Gomez-Perez,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Harvard-MIT Health Sciences and Technology, Massachusetts Institute of Technology (United States); **Shruti Sharma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States); **Gyeonghun Kim,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Shreyas Bharadwaj,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Massachusetts Institute of Technology (United States); **Brett Bouma,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States), Institute for Medical Engineering & Science, Massachusetts Institute of Technology (United States); **Martin Villiger,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States)

13329-13 • 2:50 PM - 3:10 PM
Single-shot quantitative phase imaging based on all-dielectric metasurfaces
Author(s): **Qianyi Wu,** Univ. of California, San Diego (United States); **Junxiao Zhou,** Univ. of California, San Diego (United States), City Univ. of Hong Kong (China); **Xinyu Chen**, **Junxiang Zhao**, **Ming Lei**, **Guanghao Chen**, **Yu-Hwa Lo, Zhaowei Liu,** Univ. of California, San Diego (United States)

13329-14 • 3:10 PM - 3:40 PM
Beyond phase signals: digital holographic microscopy and AI revealing disease-specific cell phenotypes *(Invited Paper)*
Author(s): **Pierre Marquet,** Univ. Laval (Canada), Ctr. Hospitalier Univ. Vaudois, Univ. de Lausanne (Switzerland)

Coffee Break • 3:40 PM - 4:00 PM

13329-15 • 4:00 PM - 4:30 PM
Quantitative nonlinear phase microscopy through computational adaptive optics *(Invited Paper)*
Author(s): **Randy A. Bartels,** Morgridge Institute for Research (United States)

13329-16 • 4:30 PM - 4:50 PM
Three-dimensional imaging of absorptive microscopic objects using partially coherent illumination
Author(s): **Yoonjae Chung**, **Herve J. Hugonnet,** KAIST (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of), Tomocube, Inc. (Korea, Republic of)

13329-17 • 4:50 PM - 5:10 PM
Advanced wavefront microscopy using color, polarized and high-definition sensors. Applications in biology and nanophotonics
Author(s): **Guillaume Baffou,** Institut Fresnel (France)

13329-18 • 5:10 PM - 5:30 PM
Snapshot sickle cell biophysical parameter recovery and analysis using Interferometric phase and amplitude microscopy (iPAM)
Author(s): **Alex C. Matlock**, **Yuhao Qiang**, **Ming Dao,** Massachusetts Institute of Technology (United States); **John Higgins,** Massachusetts General Hospital (United States), Harvard Medical School (United States); **Zahid Yaqoob,** Massachusetts Institute of Technology (United States), Boston Univ. (United States); **Peter T. C. So,** Massachusetts Institute of Technology (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 3: ALGORITHM/AI I

26 January 2025 • 8:00 AM - 10:20 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **George Barbastathis**, Massachusetts Institute of Technology (United States)

13329-41 • 8:00 AM - 8:30 AM
Dynamic optical coherence tomography of mammary epithelial cell spheroids *(Invited Paper)*
Author(s): **Amy Lynn Oldenburg,** The Univ. of North Carolina at Chapel Hill (United States)

13329-19 • 8:30 AM - 9:00 AM
Optical diffraction tomography using machine learning *(Invited Paper)*
Author(s): **Demetri Psaltis,** EPFL (Switzerland)

13329-20 • 9:00 AM - 9:20 AM
High resolution in-vivo reflection imaging using a self-calibrated optical setup
Author(s): **Herve J. Hugonnet**, **Jieun Choi**, **Pilhan Kim, YongKeun Park,** KAIST (Korea, Republic of)

13329-21 • 9:20 AM - 9:40 AM
Wavelength-multiplexed multiplane quantitative phase imaging using a diffractive optical processor
Author(s): **Che-Yung Shen**, **Jingxi Li**, **Tianyi Gan**, **Yuhang Li**, **Langxing Bai**, **Mona Jarrahi, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13329-22 • 9:40 AM - 10:00 AM
Single-shot quantitative phase gradient microscopy using physics-based untrained neural network phase retrieval
Author(s): **Sun Woong Hur**, **Sourya Sengupta**, **MinSung Kwon**, **Revathi Manoharaan**, **Mark Anastasio, Rohit Bhargava,** Univ. of Illinois (United States)

13329-23 • 10:00 AM - 10:20 AM
Computationally enhanced quantitative phase imaging for label-free organoids and in vivo mouse brains
Author(s): **Xi Chen,** Cornell Univ. (United States); **Mikhail Kandel,** Groq (United States); **Shitong Zhao**, **Rick Zirkel,** Cornell Univ. (United States); **Kaiyu Huang,** Univ. of Illinois (United States); **Chris Schaffer,** Cornell Univ. (United States); **Hyun Joon Kong,** Univ. of Illinois (United States); **Chris Xu,** Cornell Univ. (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 4: APPLICATION I

26 January 2025 • 10:50 AM - 12:20 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **YongKeun P. Park**, KAIST (Korea, Republic of)

13329-24 • 10:50 AM - 11:20 AM
AI-driven spatial multimodal 3D and 4D molecular tumor modeling: innovations and applications *(Invited Paper)*
Author(s): **Tae Hyun Hwang,** Mayo Clinic (United States)

13329-25 • 11:20 AM - 11:40 AM
Three-dimensional quantitative phase imaging for the evaluation of glioblastoma multiforme treatment efficacy
Author(s): **Caroline E. Serafini,** Georgia Institute of Technology (United States); **Amin Davarzani,** The Univ. of Georgia (United States); **Dan Cappabianca,** Univ. of Wisconsin-Madison (United States); **Daniela Baez Collazos**, **Zhenmin Li,** Georgia Institute of Technology (United States); **Deniz Mamaghani,** The Univ. of Georgia (United States); **Anna Tommasi**, **Lauren Sarko**, **Nina La Vonne Denne,** Univ. of Wisconsin-Madison (United States); **Leidong Mao,** The Univ. of Georgia (United States); **Krishanu Saha,** Univ. of Wisconsin-Madison (United States); **Lohitash Karumbaiah,** The Univ. of Georgia (United States); **Francisco E. Robles,** Georgia Institute of Technology (United States)

13329-26 • 11:40 AM - 12:00 PM
Non-invasive and unbiased AI-based 3D-holotomography analysis for pluripotency prediction of human induced pluripotent stem cells
Author(s): **Hoewon Park**, **Geon Kim**, **Jeonwon Shin**, **Seohyun Kim**, **Eui-been Hwang**, **Minji Kim**, **Taewoong Hwang,** KAIST (Korea, Republic of); **Kyungtae Yoon**, **Nam-shik Kim,** Chungnam National Univ. (Korea, Republic of); **YongKeun Park, Ki-Jun Yoon,** KAIST (Korea, Republic of)

13329-27 • 12:00 PM - 12:20 PM
Refractive index holotomography for quantifying nuclear features in clear cell renal cell carcinoma WHO/ISUP grading
Author(s): **Kyuree Kim,** Department of Premedicine, Eulji University School of Medicine (Korea, Republic of); **Su-Jin Shin,** Yonsei Univ. College of Medicine (Korea, Republic of); **Geon Kim**, **Juyeon Park,** KAIST (Korea, Republic of); **Ji Eun Heo**, **Kwang Suk Lee,** Yonsei Univ. College of Medicine (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of), Tomocube, Inc. (Korea, Republic of)

Lunch/Exhibition Break 12:20 PM - 1:30 PM

SESSION 5: APPLICATION II

26 January 2025 • 1:30 PM - 5:20 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Demetri Psaltis**, EPFL (Switzerland); **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13329-28 • 1:30 PM - 2:00 PM
Intelligent holographic imaging flow cytometry for advanced single-cell analysis *(Invited Paper)*
Author(s): **Pasquale Memmolo**, **Daniele Pirone**, **Giusy Giugliano**, **Francesca Borrelli**, **Marika Valentino**, **Michela Schiavo**, **Vittorio Bianco**, **Lisa Miccio, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13329-29 • 2:00 PM - 2:20 PM
Tracking ciliary development in three-dimensional airway organoids with reversed bipolarity with epi-mode 3D quantitative phase imaging
Author(s): **Srinidhi Bharadwaj**, **Amitej Venapally**, **Brie Heinsz**, **Paloma Casteleiro Costa**, **Caroline E. Filan**, **Shuichi Takayama, Francisco E. Robles,** Georgia Institute of Technology (United States)

13329-30 • 2:20 PM - 2:40 PM
Visualizing three-dimensional intracellular water content using holotomography
Author(s): **Sean O'Connor**, **Anna Sedelnikova,** SAIC (United States); **Zachary A. Steelman,** Air Force Research Lab. (United States)

13329-32 • 2:40 PM - 3:10 PM
Quantitative Doppler spectroscopy of intracellular motions in living tissue *(Invited Paper)*
Author(s): **David D. Nolte,** Purdue Univ. (United States)

13329-33 • 3:10 PM - 3:30 PM
Evaluation of drug responses in acral melanoma cell lines using quantitative phase imaging
Author(s): **Shukran Alizada**, **Thomas A. Zangle**, **Tarek E. Moustafa**, **Eric A. Smith, Robert L. Judson-Torres,** The Univ. of Utah (United States)

Coffee Break • 3:30 PM - 4:00 PM

13329-34 • 4:00 PM - 4:20 PM
Ferroptosis effects on sickle cell disease using high-throughput holographic cytometry
Author(s): **Robert E. Highland**, **Cindy X. Chen,** Duke Univ. (United States); **David A. Miller,** Duke Univ. (United States); **Chao-Chieh Lin**, **Jen-Tsan A. Chi, Adam Wax,** Duke Univ. (United States)

13329-35 • 4:20 PM - 4:40 PM
High resolution 3D imaging of biofluids using lens-free optical diffraction tomography
Author(s): **Teja Maruvada**, **Taylor L. Bobrow**, **Stuart C. Ray, Nicholas J. Durr,** Johns Hopkins Univ. (United States)

13329-36 • 4:40 PM - 5:00 PM
Analysis of single cell nanoparticle uptake utilizing tomographic phase imaging and fluorescence microscopy
Author(s): **Esther Teitge**, **Anne Marzi**, **Álvaro Barroso**, **Björn Kemper, Jürgen Schnekenburger,** Univ. Münster (Germany)

13329-31 • 5:00 PM - 5:20 PM
Extracting morphological properties and graph fingerprints from rat cultured neurons using automated segmentation methods and digital holographic microscopy
Author(s): **Zahra Yazdani-Najafabadi**, **Erik Bélanger**, **Maxime Moreaud**, **Mohamed Haouat,** Ctr. de Recherche CERVO (Canada); **Antoine Allard,** Univ. Laval (Canada); **Pierre Marquet, Patrick Desrosiers,** Ctr. de Recherche CERVO (Canada)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 6: ALGORITHM/AI II

27 January 2025 • 8:10 AM - 9:30 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Björn Kemper**, Univ. Münster (Germany)

13329-37 • 8:10 AM - 8:30 AM
A novel phase retrieval method for continuously acquired grating-based dark-field computed tomography using Tikhonov regularization
Author(s): **Jakob Haeusele**, **Clemens Schmid**, **Josepha Hilmer**, **Florian Schaff**, **Tobias Lasser,** Technische Univ. München (Germany); **Thomas Koehler,** Philips GmbH Innovative Technologies (Germany); **Franz Pfeiffer,** Technische Univ. München (Germany)

13329-38 • 8:30 AM - 8:50 AM
Quantitative phase imaging and robust virtual staining enable long-term studies of developing organs in zebrafish
Author(s): **Eduardo Hirata Miyasaki**, **Ziwen Liu**, **Tiger Lao**, **Akilandeswari Balasubramanian**, **Talon Chandler**, **Ivan E. Ivanov**, **Teun Huijben**, **Jordao Bragantini**, **Loic Royer**, **Adrian Jacobo, Shalin B. Mehta,** Chan Zuckerberg Biohub (United States)

13329-39 • 8:50 AM - 9:10 AM
Advances in lensless imaging based on machine learning using ray tracing
Author(s): **Samira Arabpou, Simon Thibault,** Univ. Laval (Canada)

13329-40 • 9:10 AM - 9:30 AM
Learning model QPI classification of cell-type in stop-and-go microfluidic chip: Comparing phase and amplitude imaging for lab-on-chip applications
Author(s): **Jose A. Vasquez Porto-Viso**, **Carlo Gigli**, **Amirhossein Saba**, **Camille L. Lambert**, **Tim Ferrari**, **Jorn Pezoldt**, **Nadia Grenningloh**, **Demetri Psaltis**, **Johannes Bues, Bart Deplancke,** EPFL (Switzerland)

Coffee Break 9:30 AM - 10:30 AM

SESSION 8: APPLICATION III

27 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **YongKeun P. Park**, KAIST (Korea, Republic of)

13329-42 • 10:30 AM - 10:50 AM
Label-free characterization of live migrasome using quantitative phase imaging
Author(s): **Xinyi Li**, **Nansen Zhou, Renjie Zhou,** The Chinese Univ. of Hong Kong (China)

13329-43 • 10:50 AM - 11:10 AM
Direct quantitative phase retrieval in full-field transmission optical coherence tomography
Author(s): **Martyna Mazur**, **Wojciech Krauze**, **Arkadiusz Kuś**, **Aleksandra Piekarska, Małgorzata Kujawińska,** Warsaw Univ. of Technology (Poland)

13329-44 • 11:10 AM - 11:30 AM
Comparing field versus intensity-only reconstruction of 3D refractive index via multi-slice beam propagation
Author(s): **Jeongsoo Kim, Shwetadwip Chowdhury,** The Univ. of Texas at Austin (United States)

GABRIEL POPESCU AWARD CEREMONY

27 January 2025 • 11:30 AM - 12:00 PM | Moscone South, Room 311 (Level 3)
This best paper award is given in memory of founding conference chair, Gabriel Popescu.

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13329-45 • 5:30 PM - 7:00 PM
Super-resolved digital in-line holography by a dielectric microsphere
Author(s): **Vahid Abbasian,** Washington Univ. in St. Louis (United States); **Vahideh Farzam Rad,** The Abdus Salam International Ctr. for Theoretical Physics (Italy), Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); **Humberto Cabrera,** The Abdus Salam International Ctr. for Theoretical Physics (Italy); **Arash Darafsheh,** Washington Univ. in St. Louis (United States)

13329-46 • 5:30 PM - 7:00 PM
Fourier space aberration correction method for low-coherence holotomography
Author(s): **Yoonjae Chung**, **Herve J. Hugonnet,** KAIST (Korea, Republic of); **Seung-Mo Hong,** Asan Medical Ctr. (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of), Tomocube Inc. (Korea, Republic of)

13329-47 • 5:30 PM - 7:00 PM
Integrated quantitative phase microscopy for comprehensive cell analysis
Author(s): **Ana Elizabeth Espinosa-Momox**, **Brandon Norton,** The Univ. of North Carolina at Charlotte (United States); **Maria Cywińska,** Warsaw University of Technology (Poland); **Rosario Porras-Aguilar,** The Univ. of North Carolina at Charlotte (United States)

13329-48 • 5:30 PM - 7:00 PM
Fourier imaging with a single pixel correlation
Author(s): **Tanushree Karmakar, Rakesh Kumar Singh,** Indian Institute of Technology (BHU), Varanasi (India)

13329-49 • 5:30 PM - 7:00 PM
Tunable structured illumination pattern generated by an interferometer improves the resolution limit in digital holographic microscopy
Author(s): **Sofia Obando-Vasquez,** Univ. of Massachusetts Dartmouth (United States); **Raul Castaneda**, **René Restrepo**, **Carlos Trujillo,** Univ. EAFIT (Colombia); **Ana Doblas,** Univ. of Massachusetts Dartmouth (United States)

13329-50 • 5:30 PM - 7:00 PM
Accelerated high-resolution 3D refractive index reconstruction using Holographic incoherent-light-source QPI and deep learning
Author(s): **Ivana Michalkova**, **Radim Chmelik, Miroslav Duris,** CEITEC Brno Univ. of Technology (Czech Republic)

13329-53 • 5:30 PM - 7:00 PM
Refractive index correlated pseudocoloring: enhanced visualization of thyroid cytology
Author(s): **Minseok Lee,** KAIST (Korea, Republic of); **Young Ki Lee,** National Cancer Ctr. (Korea, Republic of); **Geon Kim,** KAIST (Korea, Republic of); **Seog Yun Park**, **Hayoung Lee**, **Eun Kyung Lee,** National Cancer Ctr. (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of)

13329-54 • 5:30 PM - 7:00 PM
Incoherent dielectric tensor tomography
Author(s): **Juheon Lee**, **Herve Hugonnet, YongKeun Park,** KAIST (Korea, Republic of)

13329-55 • 5:30 PM - 7:00 PM
Deformable mirror characterisation using novel phase tilted interferometry (PTI) method
Author(s): **Oleg Soloviev,** Flexible Optical B.V. (Netherlands)

13329-56 • 5:30 PM - 7:00 PM
Solve trade-off between field of view and optical resolution in quantitative phase imaging assisted by deep-learning
Author(s): **Corentin Soubeiran,** Ctr. de Recherche CERVO (Canada), IFP Energies Nouvelles (France), Univ. Laval (Canada); **Maxime Moreaud,** IFP Energies Nouvelles (France); **Céline Larivière Loiselle,** Ctr. de Recherche CERVO (Canada), Univ. Laval (Canada); **Mohamed Haouat**, **Johan Chaniot,** Ctr. de Recherche CERVO (Canada); **Erik Belanger, Pierre Marquet,** Ctr. de Recherche CERVO (Canada), Univ. Laval (Canada)

13329-57 • 5:30 PM - 7:00 PM
Virtual staining for Papanicolaou stain in cytology using holotomography and deep learning
Author(s): **Tal Lifshitz**, **Geon Kim,** KAIST (Korea, Republic of); **Su-Jin Shin**, **Kwang Suk Lee,** Yonsei Univ. College of Medicine (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of), Tomocube, Inc. (Korea, Republic of)

13329-58 • 5:30 PM - 7:00 PM
Visualizing 3D strain tensor of micro-indented glass samples using dielectric tensor tomography
Author(s): **Juheon Lee**, **Herve J. Hugonnet, YongKeun Park,** KAIST (Korea, Republic of)

13329-59 • 5:30 PM - 7:00 PM
Assessing automation in fiber splicing localization with digital lensless holography and quantitative phase imaging
Author(s): **Georgy S. Kalenkov,** Univ. of Technology Sydney (Australia); **Bryden Quirk, Robert McLaughlin,** The Univ. of Adelaide (Australia)

13329-60 • 5:30 PM - 7:00 PM
Quantitative assessment of chondrocyte response to inflammatory cytokines using quantitative phase microscopy
Author(s): **Yujie Nie,** Shenzhen BJR Biomedical Technology Co. (China); **Rui Sun,** Shenzhen BJR Biomedical Technology Co. Ltd. (China); **Renjie Zhou**, **Zhong Alan Li,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Zhengqi Zhang**, **Yihang Zhou,** Shenzhen BJR Biomedical Technology Co. Ltd. (China); **Runxuan Cai,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13329-61 • 5:30 PM - 7:00 PM
Rytov approximation for vector waves by modifying scattering matrix
Author(s): **Chulmin Oh**, **Herve J. Hugonnet**, **Juheon Lee, YongKeun Park,** KAIST (Korea, Republic of)

13329-62 • 5:30 PM - 7:00 PM
Label-free 3D imaging of stem cell colonies at subcellular specifity through artificial intelligence-assisted holotomography
Author(s): **Juyeon Park**, **Geon Kim,** KAIST (Korea, Republic of); **Yujeong Oh,** Pohang Univ. of Science and Technology (Korea, Republic of); **Hoewon Park,** KAIST (Korea, Republic of); **Sumin Lee,** Tomocube, Inc. (Korea, Republic of); **Ki-Jun Yoon,** KAIST (Korea, Republic of); **Jiwon Jang,** Pohang Univ. of Science and Technology (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of)

13329-63 • 5:30 PM - 7:00 PM
Novel characterization of borosilicate transparent wafers by using wave front phase imaging
Author(s): **Miguel Jimenez Gomis**, **Juan Manuel Trujillo-Sevilla**, **Sebastien Pauliac-Vaujour**, **Guillermo Castro-Luis**, **Kiril Ivanov-Kurtev, Jose Manuel Rodriguez-Ramos,** Wooptix, S.L. (Spain)

13329-64 • 5:30 PM - 7:00 PM
Cell phantoms for benchmarking quantitative phase instruments
Author(s): **Michal Ziemczonok,** Warsaw Univ. of Technology (Poland); **Sylvia Desissaire**, **Tigrane Cantat-Moltrecht,** CEA Leti (France); **Małgorzata Kujawińska,** Warsaw Univ. of Technology (Poland)

13329-65 • 5:30 PM - 7:00 PM
Using PSTD method and optical phase conjugation to find the optimal angular span for refocusing effect in scattering media
Author(s): **Pei-Jie Chen, Snow H. Tseng,** National Taiwan Univ. (Taiwan)

13329-66 • 5:30 PM - 7:00 PM
Resolution enhancement of quantitative phase microscopy with vortex beam illumination
Author(s): **Chaodu Shi**, **Nansen Zhou, Renjie Zhou,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13329-67 • 5:30 PM - 7:00 PM
Time-lapsed analysis of organoid infection via epi-mode quantitative phase imaging
Author(s): **Neil Momsen**, **Chad Weiler**, **Erika Rashka**, **Julia Patrone, Andrea Timm,** Johns Hopkins Univ. Applied Physics Lab., LLC (United States)

13329-68 • 5:30 PM - 7:00 PM
Understanding myelofibrosis and osteosclerosis by label-free quantitative phase and retardance imaging
Author(s): **Benoît Wattellier**, **Cassandra Borgane,** PHASICS S.A. (France); **Julien Savatier,** Aix-Marseille Univ. (France), Centrale Méditerranée (France), Institut Fresnel, CNRS (France); **Cyril Fauriat,** Ctr. de Recherche en Cancérologie de Marseille, Institut National de la Santé et de la Recherche Médicale, Aix-Marseille Univ., CNRS (France); **Serge Monneret,** Aix-Marseille Univ. (France), Centrale Méditerranée (France), Institut Fresnel, CNRS (France); **Michel Aurrand-Lions,** Ctr. de Recherche en Cancérologie de Marseille, Institut National de la Santé et de la Recherche Médicale, Aix-Marseille Univ., CNRS (France)

13329-69 • 5:30 PM - 7:00 PM
Prospects and challenges of multiwell plates in automated high-throughput quantitative phase imaging with digital holographic microscopy
Author(s): **Anne Marzi**, **Kai M. Eder**, **Álvaro Barroso**, **Sabrina Wiegmann**, **Eva Döpker**, **Jürgen Schnekenburger, Björn Kemper,** Univ. Münster (Germany)

13329-70 • 5:30 PM - 7:00 PM
Numerical correction of phase aberration errors from axial chromatic aberration in telecentric off-axis polychromatic digital holographic microscopy for visualizing fine structure and dynamics of living cells
Author(s): **Erik Bélanger**, **Mohamed Haouat**, **Céline Larivière-Loiselle**, **Corentin Soubeiran, Pierre Marquet,** Ctr. de Recherche CERVO (Canada)

13329-73 • 5:30 PM - 7:00 PM
Quantitative phase imaging with a thin diffuser: principle and application to the label-free identification of human retinal cells
Author(s): **Anis Aggoun,** Institut de la Vision, Sorbonne Univ. (France); **Benoit Rogez,** Institut de la Vision, Sorbonne Univ. (France), Univ. de Technologie Troyes (France); **Jeremy Brogard**, **Clémence Gentner,** Institut de la Vision, Sorbonne Univ. (France); **Baptiste Blochet,** Saints-Pères Paris Institute for the Neurosciences (France); **Sacha Reichman**, **Gilles Tessier,** Institut de la Vision, Sorbonne Univ. (France); **Marc Guillon,** Saints-Pères Paris Institute for the Neurosciences (France), Univ. Paris Cité (France); **Pascal Berto,** Institut de la Vision, Sorbonne Univ. (France), Univ. Paris Cité (France)

13329-74 • 5:30 PM - 7:00 PM
High-resolution 3D phase imaging using diffused illumination
Author(s): **Hongqiang Ma, Yang Liu,** Univ. of Illinois (United States)

13329-75 • 5:30 PM - 7:00 PM
A study on the depth of field in optical diffraction tomography
Author(s): **Jeroen Kalkman, Gijs Hooghiemstra,** Technische Univ. Delft (Netherlands)

13329-76 • 5:30 PM - 7:00 PM
Three-dimensional phase and birefringence imaging by polarization differential interference contrast microscopy
Author(s): **Mariia Aleksandrovych,** The City Univ. of New York (United States); **Min Xu,** Hunter College (United States)

13329-77 • 5:30 PM - 7:00 PM
Real-time holographic telepresence: a fully holographic approach to 3D streaming
Author(s): **Chulmin Oh**, **Chansuk Park**, **Hervé J. Hugonnet**, **KyeoReh Lee, YongKeun Park,** KAIST (Korea, Republic of)

13329-78 • 5:30 PM - 7:00 PM
Temperature microscopy using quantitative phase imaging: applications in physics, chemistry and biology at small scales
Author(s): **Guillaume Baffou,** Institut Fresnel (France)

13329-80 • 5:30 PM - 7:00 PM
Real-time ultra-high-speed digital holography at 33,000 FPS for quantitative retinal angiography and optical coherence tomography
Author(s): **Michael Atlan**, **Yann Fischer**, **Zacharie Auray**, **Olivier Martinache**, **Marius Dubosc, Maxime Boy-Arnould,** Institut Langevin (France)

13329-81 • 5:30 PM - 7:00 PM
Quantitative phase estimation in 2D optical diffraction imaging using iterative blind deconvolution
Author(s): **Asim Asrar, Pranab Kumar Dutta,** Indian Institute of Technology Kharagpur (India)

13329-82 • 5:30 PM - 7:00 PM
Phase imaging through a single multimode fiber
Author(s): **Xu Liu**, **Qing Yang, zhong wen,** Zhejiang Univ. (China)

13329-83 • 5:30 PM - 7:00 PM
Automated 3D subcellular segmentation and tracking in live early embryos using deep learning and holotomography
Author(s): **Chungha Lee**, **Geon Kim**, **Biruk Kassa,** KAIST (Korea, Republic of); **Taeseop Shin**, **Sangho Lee,** Fertility Ctr., CHA Bundang Medical Ctr. (Korea, Republic of); **Jieun Do,** KAIST (Korea, Republic of); **Kyoung Hee Choi**, **Jae Young Kim,** Fertility Ctr., CHA Bundang Medical Ctr. (Korea, Republic of); **Jaephil Do,** Tomocube, Inc. (Korea, Republic of); **Ji Hyang Kim,** Fertility Ctr., CHA Bundang Medical Ctr. (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of)

13329-84 • 5:30 PM - 7:00 PM
Quantitative phase imaging with the epi-illumination multicamera array microscope
Author(s): **Xiangjiang Bao,** Duke Univ. (United States); **Mark Harfouche,** Ramona Optics, Inc. (United States); **Lucas A. Kreiss**, **Clare Cook,** Duke Univ. (United States); **Roarke W. Horstmeyer,** Duke Univ. (United States), Ramona Optics, Inc. (United States)

13329-85 • 5:30 PM - 7:00 PM
Nanoscale motion tracing and correlation analysis between cell parameters in human spermatozoa
Author(s): **Sunil Bhatt,** Indian Institute of Technology Delhi (India); **Ankit Butola,** UiT The Arctic Univ. of Norway (Norway); **Anuj Saxena,** Indian Institute of Technology Delhi (India); **Krishna Agarwal,** UiT The Arctic Univ. of Norway (Norway); **Dalip Singh Mehta,** Indian Institute of Technology Delhi (India)

13329-86 • 5:30 PM - 7:00 PM
Holographic and spectral imaging for the 3D determination of chemical and structural composition of batteries
Author(s): **Herve J. Hugonnet**, **KyeoReh Lee,** KAIST (Korea, Republic of); **Jun Lim,** Pohang Accelerator Lab., Pohang Univ. of Science and Technology (Korea, Republic of); **Jo Sugeun,** Pohang Accelerator Lab. (Korea, Republic of); **YongKeun Park,** KAIST (Korea, Republic of)

13329-87 • 5:30 PM - 7:00 PM
Automated diagnosis of diffuse large B-cell lymphoma using deep learning
Author(s): **Vishal S. Srivastava**, **Sautami Basu**, **Hari Shankar S. Singh, Vishal Gupta,** Thapar Institute of Engineering and Technology (India)

13329-88 • 5:30 PM - 7:00 PM
Single-shot Xray holographic imaging using a speckle illumination
Author(s): **Hervé J. Hugonnet**, **KyeoReh Lee,** KAIST (Korea, Republic of); **Jae-Hong Lim,** Pohang Accelerator Lab., Pohang Univ. of Science and Technology (Korea, Republic of)

13329-89 • 5:30 PM - 7:00 PM
Advanced single-shot moiré approach for high-resolution measurement
Author(s): **Andrea Cervantes**, **Gonzalo Páez**, **Manuel Servin, Moises Padilla,** Centro de Investigaciones en Óptica, A.C. (Mexico)

13329-90 • 5:30 PM - 7:00 PM
High-resolution blind-phase retrieval technique for color interferometry
Author(s): **Joselin Maldonado**, **Gonzalo Páez**, **Manuel Servin, Moises Padilla,** Centro de Investigaciones en Óptica, A.C. (Mexico)

CONFERENCE CO-SPONSORS

CONFERENCE 13330

High-Throughput Biophotonics: Imaging, Spectroscopy, and Beyond X

25 - 26 January 2025 | Moscone South, Room 312 (Level 3)

Conference Chair(s): **Kevin K. Tsia,** The Univ. of Hong Kong (Hong Kong, China); **Keisuke Goda,** The Univ. of Tokyo (Japan)

Program Committee: **Steven G. Adie,** Cornell Univ. (United States); **Shi-Wei Chu,** National Taiwan Univ. (Taiwan); **Meng Cui,** Purdue Univ. (United States); **Qionghai Dai,** Tsinghua Univ. (China); **Martí Duocastella,** Univ. de Barcelona (Spain); **Mark Foster,** Johns Hopkins Univ. (United States); **Katsumasa Fujita,** Osaka Univ. (Japan); **Liang Gao,** UCLA Samueli School of Engineering (United States); **Nobuyuki Hashimoto,** Citizen Watch Co., Ltd. (Japan); **Jessica P. Houston,** New Mexico State Univ. (United States); **Bo Huang,** Univ. of California, San Francisco (United States); **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Thomas Klein,** Optores GmbH (Germany); **Tamiki Komatsuzaki,** Hokkaido Univ. (Japan); **Edmund Y. Lam,** The Univ. of Hong Kong (Hong Kong, China); **Cheng Lei,** Wuhan Univ. (China); **Jinyang Liang,** Institut National de la Recherche Scientifique (Canada); **Jonathan T.C. Liu,** Univ. of Washington (United States); **Tzu-Ming Liu,** Univ. of Macau (Macao, China); **Yu-Hwa Lo,** Univ. of California, San Diego (United States); **Hideharu Mikami,** Hokkaido Univ. (Japan); **Wei Min,** Columbia Univ. (United States); **Nao Nitta,** The Univ. of Tokyo (Japan); **Yasushi Okada,** RIKEN Ctr. for Biosystems Dynamics Research (Japan), Univ. of Tokyo (Japan); **YongKeun Park,** KAIST (Korea, Republic of); **Adrian Podoleanu,** Univ. of Kent (United Kingdom); **Dario Polli,** Politecnico di Milano (Italy); **Eric O. Potma,** Univ. of California, Irvine (United States); **Lingyan Shi,** Univ. of California, San Diego (United States); **Guohai Situ,** Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Peter T. C. So,** Massachusetts Institute of Technology (United States); **Lei Tian,** Boston Univ. (United States); **Benjamin J. Vakoc,** Wellman Ctr. for Photomedicine (United States); **Laura Waller,** Univ. of California, Berkeley (United States); **Chao Wang,** Univ. of Kent (United Kingdom); **Lihong V. Wang,** Caltech (United States); **Kenneth Y. Wong,** The Univ. of Hong Kong (Hong Kong, China); **Yicong Wu,** National Institutes of Health (United States); **Takeshi Yasui,** Tokushima Univ. (Japan); **Terence T.W. Wong,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Zeev Zalevsky,** Bar-Ilan Univ. (Israel); **Chao Zuo,** Nanjing Univ. of Science and Technology (China)

Saturday 25 January 2025

SESSION 1: HIGH-THROUGHPUT IMAGING STRATEGIES I

25 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Kevin K. Tsia**, The Univ. of Hong Kong (Hong Kong, China)

13330-1 • 8:30 AM - 9:00 AM
An omni-mesoscope imaging platform for high-content molecular characterization of cellular dynamics in drug resistance assessment (Keynote Presentation) *(Invited Paper)*
Author(s): **Yang Liu**, **Hongqiang Ma,** Univ. of Illinois (United States); **Maomao Chen, Jianquan Xu,** Univ. of Pittsburgh (United States)

13330-2 • 9:00 AM - 9:30 AM
Advanced optoacoustic methods for ultrafast imaging of biodynamics (Keynote Presentation) *(Invited Paper)*
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland), ETH Zurich (Switzerland)

13330-3 • 9:30 AM - 9:45 AM
Towards high-speed optical coherence tomography through downconversion master slave and bidirectional sweeping
Author(s): **Alejandro Martínez Jiménez**, **Ramona Cernat**, **Adrian Bradu**, **Rene Riha,** Univ. of Kent (United Kingdom); **Esteban Andres Proano Grijalva,** Technical Univ. of Denmark (Denmark); **Bjorn Meyer**, **Thor Ansbaek,** Fotonir Aps (Denmark); **Kresten Yvind,** Technical Univ. of Denmark (Denmark); **Adrian Podoleanu,** Univ. of Kent (United Kingdom)

13330-4 • 9:45 AM - 10:00 AM
Single-shot 3D imaging of laser ablation at 1 million frames per second
Author(s): **Maria A. Troyanova-Wood,** SAIC (United States); **Gary Noojin, Joel Bixler,** Air Force Research Lab. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: COMPUTATIONAL IMAGING

25 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Liang Gao**, UCLA Samueli School of Engineering (United States)

13330-5 • 10:30 AM - 11:00 AM
Mapping virus infection dynamics with computational imaging (Keynote Presentation) *(Invited Paper)*
Author(s): **Talon Chandler**, **Deepika Sundarraman**, **Eduardo Hirata-Miyasaki**, **Ivan E. Ivanov**, **Ziwen Liu**, **Allyson Q Ryan**, **Jordao Bragantini**, **Sheng Xiao**, **Loic Royer**, **Adrian Jacobo**, **Keir Balla, Shalin B. Mehta,** Chan Zuckerberg Biohub (United States)

13330-7 • 11:00 AM - 11:15 AM
Pixel-reassigned line-scanning microscopy for fast volumetric super-resolution imaging
Author(s): **Hongjin Li,** City Univ. of Hong Kong (Hong Kong, China), Hong Kong Ctr. for Cerebro-Cardiovascular Health Engineering (Hong Kong, China); **Qi Li,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Shih-Chi Chen,** The Chinese Univ. of Hong Kong (Hong Kong, China), Hong Kong Ctr. for Cerebro-Cardiovascular Health Engineering (Hong Kong, China); **Qiuyuan Zhong,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13330-8 • 11:15 AM - 11:30 AM
Advancing organoid research: the multi-camera array microscope (MCAM) for high-throughput 3D imaging and drug analysis
Author(s): **Kanghyun Kim**, **Amey Chaware,** Duke Univ. (United States); **Jieun Esther Park**, **Rubal Singla,** The Univ. of North Carolina at Chapel Hill (United States); **Kevin Li**, **Josh Lerner,** Duke Univ. (United States); **Jason Stein,** The Univ. of North Carolina at Chapel Hill (United States); **Roarke Horstmeyer,** Duke Univ. (United States)

13330-6 • 11:30 AM - 12:00 PM
High-throughput, deep, and 3D label-free metabolic imaging of living biosystems *(Invited Paper)*
Author(s): **Sixian You,** Massachusetts Institute of Technology (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: NEXT-GENERATION FLOW CYTOMETRY

25 January 2025 • 1:30 PM - 3:30 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Keisuke Goda**, The Univ. of Tokyo (Japan)

13330-9 • 1:30 PM - 2:00 PM
Multi-pass flow cytometry using laser cell barcoding (Keynote Presentation) *(Invited Paper)*
Author(s): **Seok-Hyun Andy Yun,** Wellman Ctr. for Photomedicine (United States)

13330-10 • 2:00 PM - 2:30 PM
Measuring biophysical properties of cells and nanoscale bioparticles in health and disease *(Invited Paper)*
Author(s): **Luca Andronico,** Karolinska Institute (Sweden), SciLifeLab (Sweden); **Erdinc Sezgin,** Karolinska Institute (Sweden)

13330-11 • 2:30 PM - 2:45 PM
High-throughput FLIM flow cytometry with a continuous-wave laser
Author(s): **Hiroshi Kanno,** The Univ. of Tokyo (Japan), Tohoku Univ. (Japan); **Kotaro Hiramatsu,** Kyushu Univ. (Japan); **Hideharu Mikami,** Hokkaido Univ. (Japan); **Atsushi Nakayashiki**, **Shota Yamashita**, **Arata Nagai,** Tohoku Univ. Graduate School of Medicine (Japan); **Kohki Okabe**, **Fan Li,** The Univ. of Tokyo (Japan); **Sigurd Braun,** Justus-Liebig-Univ. Giessen (Germany); **Jessica P. Houston,** New Mexico State Univ. (United States); **Sherif Rashad**, **Kuniyasu Niizuma,** Tohoku Univ. Graduate School of Medicine (Japan); **Keisuke Goda,** The Univ. of Tokyo (Japan)

13330-12 • 2:45 PM - 3:00 PM
High-throughput, high-resolution volumetric imaging with light-field flow cytometry for multiparametric 3D single-cell analysis
Author(s): **Xuanwen Hua**, **Keyi Han, Shu Jia,** Georgia Institute of Technology (United States)

13330-13 • 3:00 PM - 3:15 PM
Ultra-High Throughput Instant Two-Color Light-Field Flow Cytometer with Extended Field and Depth
Author(s): **Zhi Ling**, **Kyungduck Yoon**, **Wenhao Liu, Shu Jia,** Georgia Institute of Technology (United States)

13330-14 • 3:15 PM - 3:30 PM
Integrating OCT with flow cytometry for enhanced detection of extracellular vesicles
Author(s): **Kirill Buiankin**, **Edwin van der Pol**, **Xavier Attendu**, **Paul Bloemen, Ton van Leeuwen,** Amsterdam UMC (Netherlands)

Coffee Break 3:30 PM - 4:00 PM

SESSION 4: LARGE-SCALE NEUROSCIENCE

25 January 2025 • 4:00 PM - 5:30 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Bo Huang**, Univ. of California, San Francisco (United States)

13330-15 • 4:00 PM - 4:30 PM
Building the next generation of large-scale, neural-behavioral recording tools for freely behaving animal *(Invited Paper)*
Author(s): **Daniel B. Aharoni,** Univ. of California, Los Angeles (United States)

13330-16 • 4:30 PM - 5:00 PM
High-throughput human cerebral blood flow monitoring with interferometric diffuse optics *(Invited Paper)*
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13330-17 • 5:00 PM - 5:15 PM
Two-photon line excitation array detection (2p-LEAD) microscopy for monitoring in vivo neural activity
Author(s): **Daniel Wu**, **Jongha Lee**, **Aditya Roy**, **Berk Camli**, **Chris Martin**, **Peisen Zhao, Adela Ben-Yakar,** The Univ. of Texas at Austin (United States)

13330-18 • 5:15 PM - 5:30 PM
Large-scale, single-shot quantitative polarization imaging with deep learning for label-free brain-wide analysis
Author(s): **Yuxin Zhang,** The Univ. of Hong Kong (Hong Kong, China); **Kevin Tsia,** The Univ. of Hong Kong (Hong Kong, China), Advanced Biomedical Instrumentation Ctr. (Hong Kong, China); **Cora Lai**, **Michelle Lo**, **Ricky Hui**, **Kelvin Lee, Dickson Siu,** The Univ. of Hong Kong (Hong Kong, China)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: HIGH-THROUGHPUT IMAGING STRATEGIES II

26 January 2025 • 8:30 AM - 9:45 AM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Kevin K. Tsia**, The Univ. of Hong Kong (Hong Kong, China); **Keisuke Goda**, The Univ. of Tokyo (Japan)

13330-19 • 8:30 AM - 9:00 AM
An implantable, wireless, multicolor fluorescence image sensor for real-time monitoring of immunotherapy response in cancer (Keynote Presentation) *(Invited Paper)*
Author(s): **Moshiur Anwar,** Univ. of California, San Francisco (United States)

13330-20 • 9:00 AM - 9:30 AM
Compact 3D fluorescence microscopes using a single layer of microlens array *(Invited Paper)*
Author(s): **Feng Tian, Weijian Yang,** Univ. of California, Davis (United States)

13330-22 • 9:30 AM - 9:45 AM
Stop stopping! A review of modern imaging and motion technologies to maximize throughput for gigapixel+ fields of view
Author(s): **Mike Kadour,** Teledyne (Canada)

Coffee Break 9:45 AM - 10:30 AM

SESSION 6: SUPER-RESOLUTION IMAGING

26 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Hiroshi Kanno**, The Univ. of Tokyo (Japan)

13330-23 • 10:30 AM - 11:00 AM
High throughput PSF-engineered microscopy (Keynote Presentation) *(Invited Paper)*
Author(s): **Yoav Shechtman,** Technion-Israel Institute of Technology (Israel)

13330-24 • 11:00 AM - 11:30 AM
Selective plane activation for super-resolution imaging inside volumetric samples *(Invited Paper)*
Author(s): **Ryosuke Oketani,** Kyushu Univ. (Japan)

13330-25 • 11:30 AM - 11:45 AM
Lens-free photonic integrated circuit for sub-diffraction resolution and large field-of-view fluorescence imaging
Author(s): **Steven Vanuytsel**, **Quentin Desmeth**, **Victor Garcia-Munoz**, **Andim Stassen**, **Qingzhong Deng**, **Vittal Prakasam**, **Vladimir Leonov**, **Seungkyu Ha**, **Pol Van Dorpe, Niels Verellen,** imec (Belgium)

13330-26 • 11:45 AM - 12:00 PM
Single-shot computational phase nanoscopy visualizing organelles
Author(s): **Yugo Inutsuka, Yasushi Okada,** The Univ. of Tokyo (Japan), RIKEN Ctr. for Biosystems Dynamics Research (Japan)

Lunch/Exhibition Break 12:00 PM - 1:00 PM

SESSION 7: HIGH-SPEED MULTIPHOTON IMAGING

26 January 2025 • 1:00 PM - 3:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **Lingyan Shi**, Univ. of California, San Diego (United States)

13330-27 • 1:00 PM - 1:30 PM
New ultrafast optics and scan engine technology to enable breakthrough multiphoton applications (Keynote Presentation) *(Invited Paper)*
Author(s): **Spencer Smith,** Univ. of California, Santa Barbara (United States); **Che-Hang Yu,** Univ. of California (United States)

13330-28 • 1:30 PM - 2:00 PM
To EV or not to EV: value of extracellular vesicles for translation of Raman spectroscopy clinical diagnostics *(Invited Paper)*
Author(s): **Randy P. Carney,** Univ. of California, Davis (United States); **Izabella Ferreira**, **Yara de Paiva Maia,** Univ. Federal de Uberlândia (Brazil); **Rebecca Mayer**, **Neona Lowe, Hannah O'Toole,** Univ. of California, Davis (United States)

13330-30 • 2:00 PM - 2:15 PM
High-speed Raman2RNA: Non-destructive prediction of single-cell expression profiles with total internal reflection Raman microscopy
Author(s): **Koseki J. Kobayashi-Kirschvink**, **Peter T. C. So, Jeon Woong Kang,** Massachusetts Institute of Technology (United States)

13330-31 • 2:15 PM - 2:30 PM
Mol2Raman: a graph neural network model for predicting Raman spectra from SMILES representations
Author(s): **Salvatore Sorrentino,** Politecnico di Milano (Italy); **Alessandro Gussoni,** Satispay Italy S.p.A. (Italy); **Gioele Pasotti,** Politecnico di Milano (Italy); **Davide Avagliano,** Chimie ParisTech - PSL (France); **Ivan Rivalta**, **Francesco Calcagno,** Univ. degli Studi di Bologna (Italy); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Marco Garavelli,** Univ. degli Studi di Bologna (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy); **Dario Polli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13330-32 • 2:30 PM - 2:45 PM
Rapid Raman mapping of 96 µ-well SERS with an automated single-array Raman probe system
Author(s): **Boo Won Seo**, **Young-Wan Choi, Woo June Choi,** Chung-Ang Univ. (Korea, Republic of)

13330-29 • 2:45 PM - 3:00 PM
MHz broadband coherent anti-Stoke Raman scattering spectroscopy using optical time stretch
Author(s): **Kangwen Yang,** The Univ. of Hong Kong (Hong Kong, China), Univ. of Shanghai for Science and Technology (China), Advanced Biomedical Instrumentation Ctr. (Hong Kong, China); **Gang Li,** Univ. of Shanghai for Science and Technology (China); **Yuxin Zhang, Kevin Tsia,** The Univ. of Hong Kong (Hong Kong, China)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: EMERGING IMAGING APPLICATIONS

26 January 2025 • 3:30 PM - 6:00 PM | Moscone South, Room 312 (Level 3)
Session Chair(s): **David Veysset**, Stanford Univ. (United States)

13330-33 • 3:30 PM - 4:00 PM
An emerging new window in tissue imaging: the shortwave infrared wavelength band for quantitative measurements of water and lipids *(Invited Paper)*
Author(s): **Darren M. Roblyer,** Boston Univ. (United States)

13330-42 • 4:00 PM - 4:30 PM
Mapping cell state dynamics with AI-enabled live cell imaging *(Invited Paper)*
Author(s): **Shalin B. Mehta,** Chan Zuckerberg Biohub (United States)

13330-43 • 4:30 PM - 5:00 PM
Parallel-Acquisition-Readout Structured Illumination Microscopy (PAR-SIM) *(Invited Paper)*
Author(s): **Peng Xi,** Peking Univ. (China)

13330-34 • 5:00 PM - 5:15 PM
Multimodal imaging of subcellular metabolic dynamics reveals the anti-aging effect of metformin
Author(s): **Sirasit Prayotamornkul**, **Avriza D. Bestafa**, **Jenna L. Cecil**, **Yajuan Li, Lingyan Shi,** Univ. of California, San Diego (United States)

13330-35 • 5:15 PM - 5:30 PM
Label-Free detection of methuosis using 2-dimensional microlens array
Author(s): **Somaiyeh Khoubafarin**, **Rabin Neupane,** The Univ. of Toledo (United States); **Amit K. Tiwari,** Univ. of Arkansas (United States); **Aniruddha Ray,** The Univ. of Toledo (United States)

13330-36 • 5:30 PM - 5:45 PM
Volumetric phenotype quantification of in-vivo aquatic model using high-throughput optical coherence tomography
Author(s): **Junseo Hong**, **Sangjin Lee**, **Geoseong Na**, **Hyunmo Yang,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Unbeom Shin,** Institute for Basic Science (Korea, Republic of); **Seongmin Yun**, **Yerim Kim**, **Taejoon Kwon,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Yoonsung Lee,** Kyung Hee Univ. (Korea, Republic of); **Woonggyu Jung,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13330-37 • 5:45 PM - 6:00 PM
Nondestructive biochemical assessment of archived tissue specimens in biobank settings using endogenous fluorescence lifetime imaging
Author(s): **Seyed Edriss Mirnia**, **Rodrigo Cuenca Martinez**, **Gabriel P. Tortorelli,** The Univ. of Oklahoma (United States); **Carissa Huynh,** Cedars-Sinai Biobank and Research Pathology (United States); **Yuan Li,** The Univ. of Oklahoma (United States); **Harrison Reid**, **V. Krishnan Ramanujan,** Cedars-Sinai Biobank and Research Pathology (United States); **Javier A. Jo,** The Univ. of Oklahoma (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13330-38 • 5:30 PM - 7:00 PM
Deep learning-based 3D virtual histopathological image generation using DAPI and eosin fluorescence double staining and SACSI-CUT (self-attention with cellular structure and intensity consistency based CUT)
Author(s): **Junyoung Shin**, **Inkeon Ryu**, **Jinhyeong Lee**, **Jaehyun Lim, Daekeun Kim,** Dankook Univ. (Korea, Republic of)

13330-39 • 5:30 PM - 7:00 PM
Mapping neuronal populations with high-throughput light-sheet fluorescence microscopy
Author(s): **Giacomo Mazzamuto,** Istituto Nazionale di Ottica (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Irene Costantini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Danila Di Meo**, **Franco Cheli**, **Michele Sorelli**, **Samuel Bradley**, **Josephine Ramazzotti,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Curzio Checcucci,** Univ. degli Studi di Firenze (Italy); **Alessandra Franceschini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Ludovico Silvestri,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Francesco S. Pavone,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica (Italy), Univ. degli Studi di Firenze (Italy)

13330-40 • 5:30 PM - 7:00 PM
Advancing digital PCR data management: an open-source benchmark database
Author(s): **Yuanyuan Wei,** The Chinese Univ. of Hong Kong (Hong Kong, China), Univ. of California, Los Angeles (United States); **Zhichao Wang,** Georgia Institute of Technology (United States); **Liwei Tan,** Tsinghua Univ. (China); **Qingyue Dong**, **Yingqi Fu**, **Chenglang Yuan,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Mingkun Xu,** Guangdong Institute of Intelligence Science and Technology (China), Tsinghua Univ. (China); **Yi-Ping Ho**, **Ho-Pui Ho, Wu Yuan,** The Chinese Univ. of Hong Kong (Hong Kong, China)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13331

Label-free Biomedical Imaging and Sensing (LBIS) 2025

26 - 28 January 2025 | Moscone South, Room 303 (Level 3)

Conference Chair(s): **Natan T. Shaked,** Tel Aviv Univ. (Israel); **Oliver Hayden,** Technische Univ. München (Germany)

Program Committee: **Shi-Wei Chu,** National Taiwan Univ. (Taiwan); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Jochen R. Guck,** Max-Planck-Institut für die Physik des Lichts (Germany); **Bahram Jalali,** Univ. of California, Los Angeles (United States); **Alexander T. Khmaladze,** Univ. at Albany (United States); **Pierre P. Marquet,** Ctr. de Recherche de l'Univ. Laval Robert-Giffard (Canada); **Jürgen Popp,** Friedrich-Schiller-Univ. Jena (Germany); **Aniruddha Ray,** The Univ. of Toledo (United States); **Francisco E. Robles,** Georgia Institute of Technology & Emory Univ. School of Medicine (United States); **Travis W. Sawyer,** Wyant College of Optical Sciences (United States); **Melissa C. Skala,** Univ. of Wisconsin-Madison (United States); **Tsu-Te Judith Su,** Wyant College of Optical Sciences (United States); **Valery V. Tuchin,** Saratov State Univ. (Russian Federation), Tomsk State Univ. (Russian Federation), Institute of Precision Mechanics and Control of the RAS (Russian Federation); **Yihui Wu,** Changchun Institute of Optics, Fine Mechanics and Physics (China); **Yizheng Zhu,** Virginia Polytechnic Institute and State Univ. (United States)

Sunday 26 January 2025

SESSION 1: VIRTUAL STAINING VIA DEEP LEARNING

26 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Natan T. Shaked**, Tel Aviv Univ. (Israel)

13331-1 • 8:40 AM - 9:00 AM
Deep learning-powered virtual fluorescent labeling of fibers in Fibrin hydrogels
Author(s): **Sarah Eldeen**, **Andres Felipe Ramirez**, **Peter Chang, Elliot Botvinick,** Univ. of California, Irvine (United States)

13331-2 • 9:00 AM - 9:20 AM
Automatic nuclei segmentation of label-free chromatin-sensitive partial wave spectroscopic microscopy using convolution neural network with transformer
Author(s): **Md Shahin Alom,** North Carolina A&T State Univ. (United States); **Ali Daneshkhah**, **Nicolas Acosta**, **Emily M. Pujadas-Liwag**, **Tiffany Kuo**, **Rachel Ye**, **Joshua A. Pritchard,** Northwestern Univ. (United States); **Narayan Bhattarai,** North Carolina A&T State Univ. (United States); **Vadim Backman,** Northwestern Univ. (United States); **Sunil Kumar Gaire,** North Carolina A&T State Univ. (United States)

13331-4 • 9:20 AM - 9:40 AM
Multi-contrast deep ultraviolet transmission and autofluorescence camera microscopy
Author(s): **Brendyn D. Cikaluk**, **Matthew T. Martell**, **Mohammad H. Masoumi, Roger J. Zemp,** Univ. of Alberta (Canada)

13331-5 • 9:40 AM - 10:00 AM
Stainless deep ultraviolet microscopy for cytology screening
Author(s): **Jiabin Chen**, **Rongguang Liang**, **Steven Dudick,** The Univ. of Arizona (United States); **Sumsum Sunny,** Mazumdar Shaw Cancer Ctr. (India); **Chaur-Dong Hsu,** The Univ. of Arizona College of Medicine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: BRILLOUIN, SCATTERING AND HYPERSPECTRAL IMAGING

26 January 2025 • 10:30 AM - 12:30 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Natan T. Shaked**, Tel Aviv Univ. (Israel)

13331-6 • 10:30 AM - 10:50 AM
Brillouin imaging: past, present, and future (Keynote Presentation)
Author(s): **Alberto Bilenca,** Ben-Gurion Univ. of the Negev (Israel)

13331-7 • 10:50 AM - 11:10 AM
Rapid detection of microbial colony in biopharmaceutical cleanroom using hyperspectral imaging technology
Author(s): **Wei-Hong Chang,** Industrial Technology Research Institute (Taiwan); **Yu-Cheng Cheng**, **Yung-Jhe Yan, Mang Ou-Yang,** National Yang Ming Chiao Tung Univ. (Taiwan)

13331-8 • 11:10 AM - 11:30 AM
Extended multi-layer Born model: incorporating evanescent modes for improved near-field light scattering in biological samples
Author(s): **Lang Wang,** Morgridge Institute for Research (United States); **Olivier Pinaud,** Colorado State Univ. (United States); **Randy Bartels,** Morgridge Institute for Research (United States)

13331-9 • 11:30 AM - 11:50 AM
Ex vivo Raman spectroscopy signals at multiple excitation wavelengths for sickle versus non-sickle RBC analysis using novel technique and computational framework
Author(s): **Parmita Mishra,** Precigenetics, Inc. (United States); **Tanishq M. Abraham,** Stability.AI (United States), Medical AI Research Ctr. (MedARC) (United States); **Richard M. Levenson,** UC Davis Medical Ctr. (United States); **Albi Tocilla,** Precigenetics, Inc. (United States)

13331-10 • 11:50 AM - 12:10 PM
Spectroscopic analysis and classification of oral bacteria in mixed samples using FTIR spectroscopy and deep-learning
Author(s): **Katharina Frings,** Leibniz Univ. Hannover (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany); **Lars Baumann,** Leibniz Univ. Hannover (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany); **Nils Heine,** Medizinische Hochschule Hannover (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany); **Nicolas Debener,** Leibniz Univ. Hannover (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany); **Janina Bahnemann,** Univ. Augsburg (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany); **Katharina Doll-Nikutta,** Medizinische Hochschule Hannover (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany); **Maria Leilani Torres-Mapa, Alexander Heisterkamp,** Leibniz Univ. Hannover (Germany), Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung (Germany), Sicherheits¬integrierte und infektions¬reaktive Implantate (Germany)

13331-11 • 12:10 PM - 12:30 PM
Lipid imaging inside Infrared-transparent microfluidic device using FTIR microspectroscopy and quantum interferometry based infrared microspectroscopy
Author(s): **Kevin Nicholas**, **Gianluca Grenci,** Mechanobiology Institute, National Univ. of Singapore (Singapore); **Thomas V. Produit, Anna Paterova,** A*STAR Agency for Science, Technology and Research (Singapore)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 3: MULTIMODAL LABEL-FREE IMAGING

26 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Travis W. Sawyer**, Wyant College of Optical Sciences (United States)

13331-12 • 1:30 PM - 1:50 PM
Metabolic characterization of bacteria using multimodal label-free nonlinear optical microscopy *(Invited Paper)*
Author(s): **Janet E. Sorrells**, **Lingxiao Yang**, **Rishyashring R. Iyer**, **Farzana R. Zaki**, **Guillermo L. Monroy**, **Adam A. Markowicz**, **Marina Marjanovic, Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

13331-13 • 1:50 PM - 2:10 PM
In vitro evaluation of cross-platform imaging system of optical diffraction tomography (ODT), Raman spectroscopy and laser scanning confocal microscope (LSCM)
Author(s): **Minju Cho**, **Kwanhee Lee**, **Kyeongryeol Kim**, **Joon Seup Hwang, Jun Ki Kim,** Univ. of Ulsan College of Medicine (Korea, Republic of)

13331-14 • 2:10 PM - 2:30 PM
Correlation analysis for label-free multimodal optical image translation
Author(s): **Yug Rao**, **Jindou Shi**, **Shitao Liu**, **Edita Aksamitiene, Stephen A. Boppart,** Univ. of Illinois (United States)

13331-15 • 2:30 PM - 2:50 PM
Spatial, metabolic, and chemical imaging for enhanced characterization and optimal selection of CHO cell lines via multimodal label-free microscopy
Author(s): **Alexander Ho**, **Jindou Shi**, **Edita Aksamitiene**, **Janet E. Sorrells**, **Kevin K. D. Tan**, **Eric Chaney,** Univ. of Illinois (United States); **Aneesh Alex,** GlaxoSmithKline (United States); **Remben V. Talaban**, **Robyn Emmins**, **Vara Prasada Rao Sankarasetty,** GlaxoSmithKline (United Kingdom); **Darold R. Spillman**, **Marina Marjanovic,** Univ. of Illinois (United States); **Minh Doan**, **Reid Groseclose,** GlaxoSmithKline (United States); **Steve R. Hood,** GlaxoSmithKline (United Kingdom); **Stephen A. Boppart,** Univ. of Illinois (United States)

13331-16 • 2:50 PM - 3:10 PM
Combined ultraviolet confocal reflectance and autofluorescence microscopy for generating virtual sectioned histology in freshly resected thick tissues
Author(s): **Nathaniel J. M. Haven**, **Brendon Restall**, **Matthew Martell**, **Joy Wang, Roger Zemp,** Univ. of Alberta (Canada)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: NONLINEAR LABEL-FREE

26 January 2025 • 3:40 PM - 5:40 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Oliver Hayden**, Technische Univ. München (Germany)

13331-22 • 3:40 PM - 4:00 PM
Distinguishing healthy and infected animal colon using label-free multiphoton lightsheet fluorescence microscopy
Author(s): **Jirapa Limsuriwong**, **Anne-Mette H. Meijburg**, **Freja Høier**, **Peter E. Andersen, Madhu Veettikazhy,** Technical Univ. of Denmark (Denmark)

13331-17 • 4:00 PM - 4:20 PM
Differentiating 2-photon and 3-photon processes: order-resolved nonlinear optical imaging with intensity modulation and frequency-gated demodulation *(Invited Paper)*
Author(s): **Kayvan F. Tehrani**, **Sida Liang,** Univ. of Illinois (United States); **Alejandro De la Cadena, Stephen A. Boppart,** Univ. of Illinois (United States)

13331-18 • 4:20 PM - 4:40 PM
Noninvasive investigation of astrocyte culture viscoelastic properties
Author(s): **Vsevolod Cheburkanov, Vladislav Yakovlev,** Texas A&M Univ. (United States)

13331-19 • 4:40 PM - 5:00 PM
Label-free multimodal nonlinear optical microscopy identifies markers of macrophage polarization
Author(s): **Francesco Manetti**, **Benedetta Gavazzoni**, **Salvatore Sorrentino**, **Andrea Rabolini**, **Matteo Mandelli,** Politecnico di Milano (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Manuela Teresa Raimondi,** Politecnico di Milano (Italy); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Emanuela Jacchetti,** Politecnico di Milano (Italy); **Dario Polli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13331-20 • 5:00 PM - 5:20 PM
Analyzing structural changes in scleral collagen induced by retinal degeneration using second harmonic generation microscopy
Author(s): **Aldo Tecse,** Univ. of Rochester (United States); **Ann-Christine Noll,** Univ. of Rochester (United States), The Institute of Optics, Univ. of Rochester (United States); **James Germann**, **David Fernandez**, **Mark Buckley,** Univ. of Rochester (United States); **Michael Telias,** Flaum Eye Institute, Univ. of Rochester (United States), Univ. of Rochester (United States); **Susana Marcos,** Univ. of Rochester (United States), Flaum Eye Institute, Univ. of Rochester (United States)

13331-21 • 5:20 PM - 5:40 PM
3D imaging and quantification of collagen and elastin fibers in asthmatic lung biopsies using higher harmonic generation microscopy
Author(s): **Sylvia Spies,** Vrije Univ. Amsterdam (Netherlands); **Sofi Vassileva,** Amsterdam UMC (Netherlands); **Mengyao Zhou,** Vrije Univ. Amsterdam (Netherlands); **Jouke T. Annema**, **Johannes M. A. Daniels**, **Peter I. Bonta,** Amsterdam UMC (Netherlands); **Marie Louise Groot,** Vrije Univ. Amsterdam (Netherlands)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13331-29 • 5:30 PM - 7:00 PM
Development of a label-free imaging system using integrated surgical microscopy-based laser speckle contrast imaging for perioperative guidance of in vivo resection and transplantation
Author(s): **Suyeon Kang,** Univ. of Ulsan (Korea, Republic of); **Kwanhee Lee,** Univ. of Ulsan College of Medicine (Korea, Republic of); **Junki Kim,** Univ. of Ulsan (Korea, Republic of), Asan Medical Ctr. (Korea, Republic of)

13331-61 • 5:30 PM - 7:00 PM
Investigation of a robust segmentation method for identifying individual microorganisms in underwater lensless imaging
Author(s): **Ana Doblas**, **Sagnik Kundu,** Univ. of Massachusetts Dartmouth (United States); **Robert A. Petitt, Andone Lavery,** Woods Hole Oceanographic Institution (United States)

13331-62 • 5:30 PM - 7:00 PM
Detection development of a diagnostic method for ureteral obstruction and ischemic kidney injury using surface-enhanced Raman spectroscopy (SERS)
Author(s): **Jeongmin Oh**, **Sanghwa Lee,** Asan Medical Ctr. (Korea, Republic of); **Jun Ki Kim,** Asan Medical Ctr. (Korea, Republic of), Univ. of Ulsan (Korea, Republic of)

13331-63 • 5:30 PM - 7:00 PM
Deep learning can identify mitochondrial dysfunction in retinal cells
Author(s): **Shannon Handley**, **Abhilash Marupally**, **Aline Knab**, **Xiaohu Xu**, **Akanksha Bhargava, Ewa M. Goldys,** The Univ. of New South Wales (Australia)

13331-65 • 5:30 PM - 7:00 PM
A label-free rapid intraoperative pathology detection system
Author(s): **Wenqi Lyu,** Tsinghua Univ. (United States); **Guoliang Huang,** Tsinghua Univ. (China)

13331-66 • 5:30 PM - 7:00 PM
Real-time monitoring of metabolic gradients using a novel 3D-printed device adapted to Raman spectroscopy
Author(s): **Maitane Márquez,** Biogipuzkoa HRI (Spain), CIC nanoGUNE (Spain); **Javier Plou Izquierdo**, **Eneko López,** CIC nanoGUNE (Spain); **Charles Lawrie,** Biogipuzkoa HRI (Spain), IKERBASQUE, Basque Foundation for Science (Spain), Univ. of Oxford (United Kingdom); **Andreas Seifert,** CIC nanoGUNE (Spain), IKERBASQUE, Basque Foundation for Science (Spain)

13331-67 • 5:30 PM - 7:00 PM
Raman Spectroscopy for Accurate and Rapid Analysis of Cell Therapy Products
Author(s): **Shruthi Ravichandran**, **Marissa Morales, Loza Tadesse,** Massachusetts Institute of Technology (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 5: LABEL-FREE SENSORS

27 January 2025 • 8:20 AM - 10:00 AM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Gili Bisker**, Tel Aviv Univ. (Israel)

13331-23 • 8:20 AM - 8:40 AM
Determining the binding affinity of agonists to bitter taste receptors using frequency locked microtoroid resonators
Author(s): **Khuong Duy Mac,** The Univ. of Arizona (United States); **Judith Su,** Wyant College of Optical Sciences (United States)

13331-25 • 8:40 AM - 9:00 AM
Free space coupling to high Q microtoroids in aqueous environments for biochemical sensing experiments
Author(s): **Sartanee Suebka, Judith Su,** Wyant College of Optical Sciences (United States)

13331-26 • 9:00 AM - 9:20 AM
Multispectral optical sensor for psychological stress detection
Author(s): **Victoria Barygina**, **Enrico Baria,** Univ. degli Studi di Firenze (Italy); **Francesco Goretti,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Elena Cravero,** Univ. Campus Bio-Medico (Italy), Istituto Nazionale di Ottica (Italy); **Francesco Saverio Pavone,** Univ. degli Studi di Firenze (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13331-27 • 9:20 AM - 9:40 AM
Nano-fibre optic probe for label-free bioimaging detection
Author(s): **Hanlin Jiang**, **Jiaxing Sun**, **M. Mahmoodi, Xianfeng Chen,** Nottingham Trent Univ. (United Kingdom)

13331-28 • 9:40 AM - 10:00 AM
Label free detection of low contrast objects by using liquid crystals
Author(s): **Tigran Galstian, Maria Hovakimyan,** Univ. Laval (Canada)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: CLINICAL APPLICATIONS

27 January 2025 • 10:30 AM - 11:10 AM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Oliver Hayden**, Technische Univ. München (Germany)

13331-30 • 10:30 AM - 10:50 AM
Low refractive index 3D culture dishes for improved embryo culture and clinical integration
Author(s): **Yunqin Zhao, Audrey K. Bowden,** Vanderbilt Univ. (United States)

13331-31 • 10:50 AM - 11:10 AM
Label-free exfoliated cell cytology for early stage oral cancer diagnosis
Author(s): **Himanshu Joshi**, **Meenakshi Ghanghas**, **Pramila Thapa,** Indian Institute of Technology Delhi (India); **Varun Surya,** All India Institute of Medical Sciences, New Delhi (India); **Dalip S. Mehta,** Indian Institute of Technology Delhi (India)

Lunch Break 11:10 AM - 2:00 PM

SESSION 7: POLARIZATION AND PHOTOACCOUSTICS

27 January 2025 • 2:00 PM - 3:00 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Natan T. Shaked**, Tel Aviv Univ. (Israel)

13331-32 • 2:00 PM - 2:20 PM
Enhanced polarization sensing with liquid crystals
Author(s): **Tigran Galstian,** Univ. Laval (Canada)

13331-33 • 2:20 PM - 2:40 PM
Extending microsphere-assisted microscopy to polarization-driven dynamic laser speckle analysis
Author(s): **Vahid Abbasian,** Washington Univ. in St. Louis (United States); **Vahideh Farzam Rad,** Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); **Arash Darafsheh,** Washington Univ. in St. Louis (United States)

13331-34 • 2:40 PM - 3:00 PM
An optical resolution photoacoustic microscopy system using 3D Lissajous trajectories for extended field of view and depth of focus
Author(s): **Lukas Bugyi,** Medizinische Univ. Wien (Austria); **Nicole Schmitner**, **Robin Kimmel**, **Dirk Meyer,** Univ. Innsbruck (Austria); **Kristen M. Meiburger,** Politecnico di Torino (Italy); **Wolfgang Drexler, Mengyang Liu,** Medizinische Univ. Wien (Austria)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: OPTICAL COHERENCE TOMOGRAPHY

27 January 2025 • 3:30 PM - 5:00 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Travis W. Sawyer**, Wyant College of Optical Sciences (United States)

13331-35 • 3:30 PM - 4:00 PM
Visualizing cellular metabolic activity within the cochlea using dynamic micro-optical coherence tomography *(Invited Paper)*
Author(s): **Hinnerk Schulz-Hildebrandt,** Mass General Brigham (United States), Harvard Medical School (United States); **Svetolik Spasic,** Stanford Univ. School of Medicine (United States); **Fang Hou,** Mass General Brigham (United States), Harvard Medical School (United States); **Shelley Batts**, **Kuan-Chung Ting,** Stanford Univ. School of Medicine (United States); **Guillermo J. Tearney,** Mass General Brigham (United States), Harvard Medical School (United States); **Konstantina M. Stankovic,** Stanford Univ. School of Medicine (United States)

13331-36 • 4:00 PM - 4:20 PM
Imaging local optic axis of multi-layered tissue using Jones-matrix optical coherence tomography
Author(s): **Yiheng Lim,** Univ. of Tsukuba (Japan); **Pradipta Mukherjee,** Indian Institute of Technology Delhi (India), Univ. of Tsukuba (Japan); **Shuichi Makita, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13331-37 • 4:20 PM - 4:40 PM
In vivo multi-contrast and tissue-activity imaging of zebrafish by label-free optical coherence tomography
Author(s): **Cunyou Bao**, **Aiyi Sui**, **Ibrahim Abd El-Sadek**, **Rion Morishita**, **Yu Guo**, **Yiheng Lim**, **Shuichi Makita**, **Makoto Kobayashi, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13331-38 • 4:40 PM - 5:00 PM
Resin-embedded ex vivo mouse retina as durable phantoms for optical coherence tomography *(Invited Paper)*
Author(s): **Álvaro Barroso Peña**, **Peter Heiduschka**, **Steffi Ketelhut,** Univ. Münster (Germany); **Rocío del Amor**, **Fernando García-Torres**, **Sandra Morales-Martínez**, **Valery Naranjo,** Univ. Politècnica de València (Spain); **Björn Kemper, Jürgen Schnekenburger,** Univ. Münster (Germany)

Tuesday 28 January 2025

SESSION 9: QUANTITATIVE PHASE IMAGING, HOLOGRAPHY AND INTERFEROMETRY I

28 January 2025 • 8:10 AM - 12:05 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Natan T. Shaked**, Tel Aviv Univ. (Israel)

13331-39 • 8:10 AM - 8:30 AM
Label-free 3D refractive-index mapping of freely swimming human sperm cells
Author(s): **Lydia Sokolovski**, **Ofira Dabah**, **Dotan Kambar**, **Simcha Mirsky**, **Itay Barnea, Natan T. Shaked,** Tel Aviv Univ. (Israel)

13331-40 • 8:30 AM - 8:50 AM
Fast and quantitative analysis of fibrotic tissues using cryostat and quantitative phase imaging
Author(s): **Lee Juho**, **Yeonwoo Baek**, **Yerim Kim**, **Hyunmo Yang**, **Sangjin Lee,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Song-Yi Choi,** Chungnam National Univ. College of Medicine (Korea, Republic of); **Woonggyu Jung,** Ulsan National Institute of Science and Technology (Korea, Republic of)

13331-41 • 8:50 AM - 9:10 AM
Visualizing intracellular trafficking using label-free dynamic scattering-particle localization interference microscopy (DySLIM)
Author(s): **Jin-Sung Park**, **Il-Buem Lee**, **Hyeon-Min Moon,** Ctr. for Molecular Spectroscopy and Dynamics, Institute for Basic Science (Korea, Republic of); **Seok-Cheol Hong, Minhaeng Cho,** Ctr. for Molecular Spectroscopy and Dynamics, Institute for Basic Science (Korea, Republic of), Korea Univ. (Korea, Republic of)

13331-42 • 9:10 AM - 9:30 AM
Interferometric concentration analyzer and ultrasmall nanoparticle tracker (iCAUNT): advanced nanoparticle characterization via label-free imaging
Author(s): **Il-Buem Lee,** Korea Univ. (Korea, Republic of); **Hyeon-Min Moon,** Korea Univ. (Kiribati, Republic of); **Jin-Sung Park**, **Se-Hwan Lee**, **Seok-Cheol Hong, Minhaeng Cho,** Korea Univ. (Korea, Republic of)

Coffee Break • 9:30 AM - 10:00 AM

13331-43 • 10:00 AM - 10:45 AM
Fourier ptychographic microscopy (FPM): a versatile label-free multimodal imaging tool, review and perspectives (Keynote Presentation)
Author(s): **Pietro Ferraro**, **Marika Valentino**, **Daniele Pirone**, **Lisa Miccio**, **Pasquale Memmolo, Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13331-44 • 10:45 AM - 11:05 AM
Through standardized measurements for clinics: a novel autofocusing framework for digital holographic microscopy
Author(s): **Alperen Yildiz,** TUMCREATE Ltd. (Singapore), National Univ. of Singapore (Singapore); **Yijing Jiang,** TUMCREATE Ltd. (Singapore), Nanyang Technological Univ. (Singapore); **Kerem Delikoyun**, **Qianyu Chen,** TUMCREATE Ltd. (Singapore), Technische Univ. München (Germany); **Si Ko Myo,** TUMCREATE Ltd. (Singapore); **Oliver Hayden,** Technische Univ. München (Germany), TUMCREATE Ltd. (Singapore)

13331-45 • 11:05 AM - 11:25 AM
A study of brain organoid using holographic tomography
Author(s): **Vinoth Balasubramani**, **Fathia Ben Rached**, **Christian Depeursinge, Pierre Magistretti,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13331-46 • 11:25 AM - 11:45 AM
Quantitative analysis of leukocyte activation in inflammatory acute conditions using digital holographic microscopy
Author(s): **Kerem Delikoyun,** TUMCREATE Ltd. (Singapore), Technische Univ. München (Germany); **Alperen Yildiz,** TUMCREATE Ltd. (Singapore), National Univ. of Singapore (Singapore); **Yijing Jiang,** TUMCREATE Ltd. (Singapore), Nanyang Technological Univ. (Singapore); **Qianyu Chen,** TUMCREATE Ltd. (Singapore), Technische Univ. München (Germany); **Si Ko Myo,** TUMCREATE Ltd. (Singapore); **Matthew Cove**, **John Soong Tshon Yit,** National Univ. of Singapore (Singapore); **Oliver Hayden,** TUMCREATE Ltd (Singapore), Technische Univ. München (Germany)

13331-64 • 11:45 AM - 12:05 PM
Label-free nanoscale imaging in live cells with advanced confocal interferometric scattering microscopy (C-iSCAT)
Author(s): **Michelle Kueppers, William E. Moerner,** Stanford Univ. (United States)

Lunch/Exhibition Break 12:05 PM - 1:05 PM

SESSION 10: QUANTITATIVE PHASE IMAGING, HOLOGRAPHY AND INTERFEROMETRY II

28 January 2025 • 1:05 PM - 2:35 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Natan T. Shaked**, Tel Aviv Univ. (Israel)

13331-47 • 1:05 PM - 1:35 PM
Microspheres with optical properties similar to living cells for benchmarking label-free quantitative phase imaging and flow cytometry *(Invited Paper)*
Author(s): **Björn Kemper,** Univ. Münster (Germany); **Jonah L. Decker**, **Willis Muganda,** Univ. Siegen (Germany); **Álvaro Barroso**, **Anne Marzi**, **Sabrina Wiegmann**, **Steffi Ketelhut**, **Burkhard Greve**, **Thomas Liedtke,** Univ. Münster (Germany); **Holger Schönherr,** Univ. Siegen (Germany); **Jürgen Schnekenburger,** Univ. Münster (Germany)

13331-48 • 1:35 PM - 1:55 PM
Cell classification based on different off-axis holographic viewings angle using label-free imaging flow cytometry
Author(s): **Dana Aharoni**, **Matan Dudaie**, **Itay Barnea, Natan T. Shaked,** Tel Aviv Univ. (Israel)

13331-49 • 1:55 PM - 2:15 PM
Label-free imaging flow cytometry using a motion sensitive camera
Author(s): **Eden Dotan**, **Dana Aharoni, Natan T. Shaked,** Tel Aviv Univ. (Israel)

13331-50 • 2:15 PM - 2:35 PM
Quasi-noise-free real-time imaging of cellular processes with polychromatic digital holographic microscopy
Author(s): **Céline Larivière-Loiselle**, **Mohamed Haouat**, **Erik Bélanger, Pierre Marquet,** Ctr. de Recherche CERVO (Canada)

Coffee Break 2:35 PM - 3:00 PM

SESSION 11: RAMAN SPECTROSCOPY

28 January 2025 • 3:00 PM - 5:50 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Oliver Hayden**, Technische Univ. München (Germany)

13331-51 • 3:00 PM - 3:30 PM
Leaping into the future: generative AI and automation towards accelerating field translation of Raman spectroscopy *(Invited Paper)*
Author(s): **Loza F. Tadesse,** Massachusetts Institute of Technology (United States)

13331-53 • 3:30 PM - 3:50 PM
Minimum source requirements for stimulated Raman scattering
Author(s): **Elise Uyehara**, **Zheng Li, Rajeev Ram,** Massachusetts Institute of Technology (United States)

13331-55 • 3:50 PM - 4:10 PM
Uncovering metabolic gradients evolution using 3D-printed multi-well plates tailored to Raman spectroscopy
Author(s): **Javier Plou Izquierdo,** CIC nanoGUNE (Spain); **Maitane Lopez,** Biogipuzkoa HRI (Spain); **Celina-Christin Schubbe,** CIC nanoGUNE (Spain); **Charles Lawry,** Biogipuzkoa HRI (Spain); **Andreas Seifert,** CIC nanoGUNE (Spain)

13331-56 • 4:10 PM - 4:30 PM
A fiber laser source for parallel dual-window multiplex SRS (DWM-SRS): single-shot CH-stretching and fingerprint imaging
Author(s): **Francesco Crisafi**, **Gabriele Di Noia,** Cambridge Raman Imaging S.r.l. (Italy); **Fedele Pisani,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Mujeeb Rahman,** Cambridge Raman Imaging Ltd. (United Kingdom); **Andrea Ragni**, **Federico Monti**, **Eleonora Erriquez,** Cambridge Raman Imaging S.r.l. (Italy); **Gianluca Galzerano,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy); **Matteo Negro,** Cambridge Raman Imaging S.r.l. (Italy)

13331-58 • 4:30 PM - 4:50 PM
Label-free metabolic nanoscopy by ultrasensitive reweighted visible stimulated Raman scattering
Author(s): **Haonan Lin, Ji-Xin Cheng,** Boston Univ. (United States)

13331-59 • 4:50 PM - 5:10 PM
Advanced hyperspectral SRS imaging for studying epithelial-mesenchymal transition in cancer metastasis
Author(s): **Thomas Wuerthwein**, **Anke Bonse**, **Ramon Droop**, **Felix Neumann,** Refined Laser Systems GmbH (Germany); **Eva Doepker**, **Jürgen Schnekenburger**, **Björn Kemper,** Univ. Münster (Germany); **Tim Hellwig, Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

13331-60 • 5:10 PM - 5:30 PM
Label-free 3-D molecular imaging of living tissues using Raman spectral projection tomography *(Invited Paper)*
Author(s): **Elzbieta Stepula,** Hochschule Bielefeld – University of Applied Sciences and Arts (HSBI) (Germany); **Anders R. Walther**, **Magnus Jensen,** Univ. of Southern Denmark (Denmark); **Dev R. Mehrotra,** Department of Mechanical Engineering, Boston University (United States); **Mu H. Yuan,** Centre for Craniofacial & Regenerative Biology, King's College London (United Kingdom); **Simon Vilms Pedersen,** Univ. of Southern Denmark (Denmark); **Vishal Kumar,** Centre for Craniofacial & Regenerative Biology (United Kingdom); **Eileen Gentleman,** Department of Biomedical Sciences, University of Lausanne (Switzerland); **Mike Albro,** Department of Mechanical Engineering, Boston University (United States); **Martin A. B. Hedegaard,** Univ. of Southern Denmark (Denmark); **Mads S. Bergholt,** Centre for Craniofacial & Regenerative Biology (United Kingdom)

13331-57 • 5:30 PM - 5:50 PM
Rapid and accurate detection of food adulterant employing surface enhanced Raman spectroscopy (SERS) based sensitive optical sensor
Author(s): **Sibashish Chakraborty, Satish K. Dubey,** Indian Institute of Technology Delhi (India)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13331-54
Comparison of machine learning models for label-free detection of viruses via surface-enhanced Raman spectroscopy
Author(s): **RyeAnne Ricker,** The George Washington Univ. (United States), National Institute of Allergy and Infectious Diseases (United States); **Nestor Perea**, **Yin-Ting Yeh**, **Mauricio Terrones,** The Pennsylvania State Univ. (United States); **Steven Jacobson,** National Institute of Neurological Disorders and Stroke (United States); **Elodie Ghedin,** National Institute of Allergy and Infectious Diseases (United States); **Murray Loew,** The George Washington Univ. (United States)

CONFERENCE 13332

Advanced Chemical Microscopy for Life Science and Translational Medicine 2025

25 - 27 January 2025 | Moscone South, Room 314 (Level 3)

Conference Chair(s): **Ji-Xin Cheng,** Boston Univ. (United States); **Wei Min,** Columbia Univ. (United States); **Garth J. Simpson,** Purdue Univ. (United States)

Program Committee: **Rohit Bhargava**, **Stephen A. Boppart,** Univ. of Illinois (United States); **Sophie Brasselet,** Institut Fresnel (France); **Minhaeng Cho,** Korea Univ. (Korea, Republic of); **Marcus T. Cicerone,** Georgia Institute of Technology (United States); **Hilton B. de Aguiar,** Lab. Kastler Brossel (France); **Conor L. Evans,** Wellman Ctr. for Photomedicine (United States); **Hanieh Fattahi,** Max-Planck-Institut für Quantenoptik (Germany); **Dan Fu,** Univ. of Washington (United States); **Katsumasa Fujita,** Osaka Univ. (Japan); **Wei E. Huang,** Univ. of Oxford (United Kingdom); **Zhiwei Huang,** National Univ. of Singapore (Singapore); **Minbiao Ji,** Fudan Univ. (China); **Julian Moger,** Univ. of Exeter (United Kingdom); **Yasuyuki Ozeki,** The Univ. of Tokyo (Japan); **Sapun H. Parekh,** The Univ. of Texas at Austin (United States); **Isaac J. Pence,** UT Southwestern Medical Center (United States); **Ammasi Periasamy,** Univ. of Virginia (United States); **Miguel A. Pleitez,** Helmholtz Zentrum München GmbH (Germany); **Dario Polli,** Politecnico di Milano (Italy); **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Eric O. Potma,** Univ. of California, Irvine (United States); **Rohith K. Reddy,** Univ. of Houston (United States); **Hervé Rigneault,** Institut Fresnel (France); **Lingyan Shi,** Univ. of California, San Diego (United States); **Chi-Kuang Sun,** National Taiwan Univ. (Taiwan); **Meng Wang,** HHMI Janelia Research Campus (United States); **Warren S. Warren,** Duke Univ. (United States); **Jesse W. Wilson,** Colorado State Univ. (United States); **Xiaoliang Sunney Xie,** Peking Univ. (China); **Xiaoji G. Xu,** Lehigh Univ. (United States); **Shuhua Yue,** Beihang Univ. (China)

Saturday 25 January 2025

SESSION 1: NOVEL CHEMICAL IMAGING MODALITIES I

25 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Ji-Xin Cheng**, Boston Univ. (United States)

13332-1 • 8:00 AM - 8:30 AM
Raman microscopy of rapidly frozen biological samples *(Invited Paper)*
Author(s): **Katsumasa Fujita,** Osaka Univ. (Japan)

13332-3 • 8:30 AM - 9:00 AM
Emerging nanophotonic platforms for molecular sensing, sequencing, and synthesis *(Invited Paper)*
Author(s): **Jennifer A. Dionne,** Stanford Univ. (United States)

13332-4 • 9:00 AM - 9:15 AM
Label-free hyperspectral 3D fieldoscopy with attosecond precision
Author(s): **Andreas Herbst**, **Anchit Srivastava**, **Kilian Scheffter**, **Soyeon Jun,** Max-Planck-Institut für die Physik des Lichts (Germany); **Nicolo Petrini**, **Andrea Rubino**, **Ilka Kriegel,** Istituto Italiano di Tecnologia (Italy); **Hanieh Fattahi,** Max-Planck-Institut für die Physik des Lichts (Germany)

13332-5 • 9:15 AM - 9:30 AM
Stimulated Raman photothermal fluorescence microscopy
Author(s): **Jianpeng Ao**, **Yifan Zhu, Ji-Xin Cheng,** Boston Univ. (United States)

13332-6 • 9:30 AM - 9:45 AM
Stimulated Raman photothermal nanoscopy
Author(s): **Haonan Lin, Ji-Xin Cheng,** Boston Univ. (United States)

13332-2 • 9:45 AM - 10:15 AM
Label-free detection of protein-ligand binding in biological liquids via UV transient absorption *(Invited Paper)*
Author(s): **Pu Wang,** Beihang Univ. (China)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: VIBRATIONAL PHOTOTHERMAL MICROSCOPY INNOVATIONS I

25 January 2025 • 10:45 AM - 12:30 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Caitlin M. Davis**, Yale Univ. (United States)

13332-7 • 10:45 AM - 11:15 AM
Positive-contrast mid-infrared excitation and optoacoustic/optothermal detection enables label-free live-cell chemical microscopy and non-invasive biosensing in vivo *(Invited Paper)*
Author(s): **Miguel A. Pleitez,** Technische Univ. München (Germany)

13332-8 • 11:15 AM - 11:45 AM
Revisiting intracellular thermal dynamics with mid-infrared photothermal microscopy *(Invited Paper)*
Author(s): **Takuro Ideguchi,** The Univ. of Tokyo (Japan)

13332-9 • 11:45 AM - 12:00 PM
Metasurface-enabled mid-IR imaging of de novo lipogenesis in adipocytes
Author(s): **Steven H. Huang, Gennady Shvets,** Cornell Univ. (United States)

13332-10 • 12:00 PM - 12:15 PM
Ultrasensitive in-vivo infrared spectroscopic imaging via oblique photothermal microscopy
Author(s): **Mingsheng Li**, **Sheng Xiao**, **Hongli Ni**, **Guangrui Ding**, **Yuhao Yuan**, **Carolyn Marar**, **Jerome Mertz, Ji-Xin Cheng,** Boston Univ. (United States)

13332-11 • 12:15 PM - 12:30 PM **(CANCELLED)**
Label-free infrared imaging for cancer diagnostics in computational pathology
Author(s): **Frederik Großerüschkamp, Klaus Gerwert,** Ruhr-Univ. Bochum (Germany)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 3: LIFE SCIENCE AND BIOMEDICAL APPLICATIONS I

25 January 2025 • 2:00 PM - 3:45 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Meng C. Wang**, Howard Hughes Medical Institute (United States)

13332-12 • 2:00 PM - 2:30 PM
Quantitative chemical Imaging reveals single-cell drug uptake and drug response *(Invited Paper)*
Author(s): **Dan Fu,** Univ. of Washington (United States)

13332-13 • 2:30 PM - 3:00 PM
Individual amyloids resolved directly in their native environment resolved by optical photothermal infrared microscopy *(Invited Paper)*
Author(s): **Oxana I. Klementieva,** Lund Univ. (Sweden)

13332-14 • 3:00 PM - 3:15 PM
Label-free assessment to myeloma therapy by protein structure sensitive mid-infrared optoacoustic microscopy
Author(s): **Francesca Gasparin,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany); **Marlene R. Tietje**, **Eslam Katab,** Klinikum der Univ. München (Germany), TranslaTUM (Germany); **Aizada Nurdinova**, **Tao Yuan**, **Andriy Chmyrov**, **Nasire Uluc**, **Dominik Jüstel,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany); **Florian Bassermann,** Klinikum der Univ. München (Germany), TranslaTUM (Germany), Deutsches Krebsforschungszentrum (Germany); **Vasilis Ntziachristos,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany), Deutsches Zentrum für Herz-Kreislauf-Forschung e. V. (Germany); **Miguel Pleitez,** Technische Univ. München (Germany)

13332-15 • 3:15 PM - 3:30 PM
SIP-SRS imaging of cell wall synthesis identifies a synergy between Micafungin and Amphotericin B
Author(s): **Meng Zhang**, **Yuewei Zhan**, **Haonan Lin,** Boston Univ. (United States); **Mohamed N. Seleem,** Virginia Polytechnic Institute and State Univ. (United States); **Michael Mansour,** Harvard Medical School (United States); **Ji-Xin Cheng,** Boston Univ. (United States)

13332-16 • 3:30 PM - 3:45 PM
Benchtop transmission-IR imaging of live cells
Author(s): **Young Jong Lee**, **Yow-Ren Chang, Charles Camp,** National Institute of Standards and Technology (United States)

Coffee Break 3:45 PM - 4:15 PM

SESSION 4: CLINICAL TRANSLATION AND COMMERCIALIZATION I

25 January 2025 • 4:15 PM - 6:00 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Delong Zhang**, Zhejiang Univ. (China)

13332-17 • 4:15 PM - 4:45 PM
Tracking climate change with FL-PTIR of Arctic sea ice diatoms *(Invited Paper)*
Author(s): **Kathleen M. Gough**, **Rinuk 'Limurn,** Univ. of Manitoba (Canada); **Craig B. Prater,** Photothermal Spectroscopy Corp. (United States)

13332-18 • 4:45 PM - 5:15 PM
Optimization of surface enhanced spatially offset Raman spectroscopy for applications in pre-clinical cancer imaging *(Invited Paper)*
Author(s): **Fay Nicolson**, **Bohdan Andreiuk,** Dana-Farber Cancer Institute (United States); **Eunah Lee**, **Andrew Whitley**, **Bridget O'Donnell,** HORIBA Scientific (United States); **Samuel Mabbott,** Texas A&M Univ. (United States); **Scott Rudder,** OptoSigma Corp. (United States); **Kevin Haigis,** Dana-Farber Cancer Institute (United States)

13332-19 • 5:15 PM - 5:30 PM
Machine learning assisted midinfrared spectrochemical fibrillar collagen imaging in clinical tissues
Author(s): **Wihan Adi**, **Bryan E. Rubio Perez**, **Yuming Liu**, **Sydney Runkle**, **Kevin W. Eliceiri, Filiz Yesilkoy,** Univ. of Wisconsin-Madison (United States)

13332-20 • 5:30 PM - 5:45 PM
Label-free visualization of biological structures in lung and parathyroid biopsies using higher harmonic generation microscopy
Author(s): **Sylvia Spies,** Vrije Univ. Amsterdam (Netherlands); **Pedro M. Rodriguez Schaap**, **Stijn van den Bosch,** Amsterdam UMC (Netherlands); **Frank van Mourik,** Flash Pathology B.V. (Netherlands); **Els J. M. Nieveen van Dijkum**, **Anton F. Engelsman**, **Johannes M. A. Daniels**, **Peter I. Bonta**, **Jouke T. Annema, Marie Louise Groot,** Amsterdam UMC (Netherlands)

13332-21 • 5:45 PM - 6:00 PM
Multispectral SRS imaging and ultra-sensitive detection in the fingerprint region and on Raman labels with a new picosecond light source
Author(s): **Ingo Rimke,** APE Angewandte Physik & Elektronik GmbH (Germany); **Lenny Reinkensmeier,** Institut für Nanophotonik Göttingen e.V. (Germany); **Gero Stibenz,** APE Angewandte Physik & Elektronik GmbH (Germany); **Rene Siegmund,** Institut für Nanophotonik Göttingen e.V. (Germany); **Peter Trabs**, **Stefan Popien,** APE Angewandte Physik & Elektronik GmbH (Germany); **Sandro Heuke,** Aix Marseille Univ. (France), Institut Fresnel (France); **Alexander Egner,** Institut für Nanophotonik Göttingen e.V. (Germany)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: COHERENT RAMAN MICROSCOPY INNOVATIONS I

26 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Shi-Wei Chu**, National Taiwan Univ. (Taiwan)

13332-22 • 8:00 AM - 8:30 AM
Stimulated Raman scattering tomography enables label-free biomolecular and functional 3D imaging of live cells and tissue *(Invited Paper)*
Author(s): **Zhiwei Huang,** National Univ. of Singapore (Singapore)

13332-43 • 8:30 AM - 9:00 AM
Transient stimulated Raman scattering spectroscopy and imaging *(Invited Paper)*
Author(s): **Hanqing Xiong**, **Qiaozhi Yu**, **Jin Guo, Haojie Zhang,** Peking Univ. (China)

13332-23 • 9:00 AM - 9:15 AM
Waveguide-based optical parametric oscillator for coherent Raman scattering spectroscopy and microscopy
Author(s): **Kristin Wallmeier**, **Ming Gao, Carsten Fallnich,** Univ. Münster (Germany)

13332-24 • 9:15 AM - 9:30 AM
High-bandwidth noise-reduced loss-corrected autobalanced detection for stimulated Raman scattering microscopy
Author(s): **Nick S. Lemberger**, **Kristin Wallmeier, Carsten Fallnich,** Univ. Münster (Germany)

13332-25 • 9:30 AM - 9:45 AM
Chirp modulation stimulated Raman scattering microscopy
Author(s): **Adrian F. Pegoraro,** National Research Council of Canada (Canada); **Albert Stolow,** Univ. of Ottawa (Canada)

13332-26 • 9:45 AM - 10:00 AM
Label-free super-resolution stimulated Raman scattering using 4Pi-SRS
Author(s): **Jonathan Kim**, **Chisa Zensho, Dan Fu,** Univ. of Washington (United States)

13332-27 • 10:00 AM - 10:15 AM
Highly sensitive CARS imaging with extensive chirped high-energy pulses
Author(s): **Guangrui Ding**, **Yifan Zhu, Ji-Xin Cheng,** Boston Univ. (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 6: CLINICAL TRANSLATION AND COMMERCIALIZATION II

26 January 2025 • 10:45 AM - 12:30 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Lu Wei**, Caltech (United States)

13332-28 • 10:45 AM - 11:15 AM
Raman microscopy tools to augment tissue structure - function analysis *(Invited Paper)*
Author(s): **Isaac J. Pence,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

13332-29 • 11:15 AM - 11:45 AM
High-speed volumetric multiphoton microscopy with deep-learning contrast enhancement for brain function investigation *(Invited Paper)*
Author(s): **Shi-Wei Chu,** National Taiwan Univ. (Taiwan)

13332-30 • 11:45 AM - 12:00 PM
Translational efforts for digital chemical pathology with infrared laser scanning microscopy
Author(s): **Kevin L. Yeh**, **Kianoush Falahkheirkhah**, **Yen-Ting Liu**, **Ruo-Jing Ho**, **Ishaan Sharma**, **Matthew P. Confer**, **Andres C. Orr**, **Mykolas Tamonis,** Univ. of Illinois (United States); **Rohit Bhargava,** Univ. of Illinois (United States), Cancer Ctr. at Illinois (United States), CZ Biohub Chicago (United States)

13332-31 • 12:00 PM - 12:15 PM
Advances in biopharmaceutical sub-visible analysis through submicron IR (O-PTIR) micro-spectroscopy
Author(s): **Mustafa Kansiz,** Photothermal Spectroscopy Corp. (United States); **Kevin Dahl,** Particlese LLC (United States)

13332-32 • 12:15 PM - 12:30 PM
Comprehensive digital chemical pathology using stimulated Raman scattering
Author(s): **Kianoush Falahkheirkhah**, **Sudipta Mukherjee**, **Kevin Yeh,** Univ. of Illinois (United States); **John Cheville,** Mayo Clinic (United States); **Rohit Bhargava,** Univ. of Illinois (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 7: VIBRATIONAL PHOTOTHERMAL MICROSCOPY INNOVATIONS II

26 January 2025 • 2:00 PM - 3:45 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Kathleen M. Gough**, Univ. of Manitoba (Canada)

13332-33 • 2:00 PM - 2:30 PM
Functional bond-selective microscopy at the single molecule regime *(Invited Paper)*
Author(s): **Lu Wei,** Caltech (United States)

13332-34 • 2:30 PM - 3:00 PM
Optical photothermal infrared imaging using metabolic probes in live biological systems *(Invited Paper)*
Author(s): **Sydney O. Shuster**, **Anna E. Curtis, Caitlin M. Davis,** Yale Univ. (United States)

13332-35 • 3:00 PM - 3:15 PM
High-resolution 3D imaging with wide-field mid-infrared photothermal microscopy
Author(s): **Masato Fukushima**, **Keiichiro Toda, Takuro Ideguchi,** The Univ. of Tokyo (Japan)

13332-36 • 3:15 PM - 3:30 PM
5D imaging of living cells with mid-infrared photothermal phase tomography
Author(s): **Danchen Jia**, **Dashan Dong**, **Tongyu Li**, **Jiabei Zhu**, **Haonan Zong**, **Xinyan Teng**, **Meng Zhang**, **Lei Tian, Ji-Xin Cheng,** Boston Univ. (United States)

13332-37 • 3:30 PM - 3:45 PM
Room-temperature single-molecule infrared imaging and spectroscopy through bond-selective fluorescence
Author(s): **Haomin Wang, Lu Wei,** Caltech (United States)

Coffee Break 3:45 PM - 4:15 PM

SESSION 8: LIFE SCIENCE AND BIOMEDICAL APPLICATIONS II

26 January 2025 • 4:15 PM - 6:00 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Lingyan Shi**, Univ. of California, San Diego (United States)

13332-49 • 4:15 PM - 4:45 PM
Chemical imaging of organelle heterogeneity and dynamics *(Invited Paper)*
Author(s): **Meng C. Wang,** Howard Hughes Medical Institute (United States)

13332-40 • 4:45 PM - 5:00 PM
Detecting early-stage apoptosis using stimulated Raman scattering microscopy
Author(s): **Shivam Mahapatra,** Purdue Univ. (United States); **Boyong Wan**, **Justin P. Lomont,** Merck & Co., Inc. (United States); **Karsten Mohn, Chi Zhang,** Purdue Univ. (United States)

13332-39 • 5:00 PM - 5:30 PM
Lipid profiling at submicron resolution by hyperspectral stimulated Raman imaging *(Invited Paper)*
Author(s): **Yihui Zhou**, **Delong Zhang, Hyeon Jeong Lee,** Zhejiang Univ. (China)

13332-41 • 5:30 PM - 5:45 PM
Assessing exogenous fatty acid and glucose response in SKOV-3 and HeLa cells using stimulated Raman scattering microscopy with deuterium labeling
Author(s): **Ryan Pierson, Fake Lu,** Binghamton Univ. (United States)

13332-42 • 5:45 PM - 6:00 PM
Hypoxia-induced metabolic and cytoskeletal changes in cancer cells revealed by chemical imaging
Author(s): **Gil Gonzalez**, **Shivam Mahapatra**, **Ezinne Osuji**, **Natalie Fiur**, **Matthew G. Clark, Chi Zhang,** Purdue Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 9: COHERENT RAMAN MICROSCOPY INNOVATIONS II

27 January 2025 • 9:00 AM - 10:00 AM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Isaac J. Pence**, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

13332-44 • 9:00 AM - 9:15 AM
Who wins in sensitivity? Spontaneous vs. stimulated Raman scattering spectroscopy in aqueous environments
Author(s): **Karsten J. Mohn**, **Bin Dong**, **Shivam Mahapatra**, **Ishaan K. Singh,** Purdue Univ. (United States); **Justin P. Lomont**, **Boyong Wan,** Merck & Co., Inc. (United States); **Chi Zhang,** Purdue Univ. (United States)

13332-45 • 9:15 AM - 9:30 AM
Modulation and lock-in amplifier free coherent Raman spectroscopy
Author(s): **David R. Smith, Randy A. Bartels,** Morgridge Institute for Research (United States)

13332-46 • 9:30 AM - 9:45 AM
Investigating hydrogen bond networks via time-resolved coherent anti-Stokes Raman scattering spectroscopy
Author(s): **Delong Zhang,** Zhejiang Univ. (China)

13332-47 • 9:45 AM - 10:00 AM
Modulator-free stimulated Raman scattering based on a novel fiber laser
Author(s): **Tim Hellwig**, **Daniel Lutscher**, **Sven Dobner**, **Niklas M. Lüpken, Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: LIFE SCIENCE AND BIOMEDICAL APPLICATIONS III

27 January 2025 • 10:30 AM - 12:15 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Miguel A. Pleitez**, Helmholtz Zentrum München GmbH (Germany)

13332-38 • 10:30 AM - 11:00 AM
Metabolic nanoscopy in aging and diseases *(Invited Paper)*
Author(s): **Lingyan Shi,** Univ. of California, San Diego (United States)

13332-50 • 11:00 AM - 11:15 AM
Label-free mid-infrared photothermal microscopy for imaging of neural cells
Author(s): **Panagis Samolis**, **Bahar Durgun**, **Edward Wei**, **Emily Kuang,** Boston Univ. (United States); **Chiara Lazzarini**, **Tamara Posati,** Istituto per la Sintesi Organica e la Fotoreattività (Italy); **Aikaterini Konstantoulaki,** Univ. degli Studi di Bologna (Italy); **Giorgia Conte,** Istituto per la Sintesi Organica e la Fotoreattività (Italy); **Barbara Barile**, **Grazia Paola Nicchia,** Univ. degli Studi di Bari Aldo Moro (Italy); **Valentina Benfenati,** Istituto per la Sintesi Organica e la Fotoreattività (Italy); **Michelle Y. Sander,** Boston Univ. (United States)

13332-51 • 11:15 AM - 11:30 AM
Advancements in photothermal mid-infrared spectroscopic imaging for biomedical diagnostics
Author(s): **Chalapathi Gajjela**, **Ragib Ishrak**, **Xinyu Wu**, **Reza Reihani**, **David Mayerich, Rohith K. Reddy,** Univ. of Houston (United States)

13332-52 • 11:30 AM - 11:45 AM
Assessing drug uptake and response differences in 2D and 3D cellular environments using stimulated Raman scattering microscopy
Author(s): **Xi Xu**, **Rui Sun**, **Ryan Owens**, **Kailun Hu, Dan Fu,** Univ. of Washington (United States)

13332-53 • 11:45 AM - 12:00 PM
High-speed imaging of epithelial-mesenchymal transition in cancer cells by stimulated Raman microscopy
Author(s): **Anke Bonse**, **Thomas Wuerthwein**, **Ramon Droop**, **Felix Neumann,** Refined Laser Systems GmbH (Germany); **Eva Doepker**, **Juergen Schnekenburger**, **Bjoern Kemper,** Univ. Münster (Germany); **Tim Hellwig, Maximilian Brinkmann,** Refined Laser Systems GmbH (Germany)

13332-54 • 12:00 PM - 12:15 PM
Multiplex stimulated Raman histology: a route towards the application to the clinical routine
Author(s): **Eleonora Erriquez**, **Francesco Crisafi**, **Andrea Ragni,** Cambridge Raman Imaging S.r.l. (Italy); **Federico Monti,** Cambridge Raman Imaging Srl (Italy); **Gabriele Di Noia,** Cambridge Raman Imaging S.r.l. (Italy); **Mujeeb Rahman,** Cambridge Raman Imaging Ltd. (United Kingdom); **Tiago Azevedo**, **Moe Vali,** Univ. of Cambridge (United Kingdom); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **David Pertzborn**, **Daniela Pelzel**, **Ulrike Weyer**, **Anna Xylander**, **Anna Muehlig**, **Orlando Guntinas-Lichius,** Universitätsklinikum Jena (Germany); **Pietro Liò,** Univ. of Cambridge (United Kingdom); **Giulio Cerullo,** Politecnico di Milano (Italy); **Matteo Negro,** Cambridge Raman Imaging S.r.l. (Italy)

Lunch Break 12:15 PM - 1:30 PM

SESSION 11: NOVEL CHEMICAL IMAGING MODALITIES II

27 January 2025 • 1:30 PM - 3:30 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Garth J. Simpson**, Purdue Univ. (United States)

13332-55 • 1:30 PM - 2:00 PM
Incoherent microscopy and spectroscopy of biological assemblies *(Invited Paper)*
Author(s): **Garth J. Simpson,** Purdue Univ. (United States)

13332-56 • 2:00 PM - 2:30 PM
Macroscopic Raman and fluorescence imaging in the shortwave infrared (SWIR) *(Invited Paper)*
Author(s): **Oliver Bruns,** Nationales Centrum für Tumorerkrankungen Dresden (Germany)

13332-57 • 2:30 PM - 2:45 PM
Multimodal field-resolved spectroscopy at near petahertz frequencies
Author(s): **Kilian Scheffter**, **Anchit Srivastava**, **Andreas Herbst**, **Soyeon Jun, Hanieh Fattahi,** Max-Planck-Institut für die Physik des Lichts (Germany)

13332-58 • 2:45 PM - 3:00 PM
Widefield temporal shearing pump-probe microscopy with a common-path, dispersion free interferometer
Author(s): **Matthew Sheinman**, **Bingying Zhao**, **Chris McMahon**, **Pajo Vujkovic-Cvijin**, **Shyamsunder Erramilli**, **Lawrence Ziegler**, **Mi K. Hong, Jerome Mertz,** Boston Univ. (United States)

13332-59 • 3:00 PM - 3:15 PM
Bayesian raster-computed optoacoustic microscopy (BayROM) enables fast, label-free hyperspectral imaging
Author(s): **Constantin Berger**, **Myeongseop Kim**, **Lukas Scheel-Platz**, **Vasilis Ntziachristos**, **Dominik Jüstel, Miguel A. Pleitez,** Technische Univ. München (Germany), Helmholtz Zentrum München GmbH (Germany)

13332-60 • 3:15 PM - 3:30 PM
Label free QCL-based mid-IR reflection microspectroscopy for molecular imaging of biofilms
Author(s): **Bei Shi Lee,** Univ. Zürich (Switzerland); **Matthias Godejohann,** MG Optical Solutions GmbH (Germany); **Mengyang Liu**, **Rainer Leitgeb**, **Wolfgang Drexler,** Medizinische Univ. Wien (Austria); **Michael Berney,** Univ. Zürich (Switzerland); **Richard Haindl,** Medizinische Univ. Wien (Austria)

Coffee Break 3:30 PM - 4:00 PM

SESSION 12: DATA SCIENCE

27 January 2025 • 4:00 PM - 5:30 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Haonan Lin**, Boston Univ. (United States)

13332-61 • 4:00 PM - 4:15 PM
Programmable hyperspectral coherent anti-Stokes Raman scattering microscopy via ultrafast pulse shaping
Author(s): **Janet E. Sorrells**, **Lingxiao Yang**, **Rishyashring R. Iyer**, **Carlos A. Renteria**, **Eric J. Chaney, Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States)

13332-62 • 4:15 PM - 4:30 PM
Single-pixel field-resolved coherent anti-Stokes Raman scattering with three-color excitation
Author(s): **Shupeng Zhao**, **Lea Chibani,** Ecole normale supérieure - CNRS (France); **Edward Chandler,** Washington Univ. in St. Louis (United States); **Jianqi Hu**, **Lorenzo Valzania,** Ecole normale supérieure - CNRS (France); **Ulugbek S. Kamilov,** Washington Univ. in St. Louis (United States); **Hilton Barbosa de Aguiar,** Ecole normale supérieure - CNRS (France)

13332-63 • 4:30 PM - 4:45 PM
Numerical analysis of the influence of thermal diffusion on the performance of mid-infrared photothermal microscopy techniques: point scanning versus wide-field
Author(s): **Keiichiro Toda, Takuro Ideguchi,** The Univ. of Tokyo (Japan)

13332-64 • 4:45 PM - 5:00 PM
Nonresonant background removal in broadband CARS microspectroscopy using deep learning algorithms
Author(s): **Salvatore Sorrentino,** Politecnico di Milano (Italy); **Federico Vernuccio,** Politecnico di Milano (Italy), Institut Fresnel (France); **Elia Broggio,** Datrix S.p.A. (Italy); **Arianna Bresci,** Politecnico di Milano (Italy), Massachusetts Institute of Technology (United States); **Rajendhar Junjuri,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Thomas Bocklitz,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Matteo Bregonzio,** Datrix S.p.A. (Italy); **Francesco Manetti**, **Giulio Cerullo,** Politecnico di Milano (Italy); **Hervé Rigneault,** Institut Fresnel (France); **Dario Polli,** Politecnico di Milano (Italy)

13332-65 • 5:00 PM - 5:15 PM
Comparative numerical analysis of the imaging performance of mid-infrared photothermal and coherent Raman scattering microscopy
Author(s): **Keiichiro Toda, Takuro Ideguchi,** The Univ. of Tokyo (Japan)

13332-66 • 5:15 PM - 5:30 PM
Light waves, hidden clues: how spectroscopy and A.I. can detect pathogens faster
Author(s): **Simi A. George, Mathew Theurer,** HyperSpectral Corp. (United States)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13332-68 • 5:30 PM - 7:00 PM
Integrating coherent Raman scattering microscopy with mass spectrometry imaging to enable spatial mapping of metabolic alterations in pancreatic cancer
Author(s): **Nina Ravoet**, **Thomas Vanhemel**, **Jakub Idkowiak**, **Tania Roskams**, **Baki Topal**, **Johannes Swinnen, Bart De Moor,** KU Leuven (Belgium)

13332-69 • 5:30 PM - 7:00 PM
Tracer Raman-driven mass spectrometry imaging (TRaMaSI): a new platform for ex-vivo tracing of nutritional and biochemical trajectories
Author(s): **Marco Giampà,** KU Leuven (Belgium), VIB (Belgium); **Bart Ghesquière,** KU Leuven (Belgium); **Shauni Loopmans, Dries Verdegem,** KU Leuven (Belgium), VIB (Belgium)

13332-70 • 5:30 PM - 7:00 PM
Label-free organelle image prediction using deep learning and largescale hyperspectral stimulated Raman imaging
Author(s): **Yang Ma**, **Takaha Mizuguchi**, **Spencer J. Spratt, Yasuyuki Ozeki,** The Univ. of Tokyo (Japan)

13332-71 • 5:30 PM - 7:00 PM
Advancing Raman spectroscopy-based metabolomics: lysis-free approach for monitoring nucleobase metabolism
Author(s): **Jiro Karlo, Surya Pratap Singh,** Indian Institute of Technology Dharwad (India)

13332-72 • 5:30 PM - 7:00 PM
A signal processing and machine learning pipeline for the analysis of spectral fluorescence data from stained brain tissue samples in Alzheimer's disease and normal aging
Author(s): **Anastasiia Stepanchuk,** Hotchkiss Brain Institute, Univ. of Calgary (Canada); **Jeffrey T. Joseph,** Univ. of Calgary (Canada); **Peter K. Stys,** Hotchkiss Brain Institute, Univ. of Calgary (Canada)

13332-73 • 5:30 PM - 7:00 PM
Amplitude-to-phase detection scheme for improved signal-to-noise ratio in stimulated Raman scattering
Author(s): **Nick S. Lemberger**, **Kristin Wallmeier, Carsten Fallnich,** Univ. Münster (Germany)

13332-74 • 5:30 PM - 7:00 PM
Low frequency impulsive Raman imaging robust to optical scattering
Author(s): **David R. Smith,** Morgridge Institute for Research (United States); **Randy A. Bartels,** Morgridge Institute for Research (United States); **Jesse W. Wilson,** Colorado State Univ. (United States); **Siddarth Shivkumar, Herve Rigneault,** Institut Fresnel, Aix Marseille Univ. (France)

13332-75 • 5:30 PM - 7:00 PM
Suppression cross-phase modulation in SRS imaging via core-shell balanced detection
Author(s): **Jianpeng Ao**, **Yifan Zhu**, **Haonan Lin, Ji-Xin Cheng,** Boston Univ. (United States)

13332-76 • 5:30 PM - 7:00 PM
Perturbation stimulated Raman scattering microscopy
Author(s): **Karsten J. Mohn**, **Matthew G. Clark**, **Bin Dong, Chi Zhang,** Purdue Univ. (United States)

13332-77 • 5:30 PM - 7:00 PM
Optical imaging and manipulation of biochemical processes in live biological samples
Author(s): **Chi Zhang**, **Bin Dong**, **Shivam Mahapatra**, **Seohee Ma, Matthew G. Clark,** Purdue Univ. (United States)

13332-78 • 5:30 PM - 7:00 PM
Advances in label-free chemical imaging using stimulated Raman scattering microscopy
Author(s): **Volker Schweikhard,** Leica Microsystems CMS GmbH (Germany)

13332-79 • 5:30 PM - 7:00 PM
Interferometric Infrared Sources in Fluorescence-Detected Photothermal Microscopy
Author(s): **Gwendylan Turner**, **Aleksandr Razumtcev,** Purdue Univ. (United States), Lawrence Berkeley National Lab. (United States); **Daniel I. Herman,** IRsweep AG (Switzerland); **Minghe Li,** Purdue Univ. (United States); **Sergey Zayats,** Photothermal Spectroscopy Corp. (United States); **Ferenc Borondics,** Synchrotron SOLEIL (France); **Aris Polyzos,** Lawrence Berkeley National Lab. (United States); **Ziyi Cao**, **Jiayue Rong**, **Charles A. Bouman**, **Gregery Buzzard,** Purdue Univ. (United States); **Hans Bechtel,** Lawrence Berkeley National Lab. (United States); **Garth J. Simpson,** Purdue Univ. (United States)

CONFERENCE 13333

Computational Optical Imaging and Artificial Intelligence in Biomedical Sciences II

25 - 27 January 2025 | Moscone South, Room 306 (Level 3)

Conference Chair(s): **Liang Gao,** UCLA Samueli School of Engineering (United States); **Guoan Zheng,** Univ. of Connecticut (United States); **Seung Ah Lee,** Yonsei Univ. (Korea, Republic of)

Program Committee: **Nicholas J. Durr,** Johns Hopkins Univ. (United States); **Roarke W. Horstmeyer,** Duke Univ. (United States); **Shu Jia,** Georgia Institute of Technology (United States); **Jinyang Liang,** Institut National de la Recherche Scientifique (Canada); **Lars Loetgering,** Carl Zeiss Microscopy GmbH (Germany); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States); **Lei Tian,** Boston Univ. (United States); **Laura Waller,** Univ. of California, Berkeley (United States); **Jiamin Wu,** Tsinghua Univ. (China); **Sixian You,** Massachusetts Institute of Technology (United States)

Saturday 25 January 2025

SESSION 1: COMPUTATIONAL 3D IMAGING I

25 January 2025 • 8:15 AM - 10:05 AM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Guoan Zheng**, Univ. of Connecticut (United States)

13333-1 • 8:15 AM - 8:40 AM
Computational adaptive optics for fluorescence microscopy *(Invited Paper)*
Author(s): **Patrick J. La Rivière,** The Univ. of Chicago (United States); **Courtney Johnson**, **Magdalena Schneider,** Janelia Research Campus, Howard Hughes Medical Institute (United States); **Joren Husic,** The Univ. of Chicago (United States); **Min Guo,** Zhejiang Univ. (China); **Hari Shroff,** Janelia Research Campus, Howard Hughes Medical Institute (United States)

13333-2 • 8:40 AM - 9:05 AM
Deep learning and wavefront shaping in localization microscopy *(Invited Paper)*
Author(s): **Yoav Shechtman,** Technion-Israel Institute of Technology (Israel)

13333-3 • 9:05 AM - 9:25 AM
Single-shot 3D imaging with QuadraPol point spread function and neural fields
Author(s): **Haowen Zhou**, **Oumeng Zhang,** Caltech (United States); **Brandon Y. Feng,** Massachusetts Institute of Technology (United States); **Elin Larsson**, **Reinaldo E. Alcalde**, **Siyuan Yin**, **Catherine Deng, Changhuei Yang,** Caltech (United States)

13333-5 • 9:25 AM - 9:45 AM
Fluorescent diffraction tomography using explicit neural fields
Author(s): **Renzhi He**, **Yucheng Li, Yi Xue,** Univ. of California, Davis (United States)

13333-4 • 9:45 AM - 10:05 AM
Large field of view and isotropic light sheet microscopy with aberration-free tunable foci
Author(s): **Yue Wang,** Peking Univ. (China); **Kebin Shi,** Peking Univ (China)

Coffee Break 10:05 AM - 10:35 AM

SESSION 2: COMPUTATIONAL 3D IMAGING II

25 January 2025 • 10:35 AM - 12:30 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Jinyang Liang**, Institut National de la Recherche Scientifique (Canada)

13333-6 • 10:35 AM - 11:00 AM
Polarization-sensitive intensity diffraction tomography for three-dimensional anisotropy imaging of multiple-scattering objects *(Invited Paper)*

Author(s): **Chulmin Joo**, **Seungri Song**, **Taegyun Moon**, **Woovin Kim, Baekcheon Seong,** Yonsei Univ. (Korea, Republic of)

13333-7 • 11:00 AM - 11:25 AM
Computational bio-imaging via inverse scattering *(Invited Paper)*
Author(s): **Shwetadwip Chowdhury,** The Univ. of Texas at Austin (United States)

13333-8 • 11:25 AM - 11:50 AM
Computational multimodal imaging with fluorescence diffraction tomography (FDT) *(Invited Paper)*
Author(s): **Yi Xue,** Univ. of California, Davis (United States)

13333-9 • 11:50 AM - 12:10 PM
Differential structured illumination microscopy (dSIM) for computationally efficient, large field-of-view, high resolution 3D computational phase imaging
Author(s): **Alex C. Matlock,** Massachusetts Institute of Technology (United States); **Zahid Yaqoob,** Massachusetts Institute of Technology (United States), Boston Univ. (United States); **Peter T. C. So,** Massachusetts Institute of Technology (United States)

13333-10 • 12:10 PM - 12:30 PM
High-speed and 3D fluorescence lifetime imaging microscopy with computational optics
Author(s): **Jongchan Park, Liang Gao,** UCLA Samueli School of Engineering (United States)

Lunch/Exhibition Break 12:30 PM - 1:50 PM

Coffee Break 3:40 AM - 4:10 AM

SESSION 3: LIGHT FIELD IMAGING

25 January 2025 • 1:50 PM - 3:40 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Liang Gao**, UCLA Samueli School of Engineering (United States)

13333-11 • 1:50 PM - 2:15 PM
Toward light-field and super-resolution biophotonics *(Invited Paper)*
Author(s): **Shu Jia,** Georgia Institute of Technology (United States)

13333-12 • 2:15 PM - 2:40 PM
High-resolution volumetric imaging with optically encoded photoacoustic microscopy (openPAM) *(Invited Paper)*
Author(s): **Xiaohua Feng,** UCLA Samueli School of Engineering (United States)

13333-13 • 2:40 PM - 3:00 PM
Kilohertz volumetric imaging of in-vivo dynamics using squeezed light field microscopy
Author(s): **Zhaoqiang Wang**, **Ruixuan Zhao,** UCLA Samueli School of Engineering (United States); **Daniel A. Wagenaar,** Caltech (United States); **Wenjun Kang**, **Rongguang Liang,** The Univ. of Arizona (United States); **Liang Gao,** UCLA Samueli School of Engineering (United States)

13333-14 • 3:00 PM - 3:20 PM
High spatial-temporal resolution short-wave infrared 3D imaging
Author(s): **Zihan Zang, Liang Gao,** Univ. of California, Los Angeles (United States)

13333-15 • 3:20 PM - 3:40 PM
High-resolution light-field cell imaging with optics aware deep learning and in silico training datasets
Author(s): **Xuanwen Hua**, **Keyi Han, Shu Jia,** Georgia Institute of Technology (United States)

SESSION 4: OPTICAL COMPUTATION AND ALGORITHMS

25 January 2025 • 4:10 PM - 6:00 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Seung Ah Lee**, Yonsei Univ. (Korea, Republic of)

13333-16 • 4:10 PM - 4:35 PM
Nonlinear operations in optical neural networks for image processing *(Invited Paper)*
Author(s): **Tianyu Wang,** Boston Univ. (United States)

13333-85 • 4:35 PM - 5:00 PM
Virtual staining of label-free tissue using deep learning *(Invited Paper)*
Author(s): **Yuzhu Li,** Univ. of California, Los Angeles (United States); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13333-18 • 5:00 PM - 5:20 PM
Fast and flexible optical propagation using the scalable angular spectrum method
Author(s): **Felix Wechsler,** EPFL (Switzerland); **Lars Loetgering,** ZEISS Research Microscopy Solutions (Germany); **Rainer Heintzmann,** Friedrich-Schiller-Univ. Jena (Germany), Leibniz-Institut für Photonische Technologien e.V. (Germany), Abbe Ctr. of Photonics (Germany)

13333-19 • 5:20 PM - 5:40 PM
Multiscale and recursive unmixing of spatiotemporal rhythms for live-cell and intravital cardiac microscopy
Author(s): **Zhi Ling**, **Wenhao Liu**, **Kyungduck Yoon**, **Jessica Hou,** Georgia Institute of Technology (United States); **Parvin Forghani,** Emory Univ. School of Medicine (United States); **Biagio Mandracchia**, **Maryam Bagheri,** Georgia Institute of Technology (United States); **Chunhui Xu,** Emory Univ. School of Medicine (United States); **Shuyi Nie, Shu Jia,** Georgia Institute of Technology (United States)

13333-20 • 5:40 PM - 6:00 PM
Computational light-in-flight imaging using synthetic waves
Author(s): **Patrick W. Cornwall,** The Univ. of Arizona (United States); **Manuel Ballester,** Northwestern Univ. (United States); **Stefan Forschner**, **Muralidhar Madabhushi Balaji,** The Univ. of Arizona (United States); **Aggelos Katsagelos,** Northwestern Univ. (United States); **Florian Willomitzer,** The Univ. of Arizona (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: COMPUTATIONAL ENDOSCOPY

26 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Sixian You**, Massachusetts Institute of Technology (United States)

13333-21 • 8:30 AM - 8:55 AM
Ultra-thin in-vivo endo-microscopy based on multimode fibers *(Invited Paper)*
Author(s): **Rafael Piestun,** Univ. of Colorado Boulder (United States)

13333-22 • 8:55 AM - 9:20 AM
Ptychographic endoscopy, microscopy, metrology, and non-line-of-sight imaging *(Invited Paper)*
Author(s): **Guoan Zheng,** Univ. of Connecticut (United States)

13333-23 • 9:20 AM - 9:40 AM
Multifunctional applications of multimode fiber empowered by wavefront shaping and learning
Author(s): **Puxiang Lai,** The Hong Kong Polytechnic Univ. (Hong Kong, China); **Tianting Zhong**, **Chi Man Woo, Haoran Li,** The Hong Kong Polytechnic Univ. (China)

13333-24 • 9:40 AM - 10:00 AM
Computational 3D fiber endoscopy with end-to-end optimization by physics-informed deep learning
Author(s): **Tom Glosemeyer**, **Robert Kuschmierz, Jürgen Czarske,** TU Dresden (Germany)

13333-25 • 10:00 AM - 10:20 AM
Fiber Endoscopy Using Synthetic Wavelengths for 3D tissue imaging
Author(s): **Muralidhar Madabhushi Balaji**, **Patrick W. Cornwall**, **Parker Liu**, **Stefan Forschner,** The Univ. of Arizona (United States); **Juergen Czarske,** TU Dresden (Germany); **Florian Willomitzer,** The Univ. of Arizona (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: OPTICAL IMAGING AND COMPUTATION USING SPECKLES

26 January 2025 • 10:50 AM - 12:05 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Liang Gao**, UCLA Samueli School of Engineering (United States)

13333-26 • 10:50 AM - 11:20 AM
Nonlinear optical encoding with recurrent linear scattering (Keynote Presentation)
Author(s): **Hui Cao,** Yale Univ. (United States)

13333-27 • 11:20 AM - 11:45 AM
Super-depth imaging with volumetric reflection matrix *(Invited Paper)*
Author(s): **Ye-Ryoung Lee,** Konkuk Univ. (Korea, Republic of); **Yonghyeon Jo**, **Dong-Young Kim,** Korea Univ. (Korea, Republic of); **Moonseok Kim,** College of Medicine, The Catholic Univ. of Korea (Korea, Republic of); **Wonshik Choi,** Korea Univ. (Korea, Republic of)

13333-28 • 11:45 AM - 12:05 PM
Single-shot real-time imaging of speckle dynamics using physics-consistent neural networks
Author(s): **Sangjun Byun**, **Changyoon Yi**, **Donggeon Bae, Seung Ah Lee,** Yonsei Univ. (Korea, Republic of)

Lunch/Exhibition Break 12:05 PM - 12:35 PM

SESSION 7: COMPUTATIONAL HIGH-SPEED/HIGH-THROUGHPUT IMAGING

26 January 2025 • 1:35 PM - 3:00 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Guoan Zheng**, Univ. of Connecticut (United States)

13333-29 • 1:35 PM - 2:00 PM
Towards efficient multi-camera sampling strategies for Fourier light field microscopy *(Invited Paper)*
Author(s): **Roarke W. Horstmeyer,** Duke Univ. (United States)

13333-31 • 2:00 PM - 2:20 PM
Rapid slide-level cytopathology diagnosis enabled by a Multi-camera array scanner (MCAS)
Author(s): **Amey Chaware**, **Kanghyun Kim**, **Richard Davis**, **Rajesh Dash**, **Kamran Mahmood**, **Carolyn Glass, Roarke W. Horstmeyer,** Duke Univ. (United States)

13333-32 • 2:20 PM - 2:40 PM
High-spatiotemporal-throughput video microscopy of freely moving organisms with diffractive multiplexing across a sensor array
Author(s): **Kevin C. Zhou**, **Chaoying Gu,** Univ. of California, Berkeley (United States); **Muneki Ikeda,** Univ. of California, San Francisco (United States); **Tina Hayward,** The Univ. of Utah (United States); **Nicholas Antipa,** Univ. of California, San Diego (United States); **Saul Kato,** Univ. of California, San Francisco (United States); **Rajesh Menon,** The Univ. of Utah (United States); **Roarke Horstmeyer,** Duke Univ. (United States); **Laura Waller,** Univ. of California, Berkeley (United States)

13333-33 • 2:40 PM - 3:00 PM
Dual-axis compressed optical-streaking fluorescence microscopy
Author(s): **Mark A. Keppler,** Texas A&M Univ. (United States), SAIC (United States); **Sean P. O'Connor,**SAIC (United States); **Zachary A. Steelman,** Air Force Research Lab. (United States); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States); **Jinyang Liang,** Institut National de la Recherche Scientifique (Canada); **Joel N. Bixler,** Air Force Research Lab. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: COMPUTATIONAL MICROSCOPY AND LENSLESS IMAGING

26 January 2025 • 3:30 PM - 5:35 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Seung Ah Lee**, Yonsei Univ. (Korea, Republic of)

13333-34 • 3:30 PM - 3:55 PM
Optical technologies for large-scale and brain-wide recording of neuroactivity at cellular resolution *(Invited Paper)*
Author(s): **Alipasha Vaziri,** The Rockefeller Univ. (United States)

13333-35 • 3:55 PM - 4:15 PM
Phase mask-based lensless image reconstruction using self-attention
Author(s): **Vasilisa Ponomarenko**, **Leyla Kabuli**, **Eric Markley**, **Clara S. Hung, Laura Waller,** Univ. of California, Berkeley (United States)

13333-36 • 4:15 PM - 4:35 PM
Monocular lensless depth camera driven by end-to-end deep learning with a synthetic dataset
Author(s): **Nakkyu Baek**, **Donggeon Bae**, **Kyung Chul Lee**, **Joonsik Park, Seung Ah Lee,** Yonsei Univ. (Korea, Republic of)

13333-37 • 4:35 PM - 4:55 PM
Robust lensless imaging under external illumination
Author(s): **Eric Bezzam**, **Stefan Peters, Martin Vetterli,** EPFL (Switzerland)

13333-38 • 4:55 PM - 5:15 PM
Estimation-theoretic analysis of lensless imaging
Author(s): **Leyla Kabuli**, **Nalini Singh, Laura Waller,** Univ. of California, Berkeley (United States)

13333-48 • 5:15 PM - 5:35 PM
Microscopic image restoration and uncertainty quantification using physics-informed generative models
Author(s): **Weimin Bai**, **Shaochi Ren**, **Weiheng Tang, He Sun,** Peking Univ. (China)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 9: COMPUTATIONAL MULTIMODAL IMAGING

27 January 2025 • 8:50 AM - 10:20 AM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Jongchan Park**, UCLA Samueli School of Engineering (United States)

13333-39 • 8:50 AM - 9:15 AM
Reduced supervision strategies in deep learning for optical signature discovery through label-free optical imaging *(Invited Paper)*
Author(s): **Jindou Shi, Stephen A. Boppart,** Univ. of Illinois (United States)

13333-40 • 9:15 AM - 9:40 AM
Computationally enhanced multimodal imaging for quantitative analysis of living organisms *(Invited Paper)*
Author(s): **Xi Chen,** Cornell Univ. (United States)

13333-42 • 9:40 AM - 10:00 AM
Novel Computational Microscopy Method for Affordable and Rapid Fluorescence Lifetime Imaging
Author(s): **Lakhvir Singh**, **Melody Yeh, Alex Walsh,** Texas A&M Univ. (United States)

13333-43 • 10:00 AM - 10:20 AM
High-compression hyperspectral imaging enabled by liquid crystal metasurfaces
Author(s): **Jiewen Nie,** Univ. of Cambridge (United Kingdom), Southeast Univ. (China); **Tao Chen,** Southeast Univ. (China); **Shan Jiang**, **Peng Dai**, **Daping Chu,** Univ. of Cambridge (United Kingdom); **Haining Yang,** Southeast Univ. (China)

Coffee Break 10:20 AM - 10:50 AM

SESSION 10: PHYSICS-INFORMED COMPUTATIONAL IMAGING

27 January 2025 • 10:50 AM - 12:40 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Nicholas J. Durr**, Johns Hopkins Univ. (United States)

13333-44 • 10:50 AM - 11:15 AM
Ocular aberrometry and fundus imaging with computational optics *(Invited Paper)*
Author(s): **Nicholas J. Durr,** Johns Hopkins Univ. (United States)

13333-45 • 11:15 AM - 11:40 AM
Machine-learning methods for adaptive optical microscopy *(Invited Paper)*
Author(s): **Na Ji,** Univ. of California, Berkeley (United States)

13333-46 • 11:40 AM - 12:00 PM
Neural network-based dark-field differential phase contrast microscopy
Author(s): **Zahra Khodabakhshi Fard**, **Henry Pinkard, Laura Waller,** Univ. of California, Berkeley (United States)

13333-47 • 12:00 PM - 12:20 PM
Physical prior-informed deep generative model for spectroscopy transfer and material characterization
Author(s): **Yanmin Zhu,** Massachusetts Institute of Technology (United States); **Loza F. Tadesse,** Massachusetts Institute of Technology (United States), Ragon Institute of Mass General, MIT, and Harvard (United States), MIT Jameel Clinic (United States)

Lunch Break 12:40 PM - 2:10 PM

SESSION 11: AI IN PATHOLOGY

27 January 2025 • 2:10 PM - 3:40 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Paloma Casteleiro Costa**, UCLA Samueli School of Engineering (United States)

13333-49 • 2:10 PM - 2:35 PM
Non-destructive 3D pathology and analysis for clinical decision support *(Invited Paper)*
Author(s): **Jonathan T. C. Liu,** Univ. of Washington (United States)

13333-51 • 2:35 PM - 2:55 PM
Hallucination and artifact detection in virtual tissue staining and digital pathology
Author(s): **Luzhe Huang**, **Yuzhu Li**, **Nir Pillar,** UCLA Samueli School of Engineering (United States); **Tal K. Haran,** Hadassah Hebrew Univ. Medical Ctr. (Israel); **William D. Wallace,** The Univ. of Southern California (United States); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13333-50 • 2:55 PM - 3:20 PM
Deep learning approaches in photoacoustic microscopy and tomography: virtual staining, image enhancement, segmentation, and/or classification *(Invited Paper)*
Author(s): **Chulhong Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13333-52 • 3:20 PM - 3:40 PM
Virtual staining of unlabeled autopsy tissue sections via deep learning
Author(s): **Yuzhu Li**, **Nir Pillar**, **Jingxi Li**, **Tairan Liu**, **Di Wu**, **Songyu Sun**, **Guangdong Ma**, **Kevin de Haan**, **Luzhe Huang**, **Yijie Zhang**, **Sepehr Hamidi,** Univ. of California, Los Angeles (United States); **Anatoly Urisman,** Univ. of California, San Francisco (United States); **Tal K. Haran,** Hadassah Hebrew Univ. Medical Ctr. (Israel); **William D. Wallace,** The Univ. of Southern California (United States); **Jonathan E. Zuckerman, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13333-53 • 5:30 PM - 7:00 PM
Accurate nucleic acids quantification in dPCR using zero-shot segment anything model
Author(s): **Yuanyuan Wei,** The Chinese Univ. of Hong Kong (Hong Kong, China), Univ. of California, Los Angeles (United States); **Changran Xu,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Shanhang Luo,** National Univ. of Singapore (Singapore); **Yingqi Fu**, **Qingyue Dong**, **Wen Lyu,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Bijie Bai,** Univ. of California, Los Angeles (United States); **Yi-Ping Ho**, **Ho-Pui Ho, Wu Yuan,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13333-54 • 5:30 PM - 7:00 PM
PHCam: built-your-own polar-spectral camera using photographic films to analyze polarization-sensitive biomedical samples
Author(s): **Yuanyuan Sun, Rongguang Liang,** Wyant College of Optical Sciences (United States)

13333-55 • 5:30 PM - 7:00 PM
Miniature microscopes using optical modelling and deep learning to enhance image resolution
Author(s): **Yunfeng Nie,** Vrije Univ. Brussel (Belgium); **Runmu Su**, **Jingang Zhang,** Univ. of Chinese Academy of Sciences (China); **Heidi Ottevaere,** Vrije Univ. Brussel (Belgium)

13333-56 • 5:30 PM - 7:00 PM
Heart rate monitoring during driving using transformer-based multiscalogram model with near infrared video
Author(s): **Kota Toyama**, **Masato Takahashi, Norimichi Tsumura,** Chiba Univ. (Japan)

13333-57 • 5:30 PM - 7:00 PM
Simultaneous acquisition of complementary coded images using a digital micromirror device in snapshot compressive imaging
Author(s): **Masahiro Usui**, **Teruyoshi Nobukawa**, **Nobuhiro Kinoshita**, **Kei Hagiwara, Tetsuhiko Muroi,** NHK Japan Broadcasting Corp. (Japan)

13333-58 • 5:30 PM - 7:00 PM
Tomographic reconstruction of dielectric tensor using a multislice computational model
Author(s): **Shuqi Mu,** Univ. of California, Los Angeles (United States); **Kebin Shi,** Peking Univ. (China); **Liang Gao,** Univ. of California, Los Angeles (United States)

13333-59 • 5:30 PM - 7:00 PM
Blind spatially variant deconvolution on 3D microscopic images
Author(s): **Linh Hoang**, **Dominique Meyer, Ji Yi,** Johns Hopkins Univ. (United States)

13333-60 • 5:30 PM - 7:00 PM
Scalable dataset acquisition for data-driven lensless imaging
Author(s): **Clara S. Hung**, **Leyla Kabuli**, **Vasilisa Ponomarenko, Laura Waller,** Univ. of California, Berkeley (United States)

13333-61 • 5:30 PM - 7:00 PM
Line sensor-based compressive coded light field camera
Author(s): **Ruixuan Zhao**, **Zhaoqiang Wang, Liang Gao,** UCLA Samueli School of Engineering (United States)

13333-62 • 5:30 PM - 7:00 PM
Self-calibrating Fourier ptychographic microscopy for high-throughput stain-free biomedical imaging
Author(s): **Ruilin You, Rongguang Liang,** Wyant College of Optical Sciences (United States)

13333-63 • 5:30 PM - 7:00 PM
Spectral imaging objects behind a diffuser using tunable filters via deep learning
Author(s): **Wataru Watanabe,** Ritsumeikan Univ. (Japan)

13333-64 • 5:30 PM - 7:00 PM
Optimized FasterViT architecture based semantic segmentation on panoramic teeth caries X-ray images
Author(s): **Tabassum Islam Mim,** Daffodil International Univ. (Bangladesh); **Muhsinuzzaman Mahim,** Manarat International Univ. (Bangladesh)

13333-65 • 5:30 PM - 7:00 PM
Depth-resolved imaging through scattering media using time-gated light field tomography
Author(s): **Woong Jae Baek**, **Liang Gao, Jongchan Park,** Univ. of California, Los Angeles (United States)

13333-66 • 5:30 PM - 7:00 PM
Single-acquisition speckle-free optical coherence tomography based on deterministic speckle formulation
Author(s): **Xibo Wang**, **Shuichi Makita**, **Nobuhisa Tateno**, **Suzuyo Komeda**, **Atsuko Furukawa**, **Satoshi Matsusaka, Yoshiaki Yasuno,** Univ. of Tsukuba (Japan)

13333-67 • 5:30 PM - 7:00 PM
High-speed, 3D imaging with Fourier lightfield camera array mesoscope
Author(s): **Clare B. Cook,** Duke Univ. (United States); **Kevin C. C. Zhou,** Univ. of California, Berkeley (United States); **Julia S Foust**, **Martin Bohlen,** Duke Univ. (United States); **Roarke W. Horstmeyer,** Duke Univ. (United States), Ramona Optics, Inc. (United States)

13333-68 • 5:30 PM - 7:00 PM **(CANCELLED)**
Integrating machine learning in laparoscopic cholecystectomy
Author(s): **Ankita Saxena,** The George Washington Univ. (United States); **Richard J. Cha**, **Khalid M. Ali**, **De Ru Tsai, Bo Ning,** Children's National Hospital (United States)

13333-69 • 5:30 PM - 7:00 PM
Fast fluorescence lifetime estimation from band-limited fluorescence frequency response data using machine learning regression model
Author(s): **Youkabed Sadri**, **Gabriel P. Tortorelli**, **Rodrigo Cuenca Martinez, Javier A. Jo,** The Univ. of Oklahoma (United States)

13333-70 • 5:30 PM - 7:00 PM
high-speed volumetric Fourier light field microscopy for imaging neural voltage indicators in-vivo
Author(s): **Ohr Benshlomo**, **Conor Dorian**, **Liron Sheintuch**, **Diego Espino**, **Peyman Golshani, Liang Gao,** Univ. of California, Los Angeles (United States)

13333-71 • 5:30 PM - 7:00 PM
Physics-aware lensless miniscope for neuronal imaging
Author(s): **Feng Tian**, **Weijian Yang, Ben Mattison,** Univ. of California, Davis (United States)

13333-73 • 5:30 PM - 7:00 PM
Single-pixel imaging study on media with increasing scattering phenomena
Author(s): **Jong Hyun Park**, **Chae-Eun Lee**, **Joon Young Lim**, **Chieun Choi, Yoon-Kyu Song,** Seoul National Univ. (Korea, Republic of)

13333-75 • 5:30 PM - 7:00 PM
Machine learning approaches for diabetic foot wound segmentation: generative models vs CNNs vs K-means
Author(s): **Fernando Chiwo**, **Armando Caro**, **Aberrachid Hamrani**, **Daniela Leizaola,** Florida International Univ. (United States); **Renato Sousa**, **Jose P. Ponce,** Adventist Health White Memorial (United States); **Stanley Mathis,** Adventist Health White Memorial (United States), Clemente Clinical Research (United States); **David G. Armstrong,** The Univ. of Southern California (United States); **Anuradha Godavarty,** Florida International Univ. (United States)

13333-76 • 5:30 PM - 7:00 PM
A diffusion-based approach for the augmentation of intraoral image datasets
Author(s): **Patrick Meng,** Rutgers, The State Univ. of New Jersey (United States); **Ananya Jana**, **Hrebesh Subhash,** Colgate-Palmolive Co. (United States); **Dimitri Metaxas,** Rutgers, The State Univ. of New Jersey (United States)

13333-77 • 5:30 PM - 7:00 PM
3D Intraoral Scanning With Digital Color Correction for Dental Plaque and Stain Detection
Author(s): **Vrinda Jain**, **Abmael Oliveira,** Rutgers, The State Univ. of New Jersey (United States); **Thomas T Livecchi,** Rutgers (United States); **Mark C. Pierce,** Rutgers, The State Univ. of New Jersey (United States); **Hrebesh M. Subhash,** Colgate-Palmolive Co. (United States)

13333-78 • 5:30 PM - 7:00 PM
A portable and low-cost lens-free on-chip microscope for monitoring bacterial biofilm growth in real-time
Author(s): **Weiming Xu**, **Hatice Ceylan Koydemir,** Texas A&M Univ. (United States); **Muhammed Veli,** Univ. of California, Los Angeles (United States)

13333-79 • 5:30 PM - 7:00 PM
Fundus imaging and defocus estimation using a phase-mask based fundus camera
Author(s): **Corey Simmerer**, **Marisa Morakis,** Johns Hopkins Univ. (United States); **Lei Tian,** Boston Univ. (United States); **Lia Gomez-Perez,** Massachusetts Institute of Technology (United States); **Nicholas J. Durr,** Johns Hopkins Univ. (United States)

13333-80 • 5:30 PM - 7:00 PM
Gigapixel-Scale Artifact-Free Imaging with Segment-Wise Angle Calibration and Phase Retrieval in Lensless LED Matrix Microscope
Author(s): **Sibi chakravarthy Shanmugavel, Shwetadwip Chowdhury,** The Univ. of Texas at Austin (United States)

13333-81 • 5:30 PM - 7:00 PM
NeuroPath: a vision foundation model for advancing neuropathological analysis
Author(s): **Shuying Li**, **Maxwell Malamut**, **Ann C. McKee**, **Jonathan Cherry, Lei Tian,** Boston Univ. (United States)

13333-82 • 5:30 PM - 7:00 PM
Video-rate terahertz spectral imaging of arbitrary curved tissue using compressed sensing
Author(s): **Zachery B. Harris**, **M. Hassan Arbab**, **Andrew Chen,** Stony Brook Univ. (United States); **Rayko Stantchev,** National Sun Yat-sen Univ. (Taiwan); **Emma Pickwell-MacPherson,** The Univ. of Warwick (United Kingdom)

13333-84 • 5:30 PM - 7:00 PM
End-to-End Neuromorphic Reconstruction of Moving Targets in Dense Scattering Media Using Event-Driven Sensing and Spiking Neural Networks
Author(s): **Ning Zhang, Arto Nurmikko,** Brown Univ. (United States)

CONFERENCE 13334

Endoscopic Microscopy XX

25 - 26 January 2025 | Moscone South, Room 313 (Level 3)

Conference Chair(s): **Guillermo J. Tearney,** Massachusetts General Hospital (United States); **Thomas D. Wang,** Univ. of Michigan (United States); **Melissa J. Suter,** Massachusetts General Hospital (United States)

Program Committee: **Kathy Beaudette,** Castor Optics, Inc. (Canada); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands); **Arthur F. Gmitro,** The Univ. of Arizona (United States); **Michalina J. Gora,** Univ. de Strasbourg (France); **Lida P. Hariri,** Massachusetts General Hospital (United States); **Amy L. Oldenburg,** The Univ. of North Carolina at Chapel Hill (United States); **Wibool Piyawattanametha,** King Mongkut's Institute of Technology Ladkrabang (Thailand); **DongKyun Kang,** Wyant College of Optical Sciences (United States); **David D. Sampson,** Univ. of Surrey (United Kingdom); **Hinnerk Schulz-Hildebrandt,** Massachusetts General Hospital (United States); **Eric J. Seibel,** Univ. of Washington (United States)

Saturday 25 January 2025

SESSION 1: ADVANCES IN IMAGE ANALYSIS AND SYSTEM DESIGN

25 January 2025 • 1:10 PM - 3:10 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Guillermo J. Tearney**, Massachusetts General Hospital (United States)

13334-1 • 1:10 PM - 1:30 PM
Deep-learning-based detection of Barrett's esophagus using tethered capsule optical coherence tomography endomicroscopy
Author(s): **Praveenbalaji Rajendran,** Wellman Ctr. for Photomedicine, Massachusetts General Hospital, Harvard Medical School (United States); **Ashutosh Raman,** Harvard-MIT Health Sciences and Technology (United States); **Jing Dong**, **Joseph A. Gardecki, Guillermo Tearney,** Wellman Ctr. for Photomedicine (United States)

13334-2 • 1:30 PM - 1:50 PM
Deep learning-based optical coherence tomography for in vivo assessment of pulmonary microvasculature in interstitial lung disease
Author(s): **Sreyankar Nandy**, **Jaeyul Lee**, **Satomi Yamamoto-Mcguire, Lida P. Hariri,** Massachusetts General Hospital (United States)

13334-3 • 1:50 PM - 2:10 PM
Supervision generation methods for learning-based NURD correction in endoscopic OCT
Author(s): **Haoran Zhang**, **Chengfu Gu**, **Qi Lan**, **Weiyi Zhang**, **Chang Liu, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13334-4 • 2:10 PM - 2:30 PM
Depth-of-focus extension in endoscopic OCT via computer-generated holography
Author(s): **Chengfu Gu**, **Haoran Zhang**, **Chang Liu**, **Qi Lan**, **Weiyi Zhang, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

13334-5 • 2:30 PM - 2:50 PM
Finite element and optical analysis of a miniature forward-scanning fiber endoscope
Author(s): **Andrew D. Rocha,** The Univ. of Arizona (United States); **Matthias Schlich,** ANSYS Germany GmbH (Germany); **David Vega,** Ansys, Inc. (United States); **Jennifer K. Barton**, **Alana Gonzales,** The Univ. of Arizona (United States); **Eduardo Gonzalez,** Edmund Optics Inc. (United States); **Dominique Galvez,** The Univ. of Arizona (United States)

13334-6 • 2:50 PM - 3:10 PM
Proximal-scanning BM-mode endoscopic OCT elastography
Author(s): **Haoran Zhang**, **Chengfu Gu**, **Qi Lan**, **Weiyi Zhang**, **Chang Liu, Jianlong Yang,** Shanghai Jiao Tong Univ. (China)

Coffee Break 3:10 PM - 3:40 PM

SESSION 2: NOVEL CATHETER LENS FABRICATION AND DESIGN

25 January 2025 • 3:40 PM - 5:00 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Thomas D. Wang**, Univ. of Michigan (United States)

13334-8 • 3:40 PM - 4:00 PM

Compact metalens catheters for endoscopic optical coherence tomography
Author(s): **Nguyen Thanh Phong Truong,** Massachusetts General Hospital (United States)

13334-9 • 4:00 PM - 4:20 PM
Compact light sheet microscopy probe for human tissue imaging
Author(s): **Jingwei Zhao,** Wyant College of Optical Sciences, The Univ. of Arizona (United States); **Yong Jun Kim,** The Univ. of Arizona (United States); **Kenneth Marcelino**, **Momoka Sugimura,** Wyant College of Optical Sciences, The Univ. of Arizona (United States); **Rafael Romero,** The Univ. of Arizona (United States); **Brooke Liang**, **Michelle J. Khan**, **Eric Yang,** Stanford Univ. School of Medicine (United States); **Dongkyun Kang,** Wyant College of Optical Sciences, The Univ. of Arizona (United States)

13334-10 • 4:20 PM - 4:40 PM
High-performance submillimeter 3D glass printed OCT endoscopy at 800nm
Author(s): **Chao Xu**, **Chenyu Shang**, **Tinghua Zhang**, **Ruiyang Zhang**, **Yuanyuan Wei,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Zhihan Hong,** The Univ. of Arizona (United States); **Wu Yuan,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13334-11 • 4:40 PM - 5:00 PM
Design and evaluation of a 0.5 mm 3D printed optical system for multiphoton microendoscopy
Author(s): **Zuzana Adams**, **Zhihan Hong,** Wyant College of Optical Sciences (United States); **Kaiyang Diao**, **Lynette K. Valenzuela,** The Univ. of Arizona (United States); **Piaoran Ye**, **Rongguang Liang,** Wyant College of Optical Sciences (United States); **Jennifer K. Barton,** Wyant College of Optical Sciences (United States), The Univ. of Arizona (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 3: CLINICAL ENDOSCOPIC MICROSCOPY

26 January 2025 • 8:30 AM - 10:30 AM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Melissa J. Suter**, Massachusetts General Hospital (United States)

13334-12 • 8:30 AM - 8:50 AM
Feasibility of transnasal optical coherence tomography for upper gastrointestinal imaging in pregnant women: a diagnostic tool for environmental enteric disease
Author(s): **Evangelia Gavgiotakis**, **Francisco Benavides**, **Michael Walz**, **Alissa Cirio**, **Zachary Jansa**, **Elizabeth Biddle**, **Nicolas Dechene**, **Luisiana Yance**, **Nicholas E. Bennett**, **Esmarline De Leon Peralta**, **Nitasha Bhat**, **Anita Chung**, **Tara Lignelli**, **Ara Bablouzian**, **Matthew Beatty,** Massachusetts General Hospital (United States); **Catriona N. Grant,** Wellman Ctr. for Photomedicine (United States); **Waliyah Mughis**, **Fayaz Umrani**, **Kamran Sadiq**, **Abdul Khalique Qureshi**, **Sheraz Ahmed**, **Haseeb Khan**, **Aneeta Hotwani**, **Uzzam Khawaja**, **Najeeha Iqbal**, **Shareef Dars**, **Shahneel Hussain**, **Nazia Aftab**, **Razia Khawaja**, **Azam Khaskheli**, **Sitara Panahwar**, **Nosheen Bhanbhro**, **Maria Memon**, **Asad Ali,** The Aga Khan Univ. (Pakistan); **Guillermo Tearney,** Massachusetts General Hospital (United States)

13334-13 • 8:50 AM - 9:10 AM
Endoscopic immuno-OCT used for in vivo imaging of barrett's esophagus and esophageal adenocarcinoma
Author(s): **Tyla Danskin,** Vrije Univ. Amsterdam (Netherlands); **Tom H. Dijkhuis,** Leiden Univ. Medical Ctr. (Netherlands); **Andrea J. Sterkenburg**, **Gursah Kats,** Univ. Medical Ctr. Groningen (Netherlands); **A. L. Post,** Vrije Univ. Amsterdam (Netherlands); **Alex L. Vahrmeijer,** Leiden Univ. Medical Ctr. (Netherlands); **Wouter B. Nagengast,** Univ. Medical Ctr. Groningen (Netherlands); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands)

13334-14 • 9:10 AM - 9:30 AM
In vivo orientation mapping of fibrotic collagen remodeling in interstitial lung disease using polarization sensitive endobronchial optical coherence tomography
Author(s): **Jaeyul Lee**, **Sreyankar Nandy**, **Sarita R. Berigei**, **Colleen M. Keyes**, **Ashok Muniappan**, **Hugh G. Auchincloss**, **Michael Lanuti**, **Amalia DeCoursey**, **Satomi Yamamoto**, **Amita Sharma**, **Martin Villiger, Lida P. Hariri,** Massachusetts General Hospital (United States)

13334-15 • 9:30 AM - 9:50 AM
Airway smooth muscle quantification in ILD and asthma versus healthy volunteers using endoscopic polarization sensitive OCT
Author(s): **Tatiana Soldati,** Vrije Univ. Amsterdam (Netherlands); **Sofi M. Vassileva,** Amsterdam UMC (Netherlands); **Margherita Vaselli,** Vrije Univ. Amsterdam (Netherlands); **Kirsten A. Kalverda**, **Pieta C. Wijsman**, **Jouke T. Annema**, **Peter I. Bonta,** Amsterdam UMC (Netherlands); **Johannes F. de Boer,** Vrije Univ. Amsterdam (Netherlands)

13334-16 • 9:50 AM - 10:10 AM
Changes in lung structure and function in response to bronchial thermoplasty
Author(s): **David C. Adams,** Massachusetts General Hospital (United States); **Adnan Majid,** Beth Israel Deaconess Medical Ctr. (United States); **Melissa Suter,** Massachusetts General Hospital (United States)

13334-17 • 10:10 AM - 10:30 AM
In vivo microscopic elastography using endobronchial optical coherence elastography for idiopathic pulmonary fibrosis: phantom validation and preliminary investigation
Author(s): **Shahed K. Mohammed**, **Sreyankar Nandy,** Massachusetts General Hospital (United States), Harvard Medical School (United States); **Sarita R. Berigei,** Massachusetts General Hospital (United States); **Ashok Muniappan**, **C. Corey Hardin, Lida P. Hariri,** Massachusetts General Hospital (United States), Harvard Medical School (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 4: ENDOSCOPIC SYSTEM AND CATHETER DESIGN I

26 January 2025 • 11:00 AM - 12:00 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Guillermo J. Tearney**, Massachusetts General Hospital (United States)

13334-19 • 11:00 AM - 11:20 AM
An ultra-compact wireless mesoscope for large-scale neural recording during fully unconstrained behavior
Author(s): **Yuanlong Zhang**, **Lekang Yuan**, **Mingrui Wang,** Tsinghua Univ. (China); **Angran Li,** Nankai Univ. (China); **Weihao Zhao,** 301 Hospital (China)

13334-20 • 11:20 AM - 11:40 AM
Clinical in-vivo validation of a forward viewing endoscopic system based on 3D swept source optical coherence tomography for human urinary bladder assessment
Author(s): **Fabian Placzek**, **Ekaterina Laukhtina,** Medizinische Univ. Wien (Austria); **Gerardo González-Cerdas,** Univ. of Freiburg (Germany); **Bernhard Messerschmidt,** Grintech GmbH (Germany); **Dragan Sandic,** Blazejewski Medi-Tech GmbH (Germany); **Eva Compérat,** Medizinische Univ. Wien (Austria); **Peter E. Andersen,** Technical Univ. of Denmark (Denmark); **Çağlar Ataman,** Univ. of Freiburg (Germany); **Rainer A. Leitgeb,** Zentrum für Medizinische Physik und Biomedizinische Technik, Medizinische Univ. Wien (Austria); **Shahrokh F. Shariat,** Medizinische Univ. Wien (Austria); **Wolfgang Drexler,** Zentrum für Medizinische Physik und Biomedizinische Technik, Medizinische Univ. Wien (Austria)

13334-21 • 11:40 AM - 12:00 PM
Design and characterization of a low-fluorescence micromotor-actuated imaging catheter for optical coherence tomography and autofluorescence imaging
Author(s): **Eric Brace,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada); **Adrian Tanskanen**, **Jeanie Malone,** BC Cancer Research Institute (Canada), School of Biomedical Engineering, The Univ. of British Columbia (Canada); **Calum MacAulay,** BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); **Pierre Lane,** BC Cancer Research Institute (Canada), Simon Fraser Univ. (Canada), School of Biomedical Engineering, The Univ. of British Columbia (Canada)

Lunch/Exhibition Break 12:00 PM - 1:50 PM

SESSION 5: ENDOSCOPIC SYSTEM AND CATHETER DESIGN II

26 January 2025 • 1:50 PM - 3:30 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Thomas D. Wang**, Univ. of Michigan (United States)

13334-22 • 1:50 PM - 2:10 PM
Endoscopic few-mode fiber optical coherence tomography
Author(s): **Adrian Tanskanen**, **Jeanie Malone**, **Eric Brace**, **Calum MacAulay, Pierre Lane,** BC Cancer Research Institute (Canada)

13334-23 • 2:10 PM - 2:30 PM
All-reflective tethered capsule endoscope for multimodal imaging in the esophagus
Author(s): **Xavier Attendu,** Polytechnique Montréal (Canada), Amsterdam UMC (Netherlands); **Paul R. Bloemen**, **Niels H. Kind**, **Daniel M. de Bruin,** Amsterdam UMC (Netherlands); **Caroline Boudoux,** Polytechnique Montréal (Canada); **Ton G. van Leeuwen,** Amsterdam UMC (Netherlands)

13334-24 • 2:30 PM - 2:50 PM
Lessons learned in the assembly of submillimeter endoscopes
Author(s): **Dominique B. Galvez,** The Univ. of Arizona (United States); **Andrew D. Rocha,** Wyant College of Optical Sciences, The Univ. of Arizona (United States); **Vinyas Bhat**, **Makayla Johnson,** The Univ. of Arizona (United States); **Jennifer K. Barton,** Wyant College of Optical Sciences (United States), The Univ. of Arizona (United States)

13334-25 • 2:50 PM - 3:10 PM
Development of a forward viewing miniature fiber-optic probe for multimodal Raman spectroscopy and optical coherence tomography
Author(s): **Jianrong Qiu**, **Priyanka Bhosale**, **Richard Cook, Mads Bergholt,** King's College London (United Kingdom)

13334-26 • 3:10 PM - 3:30 PM
The next frontier in optical biopsy: miniaturized disposable endocytoscope and technologies behind
Author(s): **FengQing Sun,** Everest Imaging, LLC (United States); **Chengshui Chen,** Quzhou People's Hospital, The Quzhou Affiliated Hospital of Wenzhou Medical Univ. (China), The First Affiliated Hospital of Wenzhou Medical Univ. (China); **Lefu Chen,** Nassau Univ. Medical Ctr. (United States); **Feng Lin,** Everest Imaging, LLC (United States); **Yang Yang Li,** City Univ. of Hong Kong (Hong Kong, China); **Yihong Wu**, **Jianhong Zhang,** Everest Imaging, LLC (United States); **Jiaru Shi,** The First Affiliated Hospital of Wenzhou Medical Univ. (China); **Yuting Zhang,** Quzhou People's Hospital, The Quzhou Affiliated Hospital of Wenzhou Medical Univ. (China); **Lingyan NMN Shen,** Everest Imaging (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13335

Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XXII

CONFERENCE CO-SPONSOR

Prizmatix

26 - 27 January 2025 | Moscone South, Room 104 (Level 1 Lobby)

Conference Chair(s): **Dror Fixler,** Bar-Ilan Univ. (Israel); **Sebastian Wachsmann-Hogiu,** McGill Univ. (Canada)

Program Committee: **Vasily N. Astratov,** The Univ. of North Carolina at Charlotte (United States); **Monica Focsan,** Univ. Babes-Bolyai (Romania); **Henry Hess,** Columbia Univ. (United States); **Sinyoung Jeong,** Intek Scientific Inc. (United States); **Sung Jin Kim,** Univ. of Louisville (United States); **Alzbeta Marcek Chorvatova,** International Laser Ctr. SCSTI (Slovakia); **Paras N. Prasad,** Univ. at Buffalo (United States); **Marco Renna,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States)

Sunday 26 January 2025

SESSION 1: NANOSCALE IMAGING, SENSING, AND ACTUATION FOR BIOMEDICAL APPLICATIONS: TECHNIQUES I

26 January 2025 • 9:00 AM - 11:30 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Dror Fixler**, Bar-Ilan Univ. (Israel)

13335-1 • 9:00 AM - 9:30 AM
Nature inspired cellulose-based networks for moisture sensors *(Invited Paper)*
Author(s): **Mariana Silva**, **João Santos**, **Francisco Sousa**, **José Malta,** Faculdade de Ciências e Tecnologia da Univ. NOVA de Lisboa (Portugal); **Pedro L. Almeida,** Faculdade de Ciências e Tecnologia da Univ. NOVA de Lisboa (Portugal), Instituto Superior de Engenharia de Lisboa (Portugal); **Maria Helena Godinho, Ana Almeida,** Faculdade de Ciências e Tecnologia da Univ. NOVA de Lisboa (Portugal)

13335-2 • 9:30 AM - 9:50 AM
Flexible electrochemiluminescence patch with carbon nanotube electrode and bacterial nanocellulose substrate
Author(s): **Xinyue Hu**, **Mohul Sharma**, **Yulemi Gonzalez Quesada**, **Mathilde Wagner, Sebastian Wachsmann-Hogiu,** McGill Univ. (Canada)

13335-3 • 9:50 AM - 10:20 AM
Marangoni flow-driven vertical self-assembly of cellulose nanocrystals, the story of tilted tactoids and folded domains *(Invited Paper)*
Author(s): **Yuchen Zhu**, **Jiaxin Hou**, **Tadeusz Balcerowski, Ahu Dumanli,** The Univ. of Manchester (United Kingdom)

Coffee Break • 10:20 AM -

13335-4 • 10:20 AM - 10:50 AM
All-organic metamaterials inspired by photosynthetic photonic organelles *(Invited Paper)*
Author(s): **Miguel Castillo,** INL - International Iberian Nanotechnology Lab. (Portugal); **Carla Gomez Varela,** Univ. de Vigo (Spain); **William P. Wardley,** Univ. of Exeter (United Kingdom); **Francisca Guedes,** INL - International Iberian Nanotechnology Lab. (Portugal); **Rosalia Serna Galán,** Consejo Superior de Investigaciones Científicas (Spain); **Isabel Pastoriza Santos,** Univ. de Vigo (Spain); **Sara Nuñez Sanchez,** Univ. do Minho (Portugal); **Martín López-García,** Consejo Superior de Investigaciones Científicas (Spain)

13335-5 • 10:50 AM - 11:10 AM
Self-calibrated single-wavelength biosensor for measuring blood pressure
Author(s): **Michal Katan**, **Hamootal Duadi, Dror Fixler,** Bar-Ilan Univ. (Israel)

13335-6 • 11:10 AM - 11:30 AM
Nanoscale chemical imaging for biological applications with Null-Deflection Infrared (NDIR) spectroscopic imaging
Author(s): **Seth Kenkel**, **Anirudha Rao**, **Ashwin Bale, Rohit Bhargava,** Beckman Institute for Advanced Science and Technology (United States)

Lunch/Exhibition Break 11:30 AM - 1:50 PM

SESSION 2: NANOSCALE IMAGING, SENSING, AND ACTUATION FOR BIOMEDICAL APPLICATIONS: APPLICATIONS II

26 January 2025 • 1:50 PM - 4:20 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Dror Fixler**, Bar-Ilan Univ. (Israel)

13335-8 • 1:50 PM - 2:20 PM
Plasmonic interactions for nanoscale actuation of therapeutic response *(Invited Paper)*
Author(s): **Dvir Yelin, Limor Minai,** Technion-Israel Institute of Technology (Israel)

13335-10 • 2:20 PM - 2:40 PM
Detection of cancer protein biomarkers in serum on a nanoporous biosilica strip using SERS
Author(s): **Mehmet Kahraman**, **Ayse Mine Saridag, Isik Didem Karagoz,** Gaziantep Üniv. (Turkey)

Coffee Break • 2:40 PM - 3:10 PM

13335-11 • 3:10 PM - 3:40 PM
Modelling of THz quantum cascade lasers for imaging, sensing, and biomedical applications *(Invited Paper)*
Author(s): **Jelena Radovanovic**, **Nikola Vukovic,** Univ. of Belgrade (Serbia), Vinca Institute of Nuclear Sciences (Serbia); **Novak Stanojevic,** Univ. of Belgrade (Serbia), VLATACOM Institute Ltd. (Serbia); **Aleksandar Demic,** Univ. of Leeds (United Kingdom); **Mihailo Stojković**, **Milan Ignjatovic**, **Nikola Basta**, **Filip Perisic,** Univ. of Belgrade (Serbia); **Dragan Indjin,** Univ. of Leeds (United Kingdom)

13335-12 • 3:40 PM - 4:00 PM
Scalable self-assembled plasmonic structural colorimetric sensor for smartphone-based point-of-care diagnostics
Author(s): **Mahdi Soudi**, **Pablo Cencillo-Abad, Debashis Chanda,** Univ. of Central Florida (United States)

13335-13 • 4:00 PM - 4:20 PM
All-optical, computation-free time-multiplexing super-resolved imaging based on speckle illumination
Author(s): **Ariel Ashkenazy**, **Nadav Shabairou,** Bar-Ilan Univ. (Israel); **André Stefanov,** Univ. Bern (Switzerland); **Peng Gao,** Xidian Univ. (China); **Dror Fixler**, **Eliahu Cohen, Zeev Zalevsky,** Bar-Ilan Univ. (Israel)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13335-28 • 5:30 PM - 7:30 PM
How to improve a primary-secondary dual-source model of diffuse reflectance near the point of entry
Author(s): **Daqing Piao, Nafiseh Frahzhadi,** Oklahoma State Univ. (United States)

13335-29 • 5:30 PM - 7:30 PM
Q-sensing method for superficial scattering extraction
Author(s): **Alon Tzroya**, **Hamootal Duadi, Dror Fixler,** Bar-Ilan Univ. (Israel)

13335-30 • 5:30 PM - 7:30 PM
Biotic photonics, trimming the optical properties of bioderived photonic nanostructures
Author(s): **Pedro Braga-Fernandes**, **Vera Cardoso**, **Christian Maibohm**, **Jana B. Nieder,** INL - International Iberian Nanotechnology Lab. (Portugal); **Johannes W. Goessling,** Univ. de Aveiro (Portugal); **Martín López-García,** Instituto de Óptica "Daza de Valdés", Consejo Superior de Investigaciones Científicas (Spain)

13335-31 • 5:30 PM - 7:30 PM
Optimized Au nanodyes for near-infrared-I fluorescence imaging
Author(s): **Neelima Chacko, Rinat Ankri,** Ariel Univ. (Israel)

13335-32 • 5:30 PM - 7:30 PM
Building a plasmonic gold nanostructure platform for ultrasensitive detection of Alzheimer's amyloids
Author(s): **Chia-Chun Chen,** National Taiwan Normal Univ. (Taiwan); **Yi-Chun Wu,** National Taiwan Univ. (Taiwan)

13335-33 • 5:30 PM - 7:30 PM
Dual-mode DNA detection and hybridization using gold nanoparticles: integrating label-free SERS and MEF to evaluate conformational changes
Author(s): **Daria Stoia,** Babes-Bolyai Univ. (Romania); **Ana Maria Craciun,** Univ. Babes-Bolyai (Romania); **Marc Lamy de la Chapelle,** Le Mans Univ. (France); **Monica Focsan,** Univ. Babes-Bolyai (Romania)

13335-34 • 5:30 PM - 7:30 PM
Self-calibrated single-wavelength biosensor for measuring SpO_2
Author(s): **Michal Katan**, **Hamootal Duadi, Dror Fixler,** Bar-Ilan Univ. (Israel)

13335-35 • 5:30 PM - 7:30 PM
Noninvasive optical technique for sensing nanoparticles permeation profile among skin layers
Author(s): **Channa Shapira**, **Rawan Salami**, **Yifat Harel**, **Esthy Levy-Eitan**, **Leah Armon**, **Hamootal Duadi, Dror Fixler,** Bar-Ilan Univ. (Israel)

13335-36 • 5:30 PM - 7:30 PM
Comparative study of glucose and mannose as liposome targeting moieties for enhanced cancer cell uptake
Author(s): **Chen Tzror-Azankot**, **Adi Anaki**, **Tamar Sadan**, **Menachem Motiei, Rachela Popovtzer,** Bar-Ilan Univ. (Israel)

13335-37 • 5:30 PM - 7:30 PM
Utilizing gold nanoparticles for renoprotection in cancer treatment
Author(s): **Yoray Sharon**, **Menachem Motiei**, **Chen Tzror**, **Tamar Sadan**, **Rachela Popovtzer,** Bar-Ilan Univ. (Israel); **Eli Rosenbaum,** Rabin Medical Ctr. (Israel)

13335-38 • 5:30 PM - 7:30 PM
Engineering antibody-gold nanoparticles for cancer therapy
Author(s): **Adi Anaki**, **Chen Tzror-Azankot**, **Tamar Sadan**, **Menachem Motiei, Rachela Popovtzer,** Bar-Ilan Univ. (Israel)

13335-39 • 5:30 PM - 7:30 PM
SERS-based immunosensor for multiplex detection of cancer protein biomarkers in serum
Author(s): **Ayse Mine Saridag, Mehmet Kahraman,** Gaziantep Üniv. (Turkey)

13335-42 • 5:30 PM - 7:30 PM
Design photonic materials and devices inspired by nature
Author(s): **Ana Almeida,** NOVA School of Science and Technology (Portugal); **Martin Lopez Garcia,** Instituto de Óptica (Spain); **Maria Helena Godinho,** NOVA School of Science and Technology (Portugal); **Vladimir Katanaev,** University of Geneva (Switzerland); **Nicolina Pop,** Politehnica University of Timisoara (Romania); **Maurizio Dabbicco,** Università di Bari (Italy); **George A. Mousdis,** University of Athens (Greece); **Ahu Gumrah Parry,** University of Manchester (United Kingdom); **Panagiotis E. Keivanidis,** Cyprus University of Technology (Cyprus); **Dragan Indjin,** University of Leeds (United Kingdom); **Jelena Radovanovic,** Univerzitet u Beogradu (Serbia); **Pawel Wityk,** Gdansk University of Technology (Poland); **Dror Fixler,** Bar-Ilan University (Israel); **Malgorzata Szczerska,** Gdansk University of Technology (Poland)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 3: NANOSCALE IMAGING, SENSING, AND ACTUATION FOR BIOMEDICAL APPLICATIONS: TECHNIQUES III

27 January 2025 • 9:30 AM - 11:40 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Sebastian Wachsmann-Hogiu**, McGill Univ. (Canada)

13335-14 • 9:30 AM - 10:00 AM
Interferometric laser speckle rolling shutter spectroscopy *(Invited Paper)*
Author(s): **Sammy Apsel**, **Shira Tziony**, **Vika Tarle, Nisan Ozana,** Bar-Ilan Univ. (Israel)

13335-16 • 10:00 AM - 10:20 AM
Improving the robustness to resolve spectral absorption with non-contact diffuse reflectance spectroscopy using scattering characterized by low coherence interferometry
Author(s): **Daqing Piao, Scott Mattison,** Oklahoma State Univ. (United States)

Coffee Break • 10:20 AM - 10:50 AM

13335-17 • 10:50 AM - 11:20 AM
Super-resolved multiplexed imaging of RNA molecules inside biopsies reveals immune–tumor interactions *(Invited Paper)*
Author(s): **Shahar Alon,** Bar-Ilan Univ. (Israel)

13335-20 • 11:20 AM - 11:40 AM
Hybrid speckle contrast optical spectroscopy: near infrared spectroscopy and electroencephalogram sensing
Author(s): **Vika Tarle**, **Tamar Dror,** Bar-Ilan Univ. (Israel); **Yumie Ono,** Meiji Univ. (Japan); **Xiaojun Cheng,** Boston Univ. (United States); **Oren Shriki,** Ben-Gurion Univ. of the Negev (Israel); **Nisan Ozana,** Bar-Ilan Univ. (Israel)

Lunch Break 11:40 AM - 1:40 PM

SESSION 4: NANOSCALE IMAGING, SENSING, AND ACTUATION FOR BIOMEDICAL APPLICATIONS: APPLICATIONS IV

27 January 2025 • 1:40 PM - 4:50 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Sebastian Wachsmann-Hogiu**, McGill Univ. (Canada)

13335-21 • 1:40 PM - 2:10 PM
Innovative plasmonic nanobiosensors for real-time biomarker detection: from simulated to real sample applications *(Invited Paper)*
Author(s): **Andreea Campu**, **Ana Maria Craciun**, **Simion Astilean, Monica Focsan ,** Univ. Babes-Bolyai (Romania)

13335-22 • 2:10 PM - 2:30 PM
Photonic crystal enhanced fluorescence with DNA-based Nano-gripper for ultrasensitive intact viral pathogen biosensing
Author(s): **Yanyu Xiong,** Stanford Univ. (United States), Univ. of Illinois (United States); **Lifeng Zhou,** Peking Univ. (China), Univ. of Illinois (United States); **Laura Cooper,** Univ. of Illinois Chicago (United States); **Mengxi Zheng**, **Skye Shepherd**, **Abhisek Dwivedy**, **Tingjie Song**, **Wei Hong**, **Xin Chen**, **Shengyan Liu**, **Linh T. P. Le**, **Saurabh Umrao,** Univ. of Illinois (United States); **Lijun Rong,** Univ. of Illinois Chicago (United States); **Tong Wang,** The City Univ. of New York (United States); **Xing Wang, Brian T. Cunningham,** Univ. of Illinois (United States)

13335-23 • 2:30 PM - 2:50 PM
Fluorescent nanothermometry and plasmonics for precise laser tissue soldering
Author(s): **Oscar Cipolato, Inge K. Herrmann,** ETH Zurich (Switzerland)

13335-24 • 2:50 PM - 3:10 PM
Portable and multiplexed biosensors: advancing analytical chemiluminescence on pixelated detectors for point-of-need diagnostics
Author(s): **Reza Abbasi, Sebastian Wachsmann-Hogiu,** McGill Univ. (Canada)

Coffee Break • 3:10 PM - 3:40 PM

13335-25 • 3:40 PM - 4:10 PM
Preliminary frequency-domain understanding of the threshold-condition of "photonic bomb" pertinent to assessing random medium *(Invited Paper)*
Author(s): **Daqing Piao,** Oklahoma State Univ. (United States)

13335-26 • 4:10 PM - 4:30 PM
Nanoscale remote optical sleep apnea diagnostics using speckle-based analysis
Author(s): **Yevgeny Beiderman**, **Moshe Malul, Elad Levi,** Holon Institute of Technology (Israel)

13335-27 • 4:30 PM - 4:50 PM
Revealing immune-tumor interactions in biopsies using optical interrogation of RNA molecules, antibodies, bacteria and modeling
Author(s): **Tal Goldberg,** Bar-Ilan Univ. (Israel)

ON-DEMAND POSTERS

On-Demand Only
The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13335-9
Adaptive segmentation of DAPI-stained, C-banded, aggregated and overlapping chromosomes for the dicentrics chromosome assay

Author(s): **Max Platkov,** Nuclear Research Ctr. Negev-Soreq (Israel); **Ziv Gardos,** Sami Shamoon College of Engineering (Israel); **Lena Gurevich,** Soroka Univ. Medical Ctr. (Israel); **Inna Levitsky**, **Ariela Burg,** Sami Shamoon College of Engineering (Israel); **Shirly Amar,** Soroka Univ. Medical Ctr. (Israel); **Aryeh Weiss,** Bar-Ilan Univ. (Israel); **Raphael Gonen,** Nuclear Research Ctr. Negev-Soreq (Israel)

13335-40
Development of a laser heated thermoluminescent dosimeter (LHTLD) for immediate, in-situ dosimetry measurements
Author(s): **Max Platkov**, **Marcelo Weinstein,** Nuclear Research Ctr. Negev-Soreq (Israel); **Abraham Katzir,** Tel Aviv Univ. (Israel); **Daniel Sattinger,** Nuclear Research Ctr. Negev-Soreq (Israel)

CONFERENCE 13336

Colloidal Nanoparticles for Biomedical Applications XX

25 - 27 January 2025 | Moscone South, Room 50 (Lower Mezz)

Conference Chair(s): **Marek Osiński,** The Univ. of New Mexico (United States); **Antonios G. Kanaras,** Univ. of Southampton (United Kingdom)

Program Committee: **James B. Delehanty,** U.S. Naval Research Lab. (United States); **Allison M. Dennis,** Boston Univ. (United States); **Erik Dujardin,** Laboratoire Interdisciplinaire Carnot de Bourgogne (ICB) - CNRS (France); **Amelie Heuer-Jungemann,** Max-Planck-Institut für Biochemie (Germany); **Hedi Mattoussi,** Florida State Univ. (United States); **Igor Medintz,** U.S. Naval Research Lab. (United States); **Chad A. Mirkin,** Northwestern Univ. (United States); **Wolfgang J. Parak,** Univ. Hamburg (Germany); **Ute Resch-Genger,** Bundesanstalt für Materialforschung und -prüfung (Germany); **Emmanuel Stratakis,** Foundation for Research and Technology-Hellas (Greece); **Lingdong Sun,** Peking Univ. (China); **Claudia Tortiglione,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Yadong Yin,** Univ. of California, Riverside (United States); **Junjie Zhu,** Nanjing Univ. (China)

Saturday 25 January 2025

WELCOME REMARKS

25 January 2025 • 8:30 AM - 8:50 AM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Antonios G. Kanaras**, Univ. of Southampton (United Kingdom); **Marek Osiński**, The Univ. of New Mexico (United States)

13336-1 • 8:30 AM - 8:50 AM
Welcome remarks
Author(s): **Antonios G. Kanaras,** Univ. of Southampton (United Kingdom); **Marek Osiński,** The Univ. of New Mexico (United States)

SESSION 1: NANOPARTICLES IN BIOIMAGING I

25 January 2025 • 8:50 AM - 10:30 AM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Florian Schulz**

13336-2 • 8:50 AM - 9:20 AM
Bright and narrow fluorescence from multi-chromophore protein shells *(Invited Paper)*
Author(s): **Bogdan G. Dragnea,** Indiana Univ. (United States)

13336-4 • 9:20 AM - 9:50 AM
Biostable lead sulfide quantum dots for longitudinal SWIR imaging *(Invited Paper)*
Author(s): **Amish Patel**, **Xingjian Zhong,** Boston Univ. (United States); **Allison M. Dennis,** Northeastern Univ. (United States)

13336-5 • 9:50 AM - 10:10 AM
Perovskite contrast agent for imaging mesenchymal stromal cells in vivo
Author(s): **Peuli Nath,** The Univ. of Toledo (United States); **Adrian Ross Liversage**, **Luke J. Mortensen,** The Univ. of Georgia (United States); **Aniruddha Ray,** The Univ. of Toledo (United States)

13336-3 • 10:10 AM - 10:30 AM **(CANCELLED)**
Electrochemiluminescence microscopy for single particle and cellular analysis *(Invited Paper)*
Author(s): **Junjie Zhu,** Nanjing Univ. (China)

Coffee Break 10:30 AM - 11:00 AM

SESSION 2: NANOPARTICLES IN BIOIMAGING II

25 January 2025 • 11:00 AM - 12:20 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Bogdan G. Dragnea**, Indiana Univ. (United States)

13336-6 • 11:00 AM - 11:30 AM
Polarization-resolved second harmonic generation microscopy in nanocrystals *(Invited Paper)*
Author(s): **Sotiris Psilodimitrakopoulos**, **Leonidas Mouchliadis**, **George-Miltos Maragkakis, Emmanuel Stratakis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

13336-7 • 11:30 AM - 12:00 PM
Nanoparticles as tracers in X-ray photon correlation spectroscopy studies of biological systems *(Invited Paper)*
Author(s): **Florian Schulz,** Univ. Hamburg (Germany); **Felix Lehmkühler,** Deutsches Elektronen-Synchrotron (Germany); **Wolfgang J. Parak,** Univ. Hamburg (Germany)

13336-8 • 12:00 PM - 12:20 PM
Yb,Y-codoped BaClF nanoparticles for NIR bioimaging
Author(s): **Quang Tin Nguyen**, **Mia I. Baca**, **Shruti I. Gharde**, **Katy Guo**, **Ravijit Khalsa**, **Erum Jamil,** The Univ. of New Mexico (United States); **Sergei A. Ivanov**, **Winson C. H. Kuo,** Los Alamos National Lab. (United States); **Sadhvikas J. Addamane**, **Dale L. Huber,** Sandia National Labs. (United States); **Marek Osiński,** The Univ. of New Mexico (United States)

Lunch/Exhibition Break 12:20 PM - 2:00 PM

SESSION 3: NANOPARTICLES FOR BIOMEDICAL APPLICATIONS I

25 January 2025 • 2:00 PM - 3:40 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Yadong Yin**, Univ. of California, Riverside (United States)

13336-10 • 2:00 PM - 2:30 PM **(CANCELLED)**
Protein corona dictates biological behaviors of nanoparticles *(Invited Paper)*
Author(s): **Lionel Maurizi**, **Dorra Ben Elkadhi,** Univ. de Bourgogne (France); **Mohammad Hajipour,** Stanford Univ. (United States); **Célia Marets**, **Lucien Saviot,** Univ. de Bourgogne (France); **Alexandra Oudot,** Ctr. Georges François Leclerc (France); **Cintia Marques**, **Gerrit Borchard**, **Olivier Jordan,** Univ. de Genève (Switzerland); **Arnaud Ponche,** Univ. de Haute Alsace (France)

13336-11 • 2:30 PM - 3:00 PM
New Insights on the radiotherapeutic effects of nanoscintillators *(Invited Paper)*
Author(s): **Anne-Laure Bulin,** Institut pour l'Avancée des Biosciences, Univ. Grenoble Alpes, CNRS (France)

13336-12 • 3:00 PM - 3:20 PM **(CANCELLED)**
Influence of anticoagulants and charge on nanoparticles' protein corona in blood plasma
Author(s): **Dorra Ben Elkadhi,** Univ. de Bourgogne (France); **Cintia Marques**, **Gerrit Borchard**, **Olivier Jordan,** Univ. de Genève (Switzerland); **Tiffany Madranges**, **Emmanuel De Maistre,** Ctr. Hospitalier Univ. de Dijon (France); **Arnaud Ponche,** Univ. de Haute Alsace (France); **Lionel Maurizi,** Univ. de Bourgogne (France)

13336-13 • 3:20 PM - 3:40 PM
Theranostic biomedical applications of caged gold nanostars
Author(s): **Aidan Canning**, **Tri Vu**, **Junjie Yao, Tuan Vo-Dinh,** Duke Univ. (United States)

Coffee Break 3:40 PM - 4:10 PM

SESSION 4: NANOPARTICLES FOR BIOMEDICAL APPLICATIONS II

25 January 2025 • 4:10 PM - 5:20 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Anne-Laure Bulin**, Institut pour l'Avancée des Biosciences, Univ. Grenoble Alpes, CNRS (France)

13336-14 • 4:10 PM - 4:40 PM
Multivalent display of erythropoietin on quantum dots enhances in vitro human astrocyte water transport via increased aquaporin-4 expression *(Invited Paper)*
Author(s): **Ryan N. Porell**, **Katherine E. Rogers**, **Okhil K. Nag**, **Michael H. Stewart**, **Kimihiro Susumu**, **Eunkeu Oh, James B. Delehanty,** U.S. Naval Research Lab. (United States)

13336-15 • 4:40 PM - 5:00 PM
Uses and advantages of fluorinated polymers on the surface of nanoparticles for biomedical in vivo applications *(Invited Paper)*
Author(s): **Monica Carril,** Univ. del País Vasco (Spain), BIOFISIKA Basque Ctr. for Biophysics, Consejo Superior de Investigaciones Científicas (Spain), IKERBASQUE, Basque Foundation for Science (Spain)

13336-34 • 5:00 PM - 5:20 PM
Assessment of functionalized superparamagnetic iron oxide nanoparticles on in vivo multispecies biofilm disease models
Author(s): **Leisha M. Armijo**, **Shayden Fritz,** Texas A&M Univ. Corpus Christi (United States); **Marek Osinski,** The Univ. of New Mexico (United States); **Maurice Newton,** Department of Redox Biology and Pathology, University of Vermont (United States); **Charles Easterling,** Center for Integrated Nanotechnologies, Sandia National Laboratories (United States); **Kimberly Lopez,** Texas A&M Univ. Corpus Christi (United States); **Kayla Simpson,** Univ. of Toronto (Canada); **Chi Huang**, **Paige Rogers**, **Megan Escochea**, **Kaitlin Garcia**, **Hector Davila**, **Jian l. Sheng**, **Frauke Seemann,** Texas A&M Univ. Corpus Christi (United States); **Qixu Zhang,** Department of Plastic Surgery, University of Texas, MD Anderson (United States); **Wei Xu,** Texas A&M Univ. Corpus Christi (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 5: NANOPARTICLES FOR BIOMEDICAL APPLICATIONS III

26 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Monica Carril**

13336-17 • 8:30 AM - 9:00 AM
Localized heating of nanostructures for biomedical applications *(Invited Paper)*
Author(s): **Yadong Yin,** Univ. of California, Riverside (United States)

13336-18 • 9:00 AM - 9:20 AM
Nanoplatforms for light activated cancer immunotherapy: solid lipid nanoparticles vs liposomes
Author(s): **Nimit Shah**, **Siddharth Soma**, **Maxwell Quaye**, **Doha Mahmoud**, **Sarah Ahmed**, **Ashritha Malkoochi, Girgis Obaid,** The Univ. of Texas at Dallas (United States)

13336-19 • 9:20 AM - 9:40 AM
Bimetallic photonanozyme catalysts for fluorometric analysis of total antioxidant capacity in human saliva
Author(s): **Sanskruti Swain**, **Ting-Yi Lin,** National Central Univ. (Taiwan); **I-Hsuan Chou,** National Tsing Hua Univ. (Taiwan), National Central Univ. (Taiwan); **Shu-Chen Liu,** National Central Univ. (Taiwan); **Bikash C. Mallick,** National Health Research Institutes (Taiwan); **Hsing-Ying Lin,** National Tsing Hua Univ. (Taiwan); **Chen-Han Huang,** National Central Univ. (Taiwan)

13336-20 • 9:40 AM - 10:00 AM
Biosynthesis of gold nanoclusters by tumor cells to enhance radiotherapy in pancreatic cancer
Author(s): **Aaron Schwartz-Duval,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Yuri Mackeyev,** The Univ. of Texas Health Science Ctr. at Houston (United States); **Iqbal Mahmud**, **Philip L. Lorenzi**, **Mihai Gagea,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Sunil Krishnan,** The Univ. of Texas Health Science Ctr. at Houston (United States); **Konstantin V. Sokolov,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: NANOPARTICLES FOR BIOMEDICAL APPLICATIONS IV

26 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Lionel Maurizi**, Univ. de Bourgogne (France)

13336-21 • 10:30 AM - 11:00 AM
Nanoparticle enabled cryopreservation: nanowarming *(Invited Paper)*
Author(s): **John C. Bischof,** Univ. of Minnesota, Twin Cities (United States)

13336-22 • 11:00 AM - 11:20 AM
NIR nanothermometers and nanoheaters for enhanced laser tissue soldering
Author(s): **Oscar Cipolato, Inge K. Herrmann,** ETH Zurich (Switzerland)

13336-23 • 11:20 AM - 11:40 AM
Scalable purification of iron oxide nanoparticles by tangential flow filtration for organ cryopreservation and transplantation
Author(s): **John C. Bischof**, **Onyinyechukwu J. Oziri**, **Joseph S. Rao**, **Cameron J. Scheithauer**, **Zonghu Han**, **Saurin A. Kantesaria**, **Diane K. Tobolt**, **Michael L. Etheridge, Erik B. Finger,** Univ. of Minnesota, Twin Cities (United States)

13336-33 • 11:40 AM - 12:00 PM
Investigation into the Synergistic Effects of Ultrasound and Hexagonal Boron Nitride Nanoflakes for the Treatment of Fatty Liver Disease
Author(s): **Bikash Chandra Mallick**, **Hsin-Yun Chang**, **Chia-Huei Lee, Gin-Shin Chen,** National Health Research Institutes (Taiwan)

SESSION 7: BIOSENSING

26 January 2025 • 12:00 PM - 12:50 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **John C. Bischof**, Univ. of Minnesota, Twin Cities (United States)

13336-25 • 12:00 PM - 12:30 PM
Biocompatible pH sensor based on chitosan IPNs and polystyrene colloidal photonic crystal films *(Invited Paper)*
Author(s): **Lubos Podlucky,** Institute of Informatics SAS (Slovakia); **Hiroshi Fudouzi,** National Institute for Materials Science (Japan); **Maria Bardosova,** Institute of Informatics SAS (Slovakia)

13336-27 • 12:30 PM - 12:50 PM
Plasmonics gold nanoparticles for colorimetric, photothermal, and SERS based lateral-flow immunoassay
Author(s): **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

Lunch/Exhibition Break 12:50 PM - 3:30 PM

NEUROTECHNOLOGIES PLENARY

26 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 207/215 (Level 2)
This session highlights the breadth of advances in neurophotonics technologies. Additional speakers to be announced.

3:30PM - 3:40PM **Welcome and Opening Remarks**

3:40PM - 4:50 PM **Plenary talks and Q&A**

4:50PM - 5:20PM **Short overviews of presentations on neurotechnology topics**

5:20PM - 5:30PM **Questions and discussion**

13304-500 • 3:30 PM - 3:50 PM
High-sensitivity optogenetic silencing with novel OptoGPCRs (Plenary Presentation)
Author(s): **Ofer Yizhar,** Weizmann Institute of Science (Israel)

13303-500 • 3:50 PM - 4:10 PM
Combining light and sound for scalable brain interrogation and stimulation (Plenary Presentation)
Author(s): **Daniel Razansky,** Univ. Zürich (Switzerland)

13304-501 • 4:10 PM - 4:35 PM
The Utah Optrode array for large volume optogenetic manipulation in the non-human primate brain (Plenary Presentation)
Author(s): **Alessandra Angelucci,** Univ. of Utah Healthcare (United States); **Steve Blair,** The Univ. of Utah (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:40 AM

SESSION 8: NANOPARTICLES

27 January 2025 • 10:40 AM - 12:10 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Lubos Podlucky**, Institute of Informatics SAS (Slovakia)

13336-28 • 10:40 AM - 11:10 AM
DNA-mediated assembly of Au bipyramids into Kagome superlattices with anisotropic light emitting *(Invited Paper)*
Author(s): **Zhiwei Li,** Univ. of Maryland, College Park (United States)

13336-29 • 11:10 AM - 11:30 AM
Emulsion-assisted synthesis of ZnS:Mn2+ nanocrystals for biomedical optogenetics
Author(s): **Zhongxiang Wang,** Univ. of California, Riverside (United States); **Yadong Yin,** University of California, Riverside (United States)

13336-31 • 11:30 AM - 11:50 AM
Investigating the silica growth mechanism and LSPR shift in dumbbell-shaped silica-coated gold nanorods
Author(s): **Luis Trabucco,** The Univ. of Texas at San Antonio (United States); **Rigo Mayorga-Luna,** Texas State Univ. (United States); **Monica Garza**, **Zena Hariri**, **Sean McFadden**, **John Forshay**, **Jonathan Shaw,** The Univ. of Texas at San Antonio (United States); **Yoichi Miyahara,** Texas State Univ. (United States); **Jing Yong Ye,** The Univ. of Texas at San Antonio (United States)

13336-32 • 11:50 AM - 12:10 PM
Enhancing stability and functionality of dumbbell-shaped silica-coated gold nanorods through optimized synthesis and purification
Author(s): **Zena H. Hariri**, **Monica Garza**, **Luis Trabucco,** The Univ. of Texas at San Antonio (United States); **Rigo Mayorga-Luna,** Texas State Univ. (United States); **Sean McFadden**, **Ben Forshay**, **Jonathan Shaw,** The Univ. of Texas at San Antonio (United States); **Yoichi Miyahara,** Texas State Univ. (United States); **JingYong Ye,** The Univ. of Texas at San Antonio (United States)

OCEAN OPTICS YOUNG INVESTIGATOR AWARD CEREMONY

27 January 2025 • 12:30 PM - 12:40 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Marek Osiński**, The Univ. of New Mexico (United States)
Join us for the announcement of the Ocean Optics Young Investigator Award winner.

CONCLUDING REMARKS

27 January 2025 • 12:40 PM - 12:45 PM | Moscone South, Room 50 (Lower Mezz)
Session Chair(s): **Antonios G. Kanaras**, Univ. of Southampton (United Kingdom)
Organizers will summarize the conference and make final announcements.

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13336-26 • 5:30 PM - 7:00 PM
Gold nanoparticles functionalized with antibodies: a colorimetric analysis for implementation in PoC devices
Author(s): **Caterina Serafinelli**, **Alessandro Fantoni**, **Miguel Fernandes**, **Elisabete Alegria**, **Rita Pacheco, Manuela Vieira,** Instituto Superior de Engenharia de Lisboa (Portugal)

CONFERENCE 13337

Plasmonics in Biology and Medicine XXII

26 - 27 January 2025 | Moscone South, Room 58 (Lower Mezz)

Conference Chair(s): **Tuan Vo-Dinh,** Duke Univ. (United States); **Ho-Pui A. Ho,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Krishanu Ray,** Univ. of Maryland School of Medicine (United States)

Program Committee: **Hatice Altug,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **A. Claude Boccara,** Institut Langevin (France); **Michael T. Canva,** Univ. de Sherbrooke (Canada); **Andrew M. Fales,** U.S. Food and Drug Administration (United States); **Dror Fixler,** Bar-Ilan Univ. (Israel); **Christopher D. Geddes,** Univ. of Maryland, Baltimore (United States); **Zygmunt Karol Gryczynski,** Texas Christian Univ. (United States); **Naomi J. Halas,** Rice Univ. (United States); **Jiri Homola,** Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); **Joseph R. Lakowicz,** Univ. of Maryland School of Medicine (United States); **Laura Maria Lechuga,** Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); **Martin Maiwald,** Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (Germany); **Shuming Nie,** Univ. of Illinois (United States); **Sang-Hyun Oh,** Univ. of Minnesota, Twin Cities (United States); **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Wei-Chuan Shih,** Univ. of Houston (United States); **P. James Schuck,** Columbia Univ. (United States); **Bernd Sumpf,** Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (Germany)

Sunday 26 January 2025

SESSION 1: SURFACE-ENHANCED RAMAN SCATTERING (SERS) I

26 January 2025 • 1:20 PM - 3:10 PM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Tuan Vo-Dinh**, Duke Univ. (United States)

13337-1 • 1:20 PM - 1:50 PM
Chemical sensing and biosensing using digital surface-enhanced Raman scattering *(Invited Paper)*
Author(s): **Alexandre Brolo,** Univ. of Victoria (Canada)

13337-2 • 1:50 PM - 2:10 PM
SERS-based miRNA detection with molecular beacons
Author(s): **Martina Banchelli**, **Sara Tombelli**, **Cristiano D'Andrea**, **Marella De Angelis**, **Cosimo Trono**, **Francesco Baldini**, **Paolo Matteini, Ambra Giannetti,** Istituto di Fisica Applicata "Nello Carrara" (Italy)

13337-3 • 2:10 PM - 2:30 PM
Revealing electrostatic interactions between bacteria and plasmonic nanorods for reproducible surface-enhanced Raman scattering (SERS)
Author(s): **Jia Dong**, **Jeong Hee Kim**, **Isaac Pincus**, **Sujan Manna, Loza Tadesse,** Massachusetts Institute of Technology (United States)

13337-4 • 2:30 PM - 2:50 PM
Development of a plasmonic biosensing system for disease-related circulating miRNAs
Author(s): **Aidan Canning**, **Tyler Vasse, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-5 • 2:50 PM - 3:10 PM
Deep-learning-enhanced SERS tag analysis for multiplex detection of cancer cells
Author(s): **E-Ping Tsai,** National Central Univ. (Taiwan); **I-Hsuan Chou,** National Central Univ. (Taiwan), Institute of Biomedical Engineering, National Tsing Hua Univ. (Taiwan); **Yen-Pei Lin**, **Sanskruti Swain**, **Ting Yi Lin**, **Yun-Jung Ting,** National Central Univ. (Taiwan); **Hsing Ying Lin,** Institute of Biomedical Engineering, National Tsing Hua Univ. (Taiwan); **Chen-Han Huang,** National Central Univ. (Taiwan)

Coffee Break 3:10 PM - 3:40 PM

SESSION 2: SURFACE-ENHANCED RAMAN SCATTERING (SERS) II

26 January 2025 • 3:40 PM - 4:40 PM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Ambra Giannetti**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

13337-6 • 3:40 PM - 4:00 PM
Methods for characterization of wafer scale SERS substrates
Author(s): **Matt Singer,** Thorlabs, Inc. (United States); **Ryan Priore**, **Longfei Ye,** Thorlabs Spectral Works (United States); **Erik Baigar,** Thorlabs GmbH (Germany)

13337-8 • 4:00 PM - 4:20 PM
Flexible gold nanostars substrate for ultra-sensitive SERS sensing
Author(s): **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-9 • 4:20 PM - 4:40 PM
Magneto-plasmonic gold nanostars for ultrasensitive SERS sensing applications
Author(s): **Taylor L. Thorsen**, **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13337-7 • 5:30 PM - 7:00 PM
Design of porous Si-cavity as highly efficient SERS active substrate for reproducible and accurate detection of bacteria
Author(s): **Sathi Das**, **Anuj Saxena, Dalip S. Mehta,** Indian Institute of Technology Delhi (India)

Monday 27 January 2025

SESSION 3: SPR AND PLASMONICS SENSING SYSTEMS

27 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Krishanu Ray**, Univ. of Maryland School of Medicine (United States)

13337-11 • 8:40 AM - 9:00 AM
Enhanced sample manipulation through the integration of droplet microfluidic technology into plasmonic detection systems
Author(s): **Yuye Wang**, **Haoyu Liu**, **Jiajie Chen, Yonghong Shao,** Shenzhen Univ. (China)

13337-12 • 9:00 AM - 9:20 AM
Mid-infrared biosensing using colloidal plasmonic particles and quantum cascade laser based spectral imaging
Author(s): **Aidana Beisenova**, **Wihan Adi**, **Kenzie B. Germanson**, **Simon Nam,** Univ. of Wisconsin-Madison (United States); **Shinwon Kang**, **Seog-Jin Jeon,** Kumoh National Institute of Technology (Korea, Republic of); **Filiz Yesilkoy,** Univ. of Wisconsin-Madison (United States)

13337-13 • 9:20 AM - 9:40 AM
Integrated single-particle plasmonic exceptional point sensor on a Mach-Zehnder interferometer for extreme biosensing
Author(s): **Kamyar Behrouzi**, **Zhanni Wu**, **Liwei Lin, Boubacar Kanté,** Univ. of California, Berkeley (United States)

13337-14 • 9:40 AM - 10:00 AM **(CANCELLED)**
Plasmonic-enhanced fluorescence for biomarkers detection via combination of small and large magnetic nanoparticles
Author(s): **Anatoliy Lapchuk,** Institute for Information Recording (Ukraine); **Ivan Gorbov,** The Univ. of Nottingham (United Kingdom), Institute for Information Recording (Ukraine); **Yevhenii Morozov,** AIT Austrian Institute of Technology GmbH (Austria); **Olexander Butok,** Institute for Information Recording (Ukraine)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: ADVANCED PLASMONICS STRUCTURES AND SYSTEMS

27 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Aaron Ho-Pui Ho**, The Chinese Univ. of Hong Kong (Hong Kong, China)

13337-16 • 10:30 AM - 10:50 AM
Design, modeling, and fabrication of plasmonic nanostructures and nanoantennas for biological and chemical sensing applications
Author(s): **Merbin John**, **Umang Chaturvedi**, **Kamal Kumar**, **Nitin Gupta**, **Vaibhav Chaturvedi**, **Mohd Asif, Anuj Dhawan,** Indian Institute of Technology Delhi (India)

13337-17 • 10:50 AM - 11:10 AM
Development and applications of a novel plasmonics-active caged nanostars
Author(s): **Aidan Canning, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-18 • 11:10 AM - 11:30 AM
Core-shell nanostars: synthesis and application for SERS sensing
Author(s): **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

Lunch/Exhibition Break 11:30 AM - 1:20 PM

SESSION 5: APPLICATIONS OF PLASMONICS AND RAMAN SYSTEMS

27 January 2025 • 1:20 PM - 2:50 PM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Martin Maiwald**, Ferdinand-Braun-Institut gGmbH (Germany)

13337-19 • 1:20 PM - 1:40 PM
Bionanoparticle trapping and sensing in solid medium via optothermal tweezers
Author(s): **Jiajie Chen**, **Yuye Wang**, **Jianxing Zhou**, **Xiaoqi Dai**, **Yuhang Peng**, **Yonghong Shao, Junle Qu,** Shenzhen Univ. (China)

13337-29 • 1:40 PM - 2:00 PM
Bimetallic silver-gold nanostars: synthesis, surface functionalization, and applications in SERS detection
Author(s): **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-22 • 2:00 PM - 2:20 PM
A genetic algorithm to optimize performance of SERS-based miRNA biosensor
Author(s): **Tyler Vasse**, **Aidan Canning**, **Tuan Vo-Dinh,** Duke Univ. (United States); **Heather Whitson,** Duke Univ. School of Medicine (United States)

13337-28 • 2:20 PM - 2:50 PM
Shifted excitation Raman difference spectroscopy: a potential tool for a sustainable recycling industry *(Invited Paper)*
Author(s): **Kay Sowoidnich**, **André F. Müller,** Ferdinand-Braun-Institut gGmbH (Germany); **Katharina Rudisch**, **Karsten Pufahl,** Technische Univ. Berlin (Germany); **Valentin Regir,** LLA Instruments GmbH (Germany); **Bernd Sumpf, Martin Maiwald,** Ferdinand-Braun-Institut gGmbH (Germany)

Coffee Break 2:50 PM - 3:20 PM

SESSION 6: APPLICATIONS OF PLASMONICS AND NANOSYSTEMS

27 January 2025 • 3:20 PM - 5:00 PM | Moscone South, Room 58 (Lower Mezz)
Session Chair(s): **Krishanu Ray**, Univ. of Maryland School of Medicine (United States)

13337-30 • 3:20 PM - 3:40 PM
Dual-modal colorimetric and surface-enhanced Raman scattering lateral flow immunoassay
Author(s): **Supriya Atta**, **Yuanhao Zhao, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-25 • 3:40 PM - 4:00 PM
Lateral-flow immunoassay using magneto-plasmonic gold nanostars
Author(s): **Taylor L. Thorsen**, **Supriya Atta, Tuan Vo-Dinh,** Duke Univ. (United States)

13337-26 • 4:00 PM - 4:20 PM
Integrated photoacoustic microscopy and optical coherence tomography tracking diabetic retinopathy diseases in living rabbits
Author(s): **Van-Phuc Nguyen,** Wilmer Eye Institute (United States), The Johns Hopkins Univ. School of Medicine (United States); **Zheng Mi,** Univ. of Michigan (United States); **Yannis Paulus,** Wilmer Eye Institute (United States), The Johns Hopkins Univ. School of Medicine (United States)

13337-27 • 4:20 PM - 4:40 PM
DNA serial dilution: an investigation toward accurate broadband plasmonic signature
Author(s): **Arash Dehzangi,** Northwestern Univ. (United States); **Masih Ghasemi,** Shahid Beheshti Univ. (Iran, Islamic Republic of); **P. K. Choudhury,** Zhejiang Univ. (China)

13337-31 • 4:40 PM - 5:00 PM
Nanoimprint lithography for scalable fabrication of nanoplasmonic devices
Author(s): **Brett Kamino,** NIL Technology Switzerland GmbH (Switzerland)

CONFERENCE 13338

Frontiers in Biological Detection: From Nanosensors to Systems XVII

25 - 26 January 2025 | Moscone South, Room 70 (Lower Mezz)

Conference Chair(s): **Amos Danielli,** Bar-Ilan Univ. (Israel); **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States); **Sharon M. Weiss,** Vanderbilt Univ. (United States)

Program Committee: **Andrea M. Armani,** The Univ. of Southern California (United States); **Nathaniel C. Cady,** SUNY Polytechnic Institute (United States); **M. Imran Cheema,** Lahore Univ. of Management Sciences (Pakistan); **Xudong Fan,** Univ. of Michigan (United States); **Andrea K. Locke,** Vanderbilt Univ. (United States); **Francesco Michelotti,** Sapienza Univ. di Roma (Italy)

Saturday 25 January 2025

SESSION 1: SERS AND PLASMONICS I

25 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Benjamin L. Miller**, Univ. of Rochester Medical Ctr. (United States)

13338-1 • 1:30 PM - 2:00 PM
Optomicrofluidic platforms for rapid and sensitive detection of biomarkers in medical diagnostics *(Invited Paper)*
Author(s): **Riccardo Funari**, **Rana M. A. Ayaz**, **Claudio J. Oton,** Scuola Superiore Sant'Anna (Italy); **Amy Q. Shen,** Okinawa Institute of Science and Technology Graduate Univ. (Japan); **Fabrizio C. F. Di Pasquale,** Scuola Superiore Sant'Anna (Italy)

13338-2 • 2:00 PM - 2:30 PM
Enhanced detection of disease biomarkers using metallic nanostructures and enzyme-free, isothermal amplification *(Invited Paper)*
Author(s): **Samuel Mabbott**, **Gerard Coté**, **Sayantan Tripathy, Siddhant Jaitpal,** Texas A&M Univ. (United States)

13338-3 • 2:30 PM - 3:00 PM
Plasmonic nano-aperture label-free imaging of single small extracellular vesicles for cancer detection *(Invited Paper)*
Author(s): **Wei-Chuan Shih,** Univ. of Houston (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 2: SERS AND PLASMONICS II

25 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Alberto Sinibaldi**, Sapienza Univ. di Roma (Italy)

13338-4 • 3:30 PM - 4:00 PM
Plasmonic sensor arrays as artificial taste buds *(Invited Paper)*
Author(s): **Alasdair W. Clark**, **Justin Sperling**, **William Peveler**, **Daniel Osborne**, **Badri Aekbote**, **Liam Wilson,** Univ. of Glasgow (United Kingdom); **Anthony Perry**, **Chad Sipperly, Rudi Schick,** Spraying Systems Co. (United States)

13338-5 • 4:00 PM - 4:20 PM
Surface-enhanced Raman spectroscopy for detection of vaginal bacteria
Author(s): **Anna S. Rourke-Funderburg**, **Sophia Juarez**, **Dalton Nelson**, **Frederick Haselton,** Vanderbilt Univ. (United States); **Emad Elsamadicy,** Vanderbilt Univ. Medical Ctr. (United States); **Anita Mahadevan-Jansen, Andrea K. Locke,** Vanderbilt Univ. (United States)

13338-6 • 4:20 PM - 4:50 PM
Beads Stacked Nano-Sieve for On-chip Concentration and Surface Enhanced Raman Sensing of Silver Nanoparticles *(Invited Paper)*
Author(s): **Tyler Ng**, **Zhaoxi Yang**, **Xinye Chen,** Univ. of California, Riverside (United States); **Eun-Yeong Bok**, **YoonJung Do,** Rural Development Administration (Korea, Republic of); **Katie Lao,** Univ. of California (United States); **Ruoxue Yan, Ke Du,** Univ. of California, Riverside (United States)

13338-25 • 4:50 PM - 5:20 PM

Fluorescence correlation as an output signal for programmable biosensing *(Invited Paper)*
Author(s): **Marcus Jones**, **Sneha Mathew,** Auckland Univ. of Technology (New Zealand); **Kirill Afonin,** The Univ. of North Carolina at Charlotte (United States)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 3: FLUORESCENCE AND MICROSCOPY

26 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Sharon M. Weiss**, Vanderbilt Univ. (United States)

13338-7 • 8:00 AM - 8:30 AM
Super-resolved interrogation of molecules within thick brain tissues using expansion sequencing *(Invited Paper)*
Author(s): **Shahar Alon,** Bar-Ilan Univ. (Israel)

13338-8 • 8:30 AM - 8:50 AM
Multimodal imaging of RNA and proteins with super-resolution in intact brain organoids
Author(s): **Alexandra Glick**, **Shahar Alon**, **Noam Feldman,** Bar-Ilan Univ. (Israel); **Gad Vatine, Kfir Varshawski,** Ben-Gurion Univ. of the Negev (Israel)

13338-9 • 8:50 AM - 9:20 AM
Single chemosensors for pattern recognition-driven chemical sensing *(Invited Paper)*
Author(s): **Yui Sasaki,** The Univ. of Tokyo (Japan)

13338-10 • 9:20 AM - 9:50 AM
Printed paper-based optical sensor array devices *(Invited Paper)*
Author(s): **Tsuyoshi Minami,** The Univ. of Tokyo (Japan)

Coffee Break 9:50 AM - 10:20 AM

SESSION 4: NOVEL NANOMATERIAL-BASED SENSORS

26 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Amos Danielli**, Bar-Ilan Univ. (Israel)

13338-11 • 10:20 AM - 10:50 AM
AI-guided optical sensors for the early detection of gynecologic cancers *(Invited Paper)*
Author(s): **Zvi Yaari,** The Hebrew Univ. of Jerusalem (Israel)

13338-12 • 10:50 AM - 11:10 AM
Sensitivity and cross reactivity analysis of NS1-based dengue virus serological assays within serotypes and with other flaviviruses
Author(s): **Sophie Terenteva**, **Amos Danielli**, **Linoy Golani,** Bar-Ilan Univ. (Israel); **Yaniv Lustig**, **Eliezer Schwartz**, **Victoria Indenbaum,** The Chaim Sheba Medical Ctr., Tel Hashomer (Israel); **Shira Avivi,** Bar-Ilan Univ. (Israel); **Nguyen Vu Trung,** Hanoi Medical Univ. (Vietnam); **Le Thi Hoi,** Phacogen Institute of Technology (Vietnam)

13338-13 • 11:10 AM - 11:30 AM
Enhancing the performance of enzyme-free nucleic acid biosensors via molecular crowding *(Invited Paper)*
Author(s): **Benjamin L. Miller**, **Jeffrey W. Beard**, **Samuel L. Hunt**, **Alexander Evans, Coleman Goenner,** Univ. of Rochester Medical Ctr. (United States)

13338-14 • 11:30 AM - 11:50 AM
Porous silicon on paper sensors: factors affecting biosensing performance
Author(s): **Huijin An**, **Andrea K. Locke**, **Paul E. Laibinis, Sharon M. Weiss,** Vanderbilt Univ. (United States)

13338-26 • 11:50 AM - 12:10 PM
Investigating angiotensin converting enzyme-2 and SARS CoV-2 spike protein interactions using a combined label-free and fluorescence detection approach
Author(s): **Alberto Sinibaldi**, **Daniele Chiappetta**, **Agostino Occhicone**, **Paola Di Matteo**, **Anastasiia Gaganina,** Sapienza Univ. di Roma (Italy); **Norbert Danz**, **Peter Munzert,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Francesco Michelotti,** Sapienza Univ. di Roma (Italy)

Lunch/Exhibition Break 12:10 PM - 1:20 PM

SESSION 5: INTEGRATED PHOTONIC SENSORS

26 January 2025 • 1:20 PM - 3:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Benjamin L. Miller**, Univ. of Rochester Medical Ctr. (United States)

13338-15 • 1:20 PM - 1:50 PM
PIC-based spectroscopic chemical sensing *(Invited Paper)*
Author(s): **JueJun Hu,** Massachusetts Institute of Technology (United States)

13338-16 • 1:50 PM - 2:10 PM
Photonic integrated circuit biosensors for sensing in complex media
Author(s): **Jennifer M. Morales**, **Justin R. Bickford**, **Sanchao Liu**, **Alexander J. Winton**, **Matthew B. Coppock**, **Paul M. Pellegrino,** U.S. Army Research Lab. (United States); **Pak S. Cho,** Fibertek, Inc. (United States)

13338-17 • 2:10 PM - 2:30 PM
Study of foundry-compatible local evanescent array-coupled (LEAC) biosensor for COVID serology
Author(s): **Cameron D. Holmes**, **Kevin L. Lear**, **Brian Geiss**, **Loran B. R. Anderson**, **Matt J. Kipper**, **Matthew C. Lynd,** Colorado State Univ. (United States); **Liszt Y. C. Madruga,** George Mason Univ. (United States); **Joe Kramer**, **Molly Worthing**, **William Price**, **Behzad Moslehi,** Intelligent Fiber Optic Systems Corp. (United States); **Nicholas Fahrenkopf,** AIM Photonics (United States), Research Foundation for The State Univ. of New York (United States)

13338-18 • 2:30 PM - 3:00 PM
Semiconductor tunable laser system for integrated photonic biosensors *(Invited Paper)*
Author(s): **Stefan F. Preble,** Rochester Institute of Technology (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 6: OTHER NOVEL OPTICAL SENSORS

26 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Andrea K. Locke**, Vanderbilt Univ. (United States)

13338-19 • 3:30 PM - 3:50 PM
Topological barrier to Cas12a activation by circular DNA nanostructures facilitates autocatalysis and transforms DNA/RNA sensing
Author(s): **Fei Deng**, **Ewa M. Goldys, Flyn Mckinnirey,** The Univ. of New South Wales (Australia)

13338-20 • 3:50 PM - 4:10 PM
Sound emitted by stressed plants: observation of structures and dynamics by transmission optical tomography
Author(s): **Albert Claude Boccara**, **Samer Alhaddad**, **Viacheslav Mazlin,** Institut Langevin (France); **Martine Boccara,** Ecole Normale Supérieure (France), Muséum national d'Histoire naturelle (France)

13338-21 • 4:10 PM - 4:30 PM
Remote evaluation of plant water content by speckle pattern AI analysis *(Invited Paper)*
Author(s): **Keren Schwartzman Oren**, **Yigal Cohen**, **Marianna Beiderman**, **Sergey Agdarov**, **Yafim Beiderman, Zeev Zalevsky,** Bar-Ilan Univ. (Israel)

13338-22 • 4:30 PM - 4:50 PM
Lambda theta reflectometry for protein biosensing
Author(s): **Alanna Klose,** Univ. of Rochester Medical Ctr. (United States); **Robert Boni**, **Joseph Katz,** Lab. for Laser Energetics, Univ. of Rochester (United States); **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13338-23 • 4:50 PM - 5:10 PM
Optical sensors for monitoring enzymatic activity *(Invited Paper)*
Author(s): **Gili Bisker,** Tel Aviv Univ. (Israel)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13338-24 • 5:30 PM - 7:00 PM
Multiplexed super-resolved characterization of intact brain organoids
Author(s): **Noam Feldman**, **Shahar Alon**, **Alexandra Glick,** Bar-Ilan Univ. (Israel); **Gad Vatine, Kfir Varshawski,** Ben-Gurion Univ. of the Negev (Israel)

13338-27 • 5:30 PM - 7:00 PM
Enhanced fluorescence detection of tau protein using photonic crystal-based biochips: a novel tool for Alzheimer's disease diagnostics
Author(s): **Alberto Sinibaldi,** Sapienza Univ. di Roma (Italy); **Francesco Chiavaioli,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Agostino Occhicone,** Sapienza Univ. di Roma (Italy); **Norbert Danz**, **Peter Munzert,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Ambra Giannetti**, **Francesco Baldini,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Francesco Michelotti,** Sapienza Univ. di Roma (Italy)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

CONFERENCE 13339

Reporters, Contrast Agents, and Molecular Probes for Biomedical Applications XVI

28 - 29 January 2025 | Moscone South, Room 104 (Level 1 Lobby)

Conference Chair(s): **Mikhail Y. Berezin,** Washington Univ. School of Medicine in St. Louis (United States); **Ramesh Raghavachari,** U.S. Food and Drug Administration (United States)

Program Committee: **Daniel A. Heller,** Memorial Sloan-Kettering Cancer Ctr. (United States); **Lingyan Shi,** Univ. of California, San Diego (United States); **Allison Dennis,** Northeastern Univ. (United States); **Martin Schnermann,** National Cancer Institute (United States); **Andrew M. Smith,** Univ. of Illinois (United States); **Igor Luzhansky,** Washington Univ. in St. Louis (United States); **Ashok Kumar Mishra,** Indian Institute of Technology Madras (India); **Gabor Patonay,** Georgia State Univ. (United States); **Baowei Fei,** The Univ. of Texas at Dallas (United States)

Monday 27 January 2025

POSTERS-MONDAY

27 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Monday BiOS poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Monday 10:00 AM – 5:00 PM
View poster presentation guidelines and set-up instructions at:
https://spie.org/PW/Poster-Guidelines

13339-24 • 5:30 PM - 7:00 PM
Development of activatable small molecular probes for detection of hypoxia by photoacoustic imaging
Author(s): **Takafumi Kasai**, **Kyohhei Fujita**, **Ryo Tachibana,** The Univ. of Tokyo (Japan); **Takeshi Hirasawa,** Nagaoka Univ. of Technology (Japan); **Tomohiro Ishikawa**, **Ryo Shintate**, **Manami Miyashita**, **Miya Ishihara,** National Defense Medical College (Japan); **Yasuteru Urano,** The Univ. of Tokyo (Japan)

13339-25 • 5:30 PM - 7:00 PM
Chatbots can guide measurement of absorption spectra with improved quality
Author(s): **Masahiko Taniguchi, Jonathan S. Lindsey,** North Carolina State Univ. (United States)

13339-26 • 5:30 PM - 7:00 PM
On the healing process of Wistar rat burnt scars implementing micro-encapsulation of reactive oxygen
Author(s): **Masih Ghasemi,** Laser and Plasma Research Institute, Shahid Beheshti Univ. (Iran, Islamic Republic of); **M. Nouri**, **A. Ansari**, **M. T. Kouhbanani,** Nanotech Anion AB (Sweden); **Arash Dehzangi,** Northwestern Univ. (United States); **S. Nazeri**, **M. Abbasi,** Zhinogene Pazhoohan Research Lab. (Iran, Islamic Republic of); **P. Nori,** Semnan Univ. (Iran, Islamic Republic of); **MohammadMahdi Ariannejad,** Xiamen Univ. (Malaysia); **P. K. Choudhury,** International Research Ctr. for Advanced Photonics, Zhejiang Univ. (China)

13339-35 • 5:30 PM - 7:00 PM
Radiolytically molecularly imprinted polymer@Au nanocomposites for morphine sensing
Author(s): **Alam Abedini**, **Farhad Larki,** Isfahan Univ. of Technology (Iran, Islamic Republic of); **Arash Dehzangi,** Northwestern Univ. (United States); **Mohammad Sarajia,** Laye Rooyan Part, Isfahan Science and Technology Town, (Iran, Islamic Republic of); **Ahmad Shirani,** Isfahan Univ. of Technology (Iran, Islamic Republic of)

Tuesday 28 January 2025

SESSION 1: FLUORESCENCE LIFETIME IMAGING

28 January 2025 • 8:30 AM - 10:25 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Ramesh Raghavachari**, U.S. Food and Drug Administration (United States); **Walter J. Akers**, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

13339-1 • 8:30 AM - 9:15 AM
Fluorescence and fluorescent life imaging probes for biomedical applications (Keynote Presentation) *(Invited Paper)*
Author(s): **Mark Bradley,** Queen Mary Univ. of London (United Kingdom)

13339-2 • 9:15 AM - 9:45 AM
Advancements in time-resolved detection for in-vivo multiphoton microscopy of human skin *(Invited Paper)*
Author(s): **Mihaela Balu,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States); **Alexander Vallmitjana**, **Amanda Durkin**, **Alexander Dvornikov**, **Belen Torrado**, **Suman Ranjit,** Beckman Laser Institute and Medical Clinic (United States); **Kristen M. Kelly, Anand K. Ganesan,** Beckman Laser Institute and Medical Clinic (United States), Univ. of California, Irvine (United States)

13339-3 • 9:45 AM - 10:05 AM
Non-fitting algorithms for fluorescence lifetime imaging
Author(s): **Hridoy Biswas**, **Rui Tang**, **Megan S. Michie,** Washington Univ. School of Medicine in St. Louis (United States); **Mykyta Kizilov**, **Vsevolod Cheburkanov**, **Vladislav V. Yakovlev,** Texas A&M Univ. (United States); **Mikhail Y. Berezin,** Washington Univ. School of Medicine in St. Louis (United States)

13339-4 • 10:05 AM - 10:25 AM
Fluorescence-lifetime-modulating probes for neural activity sensing
Author(s): **Anh-Thu Nguyen**, **Hieu Tran,** The Univ. of Texas at Austin (United States); **Yuansheng Sun**, **Shih-Chu Liao,** ISS, Inc. (United States); **HooiCheng Lim**, **Yujie He**, **Sohyun Kim**, **Saeed Seifi**, **Stephanie K. Seidlits, Hsin-Chih Yeh,** The Univ. of Texas at Austin (United States)

Coffee Break 10:25 AM - 10:45 AM

SESSION 2: NANOPROBES AND DYES I

28 January 2025 • 10:45 AM - 12:55 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Allison M. Dennis**, Northeastern Univ. (United States)

13339-9 • 10:45 AM - 11:15 AM
Developments of Raman probes for advanced stimulated Raman imaging *(Invited Paper)*
Author(s): **Yasuyuki Ozeki,** The Univ. of Tokyo (Japan)

13339-5 • 11:15 AM - 11:45 AM
Magnetoplasmonic nanoplatform for magnetic field-induced optical imaging and synergistic therapy *(Invited Paper)*
Author(s): **Tymish Y. Ohulchanskyy,** Shenzhen Univ (China)

13339-6 • 11:45 AM - 12:05 PM
Development of efficient immunotherapeutic cell labeling probes through optimized perfluorocarbon nanodroplets (PFC-NDs) coated by layer-by-layer (LbL) self-assembly: an experimental and machine learning (ML) approach
Author(s): **Ali Haghighat Mesbahi**, **Konstantin V. Sokolov**, **Dmitry Nevozhay**, **Phillip Gingrich, Bissan Al-Lazikani,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

13339-7 • 12:05 PM - 12:25 PM
Designed synthesis of bright and in vivo excretable multiplexed surface-enhanced Raman nanoparticle palettes *(Invited Paper)*
Author(s): **Jung Ho Yu,** Univ. of Waterloo (Canada)

13339-8 • 12:25 PM - 12:55 PM
Robust and gentle dyes for 4D fluorescence imaging *(Invited Paper)*
Author(s): **Zhixing Chen,** Peking Univ. (China)

Lunch/Exhibition Break 12:55 PM - 1:55 PM

SESSION 3: NANOPROBES AND DYES II

28 January 2025 • 1:55 PM - 3:05 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Mikhail Y. Berezin**, Washington Univ. School of Medicine in St. Louis (United States)

13339-10 • 1:55 PM - 2:15 PM
Antibody-targeted, liposomes encapsulated indocyanine green dye J-aggregates as contrast agents for molecular photoacoustic imaging
Author(s): **Ananthakrishnan Soundaram Jeevarathinam**, **Claire E. Jones**, **Cayla Zandbergen**, **Yunfei Wen**, **Anil Sood**, **Konstantin V. Sokolov, Richard R. Bouchard,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

13339-11 • 2:15 PM - 2:35 PM
Optimization of nanosized contrast agents for ultrasound imaging
Author(s): **Dmitry Nevozhay**, **Charles R. Dyall,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Trevor M. Mitcham,** The Univ. of Texas M.D. Anderson Cancer Ctr (United States); **Yunyun Chen**, **Linh D. Nguyen,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Gianmarco F. Pinton,** The Univ. of North Carolina at Chapel Hill (United States); **Stephen Y. Lai**, **Richard R. Bouchard, Konstantin V. Sokolov,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

13339-12 • 2:35 PM - 3:05 PM **(CANCELLED)**
Engineering upconversion nanoparticles for high-sensitivity biological imaging and sensing *(Invited Paper)*
Author(s): **Guanying Chen,** Harbin Institute of Technology (China)

Coffee Break 3:05 PM - 3:25 PM

SESSION 4: SWIR IMAGING AND SPECTROSCOPY

28 January 2025 • 3:25 PM - 5:05 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Lingyan Shi**, Univ. of California, San Diego (United States)

13339-13 • 3:25 PM - 3:55 PM
Enhancing NIR-II contrast agents: from multiplexed imaging to improved stability *(Invited Paper)*
Author(s): **Allison M. Dennis,** Northeastern Univ. (United States)

13339-14 • 3:55 PM - 4:15 PM
NIR-II fluorescent DNA nanoparticles for contrast-enhanced tumor imaging
Author(s): **Bryce Dunn,** George Mason Univ. (United States); **Ritesh Isuri,** Univ. of Pennsylvania (United States); **Marzieh Hanafi,** George Mason Univ. (United States); **Wendy Chung**, **David Rioux**, **Sébastien Blais-Ouellette,** Photon Etc. Inc (Canada); **Edward J. Delikatny,** Univ. of Pennsylvania (United States); **John R. Cressman**, **Remi Veneziano, Parag V. Chitnis,** George Mason Univ. (United States)

13339-15 • 4:15 PM - 4:35 PM
Absorption spectra library and protocol for measuring biological absorbers spanning the visible to the short-wave infrared
Author(s): **Folaoluwashewa G. Shofu**, **Hannah D. R. Gruensfelder**, **Megan S. Michie**, **Mikhail Y. Berezin**, **Leonid Shmuylovich, Christine M. O'Brien,** Washington Univ. in St. Louis (United States)

13339-34 • 4:35 PM - 5:05 PM
Non-invasive assessment of metabolic activity of mitochondria through near-infrared excitation *(Invited Paper)*
Author(s): **Vladislav V. Yakovlev,** Texas A&M Univ. (United States)

Wednesday 29 January 2025

SESSION 5: EMERGING TECHNOLOGIES IN IMAGING

29 January 2025 • 8:20 AM - 10:15 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Allison M. Dennis**, Northeastern Univ. (United States)

13339-16 • 8:20 AM - 9:05 AM
Nano-laser particles (Keynote Presentation) *(Invited Paper)*
Author(s): **Seok-Hyun Andy Yun,** Wellman Ctr. for Photomedicine (United States)

13339-17 • 9:05 AM - 9:35 AM
scHOCMO: higher order correlation model for single-cell multi-omics *(Invited Paper)*
Author(s): **Shamim Mollah,** HSpeQ LLC (United States)

13339-18 • 9:35 AM - 9:55 AM
Infrared laser imaging for tissues and cells
Author(s): **Miao Zhang,** Bruker Nano, Inc. (United States); **Peng Wang,** Bruker Corp. (United States); **Domenic Dreisbach,** Bruker Optik GmbH (Germany); **Thomas J. Tague,** Bruker Corp. (United States)

13339-19 • 9:55 AM - 10:15 AM
Wavelet based compression method for hyperspectral imaging of biological tissue in SWIR *(Invited Paper)*
Author(s): **Mikhail Y. Berezin**, **Hridoy Biswas**, **Rui Tang, Shamim Mollah,** Washington Univ. School of Medicine in St. Louis (United States)

Coffee Break 10:15 AM - 10:35 AM

SESSION 6: FLUORESCENCE IMAGING

29 January 2025 • 10:35 AM - 11:55 AM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Ramesh Raghavachari**, U.S. Food and Drug Administration (United States); **Mikhail Y. Berezin**, Washington Univ. School of Medicine in St. Louis (United States)

13339-20 • 10:35 AM - 10:55 AM
Comparative Analysis of Fluorophore-MALDI Matrix Interactions in Solid and Liquid Phases to Investigate Fluorescence Enhancement Effects in FluoMALDI Imaging
Author(s): **Wanyue Wang,** Johns Hopkins Univ. (United States); **Tae-Hun Hahm**, **Dalton R. Brown**, **Cole C. Johnson**, **Caitlin M. Tressler**, **Kristine Glunde,** The Johns Hopkins Univ. School of Medicine (United States); **Gabriella Lagdameo,** The Johns Hopkins University Applied Imaging Mass Spectrometry Core and Service Center (United States)

13339-21 • 10:55 AM - 11:15 AM
In vivo microscopy of peripheral nerve regeneration with single-axon resolution
Author(s): **Igor Luzhansky**, **Emma Anisman**, **Ron Perez**, **Dan Hunter**, **Sophia Zhang**, **Morgan Hoffman**, **Dharma Patel**, **Ahmed Ahmed**, **Muneeb Malik**, **Abby Cherian**, **Naasik Syed**, **Arjun Singh**, **Jevon Bonner**, **Emilia Feria**, **Bilal Khan**, **Lily Cohen**, **Brooke Cohen**, **Sebastian Lee**, **David Brogan**, **Matthew Wood, Mikhail Y. Berezin,** Washington Univ. in St. Louis (United States)

13339-22 • 11:15 AM - 11:35 AM
Exploring protocols to stain collagen fibers with Fast Green F.C.F for fluorescent imaging with inverted selective plane illumination microscope (iSPIM)
Author(s): **Guang Li,** Tulane Univ. (United States); **Qinhan Zhou**, **Kristin S. Miller,** The Univ. of Texas at Dallas (United States); **J. Quincy Brown,** Tulane Univ. (United States)

13339-23 • 11:35 AM - 11:55 AM
A simplified fluorescence assay to estimate binding on- and off-rates for molecular targeted imaging agents
Author(s): **Sanduni Sarathchandra,** Illinois Institute of Technology (United States); **Ranuli Abeysinghe**, **Sassan Hodge**, **Kimberley Samkoe**, **Geoffrey Luke,** Dartmouth College (United States); **Kenneth Tichauer,** Illinois Institute of Technology (United States)

Lunch/Exhibition Break 11:55 AM - 1:25 PM

SESSION 7: BEYOND FLUORESCENCE

29 January 2025 • 1:25 PM - 2:55 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Mikhail Y. Berezin**, Washington Univ. School of Medicine in St. Louis (United States)

13339-27 • 1:25 PM - 1:55 PM
Label-free tissue composition assessment using fluorescence frequency-response imaging (F-FRI) for cancer diagnosis and image-guided surgery *(Invited Paper)*
Author(s): **Javier A. Jo,** The Univ. of Oklahoma (United States)

13339-28 • 1:55 PM - 2:25 PM
Metasurface-enabled inverted reflection-mode chemical imaging of live cells: a label-free optical assay for measuring cellular dynamics *(Invited Paper)*
Author(s): **Gennady B. Shvets,** Cornell Univ. (United States)

13339-29 • 2:25 PM - 2:55 PM
Local protein detection with a lateral flow assay read through tissue using x-ray excited luminescence chemical imaging (XELCI) *(Invited Paper)*
Author(s): **Yu Ding,** Clemson Univ. (United States); **K. Bradley Kelly,** Clemson Univ. (United States), GREEN Upstate High School (United States); **Morgan N. Reel,** Clemson Univ. (United States); **Matthew J. Case,** Clemson Univ. (United States), Emory Univ. (United States); **Jeffrey N. Anker,** Clemson Univ. (United States)

SESSION 8: INTEGRATING AI AND MACHINE LEARNING FOR NEXT-GENERATION HISTOLOGY IMAGING

29 January 2025 • 3:10 PM - 5:10 PM | Moscone South, Room 104 (Level 1 Lobby)
Session Chair(s): **Farzad Fereidouni**, Emory Univ. (United States)

13339-30 • 3:10 PM - 3:40 PM
Intersection between novel imaging tools and AI—the final frontier? Or: Ground truth vs. grand truth *(Invited Paper)*
Author(s): **Richard M. Levenson**, **Nathan A. Anderson,** UC Davis Health System (United States); **Farzad Fereidounui,** Emory Univ. (United States)

13339-31 • 3:40 PM - 4:10 PM
Automatic detection of prostate cancer via 3D microscopy and deep learning *(Invited Paper)*
Author(s): **Robert B. Serafin**, **Rui Wang**, **Sarah Chow,** Univ. of Washington (United States); **Jennifer Salguero-Lopez**, **Anant Madabhushi,** Emory Univ. (United States); **Lawrence D. True, Jonathan T. C. Liu,** Univ. of Washington (United States)

13339-32 • 4:10 PM - 4:40 PM
Advancing Digital Pathology with DUET Imaging and AI *(Invited Paper)*
Author(s): **Willy Ju**, **Shelly Seth,** Emory Univ. (United States); **Samuel Border,** Univ. of Florida (United States); **Ruben Renteria,** Emory Univ. (United States); **Anupam Mitra,** Stanford Univ. (United States); **Sunil Badve**, **Romil Saxena,** Emory Univ. (United States); **Pinaki Sarder,** Univ. of Florida (United States); **Kuang-Yu Jen,** Univ of California Davis (United States); **Farzad Fereidouni,** Emory Univ. (United States)

13339-33 • 4:40 PM - 5:10 PM
Virtual gigascale tissue surface histology using structured illumination: Optical and computational strategies to enhance clinical translation *(Invited Paper)*
Author(s): **Jonathon Quincy Brown,** Tulane Univ. (United States)

CONFERENCE 13340

Quantum Effects and Measurement Techniques in Biology and Biophotonics II

25 - 28 January 2025 | Moscone South, Room 54 (Lower Mezz)

Conference Chair(s): **Clarice Aiello,** Univ. of California, Los Angeles (United States); **Sergey V. Polyakov,** National Institute of Standards and Technology (United States); **Paige Derr,** National Institutes of Health (United States)

Program Committee: **Kyungwha Chung,** Sungkyunkwan Univ. (Korea, Republic of); **Theodore Goodson,** Univ. of Michigan (United States); **Youngchan Kim,** Univ. of Surrey (United Kingdom); **Peter C. Maurer,** The Univ. of Chicago (United States); **Thomas Middelmann,** Physikalisch-Technische Bundesanstalt (Germany); **Geetha Senthil,** National Institutes of Health (United States); **G. Sitta Sittampalam,** National Ctr. for Advancing Translational Sciences (United States); **Steven S. Vogel,** National Institutes of Health (United States)

Saturday 25 January 2025

SESSION 1: NOVEL TRENDS IN QUANTUM BIOLOGY

25 January 2025 • 3:00 PM - 5:45 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **paige Derr**, National Institutes of Health (United States)

13340-1 • 3:00 PM - 3:45 PM
Tutorial (Keynote Presentation)
Author(s): **Clarice Aiello,** Univ. of California, Los Angeles (United States)

13340-2 • 3:45 PM - 4:15 PM
Quantum mechanisms in the brain: from conjectures and theories to experimental evidence *(Invited Paper)*
Author(s): **Travis J. Craddock,** Univ. of Waterloo (Canada)

13340-3 • 4:15 PM - 4:45 PM
Effects of Li isotopes on neuronal function: from brain tissues to ion channels *(Invited Paper)*
Author(s): **Zoya Leonenko**, **Khadijeh Esmaeilpour**, **Irina Bukhteeva**, **James Livingstone**, **Michael Beazely,** Univ. of Waterloo (Canada); **Evgeny Pavlov,** New York University (United States); **Brian Kendall**, **John G Mielke, Michel JP Gingras,** Univ. of Waterloo (Canada)

13340-31 • 4:45 PM - 5:15 PM
Towards biomolecular optomechanics *(Invited Paper)*
Author(s): **Warwick P. Bowen,** The Univ. of Queensland (Australia)

13340-4 • 5:15 PM - 5:45 PM
Diamond based quantum sensing for detecting stress responses in living cells with subcellular resolution *(Invited Paper)*
Author(s): **Romana Schirhagl,** Univ. of Groningen (Netherlands)

BIOS HOT TOPICS

25 January 2025 • 7:00 PM - 8:10 PM | Moscone South, Room 207/215 (Level 2)
Every year at BiOS the community gathers at Saturday Night Hot Topics to hear the latest innovations in the biophotonics field. Don't miss this year's fast-paced program of world-class speakers. Open to all registered technical attendees.

13306-500 • 7:00 PM - 7:10 PM
Sensing of the surgical field enabled by vision and robotics (Plenary Presentation)
Author(s): **Daniel S. Elson,** Imperial College London (United Kingdom)

13310-500 • 7:10 PM - 7:20 PM
Live imaging of retinal cell dynamics with dynamic full field OCT (Plenary Presentation)
Author(s): **Katharine F. Grieve,** Institut National de la Santé et de la Recherche Médicale (France)

13334-500 • 7:20 PM - 7:30 PM
Shining light on gut feelings (Plenary Presentation)
Author(s): **Michalina J. Gora,** Wyss Ctr. for Bio and Neuro Engineering (Switzerland)

13333-500 • 7:30 PM - 7:40 PM
Interferometric diffuse optics: recent advances and future outlook (Plenary Presentation)
Author(s): **Vivek J. Srinivasan,** NYU Grossman School of Medicine (United States)

13321-500 • 7:40 PM - 7:50 PM
Investigating tissue mechanopathology with speckle techniques (Plenary Presentation)
Author(s): **Seemantini K. Nadkarni,** Wellman Ctr. for Photomedicine (United States)

13338-500 • 7:50 PM - 8:00 PM
See the whole movie: continuous real-time monitoring of microphysiological systems with photonic sensors (Plenary Presentation)
Author(s): **Benjamin L. Miller,** Univ. of Rochester Medical Ctr. (United States)

13311-500 • 8:00 PM - 8:10 PM
From saliva to surgery: Raman spectroscopy with open sourced software provides diagnostics for viruses and cancer (Plenary Presentation)
Author(s): **Frédéric Leblond,** CRCHUM (Canada)

Sunday 26 January 2025

SESSION 2: MAGNETIC QUANTUM EFFECTS IN BIOLOGY

26 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Kyungwha Chung**, Sungkyunkwan Univ. (Korea, Republic of)

13340-5 • 8:30 AM - 9:00 AM
Engineered magnetosensitive proteins to control biochemical reactions *(Invited Paper)*
Author(s): **Yun Chen,** Johns Hopkins Univ. (United States)

13340-6 • 9:00 AM - 9:30 AM
Characterizing the magnetoreception in cryptochrome using a synthetic two-component system *(Invited Paper)*
Author(s): **Thorsten Ritz**, **Lucas von Chamier**, **Quang-Minh Dang**, **Mario Elabd**, **Brandon Rawson,** Univ. of California (United States); **Albert Siryaporn,** Univ. of California, Irvine (United States)

13340-8 • 9:30 AM - 10:00 AM
Quantitative differences in cellular effects between isolated sweep field and radiofrequency application in therapeutic Nuclear Magnetic Resonance *(Invited Paper)*
Author(s): **Viktoria Thöni**, **Abrian Buchter**, **Andreas Flarer**, **Justin Lampe**, **Cordula Schlegel, Margit Egg,** Univ. Innsbruck (Austria)

Coffee Break 10:00 AM - 10:30 AM

SESSION 3: QUANTUM SYSTEMS FOR BIOSENSING

26 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Alexei V. Sokolov**, Texas A&M Univ. (United States)

13340-9 • 10:30 AM - 11:00 AM
Magnetomyography with optically pumped magnetometers *(Invited Paper)*
Author(s): **Simon Nordenström**, **Victor Lebedev**, **Santiago Rodriguez**, **Stefan Hartwig**, **Marlen Kruse,** Physikalisch-Technische Bundesanstalt (Germany); **Philip J. Broser,** Children's Hospital of Eastern Switzerland (Switzerland); **Justus Marquetand,** Hertie Institute for Clinical Brain Research, University of Tübingen (Germany); **Thomas Middelmann,** Physikalisch-Technische Bundesanstalt (Germany)

13340-10 • 11:00 AM - 11:30 AM
Optically pumped magnetometers for fetal monitoring applications *(Invited Paper)*
Author(s): **Hari Eswaran,** Univ. of Arkansas for Medical Sciences (United States)

Lunch/Exhibition Break 11:30 AM - 1:00 PM

PANEL DISCUSSION: FUTURE OF QUANTUM BIOTECHNOLOGY

26 January 2025 • 1:00 PM - 2:30 PM | Moscone Center, Expo Stage, Hall DE (Exhibit Level)
Join us for a discussion of cutting-edge developments. This event will take place on the Quantum West Industry stage. View program details.

Coffee Break 2:30 PM - 3:00 PM

SESSION 4: QUANTUM MEASUREMENTS IN BIOLOGY

26 January 2025 • 3:00 PM - 5:00 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Yun Chen**, Johns Hopkins Univ. (United States)

13340-11 • 3:00 PM - 3:30 PM
To be announced *(Invited Paper)*
Author(s): **Matthew Eichenfield,** The Univ. of Arizona (United States)

13340-12 • 3:30 PM - 4:00 PM
Practical femtosecond time-resolved spectroscopy using paired single photons *(Invited Paper)*
Author(s): **JunWoo Kim,** Chungbuk National Univ. (Korea, Republic of)

13340-13 • 4:00 PM - 4:30 PM
Towards quantum-enhanced biosensing: harnessing ultrafast energy transfer in chromoproteins *(Invited Paper)*
Author(s): **Youngchan Kim,** Univ. of Surrey (United Kingdom)

13340-14 • 4:30 PM - 5:00 PM
Two kinds of quantum molecular coherence and their applications to biological sensing and imaging *(Invited Paper)*
Author(s): **Alexei V. Sokolov**, **Richard G. Sprague**, **James T. Florence**, **Marlan O. Scully**, **Zhenhuan Yi, Jizhou Wang,** Texas A&M Univ. (United States)

POSTERS-SUNDAY

26 January 2025 • 5:30 PM - 7:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the BiOS poster session on Sunday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Sunday 1:00 PM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

Event Details

FORMAT: Reception style event. Poster authors will be stationed at their posters to answer questions and present their research.
MENU: Alcoholic and non-alcoholic drinks available.
SETUP: Standing cocktail tables scattered around the room. Poster boards with poster presentations arranged in numerical order by paper number.

13340-32 • 5:30 PM - 7:00 PM
Understanding therapeutic nuclear magnetic resonance (tNMR): splitting of components indicates its unique efficacy
Author(s): **Viktoria Thöni**, **Abriana Buchter**, **Andreas Flarer**, **Louis Justin Lampe**, **Cordula Schlegel, Margit Egg,** Univ. Innsbruck (Austria)

BIOPHOTONICS FOCUS: NANOPHOTONICS AND IMAGING

26 January 2025 • 7:00 PM - 8:30 PM | Moscone South, Room 207/215 (Level 2)
Hear experts working with nanotechnology and various imaging modalities describe how these tools can work together to advance diagnostics and therapeutics. All technical registration attendees are invited to attend.

13335-500 • 7:00 PM - 7:30 PM
Quantum dots in biomedical imaging: a journey of nano-explorations (Plenary Presentation)
Author(s): **Moungi G. Bawendi,** Massachusetts Institute of Technology (United States)

13335-501 • 7:30 PM - 7:50 PM
Nanophononics and bioimaging advancing nanomedicine to impact healthcare (Plenary Presentation)
Author(s): **Paras N. Prasad,** Univ. at Buffalo (United States)

13337-500 • 7:50 PM - 8:10 PM
Illuminating health: nanophotonics in imaging for dentistry, dermatology, and beyond (Plenary Presentation)
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13335-502 • 8:10 PM - 8:30 PM
Application of nanoparticles in anticancer combination therapies: influence of nanoparticle absorption dynamics on therapeutic effect (Plenary Presentation)
Author(s): **Joanna Depciuch,** Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Monday 27 January 2025

SESSION 5: NANOTECHNOLOGIES IN BIOLOGY

27 January 2025 • 9:00 AM - 10:30 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Alex Terrasson**, The Univ. of Queensland (Australia)

13340-17 • 9:00 AM - 9:30 AM
Self-aligned nanoring doublet as a single particle nanocavity for strong coupling interaction with biomolecules *(Invited Paper)*
Author(s): **Kyungwha Chung,** Sungkyunkwan Univ. (Korea, Republic of); **Luke P. Lee,** Harvard Univ. (United States), Sungkyunkwan Univ. (Korea, Republic of)

13340-18 • 9:30 AM - 10:00 AM
Multiresonant plasmonic nano-optoelectrodes: toward nonlinear and nonclassical sensing of biological and interfacial processes *(Invited Paper)*
Author(s): **Elieser Mejia,** Virginia Polytechnic Institute and State Univ. (United States), National Institute of Standards and Technology (United States); **Yuming Zhao, Wei Zhou,** Virginia Polytechnic Institute and State Univ. (United States)

13340-33 • 10:00 AM - 10:30 AM
Photobleaching and phototoxicity of mitochondria in live cell fluorescent super-resolution microscopy: Implications for qubit manipulation of mitochondria *(Invited Paper)*
Author(s): **Chia-Hung Lee,** Univ. of Pennsylvania (United States); **Douglas Wallace, Peter John Burke,** Univ. of California, Irvine (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 6: NV CENTERS FOR QUANTUM BIOLOGY

27 January 2025 • 11:00 AM - 12:00 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Ivan A. Burenkov**, National Institute of Standards and Technology (United States)

13340-20 • 11:00 AM - 11:30 AM
Measuring bio-magnetic signals using nitrogen-vacancy centers in diamond *(Invited Paper)*
Author(s): **Connor Hart,** Quantum Catalyzer (United States)

13340-21 • 11:30 AM - 12:00 PM
Fluorescent nanodiamond for emerging quantum sensing applications *(Invited Paper)*
Author(s): **Olga A. Shenderova**, **Marco Torelli**, **Nicholas Nunn, Antonin Marek,** Adámas Nanotechnologies, Inc. (United States)

Lunch Break 12:00 PM - 1:00 PM

QUANTUM WEST PLENARY SESSION

27 January 2025 • 1:00 PM - 3:05 PM | Moscone South, Room 207/215 (Level 2)
Session Chair: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks
Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

13393-501 • 1:05 PM - 1:45 PM
Quantum structured light takes shape (Plenary Presentation)
Author(s): **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13392-501 • 1:45 PM - 2:25 PM
Optical clocks: time and the future of metrology (Plenary Presentation)
Author(s): **Tara M. Fortier,** National Institute of Standards and Technology (United States)

13392-502 • 2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory (Plenary Presentation)
Author(s): **Eric A. Cornell,** National Institute of Standards and Technology (United States)

Coffee Break 3:05 PM - 3:30 PM

SESSION 7: QUANTUM IMAGING FOR BIOLOGY AND BEYOND: JOINT SESSION WITH 13340 AND 13391

27 January 2025 • 3:30 PM - 6:00 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Davide Giacomo Marangon**, Univ. degli Studi di Padova (Italy)

13340-22 • 3:30 PM - 4:00 PM
Nonlinear quantum bioimaging with bright squeezed light *(Invited Paper)*
Author(s): **Alex Terrasson**, **Lars Madsen**, **Joel Grim, Warwick Bowen,** The Univ. of Queensland (Australia)

13340-23 • 4:00 PM - 4:20 PM
Passive super-resolution imaging via photon enumeration
Author(s): **Ivan A. Burenkov,** National Institute of Standards and Technology (United States), Joint Quantum Institute (United States); **Seungjin Yoon, Sergey Polyakov,** National Institute of Standards and Technology (United States)

13340-24 • 4:20 PM - 4:40 PM
Dynamic imaging of magnetic bioeffects in cells using multiphoton autofluorescence intensity and lifetime microscopy
Author(s): **Kevin K. Tan**, **Carlos A. Renteria**, **Rishyashring R. Iyer**, **Jindou Shi**, **Alexander Ho**, **Janet E. Sorrells,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Edita Aksamitiene,** Beckman Institute for Advanced Science and Technology (United States); **Maria Ingaramo,** Calico Life Sciences, LLC (United States); **Robert J. Usselman,** Florida Institute of Technology (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States)

13340-25 • 4:40 PM - 5:10 PM
Metasurface-based super-resolution image scanning microscopy *(Invited Paper)*
Author(s): **Yongjae Jo**, **Hyemi Park**, **Seho Lee**, **Hyeyoung Yoon**, **Taehoon Lee**, **Gyu Soo Bak**, **Jong-Chan Park, Inki Kim,** Sungkyunkwan Univ. (Korea, Republic of)

13391-41 • 5:10 PM - 5:40 PM
Fusing classical and quantum information for super resolution spatial frequency modulation imaging *(Invited Paper)*
Author(s): **Daniel Scarbrough,** Colorado School of Mines (United States); **Randy Bartels,** Morgridge Institute for Research (United States); **Jeff Squier,** Colorado School of Mines (United States)

13391-42 • 5:40 PM - 6:00 PM
A high-performance 64-pixel SNSPD camera for high data rate and picosecond time-resolved imaging applications
Author(s): **Fiona Fleming**, **Will McCutcheon,** Heriot-Watt Univ. (United Kingdom); **Emma E. Wollman**, **Boris A. Korzh,** Jet Propulsion Lab. (United States); **Gerald S. Buller**, **Mehul Malik,** Heriot-Watt Univ. (United Kingdom); **Matthew D. Shaw,** Jet Propulsion Lab. (United States)

Tuesday 28 January 2025

SESSION 8: QUANTUM ALGORITHMS AND PROTOCOLS EMPOWERING BIOLOGY

28 January 2025 • 9:00 AM - 11:45 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Clarice Aiello**, Univ. of California, Los Angeles (United States)

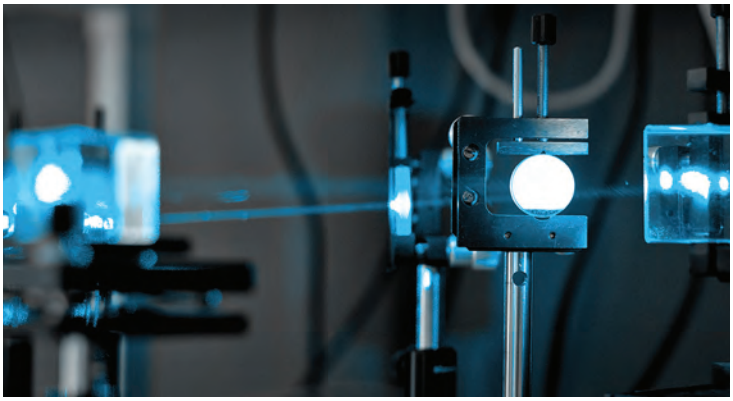
13340-27 • 9:00 AM - 9:45 AM
Quantum hardware-enabled molecular dynamics via transfer learning (Keynote Presentation)
Author(s): **Norm Tubman,** NASA (United States)

13340-29 • 9:45 AM - 10:15 AM
Distributed quantum sensing *(Invited Paper)*
Author(s): **Alexey Gorshkov,** National Institute of Standards and Technology (United States), Univ. of Maryland (United States)

Coffee Break • 10:15 AM - 10:45 AM

13340-28 • 10:45 AM - 11:15 AM
MolSpin: introducing a versatile software package for studying spin dynamics *(Invited Paper)*
Author(s): **Ilia Solov'yov,** Carl von Ossietzky Univ. Oldenburg (Germany)

13340-30 • 11:15 AM - 11:45 AM
Quantum biosensing: near-future technologies and open problems *(Invited Paper)*
Author(s): **Lincoln Carr,** Colorado School of Mines (United States)



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Clemson Univ. (USA)

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CONFERENCE 13341

Solid State Lasers XXXIV: Technology and Devices

26 - 27 January 2025 | Moscone South, Room 302 (Level 3)

Conference Chair(s): **W. Andrew Clarkson,** Optoelectronics Research Ctr. (United Kingdom); **Ramesh K. Shori,** Naval Undersea Warfare Ctr. Keyport (United States)

Program Committee: **Scott J. Hamlin,** MegaWatt Lasers, Inc. (United States); **Helena Jelínková,** Czech Technical Univ. in Prague (Czech Republic); **Eric G. Johnson,** Clemson Univ. (United States); **Jacob I. Mackenzie,** Univ. of Southampton (United Kingdom); **Paul D. Mason,** STFC Rutherford Appleton Lab. (United Kingdom); **Gisele Maxwell,** Alcon Research, Ltd. (United States); **Sean A. McDaniel,** Air Force Research Lab. (United States); **Richard P. Mildren,** Macquarie Univ. (Australia); **Narasimha S. Prasad,** NASA Langley Research Ctr. (United States); **Anthony W. Yu,** NASA Goddard Space Flight Ctr. (United States)

Sunday 26 January 2025

SESSION 1: EYE-SAFE AND MID-IR LASERS I

26 January 2025 • 8:20 AM - 10:00 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Ramesh K. Shori**, Naval Undersea Warfare Ctr. Keyport (United States)

13341-1 • 8:20 AM - 8:40 AM
Power scaling large-core erbium fibre master-oscillator power amplifiers
Author(s): **Tom Harris,** Univ. of Southampton (United Kingdom); **Roger Kirke**, **Jason Singleton**, **Richard Schafers**, **John Clowes,** Woodrow Scientific Ltd. (United Kingdom); **W. Andrew Clarkson,** Univ. of Southampton (United Kingdom)

13341-2 • 8:40 AM - 9:00 AM
Acousto-optic and passive Q-switched, energetic compact 1.54um laser transmitter design and performance
Author(s): **Baoping Guo**, **Beiming Zhou**, **Nick Acero-Blyshak**, **Josh Foster,** L3Harris Technologies Inc., Kigre (United States); **Susanne Lee,** L3Harris Technologies, Inc. (United States); **Jared Hudock,** L3Harris Technologies (United States)

13341-3 • 9:00 AM - 9:20 AM
Power scalable pedestal-free Tm-doped nested-ring fibre laser exceeding 200 W at 1.94 µm
Author(s): **Richard Švejkar**, **Martin P. Buckthorpe**, **Peter C. Shardlow, W. Andrew Clarkson,** Optoelectronics Research Ctr. (United Kingdom)

13341-4 • 9:20 AM - 9:40 AM
Widely tunable, pulsed Tm:YAP laser, based on an active/passive Q switch with YAG etalons
Author(s): **Yaakov Neustadter**, **Gad Horwitz**, **Uzziel Shaintop**, **Eytan Perez**, **Rotem Nahear**, **Neria Suliman, Salman Noach,** Jerusalem College of Technology (Israel)

13341-6 • 9:40 AM - 10:00 AM
~ 2.1 um Ho3+ doped germanate microchip laser for shortwave infrared laser applications
Author(s): **Mamoona Khalid,** Univ. of Engineering and Technology, Taxila (Pakistan)

Coffee Break 10:00 AM - 10:25 AM

SESSION 2: EYE-SAFE AND MID-IR LASERS II

26 January 2025 • 10:25 AM - 11:55 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Ramesh K. Shori**, Naval Undersea Warfare Ctr. Keyport (United States)

13341-7 • 10:25 AM - 10:45 AM
MW-peak-power nanosecond diode-pumped Ho:YAG thin-disk laser
Author(s): **Jiří Mužík**, **Yuya Koshiba,** HiLASE Ctr., Institute of Physics of the CAS, v.v.i. (Czech Republic); **Matyáš Dvořák,** HiLASE Ctr., Institute of Physics of the CAS, v.v.i. (Czech Republic), Sorbonne Univ. Abu Dhabi (United Arab Emirates); **Martin Smrž, Tomáš Mocek,** HiLASE Ctr.,

Institute of Physics of the CAS, v.v.i. (Czech Republic)

13341-8 • 10:45 AM - 11:05 AM
Single-frequency Ho:YAG nonplanar ring oscillator as a seed laser for next generation gravitational wave detectors
Author(s): **Johannes Ebert**, **Pelin Cebeci**, **Marco Höfer**, **Patrick Baer, Dieter Hoffmann,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13341-9 • 11:05 AM - 11:25 AM
200 W compact 2.1 um CTH:YAG laser
Author(s): **Scott J. Hamlin**, **Benjamin Hart**, **Alexander Likins**, **Ashley Charpentier, Chris Hardy,** MegaWatt Lasers, Inc. (United States)

13341-10 • 11:25 AM - 11:55 AM
High-power pulsed diffraction limited microsecond 2.94µm Er:YAG laser for diverse applications *(Invited Paper)*
Author(s): **Binh Trong Do**, **Laryssa Skolnik**, **Jay Skolnik, Thong Nguyen,** 3 Micron Laser Technology, LLC (United States)

Lunch/BiOS Exhibition Break 11:55 AM - 1:30 PM

SESSION 3: PULSED LASERS

26 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **W. Andrew Clarkson**, Optoelectronics Research Ctr. (United Kingdom)

13341-11 • 1:30 PM - 1:50 PM
Time-dependent numerical modeling of pulsed Alexandrite lasers
Author(s): **Stefanie Unland,** Laser Zentrum Hannover e.V. (Germany), QuantumFrontiers (Germany); **Roland Kalms**, **Phillip Booker,** Laser Zentrum Hannover e.V. (Germany); **Peter Weßels,** Laser Zentrum Hannover e.V. (Germany), QuantumFrontiers (Germany); **Jörg Neumann,** Laser Zentrum Hannover e.V. (Germany); **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)

13341-12 • 1:50 PM - 2:10 PM
Commissioning a high energy 10 Hz Ti:Sa amplifier for the petawatt laser at the Extreme Photonics Applications Centre
Author(s): **Luke McHugh**, **Danielle Clarke**, **Paul D. Mason**, **Robert Heathcote**, **Jonathan Phillips**, **Mark Harman**, **Stephanie Tomlinson**, **Thomas J. Butcher**, **Cristina Hernndez-Gomez, John L. Collier,** STFC Rutherford Appleton Lab. (United Kingdom)

13341-13 • 2:10 PM - 2:30 PM
Simulation of active q-switched solid-state lasers using Pockels cell
Author(s): **Souryadeep Saha, Christoph Pflaum,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13341-14 • 2:30 PM - 2:50 PM
Demonstration of >1 km LiDAR using 1.3 µm Nd:YAG / Vanadium:YAG passively q-switched laser
Author(s): **Mathew Rekow**, **Thomas Kane**, **John L. Nightingale, Ian McAlexander,** Fathom Light LLC (United States)

13341-16 • 2:50 PM - 3:10 PM
Numerical modelling of passively cooled and Q-switched Yb:YAG and Nd:YAG lasers: comparison with experimental results and model improvements
Author(s): **Pierre Bourdon**, **Christophe Planchat**, **Didier Goular**, **Laurent Lombard, Julien Le Gouet,** ONERA (France)

Coffee Break 3:10 PM - 3:35 PM

SESSION 4: LASER MATERIALS AND CHARACTERIZATION

26 January 2025 • 3:35 PM - 5:55 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Scott J. Hamlin**, MegaWatt Lasers, Inc. (United States)

13341-17 • 3:35 PM - 3:55 PM
W-level amplification in glass-clad Yb:YAG crystal core fiber
Author(s): **Rafael R. Gattass**, **Daniel J. Gibson**, **L. Brandon Shaw,** U.S. Naval Research Lab. (United States); **Robert R. Nicol,** Jacobs Engineering Group Inc. (United States); **Shyam S. Bayya**, **Woohong Kim**, **Daniel L. Rhonehouse,** U.S. Naval Research Lab. (United States); **Patrick M. Hemmer**, **Frederic H. Kung,** Univ. Research Foundation (United States); **Jasbinder S. Sanghera,** U.S. Naval Research Lab. (United States)

13341-18 • 3:55 PM - 4:15 PM
Lutetium oxide single crystal fibers for laser applications
Author(s): **Joseph W. Kolis**, **Allen Benton**, **Rylan Terry**, **Brian Topper**, **Liang Dong, John Ballato,** Clemson Univ. (United States)

13341-19 • 4:15 PM - 4:35 PM
Dynamic response and control of the molten zone in laser heated pedestal growth
Author(s): **Joseph A Peoples,** Air Force Research Lab. (United States), Riverside Research Institute (United States); **Alan Martinez, Benjamin Gray,** Air Force Research Lab. (United States)

13341-20 • 4:35 PM - 4:55 PM
Enhancement of Cr:LiSAF thermal properties through room temperature bonding
Author(s): **Florent Cassouret,** Institute for Molecular Science (Japan); **Arvydas Kausas**, **Yoichi Sato,** RIKEN SPring-8 Ctr. (Japan); **Takunori Taira,** RIKEN SPring-8 Ctr. (Japan), Institute for Molecular Science (Japan)

13341-21 • 4:55 PM - 5:15 PM
Enhanced silver halide development for broadband infrared components for space applications
Author(s): **Dmitry Starodubov,** DSTAR Communications Inc. (United States); **Dennis Tishinin,** Kohoku Kogyo Co., Ltd. (Japan); **Narasimha S. Prasad,** NASA Langley Research Ctr. (United States)

13341-22 • 5:15 PM - 5:35 PM
Watt-level 2.3-µm Thulium laser with upconversion pumping at 1.45 µm
Author(s): **Ji Eun Bae**, **Pavel Loiko,** Ctr. de Recherche sur les Ions, les Matériaux et la Photonique, Univ. de Caen Normandie, CNRS (France); **Said Idlahcen,** Complexe de Recherche Interproffessionnel en Aerothermochimie, Univ. de Rouen Normandie, CNRS (France); **Lauren Guillemot**, **Abdelmjid Benayad,** Ctr. de Recherche sur les Ions, les Matériaux et la Photonique, Univ. de Caen Normandie, CNRS (France); **Thomas Godin,** Complexe de Recherche Interproffessionnel en Aerothermochimie, Univ. de Rouen Normandie, CNRS (France); **Patrice Camy,** Ctr. de Recherche sur les Ions, les Matériaux et la Photonique, Univ. de Caen Normandie, CNRS (France); **Ammar Hideur,** Complexe de Recherche Interproffessionnel en Aerothermochimie, Univ. de Rouen Normandie, CNRS (France)

13341-23 • 5:35 PM - 5:55 PM
Solid state lasers materials, technologies and applications
Author(s): **Alice Cervellieri,** Univ. of Regina (Canada)

Monday 27 January 2025

SESSION 5: NOVEL LASER CONCEPTS

27 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Scott J. Hamlin**, MegaWatt Lasers, Inc. (United States)

13341-24 • 8:00 AM - 8:20 AM
Detailed simulation and experimental design of a high small-signal gain, triple-pass Yb:YAG laser amplifier
Author(s): **Jonathan Werger**, **Stefan Spiekermann**, **Peter Weßels**, **Jörg Neumann, Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany)

13341-25 • 8:20 AM - 8:40 AM
Linewidth narrowing in single-longitudinal-mode Raman lasers
Author(s): **Richard Pahlavani**, **Osama Terra**, **Adam Sharp**, **David Spence, Richard P. Mildren,** Macquarie Univ. (Australia)

13341-26 • 8:40 AM - 9:00 AM
Towards direct nonlinear compression of long-pulse lasers to the femtosecond regime
Author(s): **Gaspard Beaufort,** Deutsches Elektronen-Synchrotron (Germany), Ecole Normale Supérieure de Lyon (France); **Nayla Jiménez,** Deutsches Elektronen-Synchrotron (Germany), Helmholtz-Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); **Victor Hariton**, **Ayhan Tajalli**, **Ingmar Hartl,** Deutsches Elektronen-Synchrotron (Germany); **Marcus Seidel,** Deutsches Elektronen-Synchrotron (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

13341-27 • 9:00 AM - 9:30 AM
Cryogenic Nd:YAG, Er:YLF, and Tm:YLF lasers *(Invited Paper)*
Author(s): **Tso Yee Fan, Juan Ochoa,** MIT Lincoln Lab. (United States)

13341-28 • 9:30 AM - 9:50 AM
Improving the gain capability of high-power laser amplifiers by amplified spontaneous emission suppression in circular pump architecture
Author(s): **Tianzhuo Zhao,** Univ. of Chinese Academy of Sciences (China), Aerospace Information Research Institute (China); **Hong Xiao**, **Wenqi Ge, Shuzhen Nie,** Aerospace Information Research Institute (China)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: ULTRAFAST LASERS

27 January 2025 • 10:20 AM - 12:00 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Ramesh K. Shori**, Naval Undersea Warfare Ctr. Keyport (United States)

13341-30 • 10:20 AM - 10:40 AM
2-µm ultrafast fiber CPA for industrial-grade silicon processing
Author(s): **Christian Gaida**, **Tobias Heuermann**, **Oliver Herrfurth**, **Sven Breitkopf**, **Tino Eidam, Jens Limpert,** Active Fiber Systems GmbH (Germany)

13341-29 • 10:40 AM - 11:00 AM
A packaged and ultrastable passive GHz comb waveguide laser
Author(s): **David G. Lancaster, Dale E. Otten,** Univ. of South Australia (Australia)

13341-31 • 11:00 AM - 11:20 AM
Latest advancements in mJ-level Ti:sapphire regenerative amplifiers
Author(s): **Ian A. Read,** Spectra-Physics, a division of MKS Instruments (United States)

13341-32 • 11:20 AM - 11:40 AM
Advancements in Ultrafast 1.5 µm solid-state lasers: reaching the 10 GHz fundamental pulse repetition rate
Author(s): **Florian Emaury**, **Benjamin Rudin, Oguzhan Kara,** Menhir Photonics AG (Switzerland)

13341-33 • 11:40 AM - 12:00 PM
High-energy and -peak-power Yb Lasers: a step into the realm of Ti:Sa
Author(s): **Valdas Maslinskas**, **Giedrius Andriukaitis**, **Albertas Žukauskas**, **Karolis Jurkus**, **Domas Baliukonis**, **Marco Arrigoni, Jonas Berzinš,** Light Conversion, UAB (Lithuania)

Lunch Break 12:00 PM - 1:30 PM

SESSION 7: UV AND VISIBLE LASERS

27 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Anthony W. Yu**, NASA Goddard Space Flight Ctr. (United States)

13341-34 • 1:30 PM - 1:50 PM
Highly reliable, 6 W average-power, high-repetition-rate, deep-UV 266-nm picosecond laser source
Author(s): **Kota Koike**, **Akihiko Shimura**, **Katsutomo Kurahashi**, **Nami Nakamori**, **Mitsuyoshi Sakairi**, **Michio Oka, Naoya Oka,** OXIDE Corp. (Japan)

13341-35 • 1:50 PM - 2:20 PM
All diode-pumped 10Hz 7 joule nanosecond 527nm laser for optical parametric chirped pulse amplifier (OPCPA) pump *(Invited Paper)*
Author(s): **Faming Xu**, **Jay Doster, Ryan Feeler,** Cutting Edge Optronics (United States)

13341-36 • 2:20 PM - 2:40 PM
Ultra-high average power frequency conversion in lithium triborate at cryogenic temperature
Author(s): **Gabriel Mennerat,** CEA-Paris-Saclay (France)

13341-37 • 2:40 PM - 3:00 PM
Frequency-converted lasers for industrial applications
Author(s): **Steffen Ruebling,** TRUMPF Laser GmbH (Germany); **Jonas Mertin,** TRUMPF SE + Co. KG (Germany)

Coffee Break 3:20 PM - 4:05 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13341-40 • 6:00 PM - 8:00 PM
Red diode-pumped SESAM and Kerr-Lens modelocked femtosecond alexandrite lasers
Author(s): **Tobias Grätzer**, **Manuel Zeyen**, **Daniel Hug, Bojan Resan,** Fachhochschule NordWestschweiz (Switzerland)

13341-41 • 6:00 PM - 8:00 PM
Efficient external cavity resonant second harmonic generation of a multi-axial mode source
Author(s): **Manuel A. Medina**, **Sahar Alidousti**, **Callum McEwan, W. Andrew Clarkson,** Univ. of Southampton (United Kingdom)

13341-42 • 6:00 PM - 8:00 PM
kW-level infrared microchip lasers for UV and visible light generation
Author(s): **Goronwy Tawy**, **Rex H. S. Bannerman**, **Glenn Churchill**, **James C. Gates,** Univ. of Southampton (United Kingdom); **Corin B. E. Gawith,** Univ. of Southampton (United Kingdom), Covesion Ltd. (United Kingdom); **Peter G. R. Smith,** Univ. of Southampton (United Kingdom)

13341-43 • 6:00 PM - 8:00 PM
Analysis of interference patterns between synchronized Q-switched pulses generated in a single YAG/Yb:YAG/Cr:YAG laser resonator
Author(s): **Seongsu Kim,** Chosun Univ. (Korea, Republic of); **Sanggyu Jung,** Laserssel Corp. (Korea, Republic of); **Yujin Kim**, **Dowon Kim**, **Sejun Oh, Hyun Su Kim,** Chosun Univ. (Korea, Republic of)

13341-44 • 6:00 PM - 8:00 PM
Er:Yb:glass material limits in case of compact passively Q-switched nanosecond DPSS lasers
Author(s): **Gediminas Molis**, **Rokas Steponavičius**, **Naglis Kyžas**, **Vilius Kavaliauskas, Darius Mikšys,** Optogama UAB (Lithuania)

13341-45 • 6:00 PM - 8:00 PM
High power tunable wavelength visible laser system using gain-managed nonlinear fiber amplifier as a seed pulse
Author(s): **Abbas Shiri**, **Brittany Lu,** Univ. of California, Los Angeles (United States); **Keith Wernsing,** Mesa Photonics, LLC (United States); **Sergio Carbajo,** Univ. of California, Los Angeles (United States)

13341-46 • 6:00 PM - 8:00 PM
Comparative study of high power diode-pumped Nd:GdVO4 and Nd:YVO4 lasers
Author(s): **Marzieh Esmaeilzadeh, Arkady Major,** Univ. of Manitoba (Canada)

13341-47 • 6:00 PM - 8:00 PM
Evaluation of absorption spectra of common neodymium-doped laser crystals for long wavelength pumping
Author(s): **Marzieh Esmaeilzadeh,** Univ. of Manitoba (Canada); **Nirankush Roy,** Indian Institute of Technology, Kharagpur (India); **Arkady Major,** Univ. of Manitoba (Canada)

13341-48 • 6:00 PM - 8:00 PM
Novel implementation of KLTN-based modulator in Tm:YLF pulsed laser
Author(s): **Salman Noach**, **Yechiel Bach,** Jerusalem College of Technology (Israel); **Mulkan Adgo**, **Yehudit Garcia, Aharon J. Agrant,** The Hebrew Univ. of Jerusalem (Israel)

13341-49 • 6:00 PM - 8:00 PM
Diode-pumping-enabled high wavefront stability in a high-energy Nd:YLF ring amplifier
Author(s): **Chengyong Feng**, **Noah Dauphin**, **Richard Roides**, **Christophe Dorrer**, **Seung-Whan Bahk**, **Alexander Bolognesi**, **Michael Spilatro**, **Chad Mileham**, **Jonathan D. Zuegel, Jake Bromage,** Univ. of Rochester (United States)

13341-50 • 6:00 PM - 8:00 PM
Towards digital twins of high-power laser systems
Author(s): **Jack E. Hirschman,** Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); **Erfan Abedi,** UCLA Samueli School of Engineering (United States); **Hao Zhang,** UCLA Samueli School of Engineering (United States), SLAC National Accelerator Lab. (United States); **Randy Lemons,** SLAC National Accelerator Lab. (United States); **Sergio Carbajo,** UCLA Samueli School of Engineering (United States), SLAC National Accelerator Lab. (United States), California NanoSystems Institute (United States)

13341-51 • 6:00 PM - 8:00 PM
Optimization of seed wavelength of ytterbium-doped thin disk high power multi-pass amplifier using ytterbium-doped fiber amplifiers for seed source
Author(s): **Tatsuya Shinozaki,** RIKEN (Japan); **Kazuhiro Kawashima,** Shinkosha Co. Ltd. (Japan); **Hideomi Koinuma,** SCT Inc. (Japan); **Satoshi Wada,** RIKEN (Japan)

13341-52 • 6:00 PM - 8:00 PM
25-fs Kerr-lens mode-locked Yb:Ca(Gd,Y)AlO4 laser
Author(s): **Zhi-Qiang Li**, **Zhang-Lang Lin**, **Huang-Jun Zeng**, **Hai-Yu Nie**, **Ge Zhang,** Fujian Institute of Research on the Structure of Matter (China); **Peixiong Zhang**, **Wenjie Wu**, **Zhenqiang Chen**, **Zhen Li,** Jinan Univ. (China); **Pavel Loiko**, **Simone Normani,** Univ. de Caen Normandie (France); **Xavier Mateos,** Univ. Rovira i Virgili (Spain); **Hsing-Chih Liang,** National Yang Ming Chiao Tung Univ. (Taiwan); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Weidong Chen,** Fujian Institute of Research on the Structure of Matter (China)

13341-53 • 6:00 PM - 8:00 PM
Development of pulse shape controlled DUV solid-state light source for hybrid ArF laser
Author(s): **Yasuaki Moriai**, **Yasuhiro Kamba**, **Hironori Igarashi**, **Atsushi Fuchimukai, Taisuke Miura,** Gigaphoton Inc. (Japan)

13341-54 • 6:00 PM - 8:00 PM
Kerr-lens mode-locked Tm,Ho:Ca(Gd,Y)AlO4 laser
Author(s): **Zhang-Lang Lin**, **Weidong Chen**, **Uwe Griebner,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Ge Zhang,** Fujian Institute of Research on the Structure of Matter (China); **Peixiong Zhang,** Jinan Univ. (China); **Zhen Li,** Fujian Institute of Research on the Structure of Matter (China); **Zhenqiang Chen,** Jinan Univ. (China); **Xavier Mateos,** Univ. Rovira i Virgili (Spain); **Kirill Eremeev**, **Alain Braud**, **Pavel Loiko,** Univ. de Caen Normandie (France); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13341-55 • 6:00 PM - 8:00 PM
Room temperature sub-nanosecond Fe:ZnSe gain-switched laser characterization and modeling
Author(s): **Saugat Ghimire**, **Daniil Danilin**, **Dmitry Martyshkin**, **Vladimir Fedorov, Sergey Mirov,** The Univ. of Alabama at Birmingham (United States)

13341-56 • 6:00 PM - 8:00 PM
Megawatt peak power, nanosecond, eye-safe laser
Author(s): **Van Tuan Vu**, **Dang Ban Nguyen**, **Manh Tien Dam**, **Van Thinh Hoang**, **Duy Khanh Duong, Bao Dong To,** Viettel High-Tech Industrial Corp. (Vietnam)

13341-57 • 6:00 PM - 8:00 PM
Broadly tunable continuous-wave Yb:KGW laser pumped by a compact Nd:YAG laser
Author(s): **Ali Lotfalian, Arkady Major,** Univ. of Manitoba (Canada)

13341-58 • 6:00 PM - 8:00 PM
Characterization of Optical ZnSe ceramics fabricated by Spark Plasma Sintering
Author(s): **Saugat Ghimire**, **Jackson Marlett**, **Dmitry Martyshkin**, **Vladimir Fedorov**, **Sergey Mirov,** The Univ. of Alabama at Birmingham (United States); **Alan Martinez, Rick Watkins,** Wright-Patterson Air Force Base (United States)

13341-59 • 6:00 PM - 8:00 PM
Novel method for thermal lensing measurement applying in a Tm:Yap crystal
Author(s): **Salman Noach**, **Shahar Levi**, **Yaacov Ben-David**, **Rotem Nahear, Neria Suliman,** Jerusalem College of Technology (Israel)

13341-60 • 6:00 PM - 8:00 PM
High-power solid state thin-disk modules, pump modules and solid state lasers in SWIR region by CRYTUR
Author(s): **Antonin Fajstavr**, **Sabina Malecova**, **Krystof Polak**, **Petr Schovanec,** CRYTUR spol s.r.o. (Czech Republic); **Martin Smrz**, **Michal Chyla**, **Jiri Muzik**, **Pawel Sikocinski,** HiLASE Ctr., Institute of Physics of the CAS, v.v.i. (Czech Republic); **Tomáš Vaněk,** CRYTUR spol s.r.o. (Czech Republic)

13341-61 • 6:00 PM - 8:00 PM
Compact laser beam combiner
Author(s): **Scott J. Hamlin**, **Benjamin Hart**, **Ashley Charpentier**, **Chris Hardy, Alexander Likins,** MegaWatt Lasers, Inc. (United States)

13341-62 • 6:00 PM - 8:00 PM
Quad flashlamp driver
Author(s): **Scott J. Hamlin**, **Chris Hardy**, **William Younis, Ashley Charpentier,** MegaWatt Lasers, Inc. (United States)

13341-63 • 6:00 PM - 8:00 PM
Compensation of thermal lensing in solid-state laser gain media using phantom pulses
Author(s): **Scott J. Hamlin**, **Chris Hardy**, **Alexander Likins**, **Ashley Charpentier**, **Benjamin Hart,** MegaWatt Lasers, Inc. (United States); **Ramesh Shori,** Naval Undersea Warfare Ctr. Keyport (United States)

13341-64 • 6:00 PM - 8:00 PM
High-power 786nm VCSEL pumped Tm:YAG laser
Author(s): **Yang Li,** Institute of Semiconductors, Chinese Academy of Sciences (China); **Chuanchuan Li**, **Xin Wei, Lianghui Chen,** Institute of Semiconductors (China)

13341-66 • 6:00 PM - 8:00 PM
Few-cycle, mj-level, mid-wave infrared pulses generated via post compression of chirped pulse amplifier
Author(s): **Z. Alphonse Marra**, **Zenghu Chang**, **Morten Drees**, **Fei Xu**, **Chase Geiger, Dean Fleischmann,** Univ. of Ottawa (Canada)

13341-67 • 6:00 PM - 8:00 PM
AFB of zero-order compound wave-plates with highly accuracy and precision retardation values
Author(s): **Huai-Chuan Lee**, **Helmuth Meissner**, **David Meissner, Stephanie Meissner,** Onyx Optics Inc. (United States)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13341-15
High throughput and energy density fiber beam delivery system for ns high-energy pulses
Author(s): **Dmitry Tabakaev**, **Tibor Bereczki, Gerhard Kroupa,** Silicon Austria Labs. GmbH (Austria)

CONFERENCE 13342

Fiber Lasers XXII: Technology and Systems

27 - 30 January 2025 | Moscone South, Room 156 (Upper Mezz)

Conference Chair(s): **Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

Conference Co-Chair(s): **Matthias Savage-Leuchs,** Lockheed Martin Aculight Corp. (United States)

Program Committee: **Adrian L. Carter,** Nutown Technologies (Australia); **Mark Dubinskii,** DEVCOM Army Research Lab. (United States); **John P. Edgecumbe,** nLIGHT, Inc. (United States); **Angel Flores,** Air Force Research Lab. (United States); **Gregory D. Goodno,** Northrop Grumman Corp. (United States); **Nicoletta Haarlammert,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Thomas W. Hawkins,** Clemson Univ. (United States); **Clifford Headley,** Leonardo Electronics US Inc. (United States); **Anne Hildenbrand-Dhollande,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **César Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany); **Clémence Jollivet,** Coherent Corp. (United States); **Manoj Kanskar,** nLIGHT, Inc. (United States); **Mattia Michieletto,** NKT Photonics A/S (Denmark); **Peter F. Moulton,** MIT Lincoln Lab. (United States); **Martin H. Muendel,** Lumentum (United States); **Jeffrey W. Nicholson,** OFS (United States); **Natalija Rigere,** Technische Univ. München (Germany); **Philippe Roy,** XLIM (France); **Bryce N. Samson,** IPG Photonics Corp. (United States); **Lawrence Shah,** Consultant (United States); **L. Brandon Shaw,** U.S. Naval Research Lab. (United States); **Wei Shi,** Tianjin Univ. (China); **Paul Steinvurzel,** The Aerospace Corp. (United States); **V. R. Supradeepa,** Ctr. for Nano Science and Engineering (CeNSE) (India); **Michalis N. Zervas,** Optoelectronics Research Ctr. (United Kingdom); **Katrin Wondraczek,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Cheng Zhu,** Luminar Technologies, Inc. (United States)

Monday 27 January 2025

SESSION 1: INDUSTRIAL LASERS

27 January 2025 • 9:05 AM - 10:15 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Thomas Schreiber**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-1 • 9:05 AM - 9:35 AM
7kW single-mode ytterbium fiber laser with beam quality parameter M^2<1.1 and direct diode pumping *(Invited Paper)*
Author(s): **Nikolai Platonov**, **Roman Yagodkin**, **Joel De La Cruz**, **Cesar Arambula**, **Jesse Fitts,** IPG Photonics Corp. (United States); **Vladimir Sergeev,** IPG Laser GmbH (Germany)

13342-3 • 9:35 AM - 9:55 AM
High-power, narrow-linewidth, reverse-pumped, Yb-doped fiber amplifier using novel 7+1:1 pump-signal combiner
Author(s): **Jeffrey W. Nicholson**, **Jose Pincha**, **Lalitkumar Bansal**, **Robert Sienkowski**, **Chris Neale, Joel Mann,** OFS (United States)

13342-4 • 9:55 AM - 10:15 AM
Precision GHz fiber combs: bridging the gap to microresonators
Author(s): **Kevin F. Lee**, **Jacob Lampen**, **Jie Jiang, Martin E. Fermann,** IMRA America, Inc. (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: VISIBLE AND MID-IR

27 January 2025 • 10:45 AM - 12:15 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Jeffrey W. Nicholson**, OFS (United States)

13342-5 • 10:45 AM - 11:15 AM
Get the most out of a fiber laser: from high-power CW to ultrafast operation, from visible to mid-infrared emission *(Invited Paper)*
Author(s): **Martin Bernier**, **Yigit Ozan Aydin**, **Pascal Paradis**, **Vincent Fortin**, **William Bisson**, **Alexandre Michaud**, **Louis-Charles**

Michaud, **Tommy Boilard**, **Maxime Lemieux-Tanguay**, **Lauris Talbot**, **Quentin Perry-Auger**, **Andrew Karim**, **Stanislav Leonov**, **Marie-Pier Lord**, **Michel Olivier, Réal Vallée,** Univ. Laval (Canada)

13342-6 • 11:15 AM - 11:35 AM
Towards power scaling of Er-doped fluoride fiber laser at 3.78μm
Author(s): **Lu Zhang**, **Shijie Fu**, **Quan Sheng**, **Xuewen Luo**, **Junxiang Zhang**, **Wei Shi, Jianquan Yao,** Tianjin Univ. (China)

13342-7 • 11:35 AM - 11:55 AM
High-energy mid-IR pulse generation at ~2.78μm in a robust single transverse mode using a coiled 46μm core low-NA Er: ZBLAN fiber
Author(s): **Yu Bai**, **Bohan Zhou**, **Weizhi Du**, **Yifan Cui, Almantas Galvanauskas,** Univ. of Michigan (United States)

13342-8 • 11:55 AM - 12:15 PM
UV sub-nanosecond laser source with high average power and low peak power based on all-fiber infrared source
Author(s): **Andrea Monzani,** Bloom Lasers (France); **Christophe Pierre**, **Michael Berisset,** ALPhANOV (France); **Amélie Chervet,** Bloom Lasers (France), XLIM (France); **Guillaume Caussain**, **Julien Didierjean,** Bloom Lasers (France); **Marc Castaing,** ALPhANOV (France); **Julien Saby,** Bloom Lasers (France)

Lunch Break 12:15 PM - 1:45 PM

SESSION 3: TWO MICRON FIBER LASER I

27 January 2025 • 1:45 PM - 3:15 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Adrian L. Carter**

13342-9 • 1:45 PM - 2:15 PM
Tm-doped ultrafast fiber laser systems with chirped pulse amplification *(Invited Paper)*
Author(s): **Shutao Xu**, **Timothy Lim**, **Ahmet Turnali**, **Lachlan Hooper**, **Maria Davey, Michelle Y. Sander,** Boston Univ. (United States)

13342-10 • 2:15 PM - 2:35 PM
Power scaling of narrow-linewidth holmium-doped fiber amplifiers with low noise and linear polarization
Author(s): **Patrick Baer**, **Pelin Cebeci**, **Martin Giesberts**, **Melina Reiter, Hans-Dieter Hoffmann,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13342-11 • 2:35 PM - 2:55 PM
High efficiency power-scalable monolithic Ho3+-doped triple clad fiber laser cladding-pumped at 1.9μm
Author(s): **Nicolas Dalloz,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Julien Le Gouët,** ONERA (France); **Christophe Louot,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **François Gustave,** ONERA (France); **Thierry Ibach,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Alexandre Barnini**, **Laurent Lablonde**, **Gilles Mélin**, **Thierry Robin**, **Benoît Cadier,** Exail SAS (France); **Anne Hildenbrand-Dhollande,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

13342-12 • 2:55 PM - 3:15 PM
Pair-induced quenching in holmium doped fiber lasers and its impact on efficiency and operating wavelength
Author(s): **Jan Pokorný, Pavel Peterka,** Institute of Photonics and Electronics of the CAS, v.v.i. (Czech Republic)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 4: NOVEL LIGHT SOURCES

28 January 2025 • 8:30 AM - 10:40 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **César Jáuregui-Misas**, Friedrich-Schiller-Univ. Jena (Germany)

13342-13 • 8:30 AM - 9:00 AM
Hollow-core fiber-based light sources for advanced semiconductor metrology & inspection *(Invited Paper)*
Author(s): **Patrick Uebel,** ASML (Germany); **Johannes Koehler,** ASML Germany GmbH (Germany); **Michael H. Frosz, Michael Bergler,** Max-Planck-Institut für die Physik des Lichts (Germany)

13342-14 • 9:00 AM - 9:20 AM
Polarization maintaining, low noise, 32W, 1280nm Raman amplifier
Author(s): **Andrew T. Grimes**, **Anand Hariharan**, **Ian Sun, Jeffrey W. Nicholson,** OFS (United States)

13342-15 • 9:20 AM - 9:40 AM
All-spliced 18.4W four-wave mixing source at 770 nm
Author(s): **Patrick Hemmer,** Univ. Research Foundation (United States); **Rafael R. Gattass**, **Daniel L. Rhonehouse**, **Leslie B. Shaw,** U.S. Naval Research Lab. (United States); **Geoffrey D. Chin,** Univ. Research Foundation (United States); **Shyam S. Bayya, Jasbinder S. Sanghera,** U.S. Naval Research Lab. (United States)

13342-16 • 9:40 AM - 10:00 AM
Continuously tunable green to red visible laser sources through harmonic conversion of cascaded Raman fiber lasers
Author(s): **Sarthak Dash**, **Rashmita Deheri, V. R. Supradeepa,** Indian Institute of Science, Bengaluru (India)

13342-17 • 10:00 AM - 10:20 AM
Record-low quantum defect efficient high-power diffraction-limited fiber laser
Author(s): **Monica T. Kalichevsky-Dong**, **Samuel P. Bingham**, **Thomas W. Hawkins**, **Bailey Meeham,** Clemson Univ. (United States); **Peter Dragic,** Univ. of Illinois (United States); **John Ballato, Liang Dong,** Clemson Univ. (United States)

13342-18 • 10:20 AM - 10:40 AM
Pulse-pumped, polarization maintaining, very-large-mode area erbium-doped fiber amplifier at low repetition rates
Author(s): **Venkatapuram S. Sudarshanam**, **Cang Jin, Jeffrey W. Nicholson,** OFS (United States)

Exhibition Break 10:40 AM - 2:00 PM

SESSION 5: HIGH POWER FIBER LASERS

28 January 2025 • 2:00 PM - 3:50 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Clémence Jollivet**, Coherent Corp. (United States)

13342-19 • 2:00 PM - 2:30 PM
Transverse mode instability and two-wave mixing in narrow linewidth Yb-doped fiber amplifiers *(Invited Paper)*
Author(s): **Konstantin K. Bobkov**, **Johan Nilsson, Michalis N. Zervas,** Optoelectronics Research Ctr. (United Kingdom)

13342-20 • 2:30 PM - 2:50 PM
Control of modal energy exchange in transverse mode instability with travelling waves
Author(s): **Yiming Tu**, **César Jáuregui-Misas**, **Sobhy Kholaif, Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany)

13342-21 • 2:50 PM - 3:10 PM
Comparison of TMI thresholds in non-PM and PM Fibers
Author(s): **Gonzalo Palma-Vega**, **Denny Hässner**, **Friedrich Möller**, **Stefan Kuhn**, **Johannes Nold**, **Nicoletta Haarlammert, Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-22 • 3:10 PM - 3:30 PM
Static beam degradation due to two-wave-mixing long-period gain/loss gratings
Author(s): **Michalis N. Zervas, Konstantin K. Bobkov,** Optoelectronics Research Ctr. (United Kingdom)

13342-23 • 3:30 PM - 3:50 PM
Mitigation of transverse mode instability by incoherent combination in multicore fibers
Author(s): **Yahia Khalil,** Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics (Germany); **Cesar Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13342-56 • 6:00 PM - 8:00 PM
Proton and heavy-ion radiation effects on the performance of 1064 nm DFB Lasers
Author(s): **Juan Adrian Zepeda-Galvez**, **Shivaraman Asoda**, **Wiktor Walasik**, **Robert E. Tench**, **Jean-Marc Delavaux,** Cybel, LLC (United States); **Yasunari Maeda**, **Yutaka Onishi, Keizo Takemasa,** QD Laser, Inc. (Japan)

13342-57 • 6:00 PM - 8:00 PM
All-PM fiber 51-fs mode-locked fiber laser at 1550 nm
Author(s): **Reza Soltanian,** Institut National de la Recherche Scientifique (Canada); **Pin Long,** O/E Land Inc. (Canada); **François Légaré,** Institut National de la Recherche Scientifique (Canada)

13342-58 • 6:00 PM - 8:00 PM
Nanosecond pulse generation in an all-fiber laser at 1706nm based on gain switching
Author(s): **JeeHwan Kim**, **JunHa Jung**, **Suh-Young Kwon**, **TaeHo Woo**, **JangHyun Ryu,** The Univ. of Seoul (Korea, Republic of); **HongSung An**, **Yong-Jae Lee**, **Tae Joong Eom,** Pusan National Univ. (Korea, Republic of); **Ju Han Lee,** The Univ. of Seoul (Korea, Republic of)

13342-59 • 6:00 PM - 8:00 PM
Analysis of stability conditions for a mode-locked fiber laser using nonlinear polarization rotation based on the measured Jones matrix of an optical fiber
Author(s): **Dowon Kim,** Chosun Univ. (Korea, Republic of); **Minseok Kim,** ESOL, Inc. (Korea, Republic of); **Seonsu Kim**, **Yujin Kim**, **Sejun Oh, Hyun Su Kim,** Chosun Univ. (Korea, Republic of)

13342-61 • 6:00 PM - 8:00 PM
PEDOT:PSS saturable absorber-based femtosecond fiber laser
Author(s): **My Hoang Ha**, **JiWhan Noh, ByungJoo Kim,** Korea Institute of Machinery & Materials (Korea, Republic of)

13342-62 • 6:00 PM - 8:00 PM
Power scaling of single-frequency Yb3+-doped phosphate fiber laser oscillators
Author(s): **Jingwei Wu**, **Xiushan Zhu**, **Khawlah Alyahyaei**, **Nasser Peyghambarian, Robert Norwood,** The Univ. of Arizona (United States)

13342-63 • 6:00 PM - 8:00 PM
Passively mode-locked Nd:fiber laser at 920nm
Author(s): **Fedele Pisani,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Gabriele Di Noia**, **Francesco Crisafi**, **Matteo Negro,** Cambridge Raman Imaging S.r.l. (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy); **Gianluca Galzerano,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13342-64 • 6:00 PM - 8:00 PM
Anti-resonant hollow-core fiber with highly birefringent meniscoid nested structure
Author(s): **Yang Wang**, **Xiaobei Zhang**, **Wei Chen, Qi Zhang,** Shanghai Univ. (China)

13342-65 • 6:00 PM - 8:00 PM
Lossless in-line laser power monitoring in high-power fiber lasers
Author(s): **Sharon Huang,** Lightel Technologies, Inc. (United States); **Hung-Ying Chang,** PhotoniCore Technologies Co., Ltd. (Taiwan); **Benson Shen,** Lightel Technologies, Inc. (United States)

13342-66 • 6:00 PM - 8:00 PM
5kW single-mode narrow-linewidth ytterbium fiber amplifier with M^2-value < 1.1 in all fiber format and direct diode pumping
Author(s): **Nikolai Platonov**, **Roman Yagodkin**, **Joel De La Cruz**, **Cesar Arambula**, **Jesse Fitts,** IPG Photonics Corp. (United States); **Vladimir Sergeev,** IPG Laser GmbH (Germany)

13342-67 • 6:00 PM - 8:00 PM
Data-driven eigenmode estimation of optical fibers in TMI-Regime by exploitation of physically constrained "glass box" machine learning model
Author(s): **Alexander Kabardiadi-Virkovski**, **Leander Kläber**, **Antje Zitka, Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13342-68 • 6:00 PM - 8:00 PM
Mode-locked all-fiber ring laser with GHz fundamental repetition rate
Author(s): **Maolin Dai**, **Bowen Liu**, **Yifan Ma**, **Sze Yun Set, Shinji Yamashita,** The Univ. of Tokyo (Japan)

13342-69 • 6:00 PM - 8:00 PM
A simple system for generating 844 nm pulse laser using ytterbium-doped fiber laser and photonic crystal fiber
Author(s): **Yifan Ma**, **Maolin Dai**, **Bowen Liu**, **Sze Yun Set, Shinji Yamashita,** The Univ. of Tokyo (Japan)

13342-70 • 6:00 PM - 8:00 PM
Fiber-lasers for in-band pumping of Tm-doped hosts
Author(s): **Valentina Serafini**, **Anna Mauro**, **Matteo Cavagnetto,** Politecnico di Torino (Italy); **Sabina Zaimovic**, **Luca Maggio Tanasi**, **José Blanco Triana,** ALITE (Italy); **Guido Perrone,** Politecnico di Torino (Italy)

13342-71 • 6:00 PM - 8:00 PM
120μJ single-frequency linear-polarized 12-μm-core fiber amplifier based on pre-shaped seed pulse
Author(s): **Peiheng Jiang**, **Chaodu Shi**, **Shijie Fu**, **Quan Sheng**, **Jin Yan**, **Kai Xue**, **Wei Shi, Jianquan Yao,** Tianjin Univ. (China)

13342-72 • 6:00 PM - 8:00 PM
Spectrum suppression of high-peak-power pulsed single-frequency fiber MOPA by manipulation of pulse shape and corresponding nonlinear phase shifting
Author(s): **Hao Tian**, **Chaodu Shi**, **Junxiang Zhang**, **Shijie Fu**, **Quan Sheng**, **Wei Shi, Jianquan Yao,** Tianjin Univ. (China)

13342-73 • 6:00 PM - 8:00 PM
Phase synchronization in tiled aperture coherent beam combining based on feedback from off-axis locations in far-field plane
Author(s): **Sooraj M. S.**, **Satyajit Maji**, **Anirudh Bharadwaj, Balaji Srinivasan,** Indian Institute of Technology Madras (India)

Wednesday 29 January 2025

SESSION 6: TWO MICRON FIBER LASER II

29 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Anne Hildenbrand-Dhollande**, Institut Franco-Allemand de Recherches de Saint-Louis (France)

13342-24 • 8:30 AM - 9:00 AM
Power scaling of thulium-doped fiber laser systems *(Invited Paper)*
Author(s): **Friedrich Möller**, **Till Walbaum**, **Tilman A. K. Lühder**, **Victoria Jacob, Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-25 • 9:00 AM - 9:20 AM
Splice-optimized all-fiber continuous-wave Tm3+-doped fiber laser emitting 680W at 2036nm
Author(s): **Christophe Louot,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Félix Sanson,** Institut Franco-Allemand de Recherches de Saint-Louis (France), Ctr. Lasers Intenses et Applications, Univ. de Bordeaux, CEA, CNRS (France); **Arnaud Motard**, **Nicolas Dalloz**, **Stefano Bigotta,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Caterina Clemente,** Institut Franco-Allemand de Recherches de Saint-Louis (France), Institut des Sciences Chimiques de Rennes, Univ. de Rennes 1, CNRS (France); **Inka Manek-Hönninger,** Univ. de Bordeaux (France); **Anne Hildenbrand-Dhollande,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

13342-26 • 9:20 AM - 9:40 AM
Pump noise transfer in a highly efficient, in-band pumped thulium-doped fiber amplifier
Author(s): **Mathias Lenski**, **Qian Xu,** Friedrich-Schiller-Univ. Jena (Germany); **Philipp Gierschke,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer Institute for Applied Optics and Precision Engineering (Germany); **Ziyao Wang,** Friedrich-Schiller-Univ. Jena (Germany); **César Jáuregui,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer Institute for Applied Optics and Precision Engineering (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer Institute for Applied Optics and Precision Engineering (Germany), Helmholtz-Institute Jena (Germany)

13342-27 • 9:40 AM - 10:00 AM
Transfer functions of thulium-doped fiber amplifiers for in-band and out-of-band pumping
Author(s): **Benedikt Schuhbauer**, **Frithjof Haxsen,** Laser Zentrum Hannover e.V. (Germany); **Uwe Morgner**, **Jörg Neumann, Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: MULTIMODE, MULTICORE FIBER LASER

29 January 2025 • 10:30 AM - 12:20 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Michalis N. Zervas**, Optoelectronics Research Ctr. (United Kingdom)

13342-28 • 10:30 AM - 11:00 AM
Femtosecond CPA laser system emitting 261W average power, 1.75mJ pulse energy based on coherent combination of a 49-core fiber *(Invited Paper)*
Author(s): **Arno Klenke,** Helmholtz Institute Jena (Germany), Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Mehran Bahri,** Friedrich-Schiller-Univ. Jena (Germany); **Cesar Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Johannes Nold**, **Nicoletta Haarlammert**, **Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-29 • 11:00 AM - 11:20 AM
Pump absorption and amplification uniformity in rod-type, multicore fibers
Author(s): **César Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Arno Klenke,** Helmholtz Institute Jena (Germany), Friedrich-Schiller-Univ. Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); **Mehran Bahri,** Friedrich-Schiller-Univ. Jena (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany), Helmholtz Institute Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-30 • 11:20 AM - 11:40 AM
Precision manufacturing of multicore fibers for superior fiber laser performance
Author(s): **Nicoletta Haarlammert**, **Johannes Nold**, **Stefan Kuhn,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Arno Klenke,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Helmholtz Institute Jena (Germany), GSI Helmholtzzentrum für Schwerionenforschung GmbH (Germany); **Mehran Bahri**, **César Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Helmholtz Institute Jena (Germany); **Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-31 • 11:40 AM - 12:00 PM
18-mJ pulse energy, 27-W average power, second harmonic generation in a Q-switched 49-core Yb-doped fiber laser
Author(s): **Mehran Bahri**, **Arno Klenke**, **Cesar Jáuregui-Misas,** Friedrich-Schiller-Univ. Jena (Germany); **Johannes Nold**, **Nicoletta Haarlammert**, **Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany)

13342-32 • 12:00 PM - 12:20 PM
Modeling multimode fiber amplifiers with gain saturation and pump depletion
Author(s): **Kabish Wisal**, **Stefan Rothe**, **Chun-Wei Chen,** Yale Univ. (United States); **Peyman Ahmadi,** Coherent Corp. (United States); **Mert Ercan**, **Hui Cao, A. Douglas Stone,** Yale Univ. (United States)

Lunch/Exhibition Break 12:20 PM - 2:00 PM

SESSION 8: ULTRAFAST LASERS I

29 January 2025 • 2:00 PM - 3:30 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Peter F. Moulton**, MIT Lincoln Lab. (United States)

13342-33 • 2:00 PM - 2:30 PM
Femtosecond fiber regenerative amplifiers *(Invited Paper)*
Author(s): **Frank W. Wise,** Cornell Univ. (United States)

13342-34 • 2:30 PM - 2:50 PM
Towards a high repetition rate all-fiber ring Mamyshev oscillator
Author(s): **Corentin Delangle,** Amplitude (France), CEA-Cesta (France), Lab. de Physique des Lasers, Atomes et Molécules (France); **Florent Scol,** CEA-Cesta (France); **Clemens Hönninger,** Amplitude (France); **Géraud Bouwmans**, **Olivier Vanvincq,** Lab. de Physique des Lasers, Atomes et Molécules (France); **Emmanuel Hugonnot,** CEA-Cesta (France)

13342-35 • 2:50 PM - 3:10 PM
Pre-chirp managed Mamyshev oscillator with pulse compression using an anti-resonant hollow core fiber
Author(s): **Shan Wang**, **Ziheng Zhuang**, **Weijia Luo,** Institute of Advanced Photonics Technology, Guangdong Univ. of Technology (China), Key Lab. of Photonic Technology for Integrated Sensing and Communication (China), Guangdong Provincial Key Lab. of Information Photonics Technology (China); **Xin Zhang,** Institute of Laser Engineering, Beijing Engineering Research Ctr. of Laser Applied Technology (China), Beijing Univ. of Technology (China); **Di Lin**, **Songnian Fu,** Institute of Advanced Photonics Technology, Guangdong Univ. of Technology (China), Key Lab. of Photonic Technology for Integrated Sensing and Communication (China), Guangdong Provincial Key Lab. of Information Photonics Technology (China); **Pu Wang,** Institute of Laser Engineering, Beijing Engineering Research Ctr. of Laser Applied Technology (China), Beijing Univ. of Technology (China); **Yuwen Qin,** Institute of Advanced Photonics Technology, Guangdong Univ. of Technology (China), Key Lab. of Photonic Technology for Integrated Sensing and Communication (China), Guangdong Provincial Key Lab. of Information Photonics Technology (China)

13342-36 • 3:10 PM - 3:30 PM
Deep-learning applied to coherent combining of fiber lasers: toward an experimental demonstration in a non-controlled environment
Author(s): **Nathanaël Hulard**, **Pierre Bourdon,** ONERA (France); **Stéphane Barland,** Institut de Physique de Nice (France); **Bastien Rouzé, Laurent Lombard,** ONERA (France)

Coffee Break 3:30 PM - 4:00 PM

SESSION 9: NARROW LINEWIDTH FIBER LASERS

29 January 2025 • 4:00 PM - 5:40 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Mark Dubinskii**, DEVCOM Army Research Lab. (United States)

13342-37 • 4:00 PM - 4:20 PM
500 W single-frequency multimode fiber amplifier with controlled output profile
Author(s): **Stefan Rothe,** Yale Univ. (United States); **Peyman Ahmadi,** Yale Univ. (United States), Coherent Corp. (United States); **Kabish Wisal,** Yale Univ. (United States); **Chun-Wei Chen,** Yale Univ. (United States), Stanford Univ. (United States); **Mert Ercan**, **Nathan Vigne**, **A. Douglas Stone, Hui Cao,** Yale Univ. (United States)

13342-38 • 4:20 PM - 4:40 PM
Output pulse energy from pulsed single-mode fiber amplifiers
Author(s): **Samuel P. Bingham,** Clemson Univ. (United States); **Daniel Matyas,** U.S. Army Space and Missile Defense Command (United States); **Mark Mihalik,** U.S. Military Academy (United States); **Thomas W. Hawkins**, **Monica T. Kalichevsky-Dong**, **John Ballato, Liang Dong,** Clemson Univ. (United States)

13342-39 • 4:40 PM - 5:00 PM
Single-frequency amplifier using polarization-maintaining Yb-doped 30/400 fiber
Author(s): **Jeffrey W. Nicholson**, **Jose Pincha**, **Robert Windeler,** OFS (United States); **Simona Ovtar**, **Bera Pálsdóttir,** OFS Fitel Denmark ApS (Denmark); **Erin S. Lamb,** OFS (United States)

13342-40 • 5:00 PM - 5:20 PM
Power scaling of single-frequency Yb3+ fiber amplifiers with highly absorbing standard LMA fibers
Author(s): **Kristopher Kruska**, **Peter Weßels**, **Jörg Neumann, Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany)

13342-41 • 5:20 PM - 5:40 PM
SBS-free 100 m all-fiber delivery of 100 W single frequency laser through anti-resonant hollow-core fiber
Author(s): **Shoufei Gao,** Jinan Univ. (China), LinFiber Tech. (NanTong) Co., Ltd. (China)

Thursday 30 January 2025

SESSION 10: MANUFACTURING AND COMPONENTS

30 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Philippe Roy**, XLIM (France)

13342-43 • 8:30 AM - 8:50 AM
A nested preform stacking approach for active photonic bandgap fiber fabrication
Author(s): **Charles X. Yu**, **Matt Cook**, **Paul Pax**, **Victor Khitrov**, **William Moore**, **Mike Messerly**, **Jay Dawson,** Lawrence Livermore National Lab. (United States); **Mark Dubinskiy,** DEVCOM Army Research Lab. (United States)

13342-44 • 8:50 AM - 9:10 AM
Self-protecting index-adapting cladding light stripper
Author(s): **Tilman A. K. Lühder**, **Till Walbaum, Thomas Schreiber,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-45 • 9:10 AM - 9:30 AM
Quasi-Bessel beam generation with an SMF-MMF structure
Author(s): **Yongmin Jung**, **Natasha Vukovic,** Univ. of Southampton (United Kingdom); **Christophe A. Codemard,** TRUMPF Laser UK Ltd. (United Kingdom); **Michalis N. Zervas,** Univ. of Southampton (United Kingdom)

13342-46 • 9:30 AM - 9:50 AM
Side-fused signal-pump combiner for triple clad fibers
Author(s): **Eike Brockmüller**, **Fabian Kranert,** Laser Zentrum Hannover e.V. (Germany); **Roland Lachmayer,** Institut für Produktentwicklung und Gerätebau (Germany); **Jörg Neumann,** Laser Zentrum Hannover e.V. (Germany); **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)

Coffee Break 9:50 AM - 10:20 AM

SESSION 11: NOVEL FIBERS AND EFFECTS

30 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Thomas Schreiber**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13342-47 • 10:20 AM - 10:50 AM
Meta-fibers: merging nanophotonics with optical fibers through 3D nanoprinting for tailored beam manipulation *(Invited Paper)*
Author(s): **Markus A. Schmidt**, **Bennet Fischer**, **Mohammad Khosravi**, **Shahrzad Hosseinabadi, Matthias Zeisberger,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

13342-48 • 10:50 AM - 11:10 AM
Stimulated emission from a liquid core fiber filled with 2D semiconductor nanoplatelets
Author(s): **Veronika Adolfs,** Leibniz Univ. Hannover (Germany); **Dominik A. Rudolph,** Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany); **Artsiom Antanovich**, **Dan Huy Chau,** Leibniz Univ. Hannover (Germany); **Mario Chemnitz**, **Markus A. Schmidt,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Abbe Ctr. of Photonics (Germany), Friedrich-Schiller-Univ. Jena (Germany); **Simon Spelthann,** Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany); **Jannika Lauth,** Eberhard Karls Univ. Tübingen (Germany), Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany); **Michael Steinke,** Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany)

13342-49 • 11:10 AM - 11:30 AM
MW-level 7ps high power MOPA system with ytterbium-doped spun tapered double-clad fiber
Author(s): **Ebrahim Aghayari,** Ampliconyx Oy (Finland); **Hossein Fathi,** Tampere Univ. (Finland); **Evgenii Motorin**, **Lauri Toikkanen**, **Andrey Chumachenko**, **Vasilii Ustimchik,** Ampliconyx Oy (Finland); **Andrejs Griscenko**, **Evgenii Gribanov**, **Farrukh Safin,** CeramOptec SIA (Latvia); **Florian Lindner**, **Katrin Wondraczek,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Regina Gumenyuk,** Tampere Univ. (Finland), Ampliconyx Oy (Finland); **Valery Filippov,** Ampliconyx Oy (Finland)

13342-50 • 11:30 AM - 11:50 AM
Transverse mode instability (TMI) free high power operation of 85µm core Yb-doped chirally-coupled-core fiber amplifiers
Author(s): **Mingshu Chen**, **Christopher Pasquale**, **Jack Crandall**, **I-Ning Hu,** Univ. of Michigan (United States); **Manoj Kanskar,** nLIGHT, Inc. (United States); **Arto Nieminen**, **Ossi Kimmelma,** nLIGHT, Inc., Lohja (Finland); **Donald Sipes**, **Brian Schulz**, **Dan Schulz,** Optical Engines, Inc. (United States); **Tong Zhou**, **Fanping Kong**, **Russell Wilcox,** Lawrence Berkeley National Lab. (United States); **Almantas Galvanauskas,** Univ. of Michigan (United States)

13342-51 • 11:50 AM - 12:10 PM
Room-temperature Stark-split sub-level measurements in Yb-doped optical fibers using Purcell enhancement in microresonators
Author(s): **Nikita Toropov,** Univ. of Southampton (United Kingdom); **Christophe A. Codemard,** TRUMPF Laser UK Ltd. (United Kingdom); **Michalis N. Zervas,** Univ. of Southampton (United Kingdom)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 12: ULTRAFAST LASERS II

30 January 2025 • 1:40 PM - 3:10 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Matthias Savage-Leuchs**, Lockheed Martin Aculight Corp. (United States)

13342-52 • 1:40 PM - 2:10 PM
Ultrafast optics in gas-filled fibers *(Invited Paper)*
Author(s): **John C. Travers**, **Nikoleta Kotsina**, **Mohammed Sabbah**, **Teodora Grigorova**, **Balazs Plosz**, **Athanasios Lekosiotis**, **Joleik Nordmann**, **Michael Heynck**, **Adam Alisauskas**, **Deepjyoti Satpathy**, **Abdelrahman Almeghari**, **Martin Gebhardt**, **Federico Belli, Christian Brahms,** Heriot-Watt Univ. (United Kingdom)

13342-53 • 2:10 PM - 2:30 PM
Ultrashort pulse amplifier using a novel 40/250 polarization-maintaining Yb-doped multi-clad fiber
Author(s): **Vincent Roy**, **Mathieu Boivin**, **Louis Desbiens**, **Marc Deladurantaye, Antoine Proulx,** INO (Canada)

13342-54 • 2:30 PM - 2:50 PM
All-fiber 10-μJ class femtosecond thulium energy scalable CPA front-end platform based on long-term stable all-PM dissipative soliton oscillator
Author(s): **Dmitriy Gaponov,** LEUKOS (France); **Adrian Grande**, **Christophe Pierre,** ALPhANOV (France); **Vincent Tombelaine,** LEUKOS (France); **Marc Castaing,** ALPhANOV (France); **Ammar Hideur,** Complexe de Recherche Interproffessionnel en Aerothermochimie (France), Univ. de Rouen Normandie (France); **Guillaume Huss,** LEUKOS (France)

13342-55 • 2:50 PM - 3:10 PM
Target-in-the-loop coherent combining of 7 fiber amplifiers up to 1km range with simultaneous phase and tip-tilt control
Author(s): **Pierre Bourdon**, **Pierre Pichon**, **Laurent Lombard**, **Didier Goular, Bastien Rouzé,** ONERA (France)

FIBER LASERS STUDENT AWARD CEREMONY

30 January 2025 • 3:10 PM - 3:40 PM | Moscone South, Room 156 (Upper Mezz)
Session Chair(s): **Thomas Schreiber**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)
Sponsored by NKT Photonics A/S (Denmark) and Active Fiber Systems GmbH (Germany)

CONFERENCE 13343

High Power Lasers for Fusion Research VIII

29 January 2025 | Moscone South, Room 303 (Level 3)

Conference Chair(s): **Abdul A. S. Awwal,** Lawrence Livermore National Lab. (United States); **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

Program Committee: **Martin Adams,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Klaus Albers,** TRUMPF Laser GmbH (Germany); **Philippe Balcou,** Ctr. Lasers Intenses et Applications (France); **Nathalie Blanchot,** CEA-Cesta (France); **Jean-Christophe Francis Chanteloup,** Ecole Polytechnique (France); **Mariastefania De Vido,** STFC Rutherford Appleton Lab. (United Kingdom); **Jean-Michel G. Di Nicola**, **John E. Heebner,** Lawrence Livermore National Lab. (United States); **Ryosuke Kodama,** Osaka Univ. (Japan); **Brian E. Kruschwitz,** Univ. of Rochester (United States); **Ruxin Li,** Shanghai Institute of Optics and Fine Mechanics, CAS (China); **Takayoshi Norimatsu,** Osaka Univ. (Japan); **Christophe Simon-Boisson,** Thales LAS France SAS (France); **Kazuo A. Tanaka,** Extreme Light Infrastructure Nuclear Physics (Romania); **Sébastien Vermersch,** CEA-Cesta (France); **Changhe Zhou,** Jinan Univ. (China)

Monday 27 January 2025

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Wednesday 29 January 2025

SESSION 1: STATUS UPDATES

29 January 2025 • 8:30 AM - 10:15 AM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Constantin L. Häfner**, Fraunhofer-Institut für Lasertechnik ILT (Germany)

13343-1 • 8:30 AM - 8:45 AM
Versatile ultra-high contrast mJ-class OPCPA seeder for Petawatt lasers for fusion research
Author(s): **Raman Maksimenka**, **Christina Alexandridi**, **Benoit Bussière**, **Yoann Pertot**, **Ramatou Bello**, **Come Jacob**, **Florent Pallas**, **Emilien Gontier**, **Franck Falcoz**, **Antoine Courjaud, Pierre-Mary Paul,** Amplitude Laser Group (France)

13343-2 • 8:45 AM - 9:00 AM
LMJ-PETAL laser performance status
Author(s): **Kevin Gaudfrin**, **Chloé Lacombe, Vincent Denis,** CEA-Cesta (France)

13343-3 • 9:00 AM - 9:15 AM
Advances in laser technology for direct drive inertial fusion energy
Author(s): **Clément Paradis,** Focused Energy GmbH (Germany), Pulsed Light Technologies GmbH (Germany); **Douglas Hammond,** Focused Energy Inc. (United States); **Jiří Thoma**, **André Loescher,** Focused Energy GmbH (Germany); **Geoffroy Le Touzé**, **Gavin Friedman**, **Bruno Le Garrec,** Pulsed Light Technologies GmbH (Germany); **Gilles Chériaux,** Focused Energy GmbH (Germany)

13343-4 • 9:15 AM - 9:30 AM
Development of the Fourth-generation Laser for Ultrabroadband eXperiments (FLUX)
Author(s): **Christophe Dorrer**, **Alexander Bolognesi**, **Maeve Bozarth**, **Aaron Campbell**, **Nagitha Ekanayake**, **Kyle Gibney**, **Steve Herman**, **Elizabeth M. Hill**, **Mark Meyers**, **Siddharth Sampat**, **Michael Spilatro**, **David Weiner, Jonathan Zuegel,** Univ. of Rochester (United States)

13343-5 • 9:30 AM - 9:45 AM
Routine operations of the National Ignition Facility at 2.2 MJ of UV energy
Author(s): **Jean-Michel G. Di Nicola,** Lawrence Livermore National Lab. (United States)

13343-25 • 9:45 AM - 10:00 AM
Progress on fusion target gain using 2.2 MJ of the National Ignition Facility *(Invited Paper)*
Author(s): **Andrea L. Kritcher,** Lawrence Livermore National Lab. (United States)

13343-700 • 10:00 AM - 10:15 AM
Status Updates - Panel Q&A
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: ENGINEERING CHALLENGES

29 January 2025 • 10:45 AM - 12:30 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Jean-Michel G. Di Nicola**, Lawrence Livermore National Lab. (United States); **Christophe Dorrer**, Univ. of Rochester (United States)

13343-7 • 10:45 AM - 11:00 AM
Clusterized surface transformation under intense heating generated by laser-accelerated ion irradiation
Author(s): **Elias Catrix**, **Jean-Pierre Matte**, **Simon Vallières, Patrizio Antici,** Institut National de la Recherche Scientifique (Canada)

13343-8 • 11:00 AM - 11:15 AM
Virtual Beamline++: full-chain optical modeling for modern laser design and operation
Author(s): **Samuel A. McLaren**, **River Aden**, **Trenton Brendel**, **Thomas E Lanier**, **Kathleen McCandless**, **Gabriel Mennerat**, **Fran Morrissey**, **Jordan Penner**, **Travis Petersen**, **Richard A Sacks**, **Sam Schrauth**, **Leon Waxer, Jean-Michel Di Nicola,** Lawrence Livermore National Lab. (United States)

13343-10 • 11:15 AM - 11:30 AM
Passive wavefront-correction with high temporal and spatial fidelity with SBS mirror on kJ class lasers
Author(s): **Raphaël Humblot**, **Stéphane Branly**, **Antoine Courjaud,** Amplitude Laser Group (France); **Loic Meignien**, **Patrick Audebert,** Lab. pour l'Utilisation des Lasers Intenses (France); **Frédéric Druon,** Institut d'Optique Graduate School (France)

13343-11 • 11:30 AM - 11:45 AM
Capability enhancements to integrated opto-mechanical birefringence modeling code for high-power laser systems
Author(s): **Tyler V. Howard,** Lawrence Livermore National Lab. (United States), Univ. of Rochester (United States); **Anthony J. Vella,** Lawrence Livermore National Lab. (United States)

13343-12 • 11:45 AM - 12:00 PM
Quick radiation resistance testing of materials and electronic devices employed in harsh environment using laser-based radiation sources
Author(s): **Beatrice D'Orsi**, **Elias Catrix**, **Simon Vallières**, **Sylvain Fourmaux**, **Canan Yağmur Boynukara,** Institut National de la Recherche Scientifique (Canada); **Rocco Carcione**, **Alessia Cemmi**, **Ilaria Di Sarcina**, **Jessica Scifo,** ENEA (Italy); **Patrizio Antici,** Institut National de la Recherche Scientifique (Canada)

13343-13 • 12:00 PM - 12:15 PM
Beam-based programmable spatial shaper for reducing optics exchange in the National Ignition Facility
Author(s): **Brandon W. Buckley**, **Jean-Michel G. Di Nicola**, **Lawrence J. Pelz**, **John E. Heebner**, **Lars F. Voss**, **Ryan Muir**, **Anthony J. Vella**, **Eric A. Reichel**, **Scott C. Burkhart**, **Michael G. Taranowski**, **Clint Frye**, **Soroush Ghandiparsi**, **Qinghui Shao**, **Bikramjit Chatterjee**, **Lucas N. Taylor, Wren Carr,** Lawrence Livermore National Lab. (United States)

13343-14 • 12:15 PM - 12:30 PM
Current status of the LD pumped Yb:YAG ceramics laser toward 250 J at 10 Hz operation
Author(s): **Takaaki Morita**, **Takashi Sekine**, **Yuma Hatano**, **Yuki Muramatsu**, **Yoshinori Tamaoki**, **Tasuku Hiraiwa**, **Yoshinori Kato, Toshiyuki Kawashima,** Hamamatsu Photonics K.K. (Japan)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 3: OPERATIONS/SUBSYSTEMS

29 January 2025 • 2:00 PM - 3:15 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Andrea L. Kritcher**, Lawrence Livermore National Lab. (United States)

13343-15 • 2:00 PM - 2:15 PM
Laser model calibration for the National Ignition Facility
Author(s): **Samuel Schrauth**, **Michael A. Erickson, Jean-Michel G. Di Nicola,** Lawrence Livermore National Lab. (United States)

13343-16 • 2:15 PM - 2:30 PM
LMJ front-end performance status and underway improvements to push back E/P limitations
Author(s): **Nicolas Belon**, **Nicolas Beck**, **Manon Lamy**, **Dominique Lebeaux**, **Arnaud Perrin**, **Sébastien Montant**, **Elodie Boursier**, **Kevin Gaudfrin**, **Edouard Bordenave**, **Catherine Lanternier**, **Stéphane Bouillet**, **Margaux Chanal**, **Celine Chappuis**, **Herve Coic**, **Vincent Denis**, **Florian Gaudfrin**, **Lilian Heymans**, **Xavier Julien**, **Chloé Lacombe**, **Claude Rouyer**, **Florian Tournemenne**, **Sebastien Vermersch, Jerome Neauport,** CEA-Cesta (France)

13343-17 • 2:30 PM - 2:45 PM
NIF computing systems for ignition, high neutron yields and future high-energy-density (HED) science
Author(s): **Mike Fedorov**, **Abdul Awwal**, **Adrian Barnes**, **Lyle Beaulac**, **Allan Casey**, **Chris Estes**, **Jorge Castro Morales**, **Vinod Gopalan**, **Sukhdeep Heerey**, **Rommel Lacuata**, **Marty Lewis**, **Kathleen McCandless**, **Alan Pao**, **Mitanu Paul**, **Bela Patel**, **Steve Sauter, Lei Wang,** Lawrence Livermore National Lab. (United States)

13343-18 • 2:45 PM - 3:00 PM
Commissioning the kJ-class active multi-passed imaged cavity amplifier (AMICA)
Author(s): **Siddharth Sampat**, **Alexander Bolognesi**, **Nagitha Ekanayake**, **Kyle Gibney**, **Elizabeth M. Hill**, **Brian Kruschwitz**, **Mark Meyers**, **Michael Spilatro**, **Jonathan Zuegel, Christophe Dorrer,** Univ. of Rochester (United States)

13343-19 • 3:00 PM - 3:15 PM
Maintaining optimum performance for beam alignment at the National Ignition Facility
Author(s): **Abdul A. S. Awwal**, **Roger Lowe-Webb**, **Edmund T. Liu**, **Peter S. Ray**, **Avi Thomas**, **Dan Kalantar, Bela P. Patel,** Lawrence Livermore National Lab. (United States)

Coffee Break 3:15 PM - 3:45 PM

SESSION 4: FUTURE SYSTEMS

29 January 2025 • 3:45 PM - 5:10 PM | Moscone South, Room 303 (Level 3)
Session Chair(s): **Tammy Ma**, Lawrence Livermore National Lab. (United States)

13343-20 • 3:45 PM - 4:00 PM
Closed-loop pulse shaping with <1ps resolution over >2ns records using STILETTO combined with three phase spectral interferometry (3PSI)
Author(s): **Ryan D. Muir**, **Daniel E. Mittelberger, John E. Heebner,** Lawrence Livermore National Lab. (United States)

13343-21 • 4:00 PM - 4:15 PM
Performance scaling of high-power diode laser pumps for fusion application
Author(s): **Paul A. Crump,** Ferdinand-Braun-Institut gGmbH (Germany); **William E. Fenwick,** Lawrence Livermore National Lab. (United States)

13343-22 • 4:15 PM - 4:40 PM
Beyond ignition: the path toward an inertial fusion energy future *(Invited Paper)*
Author(s): **Tammy Ma,** Lawrence Livermore National Lab. (United States)

13343-23 • 4:40 PM - 4:55 PM
Frequency doubling and tripling in LBO for inertial confinement fusion
Author(s): **Gabriel Mennerat,** CEA-Paris-Saclay (France); **Jean-Michel G. Di Nicola,** Lawrence Livermore National Lab. (United States)

13343-24 • 4:55 PM - 5:10 PM
An overview of the UPLiFT project and an evaluation of candidate gain media for use in a laser driver for fusion
Author(s): **Agnieszka M. Wojtusiak**, **Paul D. Mason**, **Luke McHugh**, **Rajan Mistry**, **Gary Quinn**, **Christopher Spindloe**, **Thomas Butcher, Robbie Scott,** Science and Technology Facilities Council (United Kingdom)

CONFERENCE 13344

Components and Packaging for Laser Systems XI

27 - 28 January 2025 | Moscone South, Room 206 (Level 2)

Conference Chair(s): **Alexei L. Glebov,** OptiGrate – IPG Photonics (United States); **Ruth Houbertz,** ThinkMade Engineering & Consulting (Germany); **Stefan W. Heinemann,** PHIX Photonics Assembly (United States)

Program Committee: **Jens Biesenbach,** BWT Laser Europe GmbH (Germany); **Gunnar Böttger,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Johan Boullet,** Institut d'Optique Graduate School (France); **Ivan B. Divliansky,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Martin Forrer,** FISBA AG (Switzerland); **Björn Globisch,** TOPTICA eagleyard (Germany); **Hannah R. Grant,** Freedom Photonics, LLC (United States); **Thomas L. Haslett,** Avo Photonics, Inc. (United States); **Gloria E. Hoefler,** C-Speed (United States); **Dong Hou,** Focuslight Technologies, Inc. (China); **Jangsun Kim,** PANOPTICS Corp. (Korea, Republic of); **Paul O. Leisher,** Luminar Technologies, Inc. (United States); **Christian V. Poulsen,** NKT Photonics A/S (Denmark); **Nicholas W. Sawruk,** Fibertek, Inc. (United States); **Stefaan Vandendriessche,** Edmund Optics Inc. (United States)

Monday 27 January 2025

SESSION 1: PIC COMPONENTS AND PACKAGING FOR QUANTUM

27 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Alexei L. Glebov**, OptiGrate – IPG Photonics (United States); **Stefan W. Heinemann**, PHIX Photonics Assembly (United States)

13344-1 • 8:30 AM - 9:00 AM
Photonic integrated circuits for neutral-atom quantum computing *(Invited Paper)*
Author(s): **Noel Wan,** QuEra Computing Inc. (United States)

13344-2 • 9:00 AM - 9:30 AM
Integrated photonic devices for quantum systems *(Invited Paper)*
Author(s): **Paul A. Morton,** Infleqtion (United States)

13344-3 • 9:30 AM - 9:50 AM
Packaging of photonic integrated circuits (PIC) for sensing and quantum applications
Author(s): **Stefan W. Heinemann,** PHIX Photonics Assembly (United States)

13344-4 • 9:50 AM - 10:10 AM
Narrow band volume Bragg gratings with enhanced side-lobe suppression for quantum optics
Author(s): **Vadim Smirnov**, **Ruslan Vasilyeu**, **Daniel Lumpkin, Alexei Glebov,** OptiGrate – IPG Photonics (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: PIC COMPONENTS AND PACKAGING

27 January 2025 • 10:40 AM - 12:10 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany); **Gloria E. Hoefler**, C-Speed (United States)

13344-37 • 10:40 AM - 11:10 AM
R&D to reality: mastering the development process of photonics modules *(Invited Paper)*
Author(s): **Parth Panchal,** Aurora Innovation, Inc. (United States)

13344-6 • 11:10 AM - 11:30 AM
Robust packaging of tapered amplifiers for quantum technologies
Author(s): **Peter J. Schlosser**, **Adam Selyem**, **Loyd McKnight,** Fraunhofer UK Research Ltd. (United Kingdom); **William Dorward,** ALTER TECHNOLOGY TÜV NORD UK Ltd. (United Kingdom); **Ryan Hanley**, **David Bowman, Tim Ballance,** Infleqtion (United Kingdom)

13344-7 • 11:30 AM - 11:50 AM
Realization of low coupling loss and high-volume alignment of eight-channel waveguide and pigtailed laser coupling through lens and fiber array
Author(s): **Frank F. Wu,** Intel Corp. (United States)

13344-8 • 11:50 AM - 12:10 PM
Integrated 3-fiber 1550nm SLED transceiver module
Author(s): **Marcus Duelk**, **Stefan Gloor**, **José Rios**, **Nikolay Primerov**, **Callan Jobson**, **Ludmila Merker, Nicolai Matuschek,** EXALOS AG (Switzerland)

Lunch Break 12:10 PM - 1:30 PM

SESSION 3: OPTICS ASSEMBLY AND RELIABILITY

27 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Gunnar Böttger**, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Alexei L. Glebov**, OptiGrate – IPG Photonics (United States)

13344-9 • 1:30 PM - 1:50 PM
Laser soldering of large lenses for applications in high-power laser systems
Author(s): **Erik Beckert**, **Thomas Peschel, Grucheska Rosario-Rodriguez,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13344-10 • 1:50 PM - 2:10 PM
Holographic video microscopy system introduction
Author(s): **Thomas Haslett,** Avo Photonics, Inc. (United States); **Laura Philips**, **Fook C. Cheong,** Spheryx, Inc. (United States); **Sven Mahnkopf,** Avo Photonics, Inc. (United States)

13344-11 • 2:10 PM - 2:30 PM
Bonding of laser components with low outgassing adhesives
Author(s): **Thomas Ludwig,** DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany)

13344-13 • 2:30 PM - 2:50 PM
Hyperspectral imaging camera system
Author(s): **Sven Mahnkopf,** Avo Photonics, Inc. (United States); **Alexandre Fong**, **Sergey Etchin,** Hinalea Imaging Corp. (United States); **David Demmer, Thomas Haslett,** Avo Photonics, Inc. (United States)

13344-36 • 2:50 PM - 3:10 PM
High performance EEL line beam module based on GS packaging for LiDAR applications
Author(s): **Hao Zhang**, **Haiyan Li**, **Ke Yuan**, **Yixiao He**, **Fu Gen Liang**, **Hongwei Zhang**, **Tuanwei Fu**, **Yanni Zhou**, **Chungen Zah, Xingsheng Liu,** Focuslight Technologies, Inc. (China)

Coffee Break 3:10 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 4: HIGH POWER/ENERGY LASER COMPONENTS I

28 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Johan Boullet**, Institut d'Optique Graduate School (France); **Thomas L. Haslett**, Avo Photonics, Inc. (United States)

13344-14 • 8:30 AM - 9:00 AM
A cladding light stripper with ultra-low backscattering *(Invited Paper)*
Author(s): **Ju Han Lee,** The Univ. of Seoul (Korea, Republic of)

13344-15 • 9:00 AM - 9:20 AM
Advancements in deep UV fiber bundle technology
Author(s): **Jurģis Grūbe**, **Kalvis Alps, Martins Narels,** LIGHTGUIDE Optics International SIA (Latvia)

13344-16 • 9:20 AM - 9:40 AM
Large mode area 8+1 to 1 backward pump signal combiner
Author(s): **Lalitkumar Bansal**, **Robert Sienkowski**, **Christopher Neale**, **Joel Mann, Jeffrey W. Nicholson,** OFS Fitel, LLC (United States)

13344-17 • 9:40 AM - 10:00 AM
Sequential splicing of high-power suitable fiber arrays
Author(s): **Erik Beckert, Erik Bottcher,** NYFORS (Sweden)

Coffee Break 10:00 AM - 10:20 AM

SESSION 5: HIGH POWER/ENERGY LASER COMPONENTS II

28 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Ivan B. Divliansky**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Hannah R. Grant**, Freedom Photonics, LLC (United States)

13344-19 • 10:20 AM - 10:50 AM
A novel high gain, ASE suppressed, and highly efficient fiber amplifier *(Invited Paper)*
Author(s): **Chun He,** Focuslight Technologies, Inc (United States)

13344-20 • 10:50 AM - 11:10 AM
Enhancing stability and radiation resilience of phase-shifted fiber Bragg gratings for high-power and space applications
Author(s): **Laurent Lablonde**, **Emmanuel Pinsard**, **Catherine Le Grand**, **Ronan Le Masson**, **Hugo Boiron**, **Thierry Robin,** Exail SAS (France); **Mathieu Boutillier,** Ctr. National d'Études Spatiales (France)

13344-21 • 11:10 AM - 11:30 AM
Faraday isolators for high-power lasers using magneto-optical glass
Author(s): **Futoshi Suzuki**, **Tadahito Furuyama**, **Fumio Sato**, **Noriaki Masuda,** Nippon Electric Glass Co., Ltd. (Japan); **Hidetsugu Yoshida**, **Jumpei Ogino**, **Akifumi Yogo,** Osaka Univ. (Japan); **Haruki Kawaguchi**, **Ryo Yasuhara,** National Institute for Fusion Research (Japan); **Shigeki Tokita, Katsuhisa Tanaka,** Kyoto Univ. (Japan)

13344-22 • 11:30 AM - 11:50 AM
New results on the temperature coefficient of the refractive index for various optical materials
Author(s): **Ralf Jedamzik, Uwe Petzold,** SCHOTT AG (Germany); **Uwe Petzold, Henning Kaufmann,** SCHOTT AG (Germany); **Henning Kaufmann, Uwe Petzold,** SCHOTT AG (Germany); **Uwe Petzold, Henning Kaufmann,** SCHOTT AG (Germany)

13344-23 • 11:50 AM - 12:10 PM
Faraday rotator design for 266nm, 343nm and 355nm lasers
Author(s): **Volker Melzer,** Qioptiq Photonics GmbH & Co. KG (Germany), Excelitas Technologies Corp. (United States); **Werner Gabler, Matthias Anders,** Qioptiq Photonics GmbH & Co. KG (Germany)

Lunch/Exhibition Break 12:10 PM - 2:00 PM

SESSION 6: LASER DIODE PACKAGING I

28 January 2025 • 2:00 PM - 3:30 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Paul O. Leisher**, Luminar Technologies, Inc. (United States); **Chun He**, Focuslight Technologies, Inc. (United States)

13344-24 • 2:00 PM - 2:30 PM
High power single mode interband cascade lasers *(Invited Paper)*
Author(s): **Johannes Koeth**, **Josephine Nauschütz**, **Robert Weih, Julian Scheuermann,** nanoplus Nanosystems and Technologies GmbH (Germany)

13344-25 • 2:30 PM - 2:50 PM
High power diode laser development using advanced bonding technology and innovative structure design
Author(s): **Dong Hou**, **Xuejie Liang**, **Jindou Liu**, **TuanWei Fu**, **Changxuan Li**, **Zhi Li**, **Chung-en Zah**, **Xingsheng Liu,** Focuslight Technologies, Inc. (China); **Chun He**, **yingmin Fan, Ke Yuan,** Focuslight Technologies Inc (China)

13344-26 • 2:50 PM - 3:10 PM
Automated assembly and alignment of NIR and MIR external cavity diode laser systems
Author(s): **Denis Erfle**, **Christian Assmann**, **Sebastian Schmidtmann**, **Martin Honsberg, Joachim R. Sacher,** Sacher Lasertechnik GmbH (Germany)

13344-27 • 3:10 PM - 3:30 PM
High power, narrowband laser diode system for line-scan remote Raman application
Author(s): **Aleksandr I. Ryasnyanskiy**, **Oleksiy Mokhun**, **Vadim Smirnov,** OptiGrate – IPG Photonics (United States); **Jianwei Qin**, **Moon S. Kim,** Agricultural Research Service (United States); **Alexei Glebov,** OptiGrate – IPG Photonics (United States)

Coffee Break 3:30 PM - 4:00 PM

SESSION 7: LASER DIODE PACKAGING II

28 January 2025 • 4:00 PM - 5:00 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Jens Biesenbach**, BWT Laser Europe GmbH (Germany); **Katherine J. Snell**, Fibertek, Inc. (United States)

13344-28 • 4:00 PM - 4:20 PM
High-power InP diode lasers operating under long-pulse condition with high reliability
Author(s): **Yingmin Fan**, **Wenwei Li,** Focuslight Technologies, Inc. (China); **Chun He,** Focuslight Technologies, Inc. (United States); **Xingsheng Liu,** Focuslight Technologies (China)

13344-29 • 4:20 PM - 4:40 PM
Laser-locking using a phase-shifted volume Bragg grating
Author(s): **Daniel Lumpkin**, **David Guacaneme**, **Oussama Mhibik, Ivan Divliansky,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13344-30 • 4:40 PM - 5:00 PM
Ultrashort pulse written, high order volume Bragg gratings in fused silica for VIS and UV laser diode stabilization
Author(s): **Malte P. Siems**, **Daniel Richter**, **Ria G. Krämer**, **Georg Schwartz,** Friedrich-Schiller-Univ. Jena (Germany); **Stefan Nolte,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13344-32 • 6:00 PM - 8:00 PM
Miniaturized wavelength stabilized laser module emitting at 619 nm
Author(s): **Felix Mauerhoff**, **Oktay Senel**, **David Feise**, **Alexander Sahm,** Ferdinand-Braun-Institut gGmbH (Germany); **Tim Schröder,** Ferdinand-Braun-Institut gGmbH (Germany), Humboldt-Univ. zu Berlin (Germany); **Katrin Paschke,** Ferdinand-Braun-Institut gGmbH (Germany)

13344-33 • 6:00 PM - 8:00 PM
Narrow band Bragg notch filters with increased optical density for low frequency Raman spectroscopy
Author(s): **Vadim Smirnov**, **Oleksiy Mokhun**, **Joshua Beharry, Alexei Glebov,** OptiGrate – IPG Photonics (United States)

13344-34 • 6:00 PM - 8:00 PM
Output Power Stabilization of Ti:Sapphire Femtosecond Laser with TEC Cooling Systems
Author(s): **Hokyoung Kang,** Pusan National Univ. (Korea, Republic of)

13344-35 • 6:00 PM - 8:00 PM
Development of fs laser cooling system using Peltier device for laser stabilization
Author(s): **Jin Woo Jang,** Pusan National Univ. (Korea, Republic of)

CONFERENCE 13345

High-Power Diode Laser Technology XXIII

26 - 28 January 2025 | Moscone South, Room 201 (Level 2)

Conference Chair(s): **Mark S. Zediker,** Photonic Tek Works LLC (United States); **Erik P. Zucker,** Erik Zucker Consulting (United States); **Jenna Campbell,** Freedom Photonics, LLC (United States)

Program Committee: **Paul A. Crump,** Ferdinand-Braun-Institut (Germany); **Abdullah Demir,** Bilkent Univ. (Turkey); **Stefan W. Heinemann,** PHIX, Inc. (United States); **Yasumasa Kawakita,** Furukawa Electric Co., Ltd. (Japan); **Harald Koenig,** ams-OSRAM International GmbH (Germany); **Volker Krause,** Laserline GmbH (Germany); **Robert Martinsen,** nLIGHT, Inc. (United States); **Stewart D. McDougall,** TRUMPF Photonics, Inc. (United States); **David A. Schleuning,** Waymo, LLC (United States); **René Todt,** Coherent Corp. (Switzerland); **Yueting Wu,** BWT Beijing Ltd. (China); **Yuji Yamagata,** Fujikura Ltd. (Japan)

Sunday 26 January 2025

SESSION 1: WAVELENGTH-LOCKED LASER DIODE SOURCES

26 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Erik P. Zucker**, Erik Zucker Consulting (United States); **Jenna Campbell**, Freedom Photonics, LLC (United States)

13345-1 • 8:00 AM - 8:20 AM
High power diode laser modules for DPAL pumping
Author(s): **Tobias Könning**, **Andreas Bayer**, **Heiko Kissel**, **Roland Venohr**, **Christian Lux**, **Jörg Neukum, Bernd Köhler,** Coherent Mainz (Germany)

13345-2 • 8:20 AM - 8:40 AM
High power narrow linewidth 969nm diode laser pump source for kW class disk laser
Author(s): **Xiaohua Chen**, **Fangjunyue Guo**, **Yanyan Gao**, **Juan Li**, **Xiaopei Dong**, **Min Shi**, **Yancong Zhang**, **Qian Fang**, **Huaxin Gu**, **Wanting Song**, **Weirong Guo**, **Baohua Wang**, **Chao Lang,** BWT Beijing Ltd. (China); **Yongzhen Yan,** Glory Photonics Technology Co.,Ltd. (China); **Dongbing He,** Hangzhou Tuozhi Optoelectronic Technology Co., Ltd. (China); **Jun Lu**, **Bei Liu,** Glory Photonics Technology Co.,Ltd. (China); **Fanyu Kong, Peiwen Guan,** Hangzhou Tuozhi Optoelectronic Technology Co., Ltd. (China)

13345-3 • 8:40 AM - 9:00 AM
Narrow-linewidth external cavity laser diodes for laser cooling and atomic clock transitions
Author(s): **Meg Mahat**, **Edris Sarailou, Greg Charache,** Innovative Photonic Solutions (United States)

13345-4 • 9:00 AM - 9:20 AM
High-power semiconductor laser systems at 720 nm: tailored laser light delivery for quantum technologies
Author(s): **Nils Werner**, **Alice Seeger**, **Philipp Hildenstein**, **Andre Maassdorf**, **David Feise**, **Hans Wenzel, Katrin Paschke,** Ferdinand-Braun-Institut gGmbH (Germany)

13345-5 • 9:20 AM - 9:40 AM
Demonstrating FBG capabilities in wavelength locking multimode laser diodes
Author(s): **Samuel Gouin**, **Mathieu Gagnon**, **Alexandre Perron**, **Simon Munger**, **Guillaume Brochu**, **Michel Begin**, **Dominic Faucher, François Trépanier,** TeraXion Inc. (Canada)

13345-6 • 9:40 AM - 10:00 AM
Monolithic DBR broad-area diode lasers with high conversion efficiency in the 87x-88x nm wavelength range
Author(s): **Mohamed Elattar**, **Hans Wenzel**, **Jörg Fricke**, **Pietro Della Casa**, **Sabrina Kreutzmann**, **Andrea Knigge,** Ferdinand-Braun-Institut gGmbH (Germany); **Agnieszka Pietrzak**, **Ching-Long Jiang**, **Xiaohang Liu**, **Stewart McDougall,** TRUMPF Photonics, Inc. (United States); **Paul Crump,** Ferdinand-Braun-Institut gGmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: BLUE LASER DIODE TECHNOLOGY AND PACKAGING

26 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Mark S. Zediker**, Photonic Tek Works LLC (United States); **Robert Martinsen**, nLIGHT, Inc. (United States)

13345-7 • 10:30 AM - 10:50 AM
800W-class high-power blue laser diode module with GaN-based laser diodes
Author(s): **Yuki Tsuboi**, **Ryotaro Konishi**, **Naoto Morizumi**, **Masahiro Nitta**, **Ryota Okuno,** Nichia Corp. (Japan); **Satoshi Shibuya**, **Ayato Okada, Yasumasa Kawakita,** Furukawa Electric Co., Ltd. (Japan)

13345-8 • 10:50 AM - 11:10 AM
5-kW high power blue laser with near-infrared fiber laser for high-speed copper welding
Author(s): **Sumika Sano**, **Keigo Sato**, **Kazutaka Kamimura**, **Ryosuke Tamura**, **Masakazu Yoshihara**, **Nobuyasu Matsumoto**, **Hiroto Kageyama**, **Ryoya Matsumoto**, **Toshiaki Sakai**, **Yasumasa Kawakita**, **Keisuke Tominaga,** Furukawa Electric Co., Ltd. (Japan); **Naoki Mori**, **Akira Yukumoto, Hideki Kondo,** Nichia Corp. (Japan)

13345-9 • 11:10 AM - 11:30 AM
High power (over 3W) 376 nm III-nitride laser diode with unintentionally doped GaN waveguide
Author(s): **Qinchen Lin**, **Cheng Liu**, **Guangying Wang**, **Surjava Sanyal,** Univ. of Wisconsin-Madison (United States); **Matthew Dwyer,** DRS Daylight Solutions (United States); **Matthew Seitz,** Rochester Institute of Technology (United States); **Tom Earles,** DRS Daylight Solutions (United States); **Nelson Tansu,** The Univ. of Adelaide (Australia); **Jing Zhang,** Rochester Institute of Technology (United States); **Luke Mawst**, **Shubhra S. Pasayat, Chirag Gupta,** Univ. of Wisconsin-Madison (United States)

13345-10 • 11:30 AM - 11:50 AM
High-reliability spatial output blue laser based on COS package
Author(s): **Yueting Wu**, **Fengchao Zhang**, **Xiaochen Jiang**, **Jianqiang Zhang**, **Jian Yin**, **Xiujuan Ding**, **Hong Chen**, **Chao Lang, Xiaohua Chen,** BWT Beijing Ltd. (China)

13345-11 • 11:50 AM - 12:10 PM
High brightness 500W blue laser source for DED processes
Author(s): **Sabina Zaimovic**, **Luca Maggio Tanasi,** ALITE (Italy); **Valentina Serafini,** Politecnico di Torino (Italy); **Tullio Laudadio**, **José Blanco Triana,** ALITE (Italy); **Guido Perrone,** Politecnico di Torino (Italy)

Lunch/BiOS Exhibition Break 12:10 PM - 2:00 PM

SESSION 3: LASER DIODE PACKAGES AND MODULES I

26 January 2025 • 2:00 PM - 3:20 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Paul A. Crump**, Ferdinand-Braun-Institut gGmbH (Germany)

13345-12 • 2:00 PM - 2:20 PM
Next-generation high-power laser diode pump modules
Author(s): **Maksim Ermolaev**, **Nikolay Moshegov**, **Ivan Berezin**, **Pavel Trubenko**, **Ilya Shifrovich**, **Igor Berishev**, **Ildar Mukhametzhanov**, **Vadim Chuyanov**, **Fedor Kompan**, **Dmitriy Miftakhutdinov,** IPG Photonics Corp. (United States); **Anton Petruk,** Stony Brook Univ. (United States), IPG Photonics Corp. (United States); **Alex Ovtchinnikov,** IPG Photonics Corp. (United States)

13345-13 • 2:20 PM - 2:40 PM
Advancing power and efficiency with 793nm and 976nm semiconductor laser modules
Author(s): **David M. Hemenway,** nLIGHT, Inc. (United States)

13345-14 • 2:40 PM - 3:00 PM
Next-generation 80x nm high-power diode lasers based on single- and multi-bar packages
Author(s): **Tobias Kaaden**, **Jens Meusel**, **Martin Zorn,** JENOPTIK Optical Systems GmbH (Germany); **Agnieszka Pietrzak,** TRUMPF SE + Co. KG (Germany); **Ekkehard Werner**, **Matthias Schroeder**, **Ralf Huelsewede**, **Martin Stier**, **Martin Salge**, **Falk Doerfel**, **Thomas Heidecke, Phedon Palinginis,** JENOPTIK Optical Systems GmbH (Germany)

13345-15 • 3:00 PM - 3:20 PM
High efficiency, high reliability semiconductor laser diode chips and modules for fiber laser pumping
Author(s): **Xiaohang Liu**, **Yihan Xiong**, **Agnieszka Pietrzak**, **Amtout Abdenour**, **Ching-Long Jiang**, **Xi Liu, Stewart McDougall,** TRUMPF Photonics, Inc. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 4: LASER DIODE PACKAGES AND MODULES II

26 January 2025 • 3:50 PM - 5:30 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Stefan W. Heinemann**, PHIX Photonics Assembly (United States)

13345-16 • 3:50 PM - 4:10 PM
Multi-10kW diode laser systems with wall-plug efficiency greater than 50%
Author(s): **Ulrich Witte**, **Matthias Ackermann**, **Florian Rößler**, **Felix Weber**, **Robert Lange**, **Max Schütze**, **Bastian Dommermuth**, **Jörg Malchus, Volker Krause,** Laserline GmbH (Germany)

13345-17 • 4:10 PM - 4:30 PM
2800W high brightness diode laser module targeting next generation fiber laser pump
Author(s): **Liang Ding**, **Peng Liu**, **Wenfeng Lin, Xiaoxue Dong,** Xinghan Laser Technology Co., Ltd. (China)

13345-18 • 4:30 PM - 4:50 PM
Ultra low SWaP fiber-coupled pumps enabled by double-junction diode chips
Author(s): **Liping Qiu**, **Hao Yu**, **Shaoyang Tan**, **Shao Ye, Jun Wang,** Suzhou Everbright Photonics Co., Ltd. (China)

13345-20 • 4:50 PM - 5:10 PM
1.3W fiber-output of highly reliable 14xx-dual-port raman pump using asymmetric-waveguide laser by GaInAsP/InP electric-field-control-layer
Author(s): **Junji Yoshida**, **Yasuto Tatamida**, **Keito Shinomiya,** Furukawa Electric Co., Ltd. (Japan); **Masayoshi Seki**, **Naoya Hojo,** Furukawa Fitel Optical Device Co., Ltd. (Japan); **Tatsuya Muro,** Furukawa Electric Co., Ltd. (Japan); **Yusuke Isozaki,** Furukawa Fitel Optical Device Co., Ltd. (Japan)

13345-45 • 5:10 PM - 5:30 PM
High power multicolor diode laser stack with four effective wavelengths for medical aesthetic application
Author(s): **Sujuan Sun**, **Kaidi Zhao**, **Zhen Zhu**, **Chuanshang Fu,** Shandong Huaguang Optoelectronics Co., Ltd. (China); **Dechao Wang**, **Feifan Qiu,** Shandong Huaguang Optoelectronics Co. (China); **Fuyang Ren**, **C. Wang**, **Qi Liu**, **Dehua Wu,** Shandong Huaguang Optoelectronics Co., Ltd. (China); **Xiangang Xu,** Shandong University (China)

Monday 27 January 2025

SESSION 5: LASER DIODE SOURCES FOR LIDAR

27 January 2025 • 8:00 AM - 10:30 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **David A. Schleuning**, Waymo, LLC (United States); **Volker Krause**, Laserline GmbH (Germany)

13345-21 • 8:00 AM - 8:30 AM
High-brightness semiconductor laser diodes for LIDAR application *(Invited Paper)*
Author(s): **Sujoy Paul**, **Philipp Staudinger**, **Jacob Nuernberg**, **Wolfgang Pallmann**, **Thorsten Klein**, **James McHugh**, **Lukas Mutter**, **Jürgen Müller**, **Julien Boucart, Norbert Lichtenstein,** Coherent Corp. (Switzerland)

13345-22 • 8:30 AM - 8:50 AM
Advancements in 1550 nm high brightness tapered diode laser amplifiers
Author(s): **Jenna Campbell**, **Michelle Labrecque**, **Igor Kudryashov**, **Kevin McClune**, **Allen Chu**, **Matthew Larkins**, **Steven Estrella**, **Chris Ebert,** Freedom Photonics, LLC (United States); **Sander Boelen,** Luminar Technologies, Inc. (United States); **Elliot Burke**, **Thomas Liu**, **Leif Johansson**, **Milan Mashanovitch,** Freedom Photonics, LLC (United States); **Paul Leisher,** Luminar Technologies, Inc. (United States)

13345-23 • 8:50 AM - 9:10 AM
Evaluating coherent lidar for autonomous vehicles
Author(s): **Alexander Piggott**, **Cathy Yunshan Jiang**, **John Lam**, **Blaise Gassend, S. Verghese,** Waymo, LLC (United States)

13345-24 • 9:10 AM - 9:30 AM
Lasing mode design and characterization of 1550nm triple junction laser diode for time-of-flight LiDAR and LRF
Author(s): **Sidi Aboujja, Daniel Chu,** SemiNex Corp. (United States)

13345-25 • 9:30 AM - 9:50 AM
Design and characterisation of 1550nm broad-area pulsed laser diodes with outstanding electro-optical performance
Author(s): **Saïd Rouifed**, **Thierno Mamoudou Diallo**, **Christophe Rodriguez**, **Eric Desfonds, Jean-François Boucher,** Laser Components Canada, Inc. (Canada)

13345-26 • 9:50 AM - 10:10 AM
Reliable 940nm laser diode pump for automotive applications
Author(s): **Cheng Zhu,** Luminar Technologies, Inc. (United States); **Erik Zucker,** Erik Zucker Consulting (United States); **Yueting Wu,** BWT Beijing Ltd. (China); **Stewart McDougall**, **Xiaohang Liu**, **Ching-Long Jiang,** TRUMPF Photonics, Inc. (United States); **I-Ning Hu,** Luminar Technologies, Inc. (United States); **Sander Boelen**, **Alexander Grant,** Allegiant 3D Design & Manufacturing Inc. (Canada); **Xiaoshuang Liang,** BWT Beijing Ltd. (China); **Paul Leisher,** Luminar Technologies, Inc. (United States)

13345-27 • 10:10 AM - 10:30 AM
Designing high power, low linewidth, PIC based external cavity lasers with extended FMCW chirp
Author(s): **Ruud Oldenbeuving**, **Noor Schilder**, **Amir Abbas Kashi**, **Peter Girouard**, **Nicolas Chauvet,** imec (Netherlands); **Peter Gerets, Marcus Dahlem,** imec (Belgium)

Coffee Break 10:30 AM - 11:00 AM

SESSION 6: NOVEL APPLICATIONS OF LASER DIODES

27 January 2025 • 11:00 AM - 12:00 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Yueting Wu**, BWT Beijing Ltd. (China); **Erik P. Zucker**, Erik Zucker Consulting (United States)

13345-28 • 11:00 AM - 11:20 AM
Direct diode laser solutions for drying applications
Author(s): **Bernd Köhler**, **Heiko Kreuzer**, **Andreas Bayer**, **Tobias Kindervater**, **Tobias Könning**, **Wolfgang Horn, Jörg Neukum,** Coherent Mainz (Germany)

13345-29 • 11:20 AM - 11:40 AM
Recent advancements of VCSEL array modules for battery drying applications
Author(s): **Daniela Ingenhorst**, **Rolf Apetz**, **Marcus Banham**, **Ralf Conrads**, **Carsten Deppe**, **Dennis Groben**, **Stephan Gronenborn**, **Markus Herper,** TRUMPF Photonic Components GmbH (Germany); **Benedict Ingendoh**, **Achim Kampker,** PEM RWTH Achen University (Germany); **Roman Körner**, **Johanna S. Kolb**, **Michael Miller**, **Holger Mönch**, **Jens Pollmann-Retsch**, **Wolfgang Schwarz,** TRUMPF Photonic Components GmbH (Germany); **Sebastian Wolf,** PEM RWTH Achen University (Germany)

13345-30 • 11:40 AM - 12:00 PM
Compact 1 kW diode laser module emitting at 780 nm for the efficient direct additive manufacturing of aluminum
Author(s): **Marko Hübner**, **Seval Arslan**, **Lucas Wittenbecher**, **Johannes Zender**, **Bernd Eppich**, **Dominik Martin**, **Pietro Della Casa**, **Arnim Ginolas**, **Simon Basler**, **Neysha Lobo-Ploch**, **Paul Crump,** Ferdinand-Braun-Institut gGmbH (Germany); **Manuel Rozycki**, **Arnardo Schulze,** SKDK GmbH (Germany); **Uriel Elliesen**, **Andreas Knaub, Holger Alder,** Photon AG (Germany)

Lunch Break 12:00 PM - 1:30 PM

SESSION 7: LASER DIODE DEVICE TECHNOLOGY I

27 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Stewart D. McDougall**, TRUMPF Photonics, Inc. (United States)

13345-31 • 1:30 PM - 1:50 PM
Multi kW high efficiency high filling factor 870nm and 940nm QCW semiconductor diode laser bar for inertial fusion energy applications
Author(s): **Guoli Liu**, **Zuntu Xu**, **Jingwei Li**, **Eli Weiss**, **Qiang Zhang**, **Bo Guo**, **Sharon Lei**, **Yu Zhang**, **Alex Zeitschel,** Coherent Corp. (United States); **Heiko Kissel,** Coherent Mainz (Germany); **James Carriere,** Coherent Corp. (United States); **Jörg Neukum**, **Bernd Köhler, Roland Venohr,** Coherent Mainz (Germany)

13345-32 • 1:50 PM - 2:10 PM
High brightness high power semiconductor laser diode with longitudinally distributed current injection
Author(s): **Shaoyang Tan,** Suzhou Everbright Photonics Co., Ltd. (China); **Wuling Liu,** Sichuan Univ. (China); **Wu Zhao**, **Lichen Zhang,** Suzhou Everbright Photonics Co., Ltd. (China); **Jun Wang,** Suzhou Everbright Photonics Co., Ltd. (China), Sichuan Univ. (China)

13345-33 • 2:10 PM - 2:30 PM
Power scaling of broad-area laser diodes from 755 to 1064nm
Author(s): **Yuxian Liu**, **Song Tang**, **Yongming Zhao**, **Wenjun Wu**, **Wei Lo, Guowen Yang,** DoGain Optoelectronic Technology (Suzhou) Co., Ltd. (China)

13345-34 • 2:30 PM - 2:50 PM
Body temperature reduction in high-power laser diodes using distributed waveguide design
Author(s): **Osama Aadil Saadi**, **Amina Houimi**, **Kaveh Ebadi**, **Ali Kaan Sünnetçioğlu, Abdullah Demir,** Bilkent Univ. (Turkey)

13345-35 • 2:50 PM - 3:10 PM
1.06μm DFB laser with 1W optical power output
Author(s): **Mikhail Buyalo**, **Vladimir Mikhrin**, **Artem Zhabotinskii**, **Sergey Mikhrin**, **Ilia Bakshaev, Alexey Gubenko,** Innolume GmbH (Germany)

Coffee Break 3:10 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 8: LASER DIODE DEVICE TECHNOLOGY II

28 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Abdullah Demir**, Bilkent Univ. (Turkey); **Mark S. Zediker**, Photonic Tek Works LLC (United States)

13345-46 • 8:00 AM - 8:20 AM
Advancements in GaN DFBs with embedded gratings and a path to higher power
Author(s): **Ryan M. Anderson,** BluGlass, Ltd. (United States); **SeungGeun Lee,** BluGlass Inc. (United States); **Emily Trageser,** Univ. of California, Santa Barbara (United States); **Josh D. Brown,** BluGlass Inc. (United States); **Amy Zhang,** Univ. of California (United States); **Bin Zhang,** BluGlass, Ltd. (United States); **Carol Huang**, **Tanner Massimino**, **Qian Gao,** BluGlass Inc. (United States); **Alanna Fernandes,** BluGlass, Ltd. (United States); **Chris Pinzone**, **Brad Siskavich**, **Ian Mann,** BluGlass Inc. (United States); **Steven P. DenBaars**, **Shuji Nakamura,** Univ. of California, Santa Barbara (United States); **Jim Haden,** BluGlass Inc. (United States)

13345-36 • 8:20 AM - 8:40 AM
Advances in high power InAlGaAs/InP-based semiconductor lasers
Author(s): **Robert Lammert**, **Se Oh**, **Chameli Panja**, **Jeffrey Braun,** Laser Operations LLC (United States); **Wentao Hu**, **Xiaodong Yang,** QPC Lasers Inc. (United States); **Jeffrey Ungar,** Laser Operations LLC (United States)

13345-37 • 8:40 AM - 9:00 AM
Current development status of red high-power laser diodes for display applications at Nichia
Author(s): **Ryuichi Sogabe**, **Takuya Kuchimura**, **Yusuke Aoki**, **Takeshi Mori**, **Hisashi Kasai**, **Daisuke Morita**, **Masanao Ochiai, Tetsuya Yagi,** Nichia Corp. (Japan)

13345-38 • 9:00 AM - 9:20 AM
Combining fibered QCL beams using multi-plane light conversion for countermeasure applications
Author(s): **Louis Andreoli**, **Pierre Vernaz-Gris**, **Lucie Guestin**, **David Kerloch**, **Tangi Le Guennic**, **Pu Jian, Guillaume Labroille,** CAILabs (France)

13345-39 • 9:20 AM - 9:40 AM
Application of 6XXnm MF2 in photodynamic physiotherapy
Author(s): **Wei Ma**, **Yazhuang Wei**, **Jiayuan Lin**, **Zhenkun Yu**, **Xiaohua Chen,** BWT Beijing Ltd. (China); **Michael Stoiber**, **Marco Flament**, **Jens Biesenbach,** BWT Laser Europe GmbH (Germany); **Yueting Wu,** BWT Beijing Ltd. (China)

13345-40 • 9:40 AM - 10:00 AM
Implications of oblique mode structure for high power diode lasers
Author(s): **Bruce Burckel,** Sandia National Labs. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: LASER DIODE RELIABILITY

28 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **René Todt**, Coherent Corp. (Switzerland); **Jenna Campbell**, Freedom Photonics, LLC (United States)

13345-41 • 10:30 AM - 10:50 AM
Highly reliable, multi-watt continuous wave GaSb-based broad area diode lasers emitting around 2 µm
Author(s): **Anisuzzaman Boni**, **Manuel Wegelin**, **Florian Fahrentz, Alexander Kaebe,** Lumics GmbH (Germany)

13345-43 • 10:50 AM - 11:10 AM
Micro- and macroscopic analysis of degradation in high-power broad-area QW and QD lasers
Author(s): **Yongkun Sin**, **Cale Lewis**, **In-Tae Bae,** The Aerospace Corp. (United States); **Jian Li**, **Robert Bedford, Adam T. Neal,** Air Force Research Lab. (United States)

13345-47 • 11:10 AM - 11:30 AM
High performance of 640nm red laser diodes and modules for pumping source
Author(s): **Jian Su**, **Fei Liu**, **Zhen Zhu**, **Fuyang Ren,** Shandong Huaguang Optoelectronics Co., Ltd. (China); **Kang Chen**, **C.X. Wang,** Shandong Huaguang Optoelectronics Co.,Ltd. (China); **Dehua Wu**, **Qi Liu,** Shandong Huaguang Optoelectronics Co., Ltd. (China); **Wei Xia,** University of Jinan (China); **Xiangang Xu,** Shandong University (China)

CONFERENCE 13346

Vertical External Cavity Surface Emitting Lasers (VECSELs) XIV

CONFERENCE CO-SPONSOR

COHERENT

28 - 29 January 2025 | Moscone South, Room 212 (Level 2)

Conference Chair(s): **Marcel Rattunde,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

Program Committee: **Alexander R. Albrecht,** The Univ. of New Mexico (United States); **Vasilis Apostolopoulos,** Univ. of Southampton (United Kingdom); **Robert G. Bedford,** Air Force Research Lab. (United States); **Juan L. Chilla,** Coherent Corp. (United States); **Mircea Guina,** Tampere Univ. (Finland); **Jennifer E. Hastie,** Univ. of Strathclyde (United Kingdom); **Michael Jetter,** Univ. Stuttgart (Germany); **Eli Kapon,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Ursula Keller,** ETH Zurich (Switzerland)

Tuesday 28 January 2025

SESSION 1: MODELOCKED VECSEL

28 January 2025 • 8:00 AM - 9:55 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Marcel Rattunde**, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

13346-1 • 8:00 AM - 8:45 AM
Ultrafast optically pumped semiconductor disk lasers (Keynote Presentation)
Author(s): **Ursula Keller,** ETH Zurich (Switzerland)

13346-2 • 8:45 AM - 9:15 AM
Widely tunable VECSEL-based laser system for multicontrast high-speed nonlinear imaging *(Invited Paper)*
Author(s): **Thibault Bondaz**, **John Gerard G. McInerney,** Univ. College Cork (Ireland); **Jerome V. Moloney,** Wyant College of Optical Sciences, The Univ. of Arizona (United States), Univ. College Cork (Ireland); **Jason Jones,** Wyant College of Optical Sciences (United States)

13346-3 • 9:15 AM - 9:35 AM
High-speed dual-comb spectroscopy in the short-wave infrared using an InGaSb MIXSEL
Author(s): **Marco Gaulke,** ETH Zurich (Switzerland); **Maximilian C. Schuchter,** ETH Zurich (Switzerland), Tampere Univ. (Finland); **Nicolas Huwyler**, **Matthias Golling**, **Benjamin Willenberg**, **Christopher R. Phillips, Ursula Keller,** ETH Zurich (Switzerland)

13346-4 • 9:35 AM - 9:55 AM
Strain-controlled recovery time in SWIR GaSb-based SESAMs
Author(s): **Maximilian C. Schuchter,** ETH Zurich (Switzerland), Tampere Univ. (Finland); **Marco Gaulke**, **Nicolas Huwyler**, **Matthias Golling,** ETH Zurich (Switzerland); **Mircea Guina,** Tampere Univ. (Finland); **Ursula Keller,** ETH Zurich (Switzerland)

Coffee Break 9:55 AM - 10:25 AM

SESSION 2: SINGLE FREQUENCY VECSELS

28 January 2025 • 10:25 AM - 11:45 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Ursula Keller**, ETH Zurich (Switzerland)

13346-5 • 10:25 AM - 10:55 AM
Towards ultra-stable compact VECSELs *(Invited Paper)*
Author(s): **Paulo Hisao Moriya**, **Charlotte A. Hodges**, **Steven Anderson, Jennifer E. Hastie,** Univ. of Strathclyde (United Kingdom)

13346-6 • 10:55 AM - 11:25 AM
Tunable single frequency MECSEL for Ytterbium cooling *(Invited Paper)*
Author(s): **Jörn Wollenzin,** Thorlabs GmbH (Germany), Univ. zu Lübeck (Germany), Technische Hochschule Lübeck (Germany); **Garrett D. Cole,** Thorlabs Crystalline Solutions (Germany); **Johannes Dühn**, **Matthias Neef**, **Michael Verges**, **Matthias Völker,** Thorlabs GmbH (Germany); **Robert Huber,** Univ. zu Lübeck (Germany); **Kai Seger,** Technische Hochschule Lübeck (Germany)

13346-7 • 11:25 AM - 11:45 AM

Single frequency OPO pumped intracavity by a frequency-locked VECSEL for sub-30-kHz integrated linewidth at 1.55 µm
Author(s): **Steven Anderson**, **Paulo Hisao Moriya,** Univ. of Strathclyde (United Kingdom); **Lucia Caspani,** Univ. degli Studi dell'Insubria (Italy); **Jennifer E. Hastie,** Univ. of Strathclyde (United Kingdom)

Lunch/Exhibition Break 11:45 AM - 1:45 PM

SESSION 3: VECSEL FOR QUANTUM SENSING

28 January 2025 • 1:45 PM - 3:00 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Steven Anderson**, Univ. of Strathclyde (United Kingdom)

13346-8 • 1:45 PM - 2:30 PM
VECSEL for IR-laser threshold magnetometry with active stability control (Keynote Presentation)
Author(s): **Gary A. Sevison,** BlueHalo (United States); **Robert G. Bedford,** Air Force Research Lab. (United States); **Michael Wolf,** Azimuth Corp. (United States); **Michael A. Slocum,** Air Force Research Lab. (United States)

13346-9 • 2:30 PM - 3:00 PM
VECSEL-assisted laser threshold magnetometry with nitrogen-vacancy centers in diamond *(Invited Paper)*
Author(s): **Lukas Lindner**, **Yves Rottstaedt**, **Florian Schall**, **Felix Hahl**, **Tingpeng Luo,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); **Alexander Zaitsev,** College of Staten Island (United States), Gemological Institute of America (United States); **Takeshi Ohshima,** Tohoku Univ. (Japan), National Institutes for Quantum Science and Technology (Japan); **Rüdiger Quay**, **Marcel Rattunde, Jan Jeske,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: VECSEL FOR QUANTUM TECHNOLOGY

28 January 2025 • 3:30 PM - 4:40 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Alexander R. Albrecht**, The Univ. of New Mexico (United States)

13346-11 • 3:30 PM - 4:00 PM
Commercial VECSEL platform for quantum technology *(Invited Paper)*
Author(s): **Jussi-Pekka Penttinen**, **Emmi Kantola**, **Topi Uusitalo**, **Sanna Ranta, Mircea Guina,** Vexlum Oy (Finland)

13346-12 • 4:00 PM - 4:20 PM
High-power single-frequency AlGaInP VECSELs for quantum technologies
Author(s): **Charlotte A. Hodges**, **Paulo Hisao Moriya, Jennifer E. Hastie,** Univ. of Strathclyde (United Kingdom)

13346-13 • 4:20 PM - 4:40 PM
High-power 2-µm GaSb-based VECSEL with an absolute wavelength stability below 1 MHz
Author(s): **Peter Holl**, **Steffen Adler**, **Elke Diwo-Emmer**, **Andreas Bächle,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); **Maximilian Bradler**, **Milad Yahyapour**, **Ronald Holzwarth,** Menlo Systems GmbH (Germany); **Marcel Rattunde,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

Wednesday 29 January 2025

SESSION 5: MECSELS

29 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Marcel Rattunde**, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

13346-14 • 8:00 AM - 8:30 AM
2-µm GaSb-based optically pumped semiconductor membrane laser (MECSEL) *(Invited Paper)*
Author(s): **Maximilian C. Schuchter,** ETH Zurich (Switzerland), Tampere Univ. (Finland); **Nicolas Huwyler**, **Matthias Golling**, **Marco Gaulke, Ursula Keller,** ETH Zurich (Switzerland)

13346-15 • 8:30 AM - 9:00 AM
Advanced fabrication techniques for high-performance membrane external-cavity surface-emitting lasers *(Invited Paper)*
Author(s): **Garrett D. Cole,** Thorlabs Crystalline Solutions (United States); **Michael Choquer,** Univ. of California, Santa Barbara (United States); **Catherine L. Nguyen,** Thorlabs Crystalline Solutions (United States); **Hermann Kahle,** The Univ. of New Mexico (United States); **Galan Moody,** Univ. of California, Santa Barbara (United States); **Alexander R. Albrecht,** The Univ. of New Mexico (United States)

13346-16 • 9:00 AM - 9:30 AM
MECSELs for guide-star applications: In-well pumping, power scaling, frequency-doubling (589 nm), and frequency stabilization *(Invited Paper)*
Author(s): **Trevor Rubin**, **Mingyang Zhang,** The Univ. of New Mexico (United States); **Catherine L. Nguyen**, **Gar-Wing Truong**, **Garrett D. Cole,** Thorlabs Crystalline Solutions (United States); **Hermann Kahle, Alexander R. Albrecht,** The Univ. of New Mexico (United States)

13346-17 • 9:30 AM - 9:50 AM
A microchip semiconductor membrane external-cavity surface-emitting laser (μ-MECSEL)
Author(s): **Jakob Hirlinger-Alexander,** Univ. Ulm (Germany); **Michael Scharwaechter,** Twenty-One Semiconductors GmbH (Germany); **Franzisca Bader**, **Julius Steck,** Univ. Ulm (Germany); **Matthias Seibold**, **Marco Werner**, **Roman Bek,** Twenty-One Semiconductors GmbH (Germany); **Hermann Kahle,** The Univ. of New Mexico (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: NOVEL CONCEPTS AND LASER PHYSICS

29 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Robert G. Bedford**, Air Force Research Lab. (United States)

13346-18 • 10:20 AM - 10:50 AM
Harmonic and sub-harmonic RF injection locking of THz quantum-cascade VECSELs *(Invited Paper)*
Author(s): **Yu Wu**, **Jordane A. Bloomfield,** Univ. of California, Los Angeles (United States); **Sadhvikas Addamane,** Sandia National Labs. (United States); **Michael A. Schreiber**, **Christian Jirauschek,** Technische Univ. München (Germany); **Benjamin S. Williams,** Univ. of California, Los Angeles (United States)

13346-19 • 10:50 AM - 11:20 AM
From SWIFTS on mode-locking VECSEL to MEXL-applied machine-learning study *(Invited Paper)*
Author(s): **Arash Rahimi-Iman,** Justus-Liebig-Univ. Giessen (Germany)

13346-20 • 11:20 AM - 11:50 AM
Coherent optical control of laser arrays on semiconductor quantum well membrane Lasers *(Invited Paper)*
Author(s): **Vasilis Apostolopoulos,** Univ. of Crete (Greece), Univ. of Southampton (United Kingdom); **Nicholas Klokkou**, **Stephen C. Richardson,** Univ. of Southampton (United Kingdom); **Michael Jetter,** Univ. Stuttgart (Germany); **Roman Bek,** Twenty-One Semiconductors GmbH (Germany); **Peter Michler,** Univ. Stuttgart (Germany); **Jon Gorecki,** Imperial College London (United Kingdom)

13346-21 • 11:50 AM - 12:10 PM
Exploration of novel type-II quantum well gain regions for MECSEL and VECSEL at 2.4-μm center wavelength
Author(s): **Nicolas Huwyler,** ETH Zurich (Switzerland); **Maximilian C. Schuchter,** ETH Zurich (Switzerland), Tampere Univ. (Finland); **Marco Gaulke**, **Matthias Golling, Ursula Keller,** ETH Zurich (Switzerland)

VECSELS BEST STUDENT PAPER AWARD CEREMONY

29 January 2025 • 12:10 PM - 12:30 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Marcel Rattunde**, Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)
Sponsored by Coherent Corporation (United States)

CONFERENCE 13347

Nonlinear Frequency Generation and Conversion: Materials and Devices XXIV

28 - 30 January 2025 | Moscone South, Room 151 (Upper Mezz)

Conference Chair(s): **Jeffrey Moses,** Cornell Univ. (United States)

Conference Co-Chair(s): **Christopher R. Phillips,** ETH Zurich (Switzerland)

Program Committee: **Carlota Canalias,** Tailored Photons AB (Sweden); **Shekhar Guha,** Air Force Research Lab. (United States); **Christelle Kieleck,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Kentaro Miyata,** RIKEN Ctr. for Advanced Photonics (Japan); **Rita D. Peterson,** Univ. of Dayton (United States); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Kenneth L. Schepler,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Peter G. Schunemann,** onsemi (United States); **Chaitanya Kumar Suddapalli,** Tata Institute of Fundamental Research (India); **Nathalie Vermeulen,** Vrije Univ. Brussel (Belgium); **Konstantin L. Vodopyanov,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States); **Haohai Yu,** Shandong Univ. (China)

Monday 27 January 2025

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 1: FREQUENCY CONVERSION IN CRYSTALLINE NONLINEAR MATERIALS: WAVEGUIDES AND NOVEL METHODS

28 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Jeffrey Moses**, Cornell Univ. (United States)

13347-1 • 8:00 AM - 8:20 AM
Laser-written depressed cladding waveguides in the z-cut of birefringent nonlinear optical crystals for efficient frequency conversion
Author(s): **Anna-Rosa Waidhas**, **Simon Herr**, **Jens Kießling,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Frank Kühnemann,** Univ. of Freiburg (Germany)

13347-2 • 8:20 AM - 8:40 AM
Laser-written β-BBO depressed cladding waveguides for TM and TE polarizations
Author(s): **Anna-Rosa Waidhas**, **Simon Herr**, **Jens Kießling,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Frank Kühnemann,** Univ. of Freiburg (Germany)

13347-3 • 8:40 AM - 9:00 AM
Optimization of third harmonic generation in one PPLN ridge waveguide using dual temperature control technique
Author(s): **Jui-Yu Lai**, **Chih-Rong Chen**, **Jeng-Han Jang, Ming-Hsien Chou,** HC Photonics Corp. (Taiwan)

13347-4 • 9:00 AM - 9:30 AM
Periodically poled crystals with sub-μm periods: advances and future prospects *(Invited Paper)*
Author(s): **Carlota Canalias, Laura Barrett,** KTH Royal Institute of Technology (Sweden)

13347-5 • 9:30 AM - 10:00 AM
Terahertz-speed electro-optic modulators on lithium niobate platform *(Invited Paper)*
Author(s): **Aleksei Gaier**, **Cristina Benea Chelmus**, **Karen Mamian,** EPFL (Switzerland); **Amirhassan Shams-Ansari**, **Marko Lončar,** Harvard Univ. (United States); **Yazan Lampert,** EPFL (Switzerland)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: FREQUENCY CONVERSION IN METASURFACES AND NANOSTRUCTURED MATERIALS

28 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Haim Suchowski**, 3DOptix (Israel)

13347-6 • 10:30 AM - 11:00 AM
Collective excitations in nonlinear metasurfaces: challenges and possibilities *(Invited Paper)*
Author(s): **Jussi Kelavuori**, **Madona Mekhael**, **Ali Panahpour**, **Timo Stolt, Mikko J. Huttunen,** Tampere Univ. (Finland)

13347-7 • 11:00 AM - 11:20 AM
Enhancing second harmonic generation with digital alloys using metasurfaces
Author(s): **Pernille Undrum Fathi,** Harvard Univ. (United States); **Marcus Ossiander,** Technische Univ. Graz (Austria), Harvard Univ. (United States); **Amberly Ricks**, **Kevin Wen,** The Univ. of Texas at Austin (United States); **Theodore Letsou**, **Christina Spägele,** Harvard Univ. (United States); **Patrick Devaney**, **Rithvik Ramesh**, **John Duncan,** The Univ. of Texas at Austin (United States); **Ary Portes**, **Joon-Suh Park,** Harvard Univ. (United States); **Seth Bank,** The Univ. of Texas at Austin (United States); **Federico Capasso,** Harvard Univ. (United States)

13347-8 • 11:20 AM - 11:40 AM
Broadband enhancement of harmonic generation and upconverted photoluminescence from symmetry-broken plasmonic nanocavities
Author(s): **Elieser Mejia,** Virginia Polytechnic Institute and State Univ. (United States), National Institute of Standards and Technology (United States); **Yuming Zhao, Wei Zhou,** Virginia Polytechnic Institute and State Univ. (United States)

13347-9 • 11:40 AM - 12:10 PM
Nonlinear Mid-Infrared Optics Under Non-perturbative Conditions – From High Harmonics Generation to High Aspect Ratio Nanostructuring Using Femtosecond Laser Pulses *(Invited Paper)*
Author(s): **Gennady B. Shvets,** Cornell Univ. (United States)

Lunch/Exhibition Break 12:10 PM - 2:00 PM

SESSION 3: FREQUENCY CONVERSION FOR QUANTUM LIGHT APPLICATIONS

28 January 2025 • 2:00 PM - 3:40 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Marc Jankowski**, NTT Research, Inc. (United States)

13347-10 • 2:00 PM - 2:30 PM
Navigating the classical-to-quantum transition in ultrafast nonlinear nanophotonics *(Invited Paper)*
Author(s): **Edwin Ng,** NTT Research, Inc. (United States), Stanford Univ. (United States); **Ryotatsu Yanagimoto,** NTT Research, Inc. (United States), Cornell Univ. (United States); **Marc Jankowski,** NTT Research, Inc. (United States), Stanford Univ. (United States); **Martin M. Fejer, Hideo Mabuchi,** Stanford Univ. (United States)

13347-11 • 2:30 PM - 2:50 PM
Non-interferometric measurement of Pancharatnam-Berry phase using stimulated second-harmonic-generation
Author(s): **Chahat Kaushik**, **Anirban Ghosh,** Physical Research Lab. (India), Indian Institute of Technology Gandhinagar (India); **Chaitanya K. Suddapalli,** Tata Institute of Fundamental Research (India); **Kavita Devi,** Indian Institute of Technology Dharwad (India); **Ritwick Das,** Indian Institute of Technology Delhi (India); **Goutam K. Samanta,** Physical Research Lab. (India)

13347-12 • 2:50 PM - 3:10 PM
Non-reciprocal frequency conversion in a multimode nonlinear cavity
Author(s): **Sahil Pontula**, **Sachin Vaidya,** Massachusetts Institute of Technology (United States); **Charles Roques-Carmes,** Stanford Univ. (United States); **Shiekh Z. Uddin**, **Marin Soljacic,** Massachusetts Institute of Technology (United States); **Yannick Salamin,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13347-13 • 3:10 PM - 3:40 PM
Robust frequency conversion and entangled photon generation based on composite design *(Invited Paper)*
Author(s): **Haim Suchowski,** Tel Aviv Univ. (Israel)

Coffee Break 3:40 PM - 4:10 PM

SESSION 4: NONLINEAR NANOPHOTONICS IN LITHIUM NIOBATE

28 January 2025 • 4:10 PM - 6:00 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Christopher R. Phillips**, ETH Zurich (Switzerland)

13347-14 • 4:10 PM - 4:40 PM
Broadband light sources based on second-order nonlinear nanophotonics *(Invited Paper)*
Author(s): **Marc Jankowski,** NTT Research, Inc. (United States)

13347-15 • 4:40 PM - 5:00 PM
Milliwatt-level UV generation using sidewall poled lithium niobate
Author(s): **Cornelis A. A. Franken,** Harvard Univ. (United States), Univ. Twente (Netherlands); **Soumya S. Ghosh,** Harvard Univ. (United States); **Caique C. Rodrigues,** Univ. of Campinas (Brazil), Harvard Univ. (United States); **Jiayu Yang**, **Chen J. Xin**, **Shengyuan Lu**, **Donald Witt**, **Graham I. Joe,** Harvard Univ. (United States); **Klaus J. Boller,** Univ. Twente (Netherlands); **Marko Lončar,** Harvard Univ. (United States)

13347-16 • 5:00 PM - 5:20 PM
Multi-scale second harmonic generation microscopy of ferroelectric domains in x-cut thin-film lithium niobate
Author(s): **Sagar P. Doshi**, **Gavin N. West,** Massachusetts Institute of Technology (United States); **Dodd Gray,** Massachusetts Institute of Technology (United States), MIT Lincoln Lab. (United States); **Rajeev J. Ram,** Massachusetts Institute of Technology (United States)

13347-17 • 5:20 PM - 5:40 PM
RF sputtering deposition of thin-film lithium niobate for photonic integrated circuit applications
Author(s): **Yasuhito Tanaka**, **Yuma Sugai**, **Yohei Sakano**, **Hironori Sugata**, **Yosuke Inase, Takuya Sugawara,** Shincron Co., Ltd. (Japan)

13347-56 • 5:40 PM - 6:00 PM
Making waveguide frequency converters in lithium niobate robust for handling high light powers by tailoring the electrical conductivity: theoretical considerations
Author(s): **Karsten Buse**, **Simon Herr,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Ingo Breunig,** Univ. of Freiburg (Germany), Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13347-58 • 6:00 PM - 8:00 PM
Single-stage multipass cell spectral broadening and compression of 90 fs, 200 µJ Pharos laser down to 8.5 fs
Author(s): **Oleg Pronin,** n2-Photonics GbR (Germany); **Kilian Fritsch**, **Tomin Joy,** n2-Photonics GmbH (Germany); **Valdas Maslinskas, Tomas Stanislauskas,** Light Conversion, UAB (Lithuania)

13347-59 • 6:00 PM - 8:00 PM
Chirp control by four-wave-mixing in gas-filled hollow capillary fibers
Author(s): **Linshan Sun**, **Hao Zhang**, **Brittany Lu**, **Abbas Shiri, Sergio Carbajo,** Univ. of California, Los Angeles (United States)

13347-60 • 6:00 PM - 8:00 PM
Phase-matching properties of AgGa(Se1-xTex)$_2$ for SHG of a CO$_2$ laser
Author(s): **Kiyoshi Kato,** Chitose Institute of Science and Technology (Japan); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Kentaro Miyata,** RIKEN Ctr. for Advanced Photonics (Japan)

13347-61 • 6:00 PM - 8:00 PM
Sellmeier and thermo-optic dispersion formulas for Hg0.51Cd0.49Ga$_2$S$_4$ and their applications to the nonlinear optics
Author(s): **Tomotsugu Kinoshita,** Shinkosha Co Ltd (Japan); **Kazuhiro Kawashima,** Shinkosha Co. Ltd. (Japan); **Kiyoshi Kato,** Chitose Institute of Science and Technology (Japan); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13347-62 • 6:00 PM - 8:00 PM
Passively Q-switched Raman fiber laser source widely tunable in near infrared and visible window
Author(s): **Abhigyan Goswami**, **Swathi Padmanabhan**, **Sarthak Dash**, **Jaya Prakash, V. R. Supradeepa,** Indian Institute of Science, Bengaluru (India)

13347-63 • 6:00 PM - 8:00 PM
Material mechanics of GaAs1-xPx alloy epilayers for optical frequency conversion in the mid-infrared
Author(s): **Samuel M. Linser,** Air Force Research Lab. (United States), KBR, Inc. (United States); **Shivashankar R. Vangala**, **Harris J. Hall,** Air Force Research Lab. (United States); **Timothy A. Prusnick**, **Duane D. Brinegar,** Air Force Research Lab. (United States), KBR, Inc. (United States); **Vladimir L. Tassev,** Air Force Research Lab. (United States)

13347-64 • 6:00 PM - 8:00 PM
Compact, CEP-stable, few-cycle OPCPA at 2μm wavelength for attosecond pulse generation
Author(s): **Oscar Andres Naranjo Montoya**, **Philipp Merkl**, **Issam Abdallah**, **Bastian Manschwetus**, **Sebastian Starosielec**, **Torsten Golz**, **Jan Heye Buss**, **Michael Schulz, Robert Riedel,** Class 5 Photonics GmbH (Germany)

13347-65 • 6:00 PM - 8:00 PM
Generation of dynamic and static femtosecond vortex beams and its inscription in low-density polymer
Author(s): **Siyang Zheng,** The Hong Kong Polytechnic Univ. (China), Chongqing Univ. (China); **Guangyu Zhu,** Chongqing Univ. of Arts and Sciences (China), Chongqing Univ. (China); **Juan I. Ahuir-Torre,** Liverpool John Moores Univ. (United Kingdom); **Walter Perrie,** Univ. of Liverpool (United Kingdom); **Puxiang Lai,** The Hong Kong Polytechnic Univ. (China)

13347-66 • 6:00 PM - 8:00 PM
Guided space-time wavepacket generation through stimulated Brillouin scattering in waveguide system
Author(s): **Der-Han Huang**, **Cheng Guo, Shanhui Fan,** Stanford Univ. (United States)

13347-67 • 6:00 PM - 8:00 PM
Mode-division multiplexing of signals and Raman pumps in low differential mode group delay multimode optical fiber
Author(s): **Mario Zitelli,** Sapienza Univ. di Roma (Italy); **Louis Andreoli**, **Claire Autebert**, **Jean-Philippe Gauthier**, **Guillaume Labroille,** CAILabs (France); **Stefan Wabnitz,** Sapienza Univ. di Roma (Italy)

13347-69 • 6:00 PM - 8:00 PM
Prediction of ultrafast phenomena and nonlinear frequency conversion in hollow-core fibers using deep learning
Author(s): **Hao Zhang,** UCLA Samueli School of Engineering (United States), SLAC National Accelerator Lab. (United States); **Linshan Sun**, **Brittany Lu,** UCLA Samueli School of Engineering (United States); **Jack Hirschman,** Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); **Sergio Garcia Carbajo,** UCLA Samueli School of Engineering (United States), SLAC National Accelerator Lab. (United States)

13347-70 • 6:00 PM - 8:00 PM
Z-scan of ITO nanocrystals embedded within glass matrix
Author(s): **Amir Ashjari,** New York State College of Ceramics at Alfred Univ. (United States); **Brian Topper,** Clemson Univ. (United States); **Doris Möncke,** New York State College of Ceramics at Alfred Univ. (United States)

13347-71 • 6:00 PM - 8:00 PM
Tunable VUV and XUV light generation based on nonlinear resonantly enhanced four-wave mixing in gaseous media
Author(s): **Watheq Al-Basheer,** King Fahd Univ. of Petroleum & Minerals (Saudi Arabia)

Wednesday 29 January 2025

SESSION 5: OPTICAL PARAMETRIC OSCILLATORS

29 January 2025 • 8:20 AM - 9:50 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Valentin Petrov**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13347-19 • 8:20 AM - 8:40 AM
Periodically-poled LiNbO3 non-resonant optical parametric oscillator with narrowband seeding
Author(s): **Tugba Temel,** Imperial College London (United Kingdom); **Subhasis Das,** The Univ. of Burdwan (India); **Robert T. Murray,** Imperial College London (United Kingdom); **Li Wang**, **Weidong Chen,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Andre Schirrmacher,** Canlas Laser Processing GmbH (Germany); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13347-20 • 8:40 AM - 9:00 AM
Phase-matching properties of $ZnSiAs_2$ in the mid-IR
Author(s): **Takayuki Okamoto,** Okamoto Optics, Inc. (Japan); **Nobuhiro Umemura,** Chitose Institute of Science and Technology (Japan); **Kiyoshi Kato,** Chitose Institute of Science and Technology (Japan), Okamoto Optics, Inc. (Japan); **Valentin Petrov,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Japan)

13347-21 • 9:00 AM - 9:30 AM
Mid-infrared photothermal quantitative phase microscopy with nanosecond optical parametric oscillators *(Invited Paper)*
Author(s): **Takuro Ideguchi,** The Univ. of Tokyo (Japan)

13347-22 • 9:30 AM - 9:50 AM
High-power nanosecond-pulsed mid-IR CSP and ZGP OPO sources pumped at 2.06μm
Author(s): **Marcin Piotrowski**, **Achille Bogas-Droy,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Gerhard Spindler,** GS (Germany); **Anne Hildenbrand-Dhollande,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: OPTICAL PARAMETRIC AMPLIFICATION

29 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Jeffrey Moses**, Cornell Univ. (United States)

13347-23 • 10:20 AM - 10:50 AM
A scalable approach to the pulse energy of a single-cycle laser using a dual-chirped OPA *(Invited Paper)*
Author(s): **Eiji J. Takahashi,** RIKEN (Japan)

13347-24 • 10:50 AM - 11:10 AM
Development and testing of high-energy optical parametric amplifiers for multi-species differential absorption lidar within LEMON H2020 project
Author(s): **Jean-Baptiste Dherbecourt,** ONERA (France); **Kjell M. Moelster,** KTH Royal Institute of Technology (Sweden); **Jan Fabian Geus,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Sophie Duzellier,** ONERA (France); **Valdas Pasiskevicius,** KTH Royal Institute of Technology (Sweden); **Michael Strotkamp,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Jean-Michel Melkonian**, **Antoine Godard,** ONERA (France); **Cyrille Flamant,** Lab. Atmosphères, Milieux, Observations Spatiales (France); **Myriam Raybaut,** ONERA (France)

13347-25 • 11:10 AM - 11:30 AM
Efficient hybridized parametric amplification enabled by quasi-phase matching with quasiperiodic gratings
Author(s): **Amir F. Amhaz, Jeffrey Moses,** Cornell Univ. (United States)

13347-26 • 11:30 AM - 11:50 AM
Octave-spanning, field-resolved, Kerr-amplification in liquid thin film
Author(s): **Kilian Scheffter**, **Anchit Srivastava**, **Andreas Herbst**, **Soyeon Jun, Hanieh Fattahi,** Max-Planck-Institut für die Physik des Lichts (Germany)

13347-27 • 11:50 AM - 12:10 PM
Extreme nonlinear optics: higher order nonlinear frequency conversion processes in Ge, ZnSe, and ZnS
Author(s): **Joseph T. Harrington,** Texas A&M Univ. (United States), U.S. Army Space and Missile Defense Command (United States); **Anthony R. Valenzuela,** U.S. Army Space and Missile Defense Command (United States); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 7: ULTRAVIOLET AND HIGH HARMONIC GENERATION

29 January 2025 • 1:40 PM - 3:10 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **R. Jason Jones**, Wyant College of Optical Sciences (United States)

13347-28 • 1:40 PM - 2:00 PM
XUV generation with MPC and OPCPA drivers
Author(s): **Bastian Manschwetus**, **Valentina Shumakova**, **Alice Autuori**, **Thomas Braatz**, **Sebastian Starosielec**, **Hossein Goudarzi,** Class 5 Photonics GmbH (Germany); **Christoph Heyl,** Deutsches Elektronen-Synchrotron (Germany), Univ. Hamburg (Germany), Helmholtz Institute Jena (Germany); **Mark J. Prandolini,** Class 5 Photonics GmbH (Germany), Univ. Hamburg (Germany); **Jan Heye Buss**, **Michael Schulz, Robert Riedel,** Class 5 Photonics GmbH (Germany)

13347-29 • 2:00 PM - 2:30 PM
Putting high harmonic generation to work: recent achievements and future challenges *(Invited Paper)*
Author(s): **Margaret Murnane,** Univ. of Colorado Boulder (United States)

13347-30 • 2:30 PM - 2:50 PM
Tuneable ultrafast vacuum ultraviolet laser pulses through resonant dispersive emission driven by an ytterbium-based laser system
Author(s): **Christian Brahms**, **Deepjyoti Satpathy**, **Nikoleta Kotsina, John C. Travers,** Heriot-Watt Univ. (United Kingdom)

13347-31 • 2:50 PM - 3:10 PM
Laser harmonic generation with tuneable orbital angular momentum using a structured plasma target
Author(s): **Raoul Trines**, **Holger Schmitz**, **Robert Bingham,** STFC Rutherford Appleton Lab. (United Kingdom); **Martin King, Paul McKenna,** Univ. of Strathclyde (United Kingdom)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: SUPERCONTINUUM GENERATION AND HYPERSPECTRAL ARCHITECTURES

29 January 2025 • 3:40 PM - 5:40 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Eiji J. Takahashi**, RIKEN (Japan)

13347-32 • 3:40 PM - 4:00 PM
Hyperspectral ultrafast source
Author(s): **Etienne Doiron**, **Maksym Ivanov**, **Marco Scaglia**, **Pedram Ghaderi,** Few-Cycle Inc. (Canada); **Giulio Vampa,** Univ. of Ottawa-NRC Joint Ctr for Exterme Photonics (Canada); **Gabriel Tempea,** Few-Cycle Inc. (Canada); **Francois Legare,** Institut National de la Recherche Scientifique (Canada); **Bruno E. Schmidt,** Few-Cycle Inc. (Canada)

13347-33 • 4:00 PM - 4:20 PM
High-power ultra-flat supercontinuum generation in molecular-gas-filled anti-resonant fibres
Author(s): **Balazs Plosz**, **Athanasios Lekosiotis**, **Mohammed Sabbah**, **Federico Belli**, **Christian Brahms,** Heriot-Watt Univ. (United Kingdom); **Amir Abdolvand,** ASML Netherlands B.V. (Netherlands); **John C. Travers,** Heriot-Watt Univ. (United Kingdom)

13347-34 • 4:20 PM - 4:40 PM
Multi-octave bandwidth supercontinuum generation in crystalline aluminum nitride-on-sapphire waveguides
Author(s): **Samantha Sbarra**, **Samuele Brunetta**, **Jean-François Carlin**, **Nicolas Grandjean**, **Raphaël Butté, Camille-Sophie Brès,** EPFL (Switzerland)

13347-35 • 4:40 PM - 5:00 PM
Supercontinuum generation in bulk materials (InP, Si, GaN, GaAs, Diamond, PbMoO4, TiO2) pumped by radiation of Cr:ZnS fs-MOPA system
Author(s): **Rem Danilin,** The Univ. of Alabama at Birmingham (United States); **Sergey Vasilyev,** IPG Photonics Corp. (United States); **Daniil Danilin**, **Dmitry Martyshkin**, **Vladimir Fedorov, Sergey Mirov,** The Univ. of Alabama at Birmingham (United States)

13347-36 • 5:00 PM - 5:20 PM
Ultrashort pulse laser supercontinuum deflection in fused silica: measurement and modeling
Author(s): **Noah Talisa**, **Zachary Epstein**, **Hannah Clark**, **Timothy Montalbano**, **Adam Willitsford, Andy Goers,** Johns Hopkins Univ. Applied Physics Lab., LLC (United States)

13347-37 • 5:20 PM - 5:40 PM
Tunable, high-power deep UV to NIR source of femtosecond pulses utilizing various Yb-doped pump-laser architectures
Author(s): **Valentina Shumakova**, **Philipp Merkl**, **Alice Autuori**, **Thomas Braatz,** Class 5 Photonics GmbH (Germany); **Mark J. Prandolini,** Class 5 Photonics GmbH (Germany), Univ. Hamburg (Germany); **Luke Maidment**, **Hossein Goudarzi**, **Sebastian Starosielec**, **Jan Heye Buss**, **Bastian Manschwetus**, **Michael Schulz, Robert Riedel,** Class 5 Photonics GmbH (Germany)

Thursday 30 January 2025

SESSION 9: MATERIALS FOR MID-INFRARED AND THZ GENERATION

30 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Shekhar Guha**, Air Force Research Lab. (United States)

13347-38 • 8:00 AM - 8:20 AM
Measurement of laser induced damage thresholds of BaGa4Se7 at various wavelengths
Author(s): **Alexander Carson,** Air Force Research Lab. (United States); **Jani Jesenovec,** BAE Systems (United States); **Amelia Carpenter**, **Kevin Cissner**, **Alan Martinez,** Air Force Research Lab. (United States); **Kevin T. Zawilski,** BAE Systems (United States); **Shekhar Guha,** Air Force Research Lab. (United States)

13347-39 • 8:20 AM - 8:40 AM
Discovering nonlinear optical crystals for THz generation and electro-optic detection through data mining and DFT calculations
Author(s): **Sin Hang (Enoch) Ho,** Brigham Young Univ. (United States)

13347-40 • 8:40 AM - 9:00 AM
Nonlinear properties of bulk optical materials for high-peak-power long-wave-infrared lasers
Author(s): **Mikhail N. Polyanskiy**, **Dismas Choge**, **Igor V. Pogorelsky**, **Marcus Babzien**, **William Li, Mark A. Palmer,** Brookhaven National Lab. (United States)

13347-41 • 9:00 AM - 9:20 AM
Photodarkening in BGSe and BGGSe
Author(s): **Julius Lukošiūnas,** EKSPLA (Lithuania), Ctr. for Physical Sciences and Technology (Lithuania); **Robertas Kananvičius**, **Regimantas Januškevičius,** EKSPLA (Lithuania); **Justinas Ceponkus,** Vilnius Univ. (Lithuania); **Rokas Danilevičius,** EKSPLA (Lithuania); **Andrejus Michailovas,** EKSPLA (Lithuania), Ctr. for Physical Sciences and Technology (Lithuania)

13347-42 • 9:20 AM - 9:40 AM
Inhomogeneities and continued improvements in BaGa4Se7 growth and devices
Author(s): **Jani Jesenovec,** BAE Systems (United States); **Peter G. Schunemann,** onsemi (United States); **Kevin T. Zawilski,** BAE Systems (United States)

13347-43 • 9:40 AM - 10:00 AM
Advances in CSP growth and characterization related to generation of mid-IR light
Author(s): **Kevin T. Zawilski**, **Jani Jesenovec**, **Leonard Pomeranz**, **Lindsay Radl**, **Spencer Horton,** BAE Systems (United States); **Angel Flores**, **Joel M. Solomon**, **Kent Averett, Jonathan Slagle,** Air Force Research Lab. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: FREQUENCY COMBS: SPANNING THE RAINBOW

30 January 2025 • 10:30 AM - 12:30 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Christopher R. Phillips**, ETH Zurich (Switzerland)

13347-44 • 10:30 AM - 10:50 AM
Dual-comb spectroscopy with sub-10-MHz resolution simultaneously over mid-IR to THz spectral range
Author(s): **Dmitrii Konnov**, **Andrey V. Muraviev,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Sergey Vasilyev,** IPG Photonics Corp. (United States); **Konstantin L. Vodopyanov,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13347-45 • 10:50 AM - 11:10 AM
High resolution dual-comb spectroscopy in the UV with a million resolved comb lines
Author(s): **Andrey V. Muraviev**, **Dmitrii Konnov,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Vadim Smirnov,** OptiGrate – IPG Photonics (United States); **Sergey Vasilyev,** IPG Photonics Corp. (United States); **Konstantin L. Vodopyanov,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13347-46 • 11:10 AM - 11:30 AM
Dual comb spectroscopy in the deep ultraviolet
Author(s): **R. Jason Jones**, **John McCauley**, **Dylan Tooley, Mark C. Phillips,** Wyant College of Optical Sciences (United States)

13347-47 • 11:30 AM - 11:50 AM
Noise correlation properties of polarization and spatially-multiplexed single-cavity Yb:CaF2 dual-comb lasers at 160 MHz and GHz repetition rates
Author(s): **Benjamin Willenberg**, **Alexander Nussbaum-Lapping**, **Justinas Pupeikis**, **Hayk Soghomonyan**, **Ursula Keller, Christopher R. Phillips,** ETH Zurich (Switzerland)

13347-48 • 11:50 AM - 12:10 PM
High power, low noise Cr:ZnS comb source for spectroscopy and sensing
Author(s): **Sergey Vasilyev**, **Igor Moskalev**, **Oleg Mishechkin**, **Yury Barnakov, Mike Mirov,** IPG Photonics Corp. (United States)

13347-49 • 12:10 PM - 12:30 PM
Characterization of optically rectified THz frequency comb in lithium niobate waveguides
Author(s): **Alessia Sorgi**, **Francesco Cappelli**, **Paolo De Natale, Luigi Consolino,** Istituto Nazionale di Ottica (Italy)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 11: NOVEL CUBIC-ORDER NONLINEAR DEVICES

30 January 2025 • 2:00 PM - 3:30 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Jeffrey Moses**, Cornell Univ. (United States)

13347-50 • 2:00 PM - 2:30 PM
Nanocarbon-based nonlinear switching devices for compact pulsed lasers *(Invited Paper)*
Author(s): **Ji Eun Bae,** Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France), Univ. de Caen Normandie (France)

13347-51 • 2:30 PM - 2:50 PM
Cascaded intermodal four-wave mixing for visible light generation in a multimode fiber
Author(s): **Purva Bhumkar**, **Jeffrey Demas, Siddharth Ramachandran,** Boston Univ. (United States)

13347-52 • 2:50 PM - 3:10 PM
Enhanced four-wave mixing in the normal dispersion regime of a Yb-doped photonic crystal fiber
Author(s): **Bartosz Krawczyk,** Imperial College London (United Kingdom); **Alexandre Kudlinski,** Lab. de Physique des Lasers, Atomes et Molécules (France); **Ronan A. Battle**, **Robert T. Murray, Timothy H. Runcorn,** Imperial College London (United Kingdom)

13347-53 • 3:10 PM - 3:30 PM
Transient absorption in silicon thin films-based characterization of ultrashort pulses with photon energy above 1.12eV
Author(s): **Mayank Kumar**, **Saadat Mokhtari**, **Tristan Guay,** Institut National de la Recherche Scientifique (Canada); **Adrien Leblanc,** Lab. d'Optique Appliquée (France); **Kosta Oubrerie,** Université Paris-Saclay (France); **Sohail A Jalil,** Joint Attosecond Science Lab. (Canada); **Elissa Haddad**, **Gaetan Jargot**, **Heide Ibrahim,** Institut National de la Recherche Scientifique (Canada); **Giulio Vampa,** Joint Attosecond Science Lab., National Research Council of Canada (Canada), Univ. of Ottawa (Canada); **Francois Legare,** Institut National de la Recherche Scientifique (Canada)

Coffee Break 3:30 PM - 4:00 PM

SESSION 12: NOVEL CONCEPTS FOR FREQUENCY GENERATION AND CONVERSION

30 January 2025 • 4:00 PM - 5:00 PM | Moscone South, Room 151 (Upper Mezz)
Session Chair(s): **Jeffrey Moses**, Cornell Univ. (United States)

13347-54 • 4:00 PM - 4:20 PM
Brillouin de-interleaved, optical frequency comb sources at 1μm as seed sources for spectral beam combining
Author(s): **Soubhik Pal**, **Shilpi Arora**, **Lakshmi C. G., V. R. Supradeepa,** Indian Institute of Science, Bengaluru (India)

13347-55 • 4:20 PM - 4:40 PM
Non-collinear SHG with wavefront control
Author(s): **Goronwy Tawy**, **Rex H. S. Bannerman**, **Glenn Churchill**, **James C. Gates,** Univ. of Southampton (United Kingdom); **Corin B. E. Gawith,** Univ. of Southampton (United Kingdom), Covesion Ltd. (United Kingdom); **Peter G. R. Smith,** Univ. of Southampton (United Kingdom)

13347-57 • 4:40 PM - 5:00 PM
Effective phase matching strategies in high index contrast double-clad optical fibers for second and third harmonic generation of ultrashort pulses
Author(s): **Artemii Tishchenko**, **Francis Berghmans, Tigran Baghdasaryan,** Vrije Univ. Brussel (Belgium)

CONFERENCE 13348

Real-time Measurements, Rogue Phenomena, and Single-Shot Applications X

28 January 2025 | Moscone South, Room 314 (Level 3)

Conference Chair(s): **Daniel R. Solli,** UCLA Samueli School of Engineering (United States); **Georg Herink,** Univ. Bayreuth (Germany); **Serge Bielawski,** Lab. de Physique des Lasers, Atomes et Molécules (France)

Program Committee: **John M. Dudley,** FEMTO-ST (France); **Moti Fridman,** Bar-Ilan Univ. (Israel); **Hideaki Furukawa,** National Institute of Information and Communications Technology (Japan); **Goëry Genty,** Tampere Univ. (Finland); **Takuro Ideguchi,** The Univ. of Tokyo (Japan); **Bahram Jalali,** UCLA Samueli School of Engineering (United States); **Dario Polli,** Politecnico di Milano (Italy); **William Renninger,** The Institute of Optics, Univ. of Rochester (United States); **Claus Ropers,** Georg-August-Univ. Göttingen (Germany); **Günter Steinmeyer,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Pierre Suret,** Lab. de Physique des Lasers, Atomes et Molécules (France); **Masayuki Suzuki,** Doshisha Univ. (Japan); **Abdelmajid Taki,** Lab. de Physique des Lasers, Atomes et Molécules (France); **Giovanna Tissoni,** Institut de Physique de Nice (France)

Tuesday 28 January 2025

SESSION 1: NONLINEAR LASER AND SOLITON DYNAMICS

28 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Daniel R. Solli**, UCLA Samueli School of Engineering (United States)

13348-1 • 8:30 AM - 8:50 AM
Broadband and stable frequency combs in high quality factor fiber Fabry Perot resonators *(Invited Paper)*
Author(s): **Arnaud Mussot,** Unive. de Lille (France); **Matteo Conforti,** Univ. de Lille (France); **Thomas Bunel,** Unive. de Lille (France); **Julien Lumeau**, **Antonin Moreau,** Aix-Marseille Univ. (France); **Arnaud Fernandez**, **Olivier Ilopis**, **Germain Bourcier,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); **Debanuj Chatterjee,** Univ. de Lille (France)

13348-2 • 8:50 AM - 9:10 AM
Liquid-core optical fibers: a host system for uncommon nonlinear phenomena and dynamic control *(Invited Paper)*
Author(s): **Mario Chemnitz,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

13348-3 • 9:10 AM - 9:30 AM
Ultrashort dissipative Raman solitons in coherently driven Kerr resonators *(Invited Paper)*
Author(s): **Miro Erkintalo**, **Zongda Li**, **Yiqing Xu**, **Stephane Coen, Stuart G. Murdoch,** The Univ. of Auckland (New Zealand)

13348-4 • 9:30 AM - 9:50 AM
Real-time full-field spatial measurement of multimode fibers in the nonlinear regime *(Invited Paper)*
Author(s): **Goëry Genty**, **Jiaqi Li**, **Joshua Ruelle,** Tampere Univ. (Finland); **John M. Dudley,** Univ. de Franche-Comté (France)

13348-5 • 9:50 AM - 10:10 AM
THz time-domain spectroscopy with gigahertz Yb-based single-cavity dual-comb lasers *(Invited Paper)*
Author(s): **Benjamin Willenberg**, **Christopher R. Phillips**, **Justinas Pupeikis**, **Sandro L. Camenzind,** ETH Zurich (Switzerland); **Lars Liebermeister**, **Robert B. Kohlhaas**, **Björn Globisch,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Ursula Keller,** ETH Zurich (Switzerland)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: REAL-TIME SPECTROSCOPY AND IMAGING I

28 January 2025 • 10:40 AM - 12:00 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Georg Herink**, Univ. Bayreuth (Germany)

13348-6 • 10:40 AM - 11:00 AM
Temporal Aharonov-Bohm effect *(Invited Paper)*
Author(s): **Moti Fridman,** Bar-Ilan Univ. (Israel)

13348-7 • 11:00 AM - 11:15 AM
Time stretch with continuous-wave lasers
Author(s): **Tingyi Zhou,** Univ. of California, Los Angeles (United States), SiLC Technologies, Inc. (United States); **Yuta Goto**, **Takeshi Makino,** National Institute of Information and Communications Technology (Japan); **Callen MacPhee**, **Yiming Zhou**, **Asad Madni,** Univ. of California, Los Angeles (United States); **Hideaki Furukawa**, **Naoya Wada,** National Institute of Information and Communications Technology (Japan); **Bahram Jalali,** Univ. of California, Los Angeles (United States)

13348-8 • 11:15 AM - 11:30 AM
Real-time 3D visualization of the formation of micrograting structures upon direct laser interference patterning of Si and Ge
Author(s): **Miguel Alvarez-Alegria,** Instituto de Física Interdisciplinar y Sistemas Complejos (Spain); **Irene Solana, Jan Siegel,** Instituto de Óptica (Spain)

13348-9 • 11:30 AM - 11:45 AM
Visualization of surface-initiated amorphization in bulk silicon upon excitation with fs laser pulses using real-time reflectivity measurements
Author(s): **Mario Garcia-Lechuga,** Instituto de Óptica (Spain); **Pol Sopeña**, **David Grojo,** Aix-Marseille Univ. (France); **Jan Siegel,** Instituto de Óptica (Spain)

13348-10 • 11:45 AM - 12:00 PM
Time-resolved THz Stark spectroscopy of molecules in solution
Author(s): **Elnaz Zyaee,** Univ. Bern (Switzerland); **Bong Joo Kang,** Univ. Bern (Switzerland), Korea Research Institute of Chemical Technology (Korea, Democratic Peoples Republic of); **Egmont J. Rohwer**, **David Rohrbach**, **Maryam Akbarimousavi**, **Zoltan Ollmann**, **Gleb Sorohhov,** Univ. Bern (Switzerland); **Alex Borgoo**, **Michele Cascella,** Univ. of Oslo (Norway); **Andrea Cannizzo**, **Silvio Decurtins,** Univ. Bern (Switzerland); **Robert J. Stanley,** Temple Univ. (United States); **Shi-Xia Liu, Thomas Feurer,** Univ. Bern (Switzerland)

Lunch/Exhibition Break 12:00 PM - 2:05 PM

SESSION 3: REAL-TIME SPECTROSCOPY AND IMAGING II

28 January 2025 • 2:05 PM - 3:05 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Moti Fridman**, Bar-Ilan Univ. (Israel)

13348-12 • 2:05 PM - 2:20 PM
Single-shot ultrafast multiview imaging based on temporal wavelength division for capturing volumetric dynamics in femtosecond to nanosecond timescales
Author(s): **Keitaro Shimada,** The Univ. of Tokyo (Japan); **Yuki Inada,** Saitama Univ. (Japan); **Keiichi Nakagawa,** The Univ. of Tokyo (Japan)

13348-13 • 2:20 PM - 2:35 PM
Enhanced backwards N2+ air-lasing for standoff spectroscopy
Author(s): **Vasileios Korakis,** Univ. of California, Berkeley (United States); **Zachary Alvidrez,** Univ. of California (United States), Lawrence Berkeley National Laboratory (United States); **Xianglei Mao,** Lawrence Berkeley National Laboratory (United States); **Vassilia Zorba,** Univ. of California (United States), Lawrence Berkeley National Laboratory (United States)

13348-14 • 2:35 PM - 2:50 PM
Remote detection of lithium isotopes with femtosecond filament-induced plasma spectroscopy
Author(s): **Sung-Uk Choi**, **Jose Chirinos**, **Xianglei Mao,** Lawrence Berkeley National Lab. (United States); **Changmin Kim, Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

13348-15 • 2:50 PM - 3:05 PM
Numerical investigation on multiple spectral identification and separation of spurious components by clock-scanned sampling heterodyne spectroscopy
Author(s): **Hideto Takayasu**, **Tomoya Suzuki**, **Seitaro Tani**, **Zheqing Sun, Takahide Sakamoto,** Tokyo Metropolitan Univ. (Japan)

Coffee Break 3:05 PM - 3:35 PM

SESSION 4: REAL-TIME AND SINGLE-SHOT DYNAMICS

28 January 2025 • 3:35 PM - 5:05 PM | Moscone South, Room 314 (Level 3)
Session Chair(s): **Daniel R. Solli**, UCLA Samueli School of Engineering (United States)

13348-16 • 3:35 PM - 3:55 PM
Reaching higher speed and sensitivity with single-THz-pulse and single-THz-photon detection *(Invited Paper)*
Author(s): **Angela Gamouras,** National Research Council Canada (Canada); **Nicolas Couture**, **Wei Cui,** Univ. of Ottawa (Canada); **Markus Lippl,** Max-Planck-Institut für die Physik des Lichts (Germany); **Défi J. Jubgang Fandio**, **Aswin Vishnu Radhan**, **Eeswar K. Yalavarthi**, **Rachel Ostic,** Univ. of Ottawa (Canada); **Nicolas Joly,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Jean-Michel Ménard,** Univ. of Ottawa (Canada)

13348-17 • 3:55 PM - 4:15 PM
Observing spectral fluctuations in single nanocrystals across multiple time scales *(Invited Paper)*
Author(s): **Ron Tenne**, **Frieder Conradt**, **Philipp Gebauer,** Univ. Konstanz (Germany); **Chenglian Zhu,** ETH Zurich (Switzerland); **Eva Haage,** Univ. Konstanz (Germany); **Ihor Cherniukh,** ETH Zurich (Switzerland); **Claudio Bruschini,** EPFL (Switzerland); **Gabriele Raino,** ETH Zurich (Switzerland); **Edoardo Charbon,** EPFL (Switzerland); **Maksym Kovalenko,** ETH Zurich (Switzerland); **Alfred Leitenstorfer,** Univ. Konstanz (Germany)

13348-18 • 4:15 PM - 4:35 PM
Single-shot polarization imaging by machine learning *(Invited Paper)*
Author(s): **Davide Pierangeli**, **Alessandro Petrini,** Consiglio Nazionale delle Ricerche (Italy); **Claudio Conti,** Sapienza Univ. di Roma (Italy)

13348-19 • 4:35 PM - 4:50 PM
Single-shot attosecond XFEL diagnostics for online x-ray characterization
Author(s): **Jack E. Hirschman,** Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); **Benjamin Mencer,** SLAC National Accelerator Lab. (United States), Univ. of California, Santa Cruz (United States); **Amanda Shackelford,** SLAC National Accelerator Lab. (United States), Univ. of Colorado Boulder (United States); **Razib Obaid, Ryan Coffee,** SLAC National Accelerator Lab. (United States)

13348-20 • 4:50 PM - 5:05 PM
Reflection and backscattering of IR radiation from free space laser plasmas in air
Author(s): **Kristofer C. Meehan**, **Boyu Zhang**, **Jose Chirinos**, **Xianglei Mao, Vassilia Zorba,** Lawrence Berkeley National Lab. (United States)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13348-21 • 6:00 PM - 8:00 PM
Live M-squared (M2) measurement extended to the SWIR wavelengths
Author(s): **Diego Ormaechea**, **Cynthia Ibrahim**, **Xavier Levecq, Rafael Porcar-Guezenec,** Imagine Optic SA (France)

13348-23 • 6:00 PM - 8:00 PM
ms-time resolution Raman spectroscopy using sCMOS cameras
Author(s): **Andrew Carpenter**, **Jenny Goulden**, **Antoine Varagnat,** Oxford Instruments (United Kingdom); **Niels Klement**, **Wesley R. Browne,** Univ. of Groningen (Netherlands); **Hideaki Kano,** Keio Univ. (Japan)

CONFERENCE 13349

Laser Resonators, Microresonators, and Beam Control XXVII

28 - 29 January 2025 | Moscone South, Room 207 (Level 2)

Conference Chair(s): **Vladimir S. Ilchenko,** Jet Propulsion Lab. (United States); **Andrea M. Armani,** The Univ. of Southern California (United States); **Julia V. Sheldakova,** AKA Optics SAS (France)

Conference Co-Chair(s): **Alexis V. Kudryashov,** Sadovsky Institute of Geosphere Dynamics (Russian Federation); **Andrey B. Matsko,** Jet Propulsion Lab. (United States)

Program Committee: **Victor Brasch,** CSEM SA (Switzerland); **David Burghoff,** The Univ. of Texas at Austin (United States); **Yanne K. Chembo,** Institute for Research in Electronics & Applied Physics (United States), Univ. of Maryland, College Park (United States); **Francesco Dell'Olio,** Politecnico di Bari (Italy); **Jean-Claude M. Diels,** The Univ. of New Mexico (United States); **Avik Dutt,** Univ. of Maryland, College Park (United States); **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa); **Stefan Hambücker,** INGENERIC GmbH (Germany); **Tobias J. Kippenberg,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **James R. Leger,** Univ. of Minnesota, Twin Cities (United States); **Gregory Moille,** Univ. of Maryland, College Park (United States); **Gualtiero Nunzi Conti,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Marco Piccardo,** Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Nicolás Quesada,** Polytechnique Montréal (Canada); **Michael J. Scaggs,** Haas Laser Technologies, Inc. (United States); **Harald G. L. Schwefel,** Univ. of Otago (New Zealand); **Haiyin Sun,** Special Optics (United States); **Hossein Taheri,** Univ. of California, Riverside (United States); **Kai Wang,** McGill Univ. (Canada); **Jonathan M. Ward,** Okinawa Institute of Science and Technology Graduate Univ. (Japan)

Tuesday 28 January 2025

SESSION 1: NOVEL MICRODEVICES I

28 January 2025 • 8:30 AM - 9:55 AM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Vladimir S. Ilchenko**, Jet Propulsion Lab. (United States)

13349-800 • 8:30 AM - 8:35 AM
Introductory remarks
Author(s): **Vladimir S. Ilchenko,** Jet Propulsion Lab. (United States)

13349-1 • 8:35 AM - 8:55 AM
Frequency-swept feedback interferometry ranging method based on resonant-cavity enhancement
Author(s): **Weijin Meng**, **Zhigang Liu**, **Kai Tian**, **Yuqi Yu**, **Zian Wang, Junkang Guo,** Xi'an Jiaotong Univ. (China)

13349-2 • 8:55 AM - 9:15 AM
Ultrahigh finesse micro-mirrors for visible/telecom laser stabilization and neutral atom quantum computing
Author(s): **Sophie Weiyi Ding**, **Brandon Grinkemeyer**, **Eirini Mandopoulou**, **Rui Jiang**, **Kiyoul Yang**, **Mikhail Lukin, Marko Lončar,** Harvard Univ. (United States)

13349-3 • 9:15 AM - 9:35 AM
Advanced green cavity design for generating high-energy partially-coherent x-rays
Author(s): **Natalija Rigere**, **Markus Wurzer**, **Benedikt Günther**, **Chenkai Xue, Reinhard Kienberger,** Technische Univ. München (Germany)

13349-4 • 9:35 AM - 9:55 AM
Advances in wavefront shaping with bilayer metasurfaces
Author(s): **Ahmed H. Dorrah,** Technische Univ. Eindhoven (Netherlands), Harvard Univ. (United States); **Joon-Suh Park**, **Alfonso Palmieri, Federico Capasso,** Harvard Univ. (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 2: MICROCAVITY SENSORS

28 January 2025 • 10:25 AM - 12:00 PM | Moscone South, Room 207 (Level 2)

Session Chair(s): **Qing Gu**, North Carolina State Univ. (United States)

13349-5 • 10:25 AM - 10:45 AM
Frequency comb LIDAR with Kerr-induced synchronized cavity solitons
Author(s): **Sashank Kaushik Sridhar,** Univ. of Maryland, College Park (United States); **Usman A. Javid,** Univ. of Maryland, College Park (United States), National Institute of Standards and Technology (United States); **Grégory Moille,** Univ. of Maryland, College Park (United States), National Institute of Standards and Technologies (United States); **Shao-Chien Ou**, **Yichen Shen**, **Avik Dutt,** Univ. of Maryland, College Park (United States); **Kartik Srinivasan,** National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States)

13349-6 • 10:45 AM - 11:10 AM
Continuous-wave optical parametric amplification in photonic integrated circuits *(Invited Paper)*
Author(s): **Johann Riemensberger,** Norwegian Univ. of Science and Technology (Norway)

13349-7 • 11:10 AM - 11:35 AM
Microresonators for sub-nanoradian resolution *(Invited Paper)*
Author(s): **Xiaobing Zhu,** The Univ. of New Mexico (United States); **Matthias Lenzner,** Lenzner Research, LLC (United States); **Tara Drake, Jean-Claude M. Diels,** The Univ. of New Mexico (United States)

13349-8 • 11:35 AM - 12:00 PM
Rare-earth ion doped Al2O3 for on-chip lasers *(Invited Paper)*
Author(s): **Sonia Maria M. García-Blanco**, **Carlos Osornio**, **Kai Wang**, **Dawson Bonneville**, **Ward Hendriks**, **Meindert Dijkstra,** Univ. Twente (Netherlands); **Quentin Coulaud,** Univ. de Rennes (France); **Anne-Catherine Etile,** Keopsys by LUMIBIRD (France); **Ivo Hegeman,** LioniX International BV (Netherlands); **Ghaya Baili,** Thales Research & Technology (France); **Mahmoud Gaafar**, **Milan Sinobad**, **Jan Lorenzen**, **Tobias Herr**, **Neetesh Singh, Franz Kärtner,** Deutsches Elektronen-Synchrotron (Germany)

Lunch/Exhibition Break 12:00 PM - 1:45 PM

SESSION 3: MICROCOMBS I

28 January 2025 • 1:45 PM - 3:35 PM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Andrey B. Matsko**, Jet Propulsion Lab. (United States)

13349-9 • 1:45 PM - 2:05 PM
Fast synergetic simulation of soliton molecules in microresonators in the presence of noise
Author(s): **Sanzida Akter**, **Pradyoth Shandilya**, **Logan Courtright**, **Giuseppe D'Aguanno,** Univ. of Maryland, Baltimore County (United States); **Rajasekhar Anguluri,** Univ. of Maryland (United States); **Omri Gat,** The Hebrew Univ. of Jerusalem (Israel); **Curtis R. Menyuk,** Univ. of Maryland, Baltimore County (United States)

13349-10 • 2:05 PM - 2:30 PM
Existence, stability, and characteristics of pure-Kerr parametrically driven cavity solitons *(Invited Paper)*
Author(s): **Miro Erkintalo,** The Univ. of Auckland (New Zealand); **Grégory Moille,** Joint Quantum Institute (United States), National Institute of Standards and Technology (United States), Univ. of Maryland (United States); **Zongda Li**, **Miriam Leonhardt**, **David Paligora,** The Univ. of Auckland (New Zealand); **Nicolas Englebert,** Caltech (United States); **Francois Leo,** Univ. Libre de Bruxelles (Belgium); **Julien Fatome,** Lab. Interdisciplinaire Carnot de Bourgogne, CNRS (France); **Kartik Srinivasan,** Joint Quantum Institute (United States)

13349-11 • 2:30 PM - 2:50 PM
Impact of the frequency drift of a laser cooler on the phase noise of the microcomb repetition frequency
Author(s): **Tanvir Mahmood**, **James Cahill**, **Patrick Sykes,** DEVCOM Army Research Lab. (United States); **Curtis R. Menyuk,** Univ. of Maryland, Baltimore County (United States); **Weimin Zhou,** DEVCOM Army Research Lab. (United States)

13349-12 • 2:50 PM - 3:10 PM
Optical parametric trapping of an integrated dissipative Kerr soliton
Author(s): **Grégory Moille**, **Pradyoth Shandilya**, **Curtis R. Menyuk,** Univ. of Maryland, Baltimore County (United States); **Miro Erkintalo,** The Univ. of Auckland (New Zealand); **Kartik Srinivasan,** National Institute of Standards and Technology (United States)

13349-13 • 3:10 PM - 3:35 PM
Enhancing tunability and conversion efficiency of Kerr soliton microcombs in crystalline microresonators *(Invited Paper)*
Author(s): **Shun Fujii,** Keio Univ. (Japan)

Coffee Break 3:35 PM - 4:05 PM

SESSION 4: MICROCOMBS II

28 January 2025 • 4:05 PM - 5:35 PM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Andrea M. Armani**, The Univ. of Southern California (United States)

13349-14 • 4:05 PM - 4:30 PM
Quadratic bright and dark solitons in on-chip degenerate optical parametric oscillators *(Invited Paper)*
Author(s): **Nicolas Englebert,** Caltech (United States)

13349-15 • 4:30 PM - 4:55 PM
Thermorefractive noise insensitive microcombs through Kerr-Induced synchronization *(Invited Paper)*
Author(s): **Pradyoth Shandilya,** Univ. of Maryland, Baltimore County (United States); **Jordan Stone,** National Institute of Standards and Technology (United States); **Curtis R. Menyuk,** Univ. of Maryland, Baltimore County (United States); **Kartik Srinivasan,** National Institute of Standards and Technology (United States); **Grégory Moille,** Univ. of Maryland, Baltimore (United States)

13349-16 • 4:55 PM - 5:15 PM
Exploring octave-spanning solitons in photonic-crystal resonators
Author(s): **Haixin Liu**, **Jizhao Zang,** National Institute of Standards and Technology (United States), Univ. of Colorado Boulder (United States); **Travis Briles,** National Institute of Standards and Technology (United States); **Scott B. Papp,** National Institute of Standards and Technology (United States), Univ. of Colorado Boulder (United States)

13349-17 • 5:15 PM - 5:35 PM
Soliton self-injection locking to a fiber Fabry-Perot resonator with sub-100 mW pump power
Author(s): **Germain Bourcier,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France), Ctr. National d'Études Spatiales (France); **Safia Mohand Ousaid,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); **Stéphane Balac,** Institut de recherche mathematique de Rennes (France); **Julien Lumeau**, **Antonin Moreau,** Institut Fresnel (France); **Thomas Bunel**, **Arnaud Mussot,** Lab. de Physique des Lasers, Atomes et Molécules, Univ. de Lille (France); **Arnaud Fernandez, Olivier Llopis,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13349-35 • 6:00 PM - 8:00 PM
Four-channel single-sensor Shack-Hartmann metrology device for high-power laser beams
Author(s): **Ilya V. Galaktionov**, **Vladimir V. Toporovsky**, **Julia V. Sheldakova, Alexis V. Kudryashov,** Sadovsky Institute of Geosphere Dynamics (Russian Federation)

13349-37 • 6:00 PM - 8:00 PM
Whispering Gallery mode lasing with continuous-wave pumping from micro-neck structured fiber containing CdZnSe/CdS quantum dots containing micro-neck structured fiber
Author(s): **Palash Das**, **Barnali Mahato**, **Asha Bhardwaj, Sikha Menon,** Indian Institute of Science, Bengaluru (India)

13349-38 • 6:00 PM - 8:00 PM
Multi-soliton relative-jitter suppression from all-optical trapping for metrology applications
Author(s): **Pradyoth Shandilya**, **Shao-Chen Ou**, **Curtis R. Menyuk,** Univ. of Maryland, Baltimore County (United States); **Miro Erkintalo,** The Univ. of Auckland (New Zealand); **Kartik Srinivasan,** National Institute of Standards and Technology (United States); **Grégory Moille,** Univ. of Maryland, Baltimore County (United States)

13349-39 • 6:00 PM - 8:00 PM
Design of the stacked-actuator deformable mirror with high thermostabilizing efficiency
Author(s): **Vladimir V. Toporovsky**, **Pavel Kuzmitsky**, **Ilya V. Galaktionov**, **Alexis V. Kudryashov, Julia Sheldakova,** Sadovsky Institute of Geosphere Dynamics (Russian Federation)

Wednesday 29 January 2025

SESSION 5: NOVEL MICRODEVICES II

29 January 2025 • 9:00 AM - 10:05 AM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Vladimir S. Ilchenko**, Jet Propulsion Lab. (United States)

13349-18 • 9:00 AM - 9:20 AM
Photonic nanojet computation using modified Born Series
Author(s): **Mirza Karamehmedović**, **Kristoffer Linder-Steinlein,** Technical Univ. of Denmark (Denmark); **Jesper Glückstad,** Univ. of Southern Denmark (Denmark)

13349-20 • 9:20 AM - 9:40 AM
Understanding loss channels of a high-Q photonic crystal microring
Author(s): **Yi Sun**, **Daniel Pimbi**, **Roy Zektzer**, **Xiyuan Lu,** Univ. of Maryland, College Park (United States); **Kartik Srinivasan,** National Institute of Standards and Technology (United States)

13349-22 • 9:40 AM - 10:05 AM
Picometer-precise fabrication of microresonators for advanced photonic circuits using the SNAP platform *(Invited Paper)*
Author(s): **Manuel Crespo-Ballesteros, Misha Sumetsky,** Aston Univ. (United Kingdom)

Coffee Break 10:05 AM - 10:35 AM

SESSION 6: MICROWAVE PHOTONICS I

29 January 2025 • 10:35 AM - 11:45 AM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Andrey B. Matsko**, Jet Propulsion Lab. (United States)

13349-23 • 10:35 AM - 11:00 AM
Dispersion engineering of MgF2 belt resonators for frequency comb generation *(Invited Paper)*
Author(s): **Vincent Ng,** The Univ. of Auckland (New Zealand); **Luke S. Trainor**, **Harald G. L. Schwefel,** Univ. of Otago (New Zealand); **Stephane Coen**, **Miro Erkintalo, Stuart G. Murdoch,** The Univ. of Auckland (New Zealand)

13349-24 • 11:00 AM - 11:25 AM
Optical frequency division using dispersion-tunable coupled ring resonators *(Invited Paper)*
Author(s): **Qing-Xin Ji,** Caltech (United States); **Wei Zhang**, **Anatoliy Savchenkov**, **Vladimir S. Ilchenko,** Jet Propulsion Lab. (United States); **Peng Liu,** Caltech (United States); **Warren Jin,** Anello Photonics, Inc. (United States); **Joel Guo,** Univ. of California, Santa Barbara (United States); **Avi Feshali**, **Mario Paniccia,** Anello Photonics, Inc. (United States); **John Bowers,** Univ. of California, Santa Barbara (United States); **Andrey Matsko,** Jet Propulsion Lab. (United States); **Kerry Vahala,** Caltech (United States)

13349-25 • 11:25 AM - 11:45 AM
Chip-scale high-performance photonic microwave oscillator
Author(s): **Yang He**, **Long Cheng**, **Heming Wang,** hQphotonics Inc (United States); **Yu Zhang**, **Roy Meade,** Hyperlight Corp. (United States); **Kerry Vahala,** Caltech (United States); **Mian Zhang,** Hyperlight Corp. (United States); **Jiang Li,** hQphotonics Inc (United States)

Lunch/Exhibition Break 11:45 AM - 1:30 PM

SESSION 7: MICROWAVE PHOTONICS II

29 January 2025 • 1:30 PM - 3:25 PM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Andrea M. Armani**, The Univ. of Southern California (United States)

13349-26 • 1:30 PM - 1:55 PM
Resonant electro-optic upconversion for next-generation photonic radiometers *(Invited Paper)*
Author(s): **Mallika I. Suresh**, **Florian Sedlmeir,** Univ. of Otago (New Zealand); **Dominik W. Vogt,** The Univ. of Auckland (New Zealand); **Harald G. L. Schwefel,** Univ. of Otago (New Zealand)

13349-27 • 1:55 PM - 2:20 PM
Electro-optic parametric circuits as low-noise millimiter-wave receivers *(Invited Paper)*
Author(s): **Gabriel Santamaria Botello,** Colorado School of Mines (United States)

13349-28 • 2:20 PM - 2:40 PM
Photonic subsystems for a W-band radar
Author(s): **Vladimir S. Ilchenko**, **Anatoliy Savchenkov**, **Dmitry V. Strekalov**, **Wei Zhang**, **Ninoslav Majurec**, **Razi U. Ahmed, Andrey Matsko,** Jet Propulsion Lab. (United States)

13349-29 • 2:40 PM - 3:05 PM
Low noise micro- and millimeter-wave generation on chip *(Invited Paper)*
Author(s): **Igor S. Kudelin,** Nexus Photonics (United States), Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States); **William Groman,** Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States); **Qing-Xin Ji,** Caltech (United States); **Joel Guo,** Univ. of California, Santa Barbara (United States); **Megan Kelleher,** HRL Laboratories, LLC (United States); **Dahyeon Lee,** Univ. of Colorado Boulder (United States); **Takuma Nakamura**, **Charles McLemore,** Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States); **Pedram Shirmohammadi**, **Samin Hanifi**, **Junwu Bai,** Univ. of Virginia (United States); **Haotian Cheng**, **Naijun Jin,** Yale Univ. (United States); **Chao Xiang,** Univ. of California, Santa Barbara (United States); **Peter Rakich,** Yale Univ. (United States); **Vladimir S. Iltchenko**, **Andrey Matsko,** Jet Propulsion Lab. (United States); **Joe C. Campbell**, **Steven Bowers,** Univ. of Virginia (United States); **John Bowers,** Univ. of California, Santa Barbara (United States); **Kerry Vahala,** Caltech (United States); **Franklyn Quinlan,** National Institute of Standards and Technology (United States); **Scott Diddams,** Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States)

13349-30 • 3:05 PM - 3:25 PM
On-chip optical sources from THz to optical frequencies
Author(s): **Qing Gu,** North Carolina State Univ. (United States)

Coffee Break 3:25 PM - 3:55 PM

SESSION 8: BEAM CONTROL

29 January 2025 • 3:55 PM - 5:15 PM | Moscone South, Room 207 (Level 2)
Session Chair(s): **Vladimir S. Ilchenko**, Jet Propulsion Lab. (United States)

13349-31 • 3:55 PM - 4:15 PM
Spatial beam self-cleaning: from non-equilibrium to thermalization of nonlinear multimode fiber modes
Author(s): **Fabio Mangini,** Sapienza Univ. di Roma (Italy); **Mario Ferraro,** Univ. della Calabria (Italy); **Wasyhun Gemechu**, **Yifan Sun,** Sapienza Univ. di Roma (Italy); **Mikhail Gervaziev**, **Denis Kharenko,** Novosibirsk State Univ. (Russian Federation), Institute of Automation and Electrometry (Russian Federation); **Sergey Babin,** Institute of Automation and Electrometry (Russian Federation), Novosibirsk State Univ. (Russian Federation); **Vincent Couderc,** Univ. de Limoges (France); **Stefan Wabnitz,** Sapienza Univ. di Roma (Italy)

13349-32 • 4:15 PM - 4:35 PM
Wavefront-sensing based approach for Spatio-Temporal Couplings analysis of broadband femtosecond pulses
Author(s): **Xavier Levecq**, **Alok Kumar Pandey**, **Jerome Legrand, Lionel Nicolas,** Imagine Optic SA (France)

13349-33 • 4:35 PM - 4:55 PM
Broaden optical phased array beamsteering range with complementary grating emitters
Author(s): **Wuxiucheng Wang**, **Sasanka Munasinghe, Hui Wu,** Univ. of Rochester (United States)

13349-34 • 4:55 PM - 5:15 PM
Long term evaluation of industrial grade hollow-core fiber beam delivery system for short pulse lasers with average power of up to 150W
Author(s): **Benoít Beaudou**, **Matthieu Chafer**, **Ando Randromahefa**, **Alexandre Gorse,** GLOphotonics (France); **Fetah Benabid,** GLOphotonics (France), XLIM, Univ. de Limoges, CNRS (France)

CONFERENCE 13350

Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XXX

27 - 29 January 2025 | Moscone South, Room 308 (Sessions 1&4 in Room 214)

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Conference Chair(s): **Jan Kleinert,** MKS Instruments, Inc. (United States); **Godai Miyaji,** Tokyo Univ. of Agriculture and Technology (Japan); **Gwenn Pallier,** CAILabs (France)

Program Committee: **Craig B. Arnold,** Princeton Univ. (United States); **Martynas Beresna,** Univ. of Southampton (United Kingdom); **Laura Gemini,** ALPhANOV (France); **Satoshi Hasegawa,** Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Guido Hennig,** Daetwyler Graphics AG (Switzerland); **Jürgen Ihlemann,** Institut für Nanophotonik Göttingen e.V. (Germany); **Yusuke Ito,** The Univ. of Tokyo (Japan); **Tetsuya Makimura,** Univ. of Tsukuba (Japan); **Inka B. Manek-Hönninger,** Ctr. Lasers Intenses et Applications (France); **Carlos Molpeceres**, **Miguel Morales,** Univ. Politécnica de Madrid (Spain); **Yoshiki Nakata,** Osaka Univ. (Japan); **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan); **Beat Neuenschwander,** Berner Fachhochschule Technik und Informatik (Switzerland); **Jie Qiao,** Rochester Institute of Technology (United States); **Gediminas Raciukaitis,** Ctr. for Physical Sciences and Technology (Lithuania); **Joel Schrauben,** MKS Instruments, Inc. (United States); **Felix Sima,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); **Paul Somers,** Karlsruher Institut für Technologie (Germany); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan); **Mitsuhiro Terakawa,** Keio Univ. (Japan); **Onur Tokel,** Bilkent Univ. (Turkey); **Xianfan Xu,** Purdue Univ. (United States)

Monday 27 January 2025

SESSION 1: GLASS DRILLING: JOINT SESSION WITH 13350 AND 13351

27 January 2025 • 8:05 AM - 10:05 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)

13350-1 • 8:05 AM - 8:35 AM
Pump-probe shadography of glass drilling in different femtosecond burst regimes *(Invited Paper)*
Author(s): **Inka B. Manek-Hönninger**, **Pierre Balage,** Ctr. Lasers Intenses et Applications (France); **Théo Guilberteau,** Ctr. Lasers Intenses et Applications (France), ALPhANOV (France); **Manon Lafargue,** Ctr. Lasers Intenses et Applications (France), Amplitude (France); **Guillaume Bonamis**, **Clemens Hönninger,** Amplitude (France); **John Lopez,** Ctr. Lasers Intenses et Applications (France)

13350-2 • 8:35 AM - 8:55 AM
Single-step fabrication of high-aspect-ratio through-glass vias using ultrafast fiber laser
Author(s): **Bogusz Stępak**, **Natalia Grudzien**, **Rafał Smolin,** Fluence sp. z o.o (Poland); **Yuriy Stepanenko,** Fluence sp. z o.o (Poland), Institute of Physical Chemistry PAS (Poland); **Michał Nejbauer,** Fluence sp. z o.o (Poland)

13351-1 • 8:55 AM - 9:15 AM
Percussion drilling of high aspect ratio TGVs with femtosecond GHz burst lasers
Author(s): **Mykolas Karpavicius,** Light Conversion, UAB (Lithuania); **Simas Butkus,** Light Conversion, UAB (Lithuania), Vilnius Univ. (Lithuania); **Kamile Kasaciunaite,** Light Conversion, UAB (Lithuania)

13351-2 • 9:15 AM - 9:35 AM
Formation of through-glass vias (TGVs) in glass substrates using femtosecond laser operating in MHz/GHz burst mode
Author(s): **Deividas Andriukaitis,** EKSPLA (Lithuania); **Valdemar Stankevič,** Akoneer (Lithuania); **Evaldas Kažukauskas,** Akoneer (Lithuania), Laser Research Center, Vilnius University (Lithuania); **Paulius Gečys,** Ctr. for Physical Sciences and Technology (Lithuania)

13351-3 • 9:35 AM - 10:05 AM
Micro-via processing in glass material using long pulse KrF excimer laser for semiconductor interposer packaging *(Invited Paper)*
Author(s): **Yasufumi Kawasuji**, **Akira Suwa**, **Yasuhiro Adachi**, **Tomonari Tanaka, Kouji Kakizaki,** Gigaphoton Inc. (Japan)

Break 10:05 AM - 1:05 PM

SESSION 2: GLASS AND OPTICS MACHINING

27 January 2025 • 1:05 PM - 3:15 PM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Godai Miyaji**, Tokyo Univ. of Agriculture and Technology (Japan)

13350-3 • 1:05 PM - 1:35 PM
Revolutionizing optical data storage: high-speed, long-term solution with physically laser ablated matrices on ceramic-on-glass sheets *(Invited Paper)*
Author(s): **Lukas Kreuziger,** Cerabyte GmbH (Germany); **Andreas Otto,** TU Wien (Austria)

13350-4 • 1:35 PM - 2:05 PM
Hollow core waveguides for intense laser fields manipulation *(Invited Paper)*
Author(s): **Rebeca Martínez Vázquez,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13350-5 • 2:05 PM - 2:25 PM
Benefits of sub 100 fs pulses for laser micromachining of glasses and crystals
Author(s): **Beat Neuenschwander**, **Christian Nussbaum**, **Simon Walker,** Berner Fachhochschule Technik und Informatik (Switzerland); **Christian Franke**, **Kilian Fritsch, Oleg Pronin,** n2-Photonics GmbH (Germany)

13350-6 • 2:25 PM - 2:45 PM
High-precision polishing of glass using gigahertz femtosecond lasers
Author(s): **Jie Qiao**, **Gong Chen, Cyril Otieno,** Rochester Institute of Technology (United States)

13350-7 • 2:45 PM - 3:15 PM
Fabrication of terahertz meta-optics using ultrashort pulse laser processing *(Invited Paper)*
Author(s): **Kuniaki Konishi,** The Univ. of Tokyo (Japan)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 3: ADDITIVE

28 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Zhibin Lin**, MKS Instruments Ltd. (United States)

13350-8 • 8:00 AM - 8:30 AM
Additive nanomanufacturing of multimaterial and multifunctional electronics *(Invited Paper)*
Author(s): **Masoud Mahjouri-Samani**, **Adib Taba**, **Aarsh Patel**, **Suman Jaiswal**, **Shahrouz Zamani Khalajabadi, Colton Bevel,** Auburn Univ. (United States)

13350-9 • 8:30 AM - 9:00 AM
Dynamics and mechanisms of laser-based metal additive manufacturing processes *(Invited Paper)*
Author(s): **Lianyi Chen,** Univ. of Wisconsin-Madison (United States)

13350-10 • 9:00 AM - 9:20 AM
Photothermal laser printing of sub-micrometer crystalline material for microelectronics
Author(s): **Paul Somers**, **Matthias Steurer**, **Kristian Kraft**, **Lukas Grünewald**, **Steven Kraus**, **Florian Feist**, **Bastian Weinert**, **Erich Müller**, **Stefanie Dehnen**, **Yolita M. Eggeler**, **Claus Feldmann,** Karlsruher Institut für Technologie (Germany); **Christopher Barner-Kowollik,** Queensland Univ. of Technology (Australia), Karlsruher Institut für Technologie (Germany); **Martin Wegener,** Karlsruher Institut für Technologie (Germany)

13350-11 • 9:20 AM - 9:40 AM
3D direkt laser fabrication of ultrasound transducers
Author(s): **Erik Hagen Waller,** Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Anette Jacob,** Fraunhofer-Institut für Biomedizinische Technik IBMT (Germany); **Georg von Freymann,** Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Frank Tiefensee,** Fraunhofer-Institut für Biomedizinische Technik IBMT (Germany)

13350-12 • 9:40 AM - 10:00 AM
Powder-bed-fusion-inspired additive manufacturing of freeform graphene aerogels via laser upcycling of biowaste hemoglobin protein
Author(s): **Shuichiro Hayashi**, **Marco Rupp**, **Jason X. Liu**, **Ankit Das, Craig B. Arnold,** Princeton Univ. (United States)

Coffee Break 10:00 AM - 10:15 AM

SESSION 4: UV/DUV PROCESSING: JOINT SESSION WITH 13350 AND 13351

28 January 2025 • 10:15 AM - 11:45 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)

13350-13 • 10:15 AM - 10:45 AM
Current state of laser drilling of µVias in PCB production *(Invited Paper)*
Author(s): **Stefan Janssen**, **Taekyung Kim**, **Bukuk Oh**, **Min Jin Kang**, **Doo Young Kim**, **Myung Joo Park, Soo Hoa Jeong,** LG Electronics Inc. (Korea, Republic of)

13351-18 • 10:45 AM - 11:05 AM
Highly efficient UV and DUV laser micro- and nanoprocessing for microelectronics applications
Author(s): **Serhiy Danylyuk**, **Lutz Deriks**, **Julian Huertgen,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Rene Faber**, **Rik Maes,** RWTH Aachen Univ. (Germany); **Ralph F. Delmdahl,** Coherent LaserSystems GmbH & Co. KG (Germany); **Ralf Knappe,** Coherent Corp. (Germany); **Arnold Gillner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13351-19 • 11:05 AM - 11:25 AM
UV and DUV laser cutting of OLED displays for an enlarged active area
Author(s): **Oliver Haupt**, **Fabian Sörensen**, **Ralf Knappe, Alexej Belakowski,** Coherent Corp. (Germany)

13351-20 • 11:25 AM - 11:45 AM
High throughput processing of polymer and composite materials by high power nanosecond UV pulses
Author(s): **David Horain,** Bloom Lasers (France); **Laura Gemini**, **Florent Husson**, **Marc Faucon,** ALPhANOV (France); **Julien Didierjean, Julien Saby,** Bloom Lasers (France)

Lunch/Exhibition Break 11:45 AM - 1:45 PM

SESSION 5: DIRECT WRITE

28 January 2025 • 1:45 PM - 3:35 PM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Jie Qiao**, Rochester Institute of Technology (United States)

13350-14 • 1:45 PM - 2:15 PM
Laser writing in diamond: devices to gems *(Invited Paper)*
Author(s): **Patrick S. Salter,** Univ. of Oxford (United Kingdom)

13350-15 • 2:15 PM - 2:35 PM
GHz burst mode femtosecond laser processing for improving resolution of two-photon polymerization
Author(s): **Ashkan MomeniBidzard,** RIKEN Ctr. for Advanced Photonics (Japan); **Shota Kawabata,** RIKEN Ctr. for Advanced Photonics (Japan), Tokyo Univ. of Agriculture and Technology (Japan); **Kotaro Obata,** RIKEN Ctr. for Advanced Photonics (Japan); **Mirai Hanzawa,** RIKEN Ctr. for Advanced Photonics (Japan), Tokyo Univ. of Agriculture and Technology (Japan); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

13350-16 • 2:35 PM - 2:55 PM
Direct laser writing of semicylindrical conductive structures encircled by graphene quantum dots
Author(s): **Kosuke Tsukada, Mitsuhiro Terakawa,** Keio Univ. (Japan)

13350-17 • 2:55 PM - 3:15 PM
Ultrashort pulsed laser direct-write technology for rapid prototyping of MEMS devices
Author(s): **Nicholas May**, **Hongbin Choi**, **Marcus Emanuel**, **Parisa Mahyari**, **Matthew Maniscalco**, **Todor Bliznakov**, **Toni Moore**, **Mohammad Taghi Mohammadi Anaei**, **Adrian Phoulady**, **Alexander Blagojevic**, **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

13350-18 • 3:15 PM - 3:35 PM
Engineering complex tissue-like scaffolds by two photon polymerization for testing cancer cell behavior in confined environments
Author(s): **Alexandra Bran**, **Florin Jipa**, **Anca Bonciu,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); **Stefana Orobeti,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Academia Romana (Romania); **Emanuel Axente,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); **Livia E. Sima,** Academia Romana (Romania); **Felix Sima,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), RIKEN Ctr. for Advanced Photonics (Japan); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

Coffee Break 3:35 PM - 4:05 PM

SESSION 6: SENSING AND CMOS

28 January 2025 • 4:05 PM - 5:25 PM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Kuniaki Konishi**, The Univ. of Tokyo (Japan)

13350-20 • 4:05 PM - 4:25 PM
Optical coherence tomography for in situ weld seam monitoring in absorber-free laser transmission welding
Author(s): **Frederik Maiwald**, **Fabian Fries**, **Julian Schulze,** Ostbayerische Technische Hochschule Regensburg (Germany); **Petra Honnerová,** New Technologies Research Centre (NTC), University of West Bohemia (Czech Republic); **Stefan Hierl,** Laser Material Processing Laboratory, Ostbayerische Technische Hochschule Regensburg (Germany); **Michael Schmidt,** Institute of Photonic Technologies, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), Erlangen Graduate School in Advanced Optical Technologies (SAOT) (Germany)

13350-21 • 4:25 PM - 4:45 PM
Sustainable digital photocorrosion of GaAs/Al0.35Ga0.65As nanoheterostructures
Author(s): **René St-Onge**, **Jan Dubowski, Walid M. Hassen,** Univ. de Sherbrooke (Canada)

13350-22 • 4:45 PM - 5:05 PM
Lightwave and millimeter wave optoelectronic computing with the sub-1nm microwave photonic CMOS technology - circuit design considerations suitable for nano wireless ultra-large-scale integration
Author(s): **James N. Pan,** Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

13350-44 • 5:05 PM - 5:25 PM
Ablation of different materials with sub-100 fs pulses
Author(s): **Gregor Hehl**, **Rashad Esloughi**, **Cheriyan Varghese**, **Oleg Pronin, Moinuddin Kadiwala,** Helmut-Schmidt Univ. (Germany)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13350-31 • 6:00 PM - 8:00 PM
Integrated ultra-high-speed vertical NAND FLASH VCSEL and high-power CMOS VCSEL for advanced silicon photonics applications
Author(s): **James N. Pan,** Northrop Grumman Corp. (United States)

13350-32 • 6:00 PM - 8:00 PM
Experimental and numerical study of dual-laser annealing process for semiconductor fabrication
Author(s): **Rasheed A. Taiwo**, **Joonghan Shin, Yeongil Son,** Kongju National Univ. (Korea, Republic of)

13350-34 • 6:00 PM - 8:00 PM
Performance limit of wet laser cleaning processes for nanoscale particle removal
Author(s): **Haeju Park**, **Geonwoo Hyun, Dongsik Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13350-35 • 6:00 PM - 8:00 PM
Homogeneous periodic surface nanostructures formed by interference of square flattop femtosecond laser pulses
Author(s): **Takemasa Sumimoto, Godai Miyaji,** Tokyo Univ. of Agriculture and Technology (Japan)

13350-36 • 6:00 PM - 8:00 PM
A study on laser induced graphene sensors with high strength and flexible properties using polyethylene packaging
Author(s): **Jung Yeong Nam, Bosung Shin,** Pusan National Univ. (Korea, Republic of)

13350-37 • 6:00 PM - 8:00 PM
Experimental study on blue diode laser induced powder bed fusion of Ti-6Al-4V for improvement of energy efficiency
Author(s): **Koki Maeda,** Kindai Univ. (Japan); **Keisuke Takenaka**, **Yuji Sato,** Joining and Welding Research Institute, Osaka Univ. (Japan); **Hitoshi Nakano,** Kindai Univ. (Japan); **Masahiro Tsukamoto,** Joining and Welding Research Institute, Osaka Univ. (Japan)

13350-38 • 6:00 PM - 8:00 PM
Effect of beam shaping on spatter suppression in keyhole welding using 16kW disk laser
Author(s): **Masashi Nakatani,** Osaka Univ. (Japan); **Masami Mizutani,** Joining and Welding Research Institute, Osaka Univ. (Japan); **Tomomasa Ohkubo,** Tokyo Univ. of Technology (Japan); **Yuji Sato, Masahiro Tsukamoto,** Joining and Welding Research Institute, Osaka Univ. (Japan)

13350-40 • 6:00 PM - 8:00 PM
UV laser beam lithography for ultra-deep epoxy-based structures
Author(s): **Anna Casimiro**, **Kahraman Keskinbora**, **Sander Schellingerhout, Jacco Houter,** Raith Laser Systems B.V. (Netherlands)

13350-41 • 6:00 PM - 8:00 PM
Controlling 6 beam interference pattern shape of variable wavelength laser using Spatial Light Modulator
Author(s): **Tomoya Hosokawa**, **Shohei Ueda**, **Yuki Kosaka, Yoshiki Nakata,** Osaka Univ. (Japan)

13350-43 • 6:00 PM - 8:00 PM
Direct laser printing of VO2 microelectronics with integrated memristive and optoelectronic sensing capabilities
Author(s): **Liang Yang**, **Dayu Li**, **Yusheng Zhang**, **Wenxiang Hou**, **Xun Wang, Miao Ding,** Univ. of Science and Technology of China (China)

Wednesday 29 January 2025

SESSION 7: 30 YEAR ANNIVERSARY SESSION

29 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Gwenn Pallier**, CAILabs (France)

13350-23 • 8:00 AM - 8:30 AM
New frontiers in ultrafast laser processing *(Invited Paper)*
Author(s): **Eric P. Mottay,** h-nu (France)

13350-24 • 8:30 AM - 9:00 AM
Ultrafast laser 3D and volume processing of transparent materials *(Invited Paper)*
Author(s): **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

13350-25 • 9:00 AM - 9:30 AM
Laser 3D processing *(Invited Paper)*
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

13350-26 • 9:30 AM - 10:00 AM
Simulation-based laser process development for industrial laser micromachining applications *(Invited Paper)*
Author(s): **Zhibin Lin**, **Omid A. Ranjbar**, **Joel N Schrauben**, **Hisashi Matsumoto, Jan Kleinert,** MKS Instruments Ltd. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 8: ANNEALING AND SOLAR PROCESSES

29 January 2025 • 10:30 AM - 11:40 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)

13350-27 • 10:30 AM - 11:00 AM
Laser annealing for scalable frequency control on multi-qubit quantum processors *(Invited Paper)*
Author(s): **Eric J. Zhang,** IBM Thomas J. Watson Research Ctr. (United States)

13350-28 • 11:00 AM - 11:20 AM
LIFT and laser sintering of silver paste for silicon solar cells metallization
Author(s): **Cristina Muñoz-Garcia**, **David Canteli**, **Maria Canillas**, **David Muñoz-Martín**, **Sara Lauzurica**, **Miguel Morales Furió,** Univ. Politécnica de Madrid (Spain); **Miguel Ángel Rodriguez,** Instituto de Cerámica y Vidrio (Spain); **Carlos Molpeceres,** Univ. Politécnica de Madrid (Spain)

13350-29 • 11:20 AM - 11:40 AM
Laser processing for monolithic interconnection of kesterite thin-film modules
Author(s): **David Muñoz-Martín**, **David Canteli**, **Cristina Muñoz-Garcia**, **Sara Lauzurica,** Univ. Politécnica de Madrid (Spain); **Pedro Vidal Fuentes**, **Jacob Andrade-Arvizu**, **Victor Izquierdo-Roca,** Institut de Recerca en Energia de Catalunya (Spain); **Carlos Molpeceres, Miguel Morales Furió,** Univ. Politécnica de Madrid (Spain)

LAMOM BEST STUDENT PRESENTATIONS AWARD CEREMONY

29 January 2025 • 11:40 AM - 11:50 AM | Moscone South, Room 308 (Level 3)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)
Sponsored by Okamoto Optics, Inc. (Japan) and Plymouth Grating Laboratory, Inc. (United States)

CONFERENCE 13351

Laser-based Micro- and Nanoprocessing XIX

27 - 30 January 2025 | Moscone South, Room 214 (Level 2)

Conference Chair(s): **Rainer Kling,** Berner Fachhochschule (Switzerland); **Wilhelm Pfleging,** Karlsruhe Institute of Technology (Germany); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

Program Committee: **Claude Aguergaray,** The Univ. of Auckland (New Zealand); **Antonio Ancona,** Univ. degli Studi di Bari Aldo Moro (Italy); **Ya Cheng,** Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Jiyeon Choi,** Korea Institute of Machinery & Materials (Korea, Republic of); **Francois Courvoisier,** FEMTO-ST Institute, CNRS and Univ. Franche-Comte (France); **Martí Duocastella,** Univ. de Barcelona (Spain); **Oliver Haupt,** Coherent LaserSystems GmbH & Co. KG (Germany); **Miguel Holgado Bolaños,** Univ. Politécnica de Madrid (Spain); **SeungYeon Kang,** Univ. of Connecticut (United States); **Andrés-Fabián Lasagni,** TU Dresden (Germany); **Yongfeng Lu,** Univ. of Nebraska-Lincoln (United States); **Futoshi Matsumoto,** Kanagawa Univ. (Japan); **Razvan Stoian,** Lab. Hubert Curien (France); **Emmanuel Stratakis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); **Shuntaro Tani,** Univ. of Tokyo (Japan); **Mitsuhiro Terakawa,** Keio Univ. (Japan); **Michael J. Withford,** Macquarie Univ. (Australia); **Xin Zhao,** Clemson Univ. (United States); **Craig A. Zuhlke,** Univ. of Nebraska-Lincoln (United States)

Monday 27 January 2025

SESSION 1: GLASS DRILLING: JOINT SESSION WITH 13350 AND 13351

27 January 2025 • 8:05 AM - 10:05 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)

13350-1 • 8:05 AM - 8:35 AM
Pump-probe shadography of glass drilling in different femtosecond burst regimes *(Invited Paper)*
Author(s): **Inka B. Manek-Hönninger**, **Pierre Balage,** Ctr. Lasers Intenses et Applications (France); **Théo Guilberteau,** Ctr. Lasers Intenses et Applications (France), ALPhANOV (France); **Manon Lafargue,** Ctr. Lasers Intenses et Applications (France), Amplitude (France); **Guillaume Bonamis**, **Clemens Hönninger,** Amplitude (France); **John Lopez,** Ctr. Lasers Intenses et Applications (France)

13350-2 • 8:35 AM - 8:55 AM
Single-step fabrication of high-aspect-ratio through-glass vias using ultrafast fiber laser
Author(s): **Bogusz Stępak**, **Natalia Grudzien**, **Rafał Smolin,** Fluence sp. z o.o (Poland); **Yuriy Stepanenko,** Fluence sp. z o.o (Poland), Institute of Physical Chemistry PAS (Poland); **Michał Nejbauer,** Fluence sp. z o.o (Poland)

13351-1 • 8:55 AM - 9:15 AM
Percussion drilling of high aspect ratio TGVs with femtosecond GHz burst lasers
Author(s): **Mykolas Karpavicius,** Light Conversion, UAB (Lithuania); **Simas Butkus,** Light Conversion, UAB (Lithuania), Vilnius Univ. (Lithuania); **Kamile Kasaciunaite,** Light Conversion, UAB (Lithuania)

13351-2 • 9:15 AM - 9:35 AM
Formation of through-glass vias (TGVs) in glass substrates using femtosecond laser operating in MHz/GHz burst mode
Author(s): **Deividas Andriukaitis,** EKSPLA (Lithuania); **Valdemar Stankevič,** Akoneer (Lithuania); **Evaldas Kažukauskas,** Akoneer (Lithuania), Laser Research Center, Vilnius University (Lithuania); **Paulius Gečys,** Ctr. for Physical Sciences and Technology (Lithuania)

13351-3 • 9:35 AM - 10:05 AM
Micro-via processing in glass material using long pulse KrF excimer laser for semiconductor interposer packaging *(Invited Paper)*
Author(s): **Yasufumi Kawasuji**, **Akira Suwa**, **Yasuhiro Adachi**, **Tomonari Tanaka, Kouji Kakizaki,** Gigaphoton Inc. (Japan)

Coffee Break 10:05 AM - 10:35 AM

SESSION 2: BURST MODE PROCESSING

27 January 2025 • 10:35 AM - 12:25 PM | Moscone South, Room 214 (Level 2)

Session Chair(s): **Rainer Kling**, Berner Fachhochschule (Switzerland)

13351-4 • 10:35 AM - 11:05 AM
Laser patterning for micro display using GHz and MHz bursts *(Invited Paper)*
Author(s): **Hyungsik Kim,** SAMSUNG Display Co., Ltd. (Korea, Republic of)

13351-5 • 11:05 AM - 11:25 AM
Surface nanostructuring by using circularly polarized GHz burst mode femtosecond laser pulses
Author(s): **Shota Kawabata,** RIKEN Ctr. for Advanced Photonics (Japan), Tokyo Univ. of Agriculture and Technology (Japan); **Felix Sima,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), RIKEN Ctr. for Advanced Photonics (Japan); **Livia Elena Sima,** Academia Romana (Romania); **Stefana Orobeti,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Academia Romana (Romania); **Shigeru Uchiyama**, **Takashi Isoshima**, **Kozunari Ozasa**, **Kotaro Obata,** RIKEN Ctr. for Advanced Photonics (Japan); **Mirai Hanzawa,** Tokyo Univ. of Agriculture and Technology (Japan), RIKEN Ctr. for Advanced Photonics (Japan); **Shi Bai,** RIKEN Ctr. for Advanced Photonics (Japan); **Godai Miyaji,** Tokyo Univ. of Agriculture and Technology (Japan); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

13351-6 • 11:25 AM - 11:45 AM
Femtosecond GHz bursts for surface laser polishing
Author(s): **Andrius Žemaitis**, **Saulė Steponavičiūtė**, **Paulius Gečys, Mindaugas Gedvilas,** Ctr. for Physical Sciences and Technology (Lithuania)

13351-7 • 11:45 AM - 12:05 PM
Mechanism of ablation efficiency enhancement of copper by GHz burst mode of green wavelength fs laser
Author(s): **Ashkan MomeniBidzard,** RIKEN Ctr. for Advanced Photonics (Japan); **Shota Kawabata,** RIKEN Ctr. for Advanced Photonics (Japan), Tokyo Univ. of Agriculture and Technology (Japan); **Kotaro Obata, Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

13351-8 • 12:05 PM - 12:25 PM
Gigahertz laser ablation of lithium nickel manganese cobalt oxide for lithium-ion batteries
Author(s): **Niclas Straßburger**, **Penghui Zhu, Wilhelm Pfleging,** Karlsruher Institut für Technologie (Germany)

Lunch Break 12:25 PM - 1:25 PM

SESSION 3: LASER PROCESSING FOR LI-ION BATTERY

27 January 2025 • 1:25 PM - 3:15 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Wilhelm Pfleging**, Karlsruher Institut für Technologie (Germany)

13351-9 • 1:25 PM - 1:55 PM
Optimizing and upscaling of USP laser structuring for 3D lithium-ion battery electrodes for fast-charging and reduced lithium plating *(Invited Paper)*
Author(s): **Yannic Sterzl,** Karlsruher Institut für Technologie (Germany); **Shizhou Xiao,** EdgeWave GmbH (Germany); **Martin Pulst,** EAS Batteries GmbH (Germany); **Wilhelm Pfleging,** Karlsruher Institut für Technologie (Germany)

13351-10 • 1:55 PM - 2:15 PM
High throughput femtosecond laser processing for new generation battery
Author(s): **Girolamo Mincuzzi,** ALPhANOV (France); **Paolo Tallone**, **Elisa Ravesio,** Politecnico di Torino (Italy); **Valentin Gartiser,** ALPhANOV (France); **Marco Negozio, Adrian H. A. Lutey,** Univ. degli Studi di Parma (Italy)

13351-11 • 2:15 PM - 2:35 PM
Ultrafast laser ablation of high-voltage cathodes using GHz burst mode operation
Author(s): **Carolyn Reinhold, Wilhelm Pfleging,** Karlsruher Institut für Technologie (Germany)

13351-12 • 2:35 PM - 2:55 PM
Enhancing silicon anode stability: ultrashort laser micropatterning of Cu current collector for Li-ion batteries
Author(s): **Yueran Gu,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States); **Amanda Musgrove,** Oak Ridge National Lab. (United States); **Daniel Collins-Wildman**, **Minok Park**, **Vincent Battaglia**, **Robert Kostecki,** Lawrence Berkeley National Lab. (United States); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

13351-13 • 2:55 PM - 3:15 PM
Fast cutting of lithium-ion battery electrodes with a high-power ultrashort pulse laser and temporal pulse tailoring
Author(s): **James M. Bovatsek**, **Terence Hollister,** Spectra-Physics, a division of MKS Instruments (United States); **Chandra Nathala,** Spectra-Physics, a division of MKS Instruments (Austria)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 4: TRANSPARENT MATERIALS PROCESSING I

28 January 2025 • 8:15 AM - 9:45 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Bogusz D. Stępak**, Fluence sp. z o.o (Poland)

13351-14 • 8:15 AM - 8:45 AM
Fabrication and applications of 3D large-sized and high-precision glass objects by ultrafast laser volume processing *(Invited Paper)*
Author(s): **Jian Xu**, **Yunpeng Song**, **Jianping Yu**, **Aodong Zhang,** East China Normal Univ. (China); **Ya Cheng,** East China Normal Univ. (China), Shanghai Institute of Optics and Fine Mechanics, CAS (China)

13351-15 • 8:45 AM - 9:05 AM
CELLNET technology: spatially organized, functional 3D single-cell networks using laser templated collagen
Author(s): **Pranav Soman,** Syracuse Univ. (United States)

13351-16 • 9:05 AM - 9:25 AM
Ultrafast laser processing of transparent materials for testing cancer cell behavior in tumor-on-chip models
Author(s): **Felix Sima,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); **Kotaro Obata**, **Mirai Hanzawa**, **Hiroyuki Kawano,** RIKEN Ctr. for Advanced Photonics (Japan); **Alexandra Bran**, **Florin Jipa**, **Laura Ionel**, **Stefana Orobeti**, **Emanuel Axente,** Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); **Livia Elena Sima,** Academia Romana (Romania); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan)

13351-17 • 9:25 AM - 9:45 AM
Laser processed multifunctional glass for improved photovoltaic performance
Author(s): **Jake Carter**, **Kyle Ito**, **Ryan Montis**, **David Klunder**, **Minok Park, Vassilia Zorba,** Lawrence Berkeley National Lab. (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 5: UV/DUV PROCESSING: JOINT SESSION WITH 13350 AND 13351

28 January 2025 • 10:15 AM - 11:45 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Jan Kleinert**, ESI, Inc. (United States)

13350-13 • 10:15 AM - 10:45 AM
Current state of laser drilling of µVias in PCB production *(Invited Paper)*
Author(s): **Stefan Janssen**, **Taekyung Kim**, **Bukuk Oh**, **Min Jin Kang**, **Doo Young Kim**, **Myung Joo Park, Soo Hoa Jeong,** LG Electronics Inc. (Korea, Republic of)

13351-18 • 10:45 AM - 11:05 AM
Highly efficient UV and DUV laser micro- and nanoprocessing for microelectronics applications
Author(s): **Serhiy Danylyuk**, **Lutz Deriks**, **Julian Huertgen,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Rene Faber**, **Rik Maes,** RWTH Aachen Univ. (Germany); **Ralph F. Delmdahl,** Coherent LaserSystems GmbH & Co. KG (Germany); **Ralf Knappe,** Coherent Corp. (Germany); **Arnold Gillner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13351-19 • 11:05 AM - 11:25 AM
UV and DUV laser cutting of OLED displays for an enlarged active area
Author(s): **Oliver Haupt**, **Fabian Sörensen**, **Ralf Knappe, Alexej Belakowski,** Coherent Corp. (Germany)

13351-20 • 11:25 AM - 11:45 AM
High throughput processing of polymer and composite materials by high power nanosecond UV pulses
Author(s): **David Horain,** Bloom Lasers (France); **Laura Gemini**, **Florent Husson**, **Marc Faucon,** ALPhANOV (France); **Julien Didierjean, Julien Saby,** Bloom Lasers (France)

Lunch/Exhibition Break 11:45 AM - 1:45 PM

SESSION 6: TRANSPARENT MATERIALS PROCESSING II

28 January 2025 • 1:45 PM - 3:35 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Ya Cheng**, Shanghai Institute of Optics and Fine Mechanics, CAS (China)

13351-21 • 1:45 PM - 2:15 PM
Laser manufacturing of spatial resolution approaching quantum limit *(Invited Paper)*
Author(s): **Hong-Hua Fang,** Tsinghua Univ. (China)

13351-22 • 2:15 PM - 2:35 PM
Time-evolution of 3D bulk modifications inside hard crystal using single-shot ultrafast-Bessel pulse
Author(s): **Rajeev Dwivedi,** Lab. Hubert Curien (France); **Huu Dat Nguyen,** Lab. Hubert Curien (France), Univ. Claude Bernard Lyon 1 (France); **Thirunaukkarasu Kuppan,** Lab. Hubert Curien (France); **Sergio Sao Joao,** École des Mines de Saint-Étienne (France); **Anne-Magali Seydoux-Guillaume,** Univ. Jean Monnet Saint-Etienne (France); **Ciro d'Amico, Razvan Stoian,** Lab. Hubert Curien (France)

13351-23 • 2:35 PM - 2:55 PM
Anisotropic stress generation in borosilicate glass by nanosecond excimer laser irradiation for figure correction
Author(s): **Andreas Röben, Jürgen Ihlemann,** Institut für Nanophotonik Göttingen e.V. (Germany)

13351-24 • 2:55 PM - 3:15 PM
Laser fabrication of a monolithic waveguide-lens coupler in bulk fused silica
Author(s): **Nicholas A. Smith,** Fraunhofer Ctr. for Applied Photonics (United Kingdom); **Gilles Diederich**, **Paul Blair,** PowerPhotonic Ltd. (United Kingdom); **Loyd McKnight**, **Henry T. Bookey,** Fraunhofer Ctr. for Applied Photonics (United Kingdom); **Peter J. Schlosser,** Fraunhofer UK Research Ltd. (United Kingdom)

13351-25 • 3:15 PM - 3:35 PM
Trans-timescale complex optical electric-field imaging for femtosecond laser processing of dielectric materials
Author(s): **Shotaro Kawano**, **Keiichiro Toda**, **Haruyuki Sakurai**, **Kuniaki Konishi, Takuro Ideguchi,** The Univ. of Tokyo (Japan)

Coffee Break 3:35 PM - 4:05 PM

SESSION 7: TRANSPARENT MATERIALS PROCESSING III

28 January 2025 • 4:05 PM - 5:55 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Jian Xu**, East China Normal Univ. (China)

13351-26 • 4:05 PM - 4:35 PM
Inorganic halide perovskites color-conversion layers fabricated using pulsed laser deposition for microled displays *(Invited Paper)*
Author(s): **Florian Dupont**, **Elsa Parrat, Francois Templier,** CEA (France)

13351-27 • 4:35 PM - 4:55 PM
3D target shape retention within Selective Laser-induced Etching (SLE) via simulation of chemical etching
Author(s): **Henry Axt,** RWTH Aachen Univ. (Germany); **Christian Peters,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Christian Hinke**, **Benedikt Bornschlegel,** RWTH Aachen Univ. (Germany); **Martin Kratz,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13351-28 • 4:55 PM - 5:15 PM
Selective laser-induced etched molds for forming textured polymers
Author(s): **Botond Santa**, **Yucheng Yang**, **Nishan Khadka**, **Ashok Ponnuchamy**, **Anthony Hoffman**, **Matthew Rosenberger, Edward C. Kinzel,** Univ. of Notre Dame (United States)

13351-29 • 5:15 PM - 5:35 PM
Reducing laser induced stress to enable tightly packed structures in glass fabricated with selective laser etching
Author(s): **Axel Günther,** Technische Univ. Braunschweig (Germany); **Nithin Jacob,** Hannoversches Zentrum für Optische Technologien (Germany); **Wolfgang Kowalsky,** Technische Univ. Braunschweig (Germany); **Bernhard Roth,** Hannoversches Zentrum für Optische Technologien (Germany)

13351-30 • 5:35 PM - 5:55 PM
Elongation of the transverse profile of the Optical Needle using nondiffracting Airy beams and laser microprocessing of glasses
Author(s): **Sergej Orlov**, **Paulius Šlevas**, **Karolis Mundrys, Orestas Ulčinas,** Ctr. for Physical Sciences and Technology (Lithuania)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13351-65 • 6:00 PM - 8:00 PM
Global microelectronics and laser industry trends and laser compression bonding (LCB) technology for the AI chip packaging
Author(s): **Nam Seong Kim**, **Young Soo Han**, **Young Jin Lee**, **Ji DOng CHOI, Jong Jae Yoo,** Laserssel Corp. (Korea, Republic of)

13351-66 • 6:00 PM - 8:00 PM
Demonstration of record-breaking speed capabilities in direct laser interference patterning in the UV range (343 nm)
Author(s): **Petr Hauschwitz,** Institute of Physics of the CAS, v.v.i. (Czech Republic)

13351-67 • 6:00 PM - 8:00 PM
Ultrafast laser inscription of waveguides and micro chambers for on chip gas cells
Author(s): **Henry T. Bookey**, **Harry Hall**, **Nicholas A. Smith,** Fraunhofer Ctr. for Applied Photonics (United Kingdom); **Ajoy K. Kar, Richard M. Carter,** Heriot-Watt Univ. (United Kingdom)

13351-69 • 6:00 PM - 8:00 PM
Comprehensive simulation of laser processing systems: from source to surface interaction
Author(s): **Marcus Emanuel**, **Parisa Mahyari**, **Matthew Maniscalco**, **Nicholas May**, **Hongbin Choi**, **Todor Bliznakov**, **Toni Moore**, **Mohammad Taghi Mohammadi Anaei**, **Adrian Phoulady**, **Alexander Blagojevic**, **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

13351-71 • 6:00 PM - 8:00 PM
Piercing shape control of PTFE film by short-pulse CO_2 laser with controllable parameters
Author(s): **Katsunori Negishi, Kazuyuki Uno,** Univ. of Yamanashi (Japan)

13351-73 • 6:00 PM - 8:00 PM
Damage free UV-laser pretreatment of thermoplastics for paint applications
Author(s): **Thomas Lukascyk**, **Markus Veltrup**, **Andreas Keil**, **Joerg Ihde,** Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung IFAM (Germany); **Ralph F. Delmdahl,** Coherent LaserSystems GmbH & Co. KG (Germany)

13351-75 • 6:00 PM - 8:00 PM
Numerical simulation and experimental study on laser drilling with jet electrochemical machining
Author(s): **Xianmin Li**, **Wenqiang Duan**, **Xuesong Mei, Zhenlei Li,** Xi'an Jiaotong Univ. (China)

13351-76 • 6:00 PM - 8:00 PM
Investigation of phase distribution of fiber fuse in bulk glass through shadowgraph observation with NUV backlight
Author(s): **Masataka Sato**, **Sho Itoh**, **Souta Matsusaka, Hirofumi Hidai,** Chiba Univ. (Japan)

13351-77 • 6:00 PM - 8:00 PM
Fabrication of micro/nano porous cellulose structure with UV-pulsed laser and its Molecular Dynamics simulation
Author(s): **Se Young Kwon**, **Bo Sung Shin, Su A. Kim,** Pusan National Univ. (Korea, Republic of)

13351-78 • 6:00 PM - 8:00 PM
ReaxFF-based molecular dynamics simulations of laser-induced graphene patterning process
Author(s): **Jin Su Kim**, **Sung Moo Hong,** Pusan National Univ. (Korea, Republic of); **Bo Sung Shin,** Pusan National Univ. (Kiribati, Republic of)

13351-79 • 6:00 PM - 8:00 PM
450nm-pulsed laser-aided micro-nano foaming manufacturing process and its molecular dynamics simulation
Author(s): **Cheol-Hwan Kim**, **Bo-Seok Kang**, **Chae Yoon Shin, Bo Sung Shin,** Pusan National Univ. (Korea, Republic of)

13351-80 • 6:00 PM - 8:00 PM
Direct laser printing of metal gratings for transverse displacement measurements
Author(s): **Hanzhi Tao, Shih Chi Chen,** The Chinese Univ. of Hong Kong (Hong Kong, China)

13351-81 • 6:00 PM - 8:00 PM
Polarization singularities for shaping vector beams in high-power laser micromachining of various materials
Author(s): **Sergej Orlov**, **Ernestas Nacius**, **Orestas Ulčinas, Vytautas Jukna,** Ctr. for Physical Sciences and Technology (Lithuania)

13351-82 • 6:00 PM - 8:00 PM
Modeling the selective laser sintering of printed silver nanoparticle ink on a flexible substrate
Author(s): **Sagar Verma,** Oregon State Univ. (United States); **Kevin R. Wheeler,** NASA Ames Research Ctr. (United States); **Ellie Schlake, Nirmala Kandadai,** Oregon State Univ. (United States)

13351-83 • 6:00 PM - 8:00 PM
Removal of space debris using laser ablation
Author(s): **Takayo Ogawa**, **Norihito Saito, Satoshi Wada,** RIKEN Ctr. for Advanced Photonics (Japan)

13351-84 • 6:00 PM - 8:00 PM
Laser induced carbonized nanoporous micro-via on polymer thin films for double sided flexible electronics
Author(s): **Ming-Tsang Lee,** National Tsing Hua Univ. (Taiwan)

13351-86 • 6:00 PM - 8:00 PM
Logarithmic trends in the surface characteristics of femtosecond laser produced self-organized microstructures on silicon
Author(s): **Andrew Butler**, **Rahul Rajan**, **Graham Kaufman**, **Suchit Sarin**, **Joshua Gerdes**, **George Gogos**, **Jeffrey Shield, Craig Zuhlke,** Univ. of Nebraska-Lincoln (United States)

13351-87 • 6:00 PM - 8:00 PM
Selective laser scribing of thin films for photovoltaic solar cell devices
Author(s): **David J. Hwang**, **Yiting Zheng, Insoo Kim,** Stony Brook Univ. (United States)

13351-88 • 6:00 PM - 8:00 PM
Development of laser implantation of nickel and annealing process on silicon carbide substrates
Author(s): **Rou-Jhen Chen,** Taiwan Instrument Research Institute (Taiwan); **Yu-Hsin Yang,** Department of Electrical Engineering, National Taiwan University (Taiwan); **Chi-Hung Hwang**, **Chi-Chung Kei,** Taiwan Instrument Research Institute (Taiwan); **Shiau-Cheng Shiu,** Power Mechanical Engineering, National Tsing Hua University (Taiwan); **Chun-Wei Liu,** Power Mechanical Engineering (Taiwan); **Yi-Cheng Lin**, **Wen-Tse Hsiao, Teng-I Yang,** Taiwan Instrument Research Institute (Taiwan)

13351-89 • 6:00 PM - 8:00 PM
Ultrafast laser cable marking
Author(s): **Lei Yuan**, **Xiaole Cheng,** Corning Research & Development Corporation (United States); **Randy Curtis Smith,** Corning Optical Communications LLC (United States)

13351-90 • 6:00 PM - 8:00 PM
Inverse design of corrosion resistant metal surfaces using laser processing
Author(s): **Jake Carter**, **Minok Park**, **Kyle Ito**, **Ryan Montis**, **David Klunder,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States); **James Myatt,** Capgemini S.A. (France); **Selim Coskun**, **Luis Prado,** Capgemini Engineering Deutschland S.A.S. & Co. KG (Germany); **Ramon Antelo**, **Anne-Laure Cadene,** Capgemini S.A. (France); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

13351-91 • 6:00 PM - 8:00 PM
Prolonging calendar life of silicon negative electrode: advanced femtosecond laser-induced transitional metal alloying with amorphous silicon for high-performance Li-ion batteries
Author(s): **Yueran Gu,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States); **Andrew Dopilka**, **Minok Park**, **Robert Kostecki,** Lawrence Berkeley National Lab. (United States); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

Wednesday 29 January 2025

SESSION 8: DIRECT WRITE PROCESSING I

29 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Hyungsik Kim**, SAMSUNG Display Co., Ltd. (Korea, Republic of)

13351-31 • 8:30 AM - 9:00 AM
Laser processing and tip-based probing of nanomaterials *(Invited Paper)*
Author(s): **Costas P. Grigoropoulos**, **Jingang Li,** Univ. of California, Berkeley (United States); **Yoonsoo Rho,** Ulsan National Institute of Science and Technology (Korea, Republic of), Univ. of California, Berkeley (United States); **Rundi Yang**, **Runxuan Li, Brian Blankenship,** Univ. of California, Berkeley (United States)

13351-32 • 9:00 AM - 9:20 AM
Pulsed laser ablation rates of 4H silicon carbide wafer substrates with nanosecond- and ultrashort-pulse lasers
Author(s): **James M. Bovatsek**, **Terence Hollister,** Spectra-Physics, a division of MKS Instruments (United States); **Chandra Nathala,** Spectra-Physics, a division of MKS Instruments (Austria)

13351-33 • 9:20 AM - 9:40 AM
Femtosecond laser-induced micromachining and defect formation in silicon carbide
Author(s): **Cleber R. Mendonça**, **Renan Cunha**, **Kelly Tasso,** Instituto de Física de São Carlos (Brazil); **Marcelo Andrade,** Univ. Federal de Ouro Preto (Brazil)

13351-34 • 9:40 AM - 10:00 AM
High-resolution patterning of graphitic carbon structures in laser carbonization of cellulose nanofiber film
Author(s): **Yosuke Kondo, Mitsuhiro Terakawa,** Keio Univ. (Japan)

13351-35 • 10:00 AM - 10:20 AM
Efficiency improvement study of volume phase elements in fused silica toward applications
Author(s): **Valdemar Stankevič,** Ctr. for Physical Sciences and Technology (Lithuania), Akoneer (Lithuania); **Marius Kibeika**, **Eimantas Dermauskas, Paulius Gečys,** Ctr. for Physical Sciences and Technology (Lithuania)

Coffee Break 10:20 AM - 10:50 AM

SESSION 9: DIRECT WRITE PROCESSING II

29 January 2025 • 10:50 AM - 11:50 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Mitsuhiro Terakawa**, Keio Univ. (Japan)

13351-36 • 10:50 AM - 11:10 AM
Enhancing supply chain security through laser-fabricated marks on stainless steel
Author(s): **Christos Tselios,** Univ. of Peloponnese (Greece); **Simone Mazzucato,** SISMA S.p.A. (Italy); **Christina (Tanya) Politi,** Univ. of Peloponnese (Greece); **Dimitris Alexandropoulos,** Univ. of Patras (Greece)

13351-37 • 11:10 AM - 11:30 AM
The effect of femtosecond laser repetition rate on the self-organization of micro- and nano-scale surface features
Author(s): **Graham Kaufman**, **Daniel Egbebunmi**, **Joshua Gerdes**, **George Gogos**, **Jeffrey Shield, Craig Zuhlke,** Univ. of Nebraska-Lincoln (United States)

13351-38 • 11:30 AM - 11:50 AM
Plasmonic coloring of noble metals with burst mode ultrashort pulsed lasers
Author(s): **Rainer Kling, Simon Walker,** Berner Fachhochschule (Switzerland)

Lunch/Exhibition Break 11:50 AM - 1:30 PM

SESSION 10: ADVANCED ADDITIVE AND SUBTRACTIVE PROCESSES

29 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Oliver Haupt**, Coherent LaserSystems GmbH & Co. KG (Germany)

13351-40 • 1:30 PM - 2:00 PM
Solid-state metal additive manufacturing using laser-induced supersonic impact printing (LISIP) *(Invited Paper)*
Author(s): **Yiliang Liao,** Iowa State Univ. of Science and Technology (United States)

13351-41 • 2:00 PM - 2:20 PM
Laser printing of silicon-containing multilayer anodes with optimized electrode inks
Author(s): **Ulrich Rist, Wilhelm Pfleging,** Karlsruher Institut für Technologie (Germany)

13351-42 • 2:20 PM - 2:40 PM
Micro-laser assisted machining μ-LAM) for ultra-hard and brittle optical materials
Author(s): **Sai K. Kode**, **Tatiana Stepanova**, **Anteneh A. Tsegaye, Deepak Menon,** Micro-LAM, Inc. (United States)

13351-43 • 2:40 PM - 3:00 PM
Beam shaping analysis for LPBF
Author(s): **Austin Tiley, John Middendorf,** The Ohio State Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: MICRO/NANO PROCESSING OF METALS

29 January 2025 • 3:30 PM - 4:40 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Emmanuel Stratakis**, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

13351-44 • 3:30 PM - 4:00 PM
Highly efficient synthesis of solid-solution alloy nanoparticles by laser-induced reduction for industrial applications *(Invited Paper)*
Author(s): **Takahiro Nakamura,** Illuminus Co., Ltd. (Japan)

13351-45 • 4:00 PM - 4:20 PM
Decoupling laser process parameters and 5D trajectory generation using position-based pulse control mechanisms
Author(s): **Eric Belski,** Aerotech, Inc. (United States)

13351-46 • 4:20 PM - 4:40 PM
Au oxide layer pattern formation by F2 laser irradiation under ambient conditions
Author(s): **Tsuyoshi Yoshida, Masayuki Okoshi,** National Defense Academy (Japan)

Thursday 30 January 2025

SESSION 12: LARGE AREA MICRO/NANOPROCESSING I

30 January 2025 • 8:30 AM - 10:00 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Craig A. Zuhlke**, Univ. of Nebraska-Lincoln (United States)

13351-48 • 8:30 AM - 9:00 AM
Ultrafast laser biomimetic fabrication and related applications *(Invited Paper)*
Author(s): **Emmanuel Stratakis,** Foundation for Research and Technology-Hellas (Greece)

13351-49 • 9:00 AM - 9:20 AM
Controlling the morphology of 2D laser-induced periodic surface structures (LIPSS) for surface-enhanced Raman spectroscopy applications
Author(s): **Balaji Baskar**, **Atiqul Islam Ahad**, **Carla Berrospe Rodriguez, Guillermo Aguilar,** Texas A&M Univ. (United States)

13351-50 • 9:20 AM - 9:40 AM
LIPSS generation improvement with a 0.07 uniformity square top-hat at 400µJ 1030nm based on multi-plane light conversion
Author(s): **Mahmoud Ziat,** CAILabs (France); **Kerim Yildirim,** KU Leuven (Belgium); **Ivan Gusachenko**, **Gwenn Pallier,** CAILabs (France); **Balasubramanian Nagarajan**, **Sylvie Castagne,** KU Leuven (Belgium); **Pu Jian**, **Guillaume Labroille, Adeline Orieux,** CAILabs (France)

13351-51 • 9:40 AM - 10:00 AM
Far-field performance of laser textured moth's eye structures
Author(s): **Botond Santa**, **Nishan Khadka**, **Yucheng Yang**, **Ashok Ponnuchamy**, **Matthew Rosenberger**, **Anthony Hoffman, Edward C. Kinzel,** Univ. of Notre Dame (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: LARGE AREA MICRO/NANOPROCESSING II

30 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Koji Sugioka**, RIKEN Ctr. for Advanced Photonics (Japan)

13351-52 • 10:30 AM - 10:50 AM
Compact UV femtosecond direct laser write interferometry
Author(s): **Darius Gailevicius**, **Dominyka Stonyte**, **Tadas Latvys**, **Vytautas Jukna, Domas Paipulas,** Vilnius Univ. (Lithuania)

13351-53 • 10:50 AM - 11:10 AM
Tackling the next steps in direct laser interference patterning: 3D-texturing and process control
Author(s): **Christoph Zwahr**, **Frederic Schell**, **Tobias Steege,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Andrés Fabián Lasagni,** Technische Universität Dresden, Institut für Fertigungstechnik (Germany)

13351-54 • 11:10 AM - 11:30 AM
Versatile femtosecond laser interference patterning for high precision nanostructuring of semiconductors and metal films
Author(s): **Irene Solana**, **Fernando Chacon-Sanchez**, **Eneko Aiartza**, **Mario Garcia-Lechuga,** Instituto de Óptica "Daza de Valdés" (Spain); **Jan Siegel,** Instituto de Óptica "Daza de Valdés" (Spain), Consejo Superior de Investigaciones Científicas (Spain)

13351-55 • 11:30 AM - 11:50 AM
Mechanism of wettability aging post laser surface structuring
Author(s): **Xin Zhao,** Clemson Univ. (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 14: LASERS IN ENERGY STORAGE AND CONVERSION

30 January 2025 • 1:20 PM - 2:20 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Xin Zhao**, Clemson Univ. (United States)

13351-58 • 1:20 PM - 1:40 PM
Laser printing and laser sintering as a digital approach for the fabrication of micro-conductive patterns on flexible substrates
Author(s): **Kostas Andritsos,** National Technical Univ. of Athens (Greece); **Sergey Pozov,** Cyprus Univ. of Technology (Cyprus); **Ioannis Theodorakos,** National Technical Univ. of Athens (Greece); **Efthymios Georgiou**, **Apostolos Ioakeimidis,** Cyprus Univ. of Technology (Cyprus); **Filimon Zacharatos,** National Technical Univ. of Athens (Greece); **Yoann Porte**, **Patrick Too,** FlexEnable Technology Ltd. (United Kingdom); **Stelios Choulis,** Cyprus Univ. of Technology (Cyprus); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13351-59 • 1:40 PM - 2:00 PM
Tunnel oxide passivated contact solar cells completed with ultrashort pulse laser contact opening and electrochemical plating metallization techniques
Author(s): **James M. Bovatsek,** Spectra-Physics, a division of MKS Instruments (United States); **Huijae Yu**, **Jay Ahn,** Spectra-Physics, a division of MKS Instruments (Korea, Republic of); **Mutlu Iskender Muglali**, **Torsten Voss**, **Irene Kubitza,** MKS Atotech (Germany); **Scott White,** Spectra-Physics, a division of MKS Instruments (United States)

13351-60 • 2:00 PM - 2:20 PM
Periodic laser surface texturing limits hydrogen permeation in Fe-Cr alloy
Author(s): **Anthony Nakhoul,** Lab. Hubert Curien (France), MINES Saint-Étienne (France); **Alixe Dreano**, **Frederic Christien,** MINES Saint-Étienne (France); **Florence Garrelie, Jean-Philippe Colombier,** Lab. Hubert Curien (France)

Coffee Break 2:20 PM - 2:50 PM

SESSION 15: AI AND MACHINE LEARNING-BASED PROCESSING

30 January 2025 • 2:50 PM - 4:30 PM | Moscone South, Room 214 (Level 2)
Session Chair(s): **Shuntaro Tani**, The Institute for Solid State Physics (Japan)

13351-61 • 2:50 PM - 3:10 PM
Machine learning assisted optimization of surface roughness on silicium
Author(s): **Eric P. Mottay,** h-nu (France); **Wahib Mirgan Barkat**, **Emile Barjou**, **Anthony Bertrand, Girolamo Mincuzzi,** ALPhANOV (France)

13351-62 • 3:10 PM - 3:30 PM
Autonomous ultra short pulse ablation process design with Bayesian optimization
Author(s): **Moritz Kröger**, **Benedikt Bornschlegel,** RWTH Aachen Univ. (Germany); **Carlo Holly,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany); **Thomas Kaster, Christian Hinke,** RWTH Aachen Univ. (Germany)

13351-63 • 3:30 PM - 3:50 PM
AI-enabled modeling and simulation for optimized laser material processing
Author(s): **Toni Moore**, **Adrian Phoulady**, **Nicholas May**, **Hongbin Choi**, **Todor Bliznakov**, **Mohammad Taghi Mohammadi Anaei**, **Parisa Mahyari**, **Alexander Blagojevic**, **Marcus Emanuel**, **Matthew Maniscalco**, **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

13351-64 • 3:50 PM - 4:10 PM
First-time-right production of complex metal microstructures by combining Bayesian optimization and advanced modeling
Author(s): **Martin Adams**, **Markus Niessen,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Moritz Kröger,** RWTH Aachen Univ. (Germany); **Carlo Holly,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13351-68 • 4:10 PM - 4:30 PM
Comparison of Machine Learning and Two-Temperature models for prediction of ultrafast laser ablation
Author(s): **Eric P. Mottay,** h-nu (France)

CONFERENCE 13352

Nanoscale and Quantum Materials: From Synthesis and Laser Processing to Applications 2025

25 - 26 January 2025 | Moscone South, Room 213 (Level 2)

Conference Chair(s): **Andrei V. Kabashin,** Aix-Marseille Univ. (France); **Maria Farsari,** Foundation for Research and Technology-Hellas (Greece); **Masoud Mahjouri-Samani,** Auburn Univ. (United States)

Program Committee: **Jan J. Dubowski,** Univ. de Sherbrooke (Canada); **David B. Geohegan,** Oak Ridge National Lab. (United States); **Anderson S.L. Gomes,** Univ. Federal de Pernambuco (Brazil); **Costas P. Grigoropoulos,** Univ. of California, Berkeley (United States); **Tatiana E. Itina,** Lab. Hubert Curien (France); **Yongfeng Lu,** Univ. of Nebraska-Lincoln (United States); **Mangirdas Malinauskas,** Vilnius Univ. (Lithuania); **Anton V. Malko,** The Univ. of Texas at Dallas (United States); **Igor V. Meglinski**, **Edik U. Rafailov,** Aston Univ. (United Kingdom); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States); **Gordon Zyla,** Foundation for Research and Technology-Hellas (Greece)

Saturday 25 January 2025

SESSION 1: SYNTHESIS, CHARACTERIZATION, AND APPLICATIONS OF NANOSCALE AND QUANTUM MATERIALS

25 January 2025 • 10:00 AM - 12:00 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Andrei V. Kabashin**, Aix-Marseille Univ. (France); **Anderson S. L. Gomes**, Univ. Federal de Pernambuco (Brazil)

13352-1 • 10:00 AM - 10:20 AM
Optical properties of hydrothermally synthesized Sb2Se3 and Sb2S3 and their application in water splitting
Author(s): **Hong-Yu Chen,** National Taiwan Normal Univ. (Taiwan); **Yu-Hsiang Tsai**, **Juan-Xuan Li**, **Tsuan-Hsuan Yang**, **Yuan-Chi Lin**, **Cheng-Ying Chen,** National Taiwan Ocean Univ. (Taiwan); **Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan)

13352-5 • 10:20 AM - 10:50 AM
Optical metrology of nanoparticles, 2D-materials and metasurfaces using high-resolution wavefront microscopy *(Invited Paper)*
Author(s): **Guillaume Baffou,** Institut Fresnel (France)

13352-6 • 10:50 AM - 11:20 AM
Breaking the limit of exception point generation in a single chip *(Invited Paper)*
Author(s): **Abdoulaye Ndao,** Univ. of California, San Diego (United States)

13352-7 • 11:20 AM - 11:40 AM
Smart nano/metamaterials for biosensing: design and laser-assisted fabrication
Author(s): **Andrei V. Kabashin,** Aix-Marseille Univ. (France)

13352-8 • 11:40 AM - 12:00 PM
Optimization of gold nanorods' optical properties via Multi-Objective Genetic Algorithms
Author(s): **Anderson S. L. Gomes**, **José G. B. A. Lima,** Univ. Federal de Pernambuco (Brazil); **Isabel Carvalho**, **Yan Machado,** Pontifical Catholic Univ. of Rio de Janeiro (Brazil); **Adiel Almeida-Filho,** Univ. Federal de Pernambuco (Brazil)

Lunch/BiOS Exhibition Break 12:00 PM - 1:30 PM

SESSION 2: OPTOELECTRONICS, PHOTONICS, AND PHOTOCATALYSIS APPLICATIONS OF NANOSCALE AND QUANTUM MATERIALS

25 January 2025 • 1:30 PM - 2:50 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Masoud Mahjouri-Samani**, Auburn Univ. (United States)

13352-9 • 1:30 PM - 2:00 PM
Highly stable biexciton-exciton single photon pairs from CdS/CdSe/CdS quantum shells *(Invited Paper)*
Author(s): **Anton V. Malko,** The Univ. of Texas at Dallas (United States)

13352-10 • 2:00 PM - 2:30 PM
Gold nanorods: a fantastic nanomaterial for a diversity of applications *(Invited Paper)*
Author(s): **Anderson S. L. Gomes,** Univ. Federal de Pernambuco (Brazil)

13352-11 • 2:30 PM - 2:50 PM
Thermo-optical response of Er/Yb-doped single particles trapped in vacuum and embedded in different media
Author(s): **Laura Martínez Maestro**, **Miguel Antón-Revilla**, **Eduardo Cabrera-Granado**, **Rosa Weigand, Javier Hernandez Rueda,** Univ. Complutense de Madrid (Spain)

Coffee Break 2:50 PM - 3:20 PM

SESSION 3: 2D MATERIALS: SYNTHESIS PROCESSING AND DIAGNOSTICS

25 January 2025 • 3:20 PM - 5:30 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Anton V. Malko**, The Univ. of Texas at Dallas (United States)

13352-12 • 3:20 PM - 3:50 PM
Atomic substitution approach for electronic non-vdW 2D materials *(Invited Paper)*
Author(s): **Xi Ling,** Boston Univ. (United States)

13352-13 • 3:50 PM - 4:20 PM
Resolve optical and acoustic phonon thermal nonequilibrium in 2D materials under photon excitation *(Invited Paper)*
Author(s): **Xinwei Wang,** Iowa State Univ. of Science and Technology (United States)

13352-14 • 4:20 PM - 4:40 PM
Laser synthesis and processing 2D quantum materials
Author(s): **Masoud Mahjouri-Samani**, **Suman Jaiswal**, **Nurul Azam**, **Zabihollah Ahmadi, Parvin Fathi-Hafshejani,** Auburn Univ. (United States)

13352-2 • 4:40 PM - 5:00 PM
Single step MACE for SiNWs fabrication with (Au & Ag) metals
Author(s): **A. Khalifa**, **Amira A. M. Ahmed,** The American Univ. in Cairo (Egypt); **Christen T. Aziz,** National Research Ctr. (Egypt); **Mariam El Koddosy, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13352-3 • 5:00 PM - 5:30 PM
Colloidal synthesis of organic-inorganic quantum material heterostructures *(Invited Paper)*
Author(s): **Qin Li,** Griffith Univ. (Australia)

Sunday 26 January 2025

SESSION 4: LASER-BASED ADDITIVE MICRO/NANOMANUFACTURING

26 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Andrei V. Kabashin**, Aix-Marseille Univ. (France)

13352-16 • 8:30 AM - 9:00 AM
AI-driven pulsed laser deposition of nanomaterials *(Invited Paper)*
Author(s): **Sumner B. Harris,** Oak Ridge National Lab. (United States); **Arpan Biswas,** The Univ. of Tennessee - Oak Ridge Innovation Institute (United States); **Daniel T. Yimam,** Oak Ridge National Lab. (United States); **Ruth Fajardo**, **Feng Bao,** Florida State Univ. (United States); **Christopher M. Rouleau**, **Alexander Puretzky**, **Kai Xiao, Rama Vasudevan,** Oak Ridge National Lab. (United States)

13352-17 • 9:00 AM - 9:30 AM
Enhanced reliability and precision for internal laser processing of semiconductors using temporal domain strategies *(Invited Paper)*
Author(s): **Pol Sopeña,** Aix-Marseille Univ. (France); **Andong Wang,** Beijing Institute of Technology (China); **David Grojo,** Aix-Marseille Univ. (France)

13352-18 • 9:30 AM - 9:50 AM
Laser direct printed 2D material-based touch sensing devices
Author(s): **Ilias Cheliotis**, **Filimon Zacharatos**, **Evangelos Aslanidis,** National Technical Univ. of Athens (Greece); **Amaia Pesquera**, **Amaia Zurutuza,** Graphenea S.A. (Spain); **Dimitrios Tsoukalas**, **Leonidas Tsetseris, Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13352-19 • 9:50 AM - 10:10 AM
Design and modeling of multiphoton lithography fabricated space dust shields
Author(s): **Stefanos Mavrikos,** Univ. of California, Berkeley (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: NANOSTRUCTURES BY LASER ABLATION AND ABLATION-FREE MANUFACTURING

26 January 2025 • 10:40 AM - 12:40 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Pol Sopeña**, Aix-Marseille Univ. (France)

13352-20 • 10:40 AM - 11:10 AM
Controlled plasma plume interactions with 2D materials for doping and encapsulation using pulsed laser deposition within situ diagnostics *(Invited Paper)*
Author(s): **Daniel T. Yimam**, **Sumner B. Harris**, **Alexander Puretzky**, **Christopher M. Rouleau**, **David B. Geohegan, Kai Xiao,** Oak Ridge National Lab. (United States)

13352-21 • 11:10 AM - 11:40 AM
Atomistic modeling as a key to unraveling ultra-short laser nano-synthesis and nano-treatment *(Invited Paper)*
Author(s): **Tatiana E. Itina**, **Dmitry Ivanov, Ilemona S. Omeje,** Lab. Hubert Curien (France)

13352-22 • 11:40 AM - 12:00 PM
Alternative plasmonic nanomaterials based on transition metal nitrides: laser-ablative fabrication and appealing prospects for biophotonic applications
Author(s): **Andrei V. Kabashin,** Aix-Marseille Univ. (France)

13352-23 • 12:00 PM - 12:20 PM
Additive nanomanufacturing of electronics and sensors
Author(s): **Aarsh Patel**, **Shahrouz Zamani Khalajabadi**, **Adib Taba**, **Suman Jaiswal, Masoud Mahjouri-Samani,** Auburn Univ. (United States)

13352-15 • 12:20 PM - 12:40 PM
Dual laser beam-assisted chemical doping of 2D layered material
Author(s): **Yoonsoo Rho,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Runxuan Li, Costas P. Grigoropoulos,** Univ. of California, Berkeley (United States)

Lunch/BiOS Exhibition Break 12:40 PM - 2:00 PM

SESSION 6: LASER PROCESSING AND MODIFICATION OF NANOSCALE AND QUANTUM MATERIALS I

26 January 2025 • 2:00 PM - 3:30 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Masoud Mahjouri-Samani**, Auburn Univ. (United States)

13352-24 • 2:00 PM - 2:30 PM
Nanosecond laser-induced dewetting: a new way to synthesize high entropy alloy nanoparticles *(Invited Paper)*
Author(s): **Ritesh Sachan,** Oklahoma State Univ. (United States)

13352-25 • 2:30 PM - 2:50 PM
Femtosecond laser fabrication of plasmonic-magnetic Ni-Au nanoparticles with enhanced magnetic properties
Author(s): **Tatiana E. Itina,** Lab. Hubert Curien (France); **Oliwia Polit,** IPN (Poland); **Andrei Pastukhov,** Aix-Marseille Univ. (France); **Yaroslava Yingling,** North Carolina State Univ. (United States); **Zaneta Swiatkowska-Warkocka,** IPN (Poland); **Andrei V. Kabashin,** Aix-Marseille Univ. (France)

13352-26 • 2:50 PM - 3:10 PM
Surface Morphologies and crystallinities of a zirconium (Zr) thin film on Si(100) by pulsed laser deposition
Author(s): **Berdimyrat Annamuradov**, **Zikrulloh Khuzhakulov**, **Jasminka Terzic**, **Mikhail Khenner, Ali O. Er,** Western Kentucky Univ. (United States)

13352-27 • 3:10 PM - 3:30 PM
Optimization of defects in monolayer MoS_2 via femtosecond laser pulse annealing
Author(s): **Ying-Kai Chen, Chun-Che Chang,** National Taiwan Normal Univ. (Taiwan)

Coffee Break 3:30 PM - 4:00 PM

SESSION 7: LASER PROCESSING AND MODIFICATION OF NANOSCALE AND QUANTUM MATERIALS II

26 January 2025 • 4:00 PM - 4:40 PM | Moscone South, Room 213 (Level 2)
Session Chair(s): **Tatiana E. Itina**, Lab. Hubert Curien (France)

13352-29 • 4:00 PM - 4:20 PM
Background reduction in nano-photoluminescence measurements through tapping-mode demodulation
Author(s): **Matthew Fu**, **Samuel Moore**, **Thomas Darlington**, **Kevin W. C. Kwock**, **Shuai Zhang**, **Jonas Kolker**, **Jordan Pack**, **Suheng Xu**, **Birui Yang,** Columbia Univ. (United States); **Haeyeong Lee,** Rice Univ. (United States), Columbia Univ. (United States); **Emanuel S. Yanev**, **Abhay Pasupathy**, **Cory R. Dean**, **James Hone**, **James Schuck, Dmitri N. Basov,** Columbia Univ. (United States)

13352-30 • 4:20 PM - 4:40 PM
Synthesis and optical characterization of graphene materials produced with a power-tunable CW laser
Author(s): **Azael D. Dominguez Flores**, **Juan Antonio Rayas**, **Amalia Martínez-García,** Centro de Investigaciones en Óptica, A.C. (Mexico); **Raúl R. Crodero,** Univ. de Santiago de Chile (Chile)

Tuesday 28 January 2025

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13352-32 • 6:00 PM - 8:00 PM
Renewable energy application of pulsed laser annealing perovskite quantum dots materials
Author(s): **Yen-Ting Lin**, **Jui-Ting Hsieh,** National Taiwan Normal Univ. (Taiwan); **Meng-Lin Tsai,** National Taiwan Univ. of Science and Technology (Taiwan); **Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan), Micro/Nano Device Inspection and Research Ctr. (Taiwan), National Cheng Kung Univ. (Taiwan)

13352-33 • 6:00 PM - 8:00 PM
Variable magnification comparative studies in polarimetric microscopy using thin film samples
Author(s): **Shouvik Sadhukhan,** Indian Institute of Space Science and Technology (India); **Shirsendu Sarkar, Debabrata Bhadra,** Bhairab Ganguly College (India)

13352-34 • 6:00 PM - 8:00 PM
Laser-induced transfer and processing of graphene into plasmonic structures of advanced photodetectors
Author(s): **Kostas Andritsos**, **Filimon Zacharatos**, **Leonidas Tsetseris, Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

CONFERENCE 13353

Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXV

26 - 29 January 2025 | Moscone South, Room 210 (Level 2)

CONFERENCE CO-SPONSORS

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Conference Chair(s): **Peter R. Herman,** Univ. of Toronto (Canada); **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Adela Ben-Yakar,** The Univ. of Texas at Austin (United States)

Program Committee: **Craig B. Arnold,** Princeton Univ. (United States); **Yves Bellouard,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Daniel Flamm,** TRUMPF Laser- und Systemtechnik GmbH (Germany); **Alexander Heisterkamp,** Leibniz Univ. Hannover (Germany); **Eric Mazur,** Harvard Univ. (United States); **Eric P. Mottay,** h-nu (France); **Beat Neuenschwander,** Berner Fachhochschule Technik und Informatik (Switzerland); **Stefan Nolte,** Friedrich-Schiller-Univ. Jena (Germany); **Aleks Ovsianikov,** Technische Univ. Wien (Austria); **Jan Siegel,** Instituto de Óptica "Daza de Valdés" (Spain); **Koji Sugioka,** RIKEN Ctr. for Advanced Photonics (Japan); **Mitsuhiro Terakawa,** Keio Univ. (Japan); **Alfred Vogel,** Univ. zu Lübeck (Germany); **Dvir Yelin,** Technion-Israel Institute of Technology (Israel)

Sunday 26 January 2025

SESSION 1: BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASER SYSTEMS I

26 January 2025 • 2:00 PM - 3:40 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Adela Ben-Yakar**, The Univ. of Texas at Austin (United States)

13353-1 • 2:00 PM - 2:30 PM
Combined diagnosis and therapy by multimodal nonlinear endospectroscopy guided laser tissue ablation *(Invited Paper)*
Author(s): **Jürgen Popp,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller-Univ. Jena (Germany)

13353-2 • 2:30 PM - 2:50 PM
Laboratory-scale production of tunable, narrow-bandwidth x-rays in the clinical energy regime
Author(s): **Natalija Rigere**, **Markus Wurzer**, **Martin Dierolf**, **Benedikt Günther**, **Franz Pfeiffer, Reinhard Kienberger,** Technische Univ. München (Germany)

13353-3 • 2:50 PM - 3:10 PM
Design of an ultrafast laser scalpel for spinal decompression surgery
Author(s): **Biswajit Mishra**, **Aditya Roy, Adela Ben-Yakar,** The Univ. of Texas at Austin (United States)

13353-4 • 3:10 PM - 3:40 PM
Why doing better with less is the future of femtosecond laser assisted cataract surgery? *(Invited Paper)*
Author(s): **François Salin**, **Pierre Deslandes, Florent Deloison,** Ilasis Laser (France)

Coffee Break 3:40 PM - 4:10 PM

SESSION 2: BIOMEDICAL APPLICATIONS FOR ULTRAFAST LASER SYSTEMS II

26 January 2025 • 4:10 PM - 5:20 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Adela Ben-Yakar**, The Univ. of Texas at Austin (United States)

13353-5 • 4:10 PM - 4:30 PM
High-resolution kinoform microlenses fabricated via two-photon polymerization for advanced in-vivo imaging
Author(s): **Alessandra Nardini,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy), Univ. del Salento (Italy); **Behjat Sadat Kariman**, **Carlo Andrea Penasa,** Politecnico di Milano (Italy); **Mario Marini,** Univ. degli Studi di Milano-Bicocca (Italy); **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giulio Nicola Felice Cerullo**, **Manuela Teresa Raimondi,** Politecnico di Milano (Italy); **Giuseppe Chirico,** Univ. degli Studi di Milano-Bicocca (Italy); **Rebeca Martínez Vázquez,** CNR-Istituto di Fotonica e Nanotecnologie

(Italy)

13353-6 • 4:30 PM - 4:50 PM
Laser bioprinting: creating cell patterns for cancer metastasis studies
Author(s): **Maria A. Chliara,** National Technical Univ. of Athens (Greece); **Maria Dimadi,** PhosPrint P.C. (Greece); **Marianneza Chatzipetrou,** National Technical Univ. of Athens (Greece); **Katerina Tsilingiri**, **Apostolos Klinakis,** Biomedical Research Foundation, Academy of Athens (Greece); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13353-7 • 4:50 PM - 5:20 PM
Make living cells fly: laser-induced single-cell bioprinting *(Invited Paper)*
Author(s): **Stefan Niehren,** Molecular Machines & Industries GmbH (Germany)

Monday 27 January 2025

SESSION 3: ULTRAFAST LASER-MATTER INTERACTION

27 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Peter R. Herman**, Univ. of Toronto (Canada)

13353-8 • 8:30 AM - 9:00 AM
Functionalizing glasses femtosecond by laser for high temperature applications: trends, limits, and opportunities *(Invited Paper)*
Author(s): **Maxime Cavillon, Matthieu Lancry,** Univ. Paris-Saclay (France)

13353-9 • 9:00 AM - 9:20 AM
Investigating the application of adaptive optics in femtosecond filament-assisted remote sensing under atmospheric turbulence
Author(s): **Changmin Kim**, **Boyu Zhang,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States); **Xianglei Mao**, **José Chirinos,** Lawrence Berkeley National Lab. (United States); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

13353-11 • 9:20 AM - 9:40 AM
Systematic study of gas effects on laser material processing in controlled environments
Author(s): **Hongbin Choi**, **Matthew Maniscalco**, **Parisa Mahyari**, **Nicholas May**, **Marcus Emanuel**, **Todor Bliznakov**, **Toni Moore**, **Mohammad Taghi Mohammadi Anaei**, **Adrian Phoulady**, **Alexander Blagojevic,** Univ. of Connecticut (United States); **Shahram Amini,** Pulse Technologies, Inc. (United States); **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

13353-12 • 9:40 AM - 10:00 AM
Stable 710kW average-power of infrared-red light stacked in an enhancement optical cavity of 45,000 finesse
Author(s): **Xin-Yi Lu,** Tsinghua Univ. (China); **Alice Renaux**, **Ronic Chiche**, **Kevin Dupraz**, **Aurelien Martens**, **Daniele Nutarelli**, **Viktor Soskov**, **Fabian Zomer,** Lab. de Physique des 2 Infinis Irène Joliot-Curie (France); **Xing Liu**, **Li-Xin Yan**, **Wen-hui Huang**, **Chaun-Xiang Tang,** Tsinghua Univ. (China); **Christophe Michel**, **Laurent Pinard,** Lab. des Matériaux Avancés (France), Institut de Physique des 2 Infinis de Lyon (France); **Jérôme Lhermite,** Ctr. Lasers Intenses et Applications, Univ. de Bordeaux, CEA, CNRS (France)

13353-13 • 10:00 AM - 10:20 AM
Nomarski interferometer with sub-micron spatial resolution for time-resolved complex-amplitude imaging of femtosecond laser-induced air plasma
Author(s): **Wataru Kimura**, **Shotaro Kawano**, **Ryohei Yamada**, **Haruyuki Sakurai**, **Kuniaki Konishi, Norikatsu Mio,** The Univ. of Tokyo (Japan)

Coffee Break 10:20 AM - 10:50 AM

SESSION 4: GENERATION AND APPLICATION OF EUV AND X-RAY ULTRASHORT PULSES

27 January 2025 • 10:50 AM - 12:00 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Daniel Flamm**, TRUMPF Laser- und Systemtechnik GmbH (Germany)

13353-14 • 10:50 AM - 11:20 AM
Microfluidic-based sources for efficient XUV generation and manipulation *(Invited Paper)*
Author(s): **Anna G. Ciriolo**, **Rebeca Martinez Vazquez,** Consiglio Nazionale delle Ricerche (Italy); **Riccardo Piccoli,** Univ. Ca' Foscari di Venezia (Italy), Politecnico di Milano (Italy); **Davide Faccialà**, **Michele Devetta,** Consiglio Nazionale delle Ricerche (Italy); **Stavroula Vovla,** Consiglio Nazionale delle Ricerche (Italy), Politecnico di Milano (Italy); **Kamal Abedin,** Politecnico di Milano (Italy); **Fabio Frassetto**, **Luca Poletto**, **Roberto Osellame,** Consiglio Nazionale delle Ricerche (Italy); **Salvatore Stagira,** Politecnico di Milano (Italy); **Caterina Vozzi,** Consiglio Nazionale delle Ricerche (Italy)

13353-17 • 11:20 AM - 11:40 AM
Imaging femtosecond laser-induced lattice distortions inside crystalline semiconductors by ultrafast x-ray dynamical diffraction
Author(s): **Angel Rodriguez-Fernandez**, **Jan-Etienne Pudell,** European XFEL GmbH (Germany); **Pablo Villanueva Perez,** Lund Univ. (Sweden); **Roman Shayduk,** European XFEL GmbH (Germany); **Thies J. Albert,** Univ. Duisburg-Essen (Germany); **Jerzy Antonowicz,** Warsaw Univ. of Technology (Poland); **Dominik Kaczmarek,** Univ. Duisburg-Essen (Germany); **Zdenek Matej,** Max IV Lab. (Sweden), Lund Univ. (Sweden); **Houri Mosafer**, **Oleksii Liubchenko,** Polish Academy of Sciences (Poland); **Javier Solis,** Instituto de Óptica "Daza de Valdés" (Spain); **Lukas Horak,** Charles Univ. (Czech Republic); **Peter Zalden**, **Joerg Hallmann**, **Wonhyuk Jo**, **Johannes Moeller**, **James Wrigley**, **Alexey Zozulya**, **Anders Madsen,** European XFEL GmbH (Germany); **Ryszard Sobierajski,** Polish Academy of Sciences (Poland); **Klaus Sokolowski-Tinten,** Univ. Duisburg-Essen (Germany); **Jan Siegel,** Instituto de Óptica "Daza de Valdés" (Spain)

13353-16 • 11:40 AM - 12:00 PM
High-flux XUV beamlines enabling photon-hungry imaging and spectroscopy methods
Author(s): **Maxim Tschernajew**, **Vinzenz Hilbert**, **Oliver Herrfurth**, **Christian Gaida**, **Sven Breitkopf**, **Tino Eidam, Jens Limpert,** Active Fiber Systems GmbH (Germany)

Lunch Break 12:00 PM - 2:00 PM

SESSION 5: NOVEL ULTRAFAST LASER PROCESSING AND CHARACTERIZATION TECHNIQUES

27 January 2025 • 2:00 PM - 3:20 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Roberto Osellame**, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13353-18 • 2:00 PM - 2:20 PM
Femtosecond GHz fs pulses: how to increase the productivity of industrial applications
Author(s): **Vincent Rouffiange**, **Eric Audouard**, **Marie Fleureau**, **Benoît Morin, Quentin Mocaer,** Amplitude (France)

13353-19 • 2:20 PM - 2:40 PM
Wide-field polarimetric second harmonic imaging for rapid and non-destructive investigation of laser-induced crystallization phenomena
Author(s): **Seonwoo Lee,** EPFL (Switzerland); **Tetsuo Kishi,** Tokyo Institute of Technology (Japan); **Yves Bellouard,** EPFL (Switzerland)

13353-20 • 2:40 PM - 3:00 PM
Fringe-averaged collinear frequency-resolved optical gating: in situ characterization of ultrashort pulses in nonlinear microscopy
Author(s): **Leah Frackleton**, **Alexander N. Harper**, **Malcolm Latorre,** Univ. of Ottawa (Canada); **Adrian F. Pegoraro,** National Research Council Canada (Canada); **Albert Stolow,** Univ. of Ottawa (Canada), National Research Council Canada (Canada); **Siddarth Shivkumar,** Univ. of Ottawa (Canada)

13353-21 • 3:00 PM - 3:20 PM
Sensitive and accurate interferometric pulse characterization via two-photon absorption in Fabry-Pérot laser diodes
Author(s): **Adrian Chlebowski**, **Łukasz Sterczewski, Jarosław Sotor,** Wroclaw Univ. of Science and Technology (Poland)

Coffee Break 3:20 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 6: ULTRAFAST LASER MICRO/NANO-MACHINING

28 January 2025 • 8:25 AM - 9:55 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Matthieu Lancry**, Institut de Chimie Moléculaire et des Matériaux d'Orsay (France)

13353-22 • 8:25 AM - 8:55 AM
Ultrafast laser micromachining using wavelengths from ~0.2µm to ~2µm *(Invited Paper)*
Author(s): **Daniel Flamm,** TRUMPF Laser- und Systemtechnik GmbH (Germany); **Marc Sailer,** TRUMPF Laser GmbH (Germany); **Daniel Grossmann,** TRUMPF Laser- und Systemtechnik GmbH (Germany); **Steffen Rübling,** TRUMPF Laser GmbH (Germany); **Dennis Decker,** TRUMPF Laser- und Systemtechnik GmbH (Germany); **Christian Gaida,** Active Fiber Systems GmbH (Germany); **Markus Blothe, Stefan Nolte,** Friedrich Schiller University Jena (Germany)

13353-24 • 8:55 AM - 9:15 AM
Overcoming challenges in transparent material assembly: advances of ultra short pulse laser welding
Author(s): **Lukas Günther,** SCHOTT AG (Germany), Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Jens Ulrich Thomas**, **Jens Herrmann**, **Axel Ohlinger**, **Anne Friedrich,** SCHOTT AG (Germany); **Dominique de Ligny,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13353-25 • 9:15 AM - 9:35 AM
Laser-induced breakdown spectroscopy for real-time 3D material composition mapping
Author(s): **Parisa Mahyari**, **Hongbin Choi**, **Nicholas May**, **Marcus Emanuel**, **Matthew Maniscalco**, **Todor Bliznakov**, **Toni Moore**, **Mohammad Taghi Mohammadi Anaei**, **Adrian Phoulady**, **Alexander Blagojevic**, **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

13353-26 • 9:35 AM - 9:55 AM
High-resolution 3D volumetric imaging using laser-enabled delayering techniques
Author(s): **Nicholas May**, **Hongbin Choi**, **Marcus Emanuel**, **Parisa Mahyari**, **Matthew Maniscalco**, **Todor Bliznakov**, **Toni Moore**, **Mohammad Taghi Mohammadi Anaei**, **Adrian Phoulady**, **Alexander Blagojevic**, **Sina Shahbazmohamadi, Pouya Tavousi,** Univ. of Connecticut (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 7: NOVEL ULTRAFAST LASER SOURCES I

28 January 2025 • 10:25 AM - 11:45 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Peter R. Herman**, Univ. of Toronto (Canada)

13353-27 • 10:25 AM - 10:45 AM
High average power Yb-doped amplifier single stage compression in a gas-filled Multi-Pass Cell (MPC)
Author(s): **Michele Natile**, **Ahmed Maghraoui**, **Florent Guichard**, **Antoine Comby**, **Yoann Zaouter**, **Clemens Hönninger,** Amplitude (France); **Marc Hanna, Patrick Georges,** Univ. Paris-Saclay (France), Institut d'Optique Graduate School (France), Lab. Charles Fabry, CNRS (France)

13353-28 • 10:45 AM - 11:05 AM
Multipass-cell-based post compression to 250W, 2.5mJ, <8fs at 1030nm
Author(s): **Sven Breitkopf**, **Christian Grebing**, **Stefano Wunderlich**, **Maxim Tschernajew**, **Evgeny Shestaev**, **Florian Just**, **Vinzenz Hilbert**, **Christian Kern**, **Anke Heilmann**, **Marco Kienel**, **Hafiz Masood**, **Tobias Heuermann**, **Christian Gaida**, **Oliver Herrfurth**, **Tino Eidam, Jens Limpert,** Active Fiber Systems GmbH (Germany)

13353-29 • 11:05 AM - 11:25 AM
Nonlinear post-compression of industrial ytterbium-based ultrafast laser sources
Author(s): **Torsten G. Mans,** TRUMPF Laser SE (Germany); **Christian Grebing**, **Sven Breitkopf**, **Tino Eidam,** Active Fiber Systems GmbH (Germany); **Gaia Barbiero**, **Thomas Metzger,** TRUMPF Scientific Lasers GmbH + Co. KG (Germany); **Maike Prossotowicz**, **Jonathan Brons**, **Aleksander Budnicki**, **Steffen Ried,** TRUMPF Laser SE (Germany); **Dirk Sutter,** TRUMPF Laser GmbH (Germany); **Dominik Bauer**, **Florian Jansen,** TRUMPF Laser SE (Germany); **Jonas Mertin,** TRUMPF SE + Co. KG (Germany)

13353-30 • 11:25 AM - 11:45 AM
kW fs laser with beam steering functionality for optimized productivity
Author(s): **Julien Pouysegur**, **Dominique Platzer**, **Cedric Brun**, **Antoine Renaud**, **Sebastien Renard**, **Antoine Campion**, **Jean Chabrerie, Clemens Hönninger,** Amplitude (France)

Lunch/Exhibition Break 11:45 AM - 1:45 PM

SESSION 8: NOVEL ULTRAFAST LASER SOURCES II

28 January 2025 • 1:45 PM - 2:45 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Peter R. Herman**, Univ. of Toronto (Canada)

13353-31 • 1:45 PM - 2:05 PM
100 W-class, mJ-level, few-cycle source at 1.9 µm wavelength
Author(s): **Ziyao Wang,** Friedrich-Schiller-Univ. Jena (Germany); **Philipp Gierschke**, **Warunya Röder,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Tobias Heuermann,** Active Fiber Systems GmbH (Germany); **Chang Liu,** Helmholtz Institute Jena (Germany); **Yi Zhang**, **Maximilian Karst**, **Mathias Lenski,** Friedrich-Schiller-Univ. Jena (Germany); **Jan Rothhardt,** Helmholtz Institute Jena (Germany); **Jens Limpert,** Friedrich-Schiller-Univ. Jena (Germany)

13353-32 • 2:05 PM - 2:25 PM
Single-diode-pumped, self-starting 1-GHz Kerr-lens-modelocked Ti:sapphire laser producing 48-fs pulses
Author(s): **Pablo Castro-Marín**, **Rhodri Davies**, **Ewan Allan**, **Hanna Ostapenko, Derryck T. Reid,** Heriot-Watt Univ. (United Kingdom)

13353-33 • 2:25 PM - 2:45 PM
Unleashing low-noise potential of 1030-nm femtosecond lasers
Author(s): **Jonas Heidrich**, **Benjamin Rudin, Florian Emaury,** Menhir Photonics AG (Switzerland)

Coffee Break 2:45 PM - 3:15 PM

SESSION 9: DIRECT WRITING, POLYMERIZATION, AND 3D MICROSTRUCTURING OF INTEGRATED MICROSYSTEMS

28 January 2025 • 3:15 PM - 5:25 PM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Roberto Osellame**, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13353-34 • 3:15 PM - 3:45 PM
3D waveguide optical interconnects for high bandwidth communication *(Invited Paper)*
Author(s): **Andrew Ross-Adams**, **Elizabeth Arcadi**, **Glen Douglass,** Macquarie Univ. (Australia); **Toney T. Fernandez,** Univ. of South Australia (Australia); **Michael J. Withford, Simon Gross,** Macquarie Univ. (Australia)

13353-35 • 3:45 PM - 4:05 PM
High-speed low-loss waveguide writing in fused silica using UV femtosecond laser pulses
Author(s): **Lisa Ackermann**, **Benedikt Hermann**, **Ernesto Gribaudo**, **Daniel Talán Echarri, Yves Bellouard,** EPFL (Switzerland)

13353-36 • 4:05 PM - 4:25 PM
Reconfigurable integrated photonic device to test Born's rule
Author(s): **Giulio Gualandi,** Politecnico di Milano (Italy); **Josefine Krause,** Technische Univ. München (Germany); **Roberto Osellame,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Tobias Vogl,** Technische Univ. München (Germany); **Giacomo Corrielli,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13353-37 • 4:25 PM - 4:45 PM
Laser writing waveguides up to the sample edge
Author(s): **Patrick S. Salter**, **Zhi Kai Pong, Martin Booth,** Univ. of Oxford (United Kingdom)

13353-38 • 4:45 PM - 5:05 PM
Towards all-glass monolithic realization of arbitrary whispering gallery mode resonators
Author(s): **Manuel Deckart, Yves Bellouard,** EPFL (Switzerland)

13353-39 • 5:05 PM - 5:25 PM
Two-photon polymerization of conductive polymer network inside a thermoresponsive hydrogel
Author(s): **Ken Kashikawa**, **Hiroaki Onoe, Mitsuhiro Terakawa,** Keio Univ. (Japan)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13353-44 • 6:00 PM - 8:00 PM
Use of noise-like pulses in fiber optic interferometric devices to improve sensitivity of vibration sensor
Author(s): **Juan Carlos Hernández-García**, **Stephanie Guadalupe Hernández García**, **Julian Moisés Estudillo-Ayala**, **Maximino Roberto Tapia-Garcia,** Univ. de Guanajuato (Mexico); **José David Filoteo-Razo,** Univ. Autónoma de Tamaulipas (Mexico); **Olivier Pottiez,** Centro de Investigaciones en Óptica, A.C. (Mexico); **Juan Manuel Sierra-Hernández, Roberto Rojas-Laguna,** Univ. de Guanajuato (Mexico)

13353-45 • 6:00 PM - 8:00 PM
Fs-Erbium-ring fiber laser as a simple training tool for enhancing laser engineering education
Author(s): **Daniel Ruf**, **Marcus Wittig**, **Tobias Baselt**, **Leander Kläber**, **Karsten Schmiedel**, **Gloria Seidel, Peter Hartmann,** Westsächsische Hochschule Zwickau (Germany)

13353-46 • 6:00 PM - 8:00 PM
Three-dimensional femtosecond laser beam shaping by real-time training and inference of a Physics Informed Machine Learning Model
Author(s): **Ziyong Yao**, **Pok Man Chow**, **Stephen Ho, Peter R. Herman,** Univ. of Toronto (Canada)

13353-47 • 6:00 PM - 8:00 PM
Fabrication of ultra-efficient all-fiber visible Bragg grating-based spectrometer using violet and near-infrared femtosecond laser pulses with the phase mask technique
Author(s): **Abdullah Rahnama**, **Cyril Hnatovsky**, **Rune Lausten**, **Robert B. Walker**, **Kasthuri De Silva, Stephen J. Mihailov,** National Research Council Canada (Canada)

Wednesday 29 January 2025

SESSION 10: SPATIO-TEMPORAL BEAM SHAPING

29 January 2025 • 8:00 AM - 9:20 AM | Moscone South, Room 210 (Level 2)
Session Chair(s): **Patrick S. Salter**, Univ. of Oxford (United Kingdom)

13353-40 • 8:00 AM - 8:20 AM
A Physics-Informed Machine Learning model for enabling arbitrary and three-dimensional femtosecond laser beam shaping
Author(s): **Pok Man Chow**, **Ziyong Yao**, **Stephen Ho, Peter R. Herman,** Univ. of Toronto (Canada)

13353-41 • 8:20 AM - 8:40 AM
Advanced pulse shaping for photoinjector lasers
Author(s): **Denis Ilia**, **Chen Li**, **Uwe Grosse-Wortmann**, **Ingmar Hartl**, **Yujiao Jiang**, **Christoph Mahnke**, **Harsha Panuganti**, **Federico Pressacco**, **Hamed Tavakol, Henrik Tünnermann,** Deutsches Elektronen-Synchrotron (Germany)

13353-42 • 8:40 AM - 9:00 AM
Spatial light shaping of uniform femtosecond laser filament for fabrication of Bragg grating arrays in optical fibers
Author(s): **Yueqi Wang**, **Gligor Djogo**, **Polina Zavyalova,** Univ. of Toronto (Canada); **Abdullah Rahnama,** Quantum and Nanotechnologies Research Ctr., National Research Council Canada (Canada); **Jianzhao Li, Peter R. Herman,** Univ. of Toronto (Canada)

13353-43 • 9:00 AM - 9:20 AM
High-flexibility beam shaping and beam splitting to upscale surface texturing with femtosecond lasers
Author(s): **Gwenn Pallier**, **Ivan Gusachenko**, **Dmitry Nuzhdin,** CAILabs (France); **Jérôme Patars**, **Anne Henrottin,** Lasea (Belgium); **Pu Jian, Guillaume Labroille,** CAILabs (France)

FRONTIERS IN ULTRAFAST OPTICS BEST STUDENT PAPER COMPETITION AND AWARDS CEREMONY

29 January 2025 • 9:20 AM - 12:00 PM | Moscone South, Room 210 (Level 2)

SIGN UP FOR THE AWARD COMPETITION

Fill out this Microsoft form so the chairs know to expect you: https://forms.office.com/r/JVhTLwA0Wx

Deadline to Sign Up: Sunday 26 January 2025 5:00 PM Pacific Standard Time

We are pleased to announce that a cash prize will be awarded to the best student presentation in the LASE conference on Frontiers in Ultrafast Optics (both poster and oral papers considered).

Papers submitted and presented in person by graduate and undergraduate students are eligible. For the competition, students will present a brief 4-minute summary with a few slides of their original talk or poster during this in-person session, and participate in a live Q&A.

4-MINUTE SUMMARY FOR COMPETITION

Your slides should entail all elements of a regular talk or poster, condensed into a 4-minute summary:

- A brief introduction and motivation for the work in the context of existing knowledge;
- A summary of the key research activities and observations would be the main body of the presentation;
- Do not try to cover everything; highlight the most significant factors in your methodology and analysis on which conclusions were drawn;
- The presentation should offer a clear interpretation of data that builds to a clear and final conclusion, telling us clearly what was learned and why the results are new and significant.

In order to ensure a fair evaluation, the conference chairs and the program committee will judge the students during this student competition session.

Following the student competition, the judges will meet and decide on the winner. The winner and runner-ups will be announced during the award ceremony and cash prizes will be sent to the winner and runner-ups after the event.

Award Sponsors:
Amplitude Laser Group (France)
TRUMPF Inc. (United States)

CONFERENCE 13354

Laser 3D Manufacturing XII

28 - 30 January 2025 | Moscone South, Room 201 (Session 1 in Rm 155)

Conference Chair(s): **Bo Gu,** Bos Photonics (United States); **Hongqiang Chen,** GE Research (United States)

Conference Co-Chair(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Program Committee: **John T. Fourkas,** Univ. of Maryland, College Park (United States); **Dongdong Gu,** Nanjing Univ. of Aeronautics and Astronautics (China); **Andreas Heinrich,** Hochschule Aalen - Technik und Wirtschaft (Germany); **Ruth Houbertz,** ThinkMade Engineering & Consulting (Germany); **Linas Jonušauskas,** Femtika UAB (Lithuania); **Aravinda Kar,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Edward C. Kinzel,** Univ. of Notre Dame (United States); **Christoph Leyens,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Robert Martinsen,** nLIGHT, Inc. (United States); **Henrikki Pantsar,** TRUMPF Inc. (United States); **Shailesh Patkar,** Coherent Corp. (United States); **Henry Peng,** Chinese Academy of Sciences (China); **Alberto Piqué,** U.S. Naval Research Lab. (United States); **Jianrong Qiu,** Zhejiang Univ. (China); **Daniela Serien,** National Institute of Advanced Industrial Science and Technology (Japan); **Michael Thiel,** Nanoscribe GmbH & Co. KG (Germany); **Andrea Toulouse,** Institut für Technische Optik (Germany); **Masahiro Tsukamoto,** Joining and Welding Research Institute, Osaka Univ. (Japan); **Thejaswi Tumkur Umanath,** Lawrence Livermore National Lab. (United States); **Augustine M. Urbas,** Air Force Research Lab. (United States); **Martin Wegener,** Karlsruher Institut für Technologie (Germany); **Xianfan Xu,** Purdue Univ. (United States)

Monday 27 January 2025

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)

3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 1: 3D PRINTING: JOINT SESSION WITH 13354 AND 13381

28 January 2025 • 8:30 AM - 12:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Bo Gu**, Bos Photonics (United States); **Georg von Freymann**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13354-1 • 8:30 AM - 8:55 AM
Flow dynamics of multi-material exchange in two-photon absorption 3D printing *(Invited Paper)*
Author(s): **Pratyaksh Yemulwar,** HETEROMERGE (Germany), TU Dresden (Germany); **Fatemeh Rajabasadi,** HETEROMERGE (Germany); **Tanya Saxena,** HETEROMERGE (Germany), TU Dresden (Germany); **Man Ho Wong**, **Josua Zscheile,** HETEROMERGE (Germany); **Robert Kirchner,** HETEROMERGE (Germany), TU Dresden (Germany)

13354-2 • 8:55 AM - 9:20 AM
In-situ optical tomographic reconstruction during 3D laser microprinting using deep learning *(Invited Paper)*
Author(s): **Tim Alletzhäusser**, **Roman Zvagelsky**, **Sebastian Kalt**, **Pascal Friederich, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

13354-3 • 9:20 AM - 9:35 AM
Bayesian optimization with Gaussian-process based active machine learning for projection multi-photon 3D printing
Author(s): **Jason E. Johnson**, **Ishat Raihan Jamil**, **Liang Pan**, **Guang Lin, Xianfan Xu,** Purdue Univ. (United States)

13354-4 • 9:35 AM - 9:50 AM
Compact diode laser-based system for multi-photon polymerization with conventional resins
Author(s): **Nils Surkamp**, **Felix Behlau**, **Cilly Plassmann,** Ruhr-Univ. Bochum (Germany); **Shulin Wohlfeil**, **Andrea Knigge,** Ferdinand-Braun-Institut gGmbH (Germany); **Cemal Esen**, **Andreas Ostendorf, Martin R. Hofmann,** Ruhr-Univ. Bochum (Germany)

13354-5 • 9:50 AM - 10:05 AM
Convolutional neural networks for projection multi-photon 3D printing
Author(s): **Ishat Raihan Jamil**, **Jason Johnson, Xianfan Xu,** Purdue Univ. (United States)

Coffee Break • 10:05 AM - 10:35 AM

13381-24 • 10:35 AM - 11:00 AM
Discussion on 3D holographic laser nanoprinting *(Invited Paper)*
Author(s): **Martin Wegener, Paul Somers,** Karlsruher Institut für Technologie (Germany)

13381-25 • 11:00 AM - 11:15 AM
Unraveling structure-process-property relationships of 3D/4D two-photon laser printed polymer microstructures
Author(s): **Eva Blasco**, **Clara Vazquez-Martel, Christoph A. Spiegel,** Ruprecht-Karls-Univ. Heidelberg (Germany)

13381-26 • 11:15 AM - 11:30 AM
Multiscale analysis on direct laser written structures to enhance calibration processes
Author(s): **Julian Hering-Stratemeier,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); **Matthias Eifler,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany), IU International Univ. of Applied Sciences (Germany); **Jörg Seewig,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); **Georg von Freymann,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany), Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany)

13381-27 • 11:30 AM - 11:45 AM
Programmable liquid crystal microstructures made by 4D microprinting
Author(s): **Sébastien Dominici**, **Keynaz Kamranikia**, **Karine Mougin, Arnaud Spangenberg,** Institut de Sciences des Matériaux de Mulhouse (France)

13381-28 • 11:45 AM - 12:00 PM
3D laser printing below the diffraction limit using two-step absorption and depletion
Author(s): **Josephine Spiegelberg**, **Paul Somers, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

Lunch/Exhibition Break 12:00 PM - 1:45 PM

SESSION 2: SPECIAL SESSION ON BIO 3D PRINTING

28 January 2025 • 1:45 PM - 3:50 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Henry Helvajian**, The Aerospace Corp. (United States)

13354-6 • 1:45 PM - 2:10 PM
Laser-patterned functional microstructures in hydrogels: fabrication and applications *(Invited Paper)*
Author(s): **Mitsuhiro Terakawa,** Keio Univ. (Japan)

13354-7 • 2:10 PM - 2:35 PM
Exploring mechanics of protein printing *(Invited Paper)*
Author(s): **Dmitry Sivun**, **Christoph Naderer, Jaroslaw Jacak,** FH Oberösterreich (Austria)

13354-8 • 2:35 PM - 3:00 PM
Laser bioprinting of cells bioinks for ex vivo graft fabrication *(Invited Paper)*
Author(s): **S. Elezoglou,** National Technical Univ. of Athens (Greece); **A. Chalari,** Biomedical Research Foundation, Academy of Athens (Greece); **C. Chandrinou,** National Technical Univ. of Athens (Greece); **A. Klinakis,** Biomedical Research Foundation, Academy of Athens (Greece); **K. Giannakopoulos**, **A. Hatziapostolou**, **C. Katopodis, I. Zergioti,** National Technical Univ. of Athens (Greece)

13354-9 • 3:00 PM - 3:25 PM
Applications of multi-focus multi-photon 3D laser microprinting: from material science to pharmacy *(Invited Paper)*
Author(s): **Alexander Berkes**, **Martin Wegener**, **Jens Bauer,** Karlsruher Institut für Technologie (Germany); **Regina Scherliess,** Christian-Albrechts-Univ. zu Kiel (Germany); **Pascal M. Kiefer,** Karlsruher Institut für Technologie (Germany); **Melvin Wostry,** Christian-Albrechts-Univ. zu Kiel (Germany); **Rachel Doherty**, **Daniela Kraft,** Leiden Univ. (Netherlands); **Peter Serles,** Univ. of Toronto (Canada)

13354-10 • 3:25 PM - 3:50 PM
Impact of exposure time and power intensity on cell viability in 3D bioprinting *(Invited Paper)*
Author(s): **Jorge A. Tavares Negrete**, **Ceren Babayigit**, **Ozdal Boyraz, Rahim Esfandyarpour,** Univ. of California, Irvine (United States)

Coffee Break 3:50 PM - 4:10 PM

SESSION 3: 3D MICRO-NANO PRINTING

28 January 2025 • 4:10 PM - 5:45 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Cheng Sun**, Northwestern Univ. (United States)

13354-11 • 4:10 PM - 4:35 PM
Addressing key challenges in multi-material and multiscale digital projection stereolithography *(Invited Paper)*
Author(s): **Pranav Soman,** Syracuse Univ. (United States)

13354-12 • 4:35 PM - 5:00 PM
Parallelized two-step-absorption 3D laser nanoprinting via computational holography using a digital micromirror device *(Invited Paper)*
Author(s): **Pascal Rietz**, **Paul Somers**, **Sebastian Kalt**, **Pascal Kiefer**, **Jonathan Ludwig Günter Schneider, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

13354-13 • 5:00 PM - 5:15 PM
Ultrafast optical pulses for advanced 3D microstructure fabrication and assembly
Author(s): **Jieliyue Sun**, **Krishangi Krishna, Kimani C. Toussaint,** Brown Univ. (United States)

13354-14 • 5:15 PM - 5:30 PM
The need for speed: continuous 3D printing at centimeters-per-second speeds using a lubricated textured membrane
Author(s): **Evan Jones,** Northwestern Univ. (United States); **Nanzhu Zhao,** Nissan Technical Ctr., North America (United States); **Cheng Sun,** Northwestern Univ. (United States)

13354-15 • 5:30 PM - 5:45 PM
Multidimensional integrated imaging for precision laser processing
Author(s): **Alvaro Fernandez Galiana**, **Patrick S. Salter**, **Julian Fells, Martin J. Booth,** Univ. of Oxford (United Kingdom)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13354-38 • 6:00 PM - 8:00 PM
Laser-based directed energy deposition for micro 3D metallic current collector scaffold for supercapacitor application
Author(s): **Changyoung Ryu,** Chung-Ang Univ. (Korea, Republic of); **Minh Huan Do,** Chung-Ang Univ (Korea, Republic of); **Kim Hakgae**, **Choi Jonghyuck, Jung Bin In,** Chung-Ang Univ. (Korea, Republic of)

13354-39 • 6:00 PM - 8:00 PM
Advancing 3D direct-laser writing: leveraging optical metalenses for enhanced two-photon polymerization
Author(s): **Luigi Ranno**, **Fan Yang**, **Hung-I Lin,** Massachusetts Institute of Technology (United States); **Andre Romero,** Instituto de Física de São Carlos (Brazil); **H. Zheng**, **Shaoliang Yu**, **Tian Gu**, **Juejun Hu,** Massachusetts Institute of Technology (United States); **Cleber R. Mendonça,** Instituto de Física de São Carlos (Brazil), Massachusetts Institute of Technology (United States)

13354-40 • 6:00 PM - 8:00 PM
Segmentation approach for enhanced DLP bioprinting
Author(s): **Ceren Babayigit**, **Jorge A. Tavares-Negrete**, **Rahim Esfandyarpour, Ozdal Boyraz,** Univ. of California, Irvine (United States)

13354-41 • 6:00 PM - 8:00 PM
Measuring geometries with high aspect ratio and high accuracy: an investigation of 3D-printed micro-optics for optical coherence tomography fibre probes
Author(s): **Jannik Lind,** ARENA2036 e.V. (Germany); **Jakob Mayer,** Univ. Stuttgart (Germany); **Clemens Obergfell**, **Patrik Doraciak,** Mercedes-Benz AG (Germany); **Nils Fahrbach**, **Simon Amann,** Printoptix GmbH (Germany); **Markus Kogel-Hollacher,** Precitec GmbH & Co. KG (Germany); **Daniel Holder,** ARENA2036 e.V. (Germany), Univ. Stuttgart (Germany); **Patrick Hildebrand**, **Alexander Peter**, **Andreas Michalowski, Tobias Menold,** Univ. Stuttgart (Germany)

13354-42 • 6:00 PM - 8:00 PM
DMD-based optical printing of PHEMA hydrogel gratings for sensitive and rapid alcohol sensing
Author(s): **Jing Xu**, **Fanglei Guo**, **Carmen Bartic**, **Koen Clays, Yovan de Coene,** KU Leuven (Belgium)

Wednesday 29 January 2025

SESSION 4: METAL 3D PRINTING I

29 January 2025 • 8:15 AM - 9:50 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Thejaswi Tumkur Umanath**, Lawrence Livermore National Lab. (United States)

13354-16 • 8:15 AM - 8:40 AM
Darkfield-scattering surface analysis in powder-based AM-processes: analysis of a multi-wavelength approach *(Invited Paper)*
Author(s): **Christopher Taudt**, **Christoph Leyens**, **Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Andrey Molotnikov,** RMIT Univ. (Australia)

13354-17 • 8:40 AM - 9:05 AM
Dependence of pure copper layer formation on substrate materials in the multibeam method using blue diode lasers *(Invited Paper)*
Author(s): **Ritsuko Higashino**, **Yuji Sato**, **Keisuke Takenaka**, **Nobuyuki Abe, Masahiro Tsukamoto,** Joining and Welding Research Institute, Osaka Univ. (Japan)

13354-18 • 9:05 AM - 9:20 AM
Real-time spatial frequency modulation imaging for monitoring laser powder bed fusion melt track metrology
Author(s): **Scott A. Hunter**, **Seth Cottrell**, **Daniel Scarbrough, Jeff Squier,** Colorado School of Mines (United States)

13354-19 • 9:20 AM - 9:35 AM
Laser powder bed fusion process combined with infrared heating for reduced residual stress and support-free fabrication of parts
Author(s): **Arif Hussain**, **Junghoon Lee,** Pohang Univ. of Science and Technology (Korea, Republic of); **Seongi Hong,** Pohang Univ. of Science and Technology (Kosovo, Republic of); **Young Sam Kwon,** CetaTech, Inc. (Korea, Republic of); **Dongsik Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13354-20 • 9:35 AM - 9:50 AM
Advanced beam steering scan head with in-situ sensing for metal additive manufacturing from Novanta
Author(s): **Thomas Davis,** Novanta, Inc. (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 5: METAL 3D PRINTING II

29 January 2025 • 10:20 AM - 11:55 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Hongqiang Chen**, GE Research (United States)

13354-21 • 10:20 AM - 10:45 AM
AI-assisted process monitoring and control approaches for AM: state-of-the-art and challenges in industrial application *(Invited Paper)*
Author(s): **Frank Brueckner,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Luleå Univ. of Technology (Sweden); **Joao Sousa,** Univ. do Porto (Portugal); **Mirko Riede**, **Rico Hemschik**, **Marko Seifert**, **Stefan Kuehn,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Benedikt Brandau,** JENOPTIK Automatisierungstechnik GmbH (Germany); **Elena Lopez,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Christoph Leyens,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), TU Dresden (Germany)

13354-22 • 10:45 AM - 11:10 AM
Laser assisted powder bed fusion of refractory metals using ultra short laser pulses *(Invited Paper)*
Author(s): **Hagen P. Kohl**, **Lisa Matthäus**, **Brian Seyfarth,** Abbe Ctr. of Photonics (Germany), Friedrich-Schiller-Univ. Jena (Germany); **Stefan Nolte,** Abbe Ctr. of Photonics (Germany), Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13354-23 • 11:10 AM - 11:25 AM
Increase of theoretical build rate in laser powder bed fusion through adapted laser intensity distribution
Author(s): **Mahmoud Ziat,** CAILabs (France); **Niklas Prätzsch,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Adeline Orieux**, **Gwenn Pallier,** CAILabs (France); **Tim Lantzsch,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Pu Jian, Guillaume Labroille,** CAILabs (France)

13354-24 • 11:25 AM - 11:40 AM
Computation of spatial intensity distributions for laser powder bed fusion through the solution of an inverse heat conduction problem
Author(s): **Thomas Bussek**, **Oskar Hofmann**, **Annika Bonhoff,** RWTH Aachen Univ. (Germany); **Carlo Holly,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany)

13354-25 • 11:40 AM - 11:55 AM
Powder melting efficiency during laser powder bed fusion additive manufacturing
Author(s): **Yang Du,** Iowa State Univ. of Science and Technology (United States); **Craig Arnold,** Princeton Univ. (United States)

Lunch/Exhibition Break 11:55 AM - 1:25 PM

SESSION 6: MICRO-OPTICS AND FUNCTIONAL DEVICE PRINTING I

29 January 2025 • 1:25 PM - 2:45 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany)

13354-26 • 1:25 PM - 1:50 PM
Stereolithography 3D printing of an accelerometer embedded nightguard for TMD monitoring *(Invited Paper)*
Author(s): **Elizabeth McLaughlin**, **Maya Gerding**, **Yongji Wu**, **Hai Xiao, Hai Yao,** Clemson Univ. (United States)

13354-27 • 1:50 PM - 2:15 PM
CO_2 laser deposition of single and multilayer transparent coatings using oxide nanoparticles *(Invited Paper)*
Author(s): **Yahya Bougdid**, **Gunjan Kulkarni,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Francois Chenard,** IRflex Corporation (United States); **Chandraika J. Sugrim,** Naval Air Warfare Ctr. Aircraft Div. (United States); **Ranganathan Kumar,** Univ. of Central Florida (United States); **Aravinda Kar,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13354-28 • 2:15 PM - 2:30 PM
Laser induced forward transfer of metals and solder materials for the digital bonding in photonic applications
Author(s): **Marina Makrygianni**, **Kostas Andritsos,** National Technical Univ. of Athens (Greece); **Sohrab Kamyar**, **Erik Schreuder**, **Ronald Dekker,** LioniX International BV (Netherlands); **Karol Obara,** PHIX Photonics Assembly (Netherlands); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13354-29 • 2:30 PM - 2:45 PM
A quick explicit algorithm reconstructing mechanical constitutive curve for 3D printed miniaturized specimen in uniaxial tensile test
Author(s): **Junqing Leng**, **Pengpeng Zhang**, **Caralyn Collins**, **Cheng Sun, Guillermo A. Ameer,** Northwestern Univ. (United States)

Coffee Break 2:45 PM - 3:15 PM

SESSION 7: MICRO-OPTICS AND FUNCTIONAL DEVICE PRINTING II

29 January 2025 • 3:15 PM - 4:20 PM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Yahya Bougdid**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13354-30 • 3:15 PM - 3:40 PM
High-quality glass micro- and nanostructures by two-photon grayscale lithography (2GL®) *(Invited Paper)*
Author(s): **Jonathan L. G. Schneider**, **Jiajie Liang**, **Martin Wegener, Jens Bauer,** Karlsruher Institut für Technologie (Germany)

13354-31 • 3:40 PM - 4:05 PM
3D manufacturing of glass multifocal microlens-arrays and skewed optics through laser assisted processes *(Invited Paper)*
Author(s): **Martin Lentz**, **Samuel Benketaf, Yves Bellouard,** EPFL (Switzerland)

13354-32 • 4:05 PM - 4:20 PM
Visible-light optical coherence tomography imaging-driven 3D printing of customized contact lens
Author(s): **Pengpeng Zhang**, **Raymond Fang**, **Weijia Fan**, **Junqing Leng**, **Hao F. Zhang, Cheng Sun,** Northwestern Univ. (United States)

Thursday 30 January 2025

SESSION 8: MICRO-OPTICS AND FUNCTIONAL DEVICE PRINTING III

30 January 2025 • 9:00 AM - 10:45 AM | Moscone South, Room 201 (Level 2)
Session Chair(s): **Edward C. Kinzel**, Univ. of Notre Dame (United States)

13354-33 • 9:00 AM - 9:25 AM
High throughput two-photon-lithography system powered by metalens array *(Invited Paper)*
Author(s): **Chenkai Mao,** Stanford Univ. (United States); **Songyun Gu**, **Sarvesh A. Sadana**, **Liliana Wang,** Lawrence Livermore National Lab. (United States); **You Zhou,** The Univ. of North Carolina at Charlotte (United States); **Anna Guell Izard**, **Magi Yassa**, **Thej Tumkur Umanath**, **Travis Massey**, **Xiaoxing Xia,** Lawrence Livermore National Lab. (United States); **Jonathan A. Fan,** Stanford Univ. (United States)

13354-34 • 9:25 AM - 9:40 AM
One step femtosecond direct laser writing (Fs-DLW) of tunable optical vortex (OV) generator
Author(s): **Saurabh Awasthi,** Lawrence Berkeley National Lab. (United States); **SeungYeon Kang,** Univ. of Connecticut (United States); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States)

13354-35 • 9:40 AM - 10:05 AM
Laser 3D printing of industrial-scale micro-reactors in glass for flow chemistry applications *(Invited Paper)*
Author(s): **Ya Cheng,** Shanghai Institute of Optics and Fine Mechanics (China)

13354-36 • 10:05 AM - 10:30 AM
Additive-free multi-transparency glass 3D printing *(Invited Paper)*
Author(s): **Zhihan Hong,** Wyant College of Optical Sciences (United States); **Piaoran Ye**, **Douglas A. Loy,** The Univ. of Arizona (United States); **Rongguang Liang,** Wyant College of Optical Sciences (United States), The Univ. of Arizona (United States)

13354-37 • 10:30 AM - 10:45 AM
Laser-written liquid crystal devices for non-mechanical beam steering
Author(s): **Camron Nourshargh**, **Alec Xu**, **Zhiyu Xu**, **Nathan Spiller**, **Waqas Kamal**, **Patrick S. Salter**, **Martin J. Booth**, **Steve J. Elston, Stephen M. Morris,** Univ. of Oxford (United Kingdom)

CONFERENCE 13355

Free-Space Laser Communications XXXVII

28 - 30 January 2025 | Moscone South, Room 208 (Level 2)

Conference Chair(s): **Hamid Hemmati,** ViaSat, Inc. (United States); **Bryan S. Robinson,** MIT Lincoln Lab. (United States)

Program Committee: **Erik Alerstam**, **Abhijit Biswas,** Jet Propulsion Lab. (United States); **Don M. Boroson,** MIT Lincoln Lab. (United States); **Kerri L. Cahoy,** Massachusetts Institute of Technology (United States); **Donald M. Cornwell,** Amazon.com, Inc. (United States); **Baris I. Erkmen,** Aalyria Technologies, Inc. (United States); **Mark Gregory,** Tesat-Spacecom GmbH & Co. KG (Germany); **Harald Hauschildt,** European Space Research and Technology Ctr. (Netherlands); **William S. Rabinovich,** U.S. Naval Research Lab. (United States); **Todd S. Rose,** The Aerospace Corp. (United States); **Julie Smith,** Air Force Research Lab. (United States); **Sarah A. Tedder,** NASA Glenn Research Ctr. (United States); **Linda M. Thomas,** U.S. Naval Research Lab. (United States); **Morio Toyoshima,** National Institute of Information and Communications Technology (Japan)

Tuesday 28 January 2025

WELCOMING NOTES

28 January 2025 • 8:30 AM - 8:35 AM | Moscone South, Room 208 (Level 2)
Hamid Hemmati, ViaSat, Inc. (United States) and Bryan S. Robinson, MIT Lincoln Lab. (United States)

SESSION 1: SPACE DEMONSTRATIONS/OPERATIONS/MEASUREMENTS I

28 January 2025 • 8:35 AM - 10:05 AM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Hamid Hemmati**, ViaSat, Inc. (United States)

13355-1 • 8:35 AM - 9:05 AM
Results of SDA-standard-compatible optical inter-satellite link testing between Kepler Communications LEO satellites *(Invited Paper)*
Author(s): **James Spicer,** Kepler Communications (United States); **Stephen Lau, Robin Aucoin,** Kepler Communications (Canada)

13355-2 • 9:05 AM - 9:25 AM
Recent results in optical satellite link research at DLR
Author(s): **Christian Fuchs**, **Douglas Laidlaw**, **Florian Moll**, **Juraj Poliak**, **Amita Shrestha, Christopher Schmidt,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

13355-3 • 9:25 AM - 9:45 AM
Status on laser communication activities at Tesat-Spacecom
Author(s): **Mark Gregory**, **Frank Heine**, **Fabian Helde**, **Robert Mahn**, **Patricia Martin-Pimentel, Herwig Zech,** Tesat-Spacecom GmbH & Co. KG (Germany)

13355-4 • 9:45 AM - 10:05 AM
LEO-to-ground laser link experimentation and optical ground station development in the Keraunos project
Author(s): **Martin Rabault**, **Domitille Schanne**, **Henri Lehec**, **Aubin Beauland**, **Maxime Joos**, **Laurie Paillier**, **Matthieu Meunier**, **Pu Jian**, **Olivier Pinel, Guillaume Labroille,** CAILabs (France)

Coffee Break 10:05 AM - 10:35 AM

SESSION 2: SPACE DEMONSTRATIONS/OPERATIONS/MEASUREMENTS II

28 January 2025 • 10:35 AM - 11:45 AM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Bryan S. Robinson**, MIT Lincoln Lab. (United States)

13355-5 • 10:35 AM - 11:05 AM
Experimental results from integrated LCRD Low-Earth Orbit User Modem and Amplifier Terminal (ILLUMA-T) Program *(Invited Paper)*
Author(s): **Zachary Gonnsen,** NASA Goddard Space Flight Ctr. (United States); **Jade P. Wang**, **Farzana I. Khatri,** MIT Lincoln Lab. (United States); **Christian Rivera Rivera**, **Jacob Gregory**, **Alan Hylton**, **Mahima Kaushik**, **Samuel Larson**, **Trisha Randazzo**, **Kathy Strickler**,

Jennifer Sager, **Jeff Towns**, **John Veselka**, **Douglas Ward**, **Jonathon Woodward**, **Jean-Pierre Chamoun**, **Rick Butler**, **Miriam Wennersten**, **Nick Cummings**, **Nic du Toit**, **David Israel**, **Glenn Jackson,** NASA Goddard Space Flight Ctr. (United States); **Bryan S. Robinson**, **Jamie Burnside**, **Jesse Chang**, **Benjamin Croop**, **Catherine E. DeVoe**, **Olga Mikulina**, **John D. Moores**, **Neal Spellmeyer**, **James Torres,** MIT Lincoln Lab. (United States); **Sabino Piazzolla**, **Tom Roberts,** Jet Propulsion Lab. (United States); **Suzanne Smith,** NASA Goddard Space Flight Ctr. (United States)

13355-6 • 11:05 AM - 11:25 AM
On-orbit measurements of solar exclusion angle for Modular Agile Scalable Optical Terminal (MAScOT) on the ILLUMA-T mission
Author(s): **Catherine E. DeVoe**, **Jesse Chang**, **Farzana I. Khatri**, **Kenneth Aquino**, **Jamie Burnside**, **Igor Gaschits**, **Steven Gillmer**, **Olga Mikulina**, **Vishwa Shukla**, **Corrie Smeaton**, **James Torres**, **Jade P. Wang,** MIT Lincoln Lab. (United States); **Zachary Gonnsen**, **Jacob Gregory**, **Samuel Larson**, **Matthew Magsamen**, **Trisha Randazzo**, **Christian Rivera Rivera**, **Suzanne Smith**, **Jennifer Sager**, **Jeffrey Towns**, **Douglas Ward**, **David Israel**, **Glenn Jackson,** NASA Goddard Space Flight Ctr. (United States); **Bryan S. Robinson,** MIT Lincoln Lab. (United States)

13355-7 • 11:25 AM - 11:45 AM
End-to-end communication test results of the in-orbit demonstration of a 1U Optical Laser Communication Terminal
Author(s): **C. Willem Korevaar**, **Dong-Nhat Nguyen**, **Dick de Bruijn**, **Karthik Selvan**, **Gert Witvoet**, **Rodolf W. Herfst**, **Niek J. Doelman**, **Kristiaan Broekens, Floris van Kempen,** TNO (Netherlands)

Lunch/Exhibition Break 11:45 AM - 1:45 PM

SESSION 3: SPACE DEMONSTRATIONS/OPERATIONS/MEASUREMENTS III

28 January 2025 • 1:45 PM - 2:25 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Bryan S. Robinson**, MIT Lincoln Lab. (United States)

13355-8 • 1:45 PM - 2:05 PM
CubeSat optical crosslink
Author(s): **Todd S. Rose**, **Nicolette Werner**, **Ariel Berman**, **John Swigert**, **Eric McDonald**, **Sara Lampen**, **Stephanie Rodriguez**, **Sara Grasso**, **Chrissy Fortuno**, **Arthur Martirosyan**, **William Crain, Nery Moreno,** The Aerospace Corp. (United States)

13355-9 • 2:05 PM - 2:25 PM
Operational status of JAXA's new optical data relay system LUCAS
Author(s): **Yohei Satoh**, **Takamasa Itahashi**, **Yutaka Takano, Shiro Yamakawa,** Japan Aerospace Exploration Agency (Japan)

SESSION 4: COMPONENT/SUBSYSTEM/TRANSCEIVER TECHNOLOGY I

28 January 2025 • 2:25 PM - 4:35 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Donald M. Cornwell**, Amazon.com, Inc. (United States)

13355-10 • 2:25 PM - 2:45 PM
Optical phased arrays for space-to-space communications
Author(s): **Juan Montoya**, **Dan Mack**, **Charles Klimcak**, **Vahid Riasati**, **Andrew Walston**, **Jeff Norman**, **Ianko Chterev**, **George Valley**, **Todd S. Rose**, **Phillip Nee**, **Robert Carlson**, **Austin Lee, Kevin Gaab,** The Aerospace Corp. (United States)

13355-11 • 2:45 PM - 3:05 PM
Phase noise compensation with highly-stabilized laser for long-distance free-space optical coherence communication
Author(s): **Taewon Kim**, **Hyeokin Kang**, **Shin Hyung Kim**, **Guseon Kang**, **Jaeyoon Kim**, **Jeong Hun Seong**, **Gibeen Gu**, **Seung-Woo Kim, Young-Jin Kim,** KAIST (Korea, Republic of)

Coffee Break • 3:05 PM - 3:35 PM

13355-99 • 3:35 PM - 3:55 PM
From high throughput optical network to quantum information network: overview of European Space Agency networks
Author(s): **Kasia Balakier**, **Josep Perdigués Armengol**, **Christopher Vasko, Harald Hauschildt,** European Space Agency (Netherlands)

13355-14 • 3:55 PM - 4:15 PM
Small satellite lunar optical communications for NASA Science and Artemis
Author(s): **Mark Storm, Keith Petrillo,** Fibertek, Inc. (United States)

13355-16 • 4:15 PM - 4:35 PM
Optical communication for nano-sat
Author(s): **Moti Fridman,** Bar-Ilan Univ. (Israel)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13355-53 • 6:00 PM - 8:00 PM
Effect of satellite slew rate in bit error rate model under atmospheric turbulence
Author(s): **Larry B. Stotts,** Stotts Consulting, LLC (United States); **Morio Toyoshima,** National Institute of Information and Communications Technology (Japan); **Larry C. Andrews,** Univ. of Central Florida (United States)

13355-54 • 6:00 PM - 8:00 PM
Demonstration of anti-diffracting optical pin-like beam enabled 5Gbit/s OFDM underwater wireless optical communication system
Author(s): **Xiaotian Han**, **Wei Wang**, **Peng Li**, **Guangying Li**, **Duorui Gao**, **Chang Chang**, **Peixuan Liao**, **Chenhua Xie, Xiaoping Xie,** Xi'an Institute of Optics and Precision Mechanics (China)

13355-55 • 6:00 PM - 8:00 PM
Evaluation of a semiconductor optical amplifier for free space optical communication applications
Author(s): **Charlotte K. Duda,** Space Dynamics Lab. (United States); **Chadwick Lindstrom,** Air Force Research Lab. (United States); **Francisco Fonta**, **Ben Stuhl,** Space Dynamics Lab. (United States); **Aaron D. Cross,** Leidos, Inc. (United States); **Julie Smith,** Air Force Research Lab. (United States)

13355-56 • 6:00 PM - 8:00 PM
Prototype development and evaluation of space-grade WDM-based HPA/LNA modules for small LEO satellite constellations
Author(s): **Hideaki Kotake**, **Hiroyuki Tsuji, Morio Toyoshima,** National Institute of Information and Communications Technology (Japan)

13355-57 • 6:00 PM - 8:00 PM
On campus low-cost FSO communication link analysis for backhaul connectivity in B5G communications
Author(s): **Saad Saeed**, **Abdullah Nafis Khan, Usman Younis,** Information Technology Univ. of the Punjab (Pakistan)

13355-58 • 6:00 PM - 8:00 PM
Long-term intensity modulated optical communication over a 1.3km free-space atmospheric link using optimized PAT system and AM noise suppression
Author(s): **Hyeokin Kang**, **Taewon Kim**, **Guseon Kang**, **Jaeyoon Kim**, **Jeong Hun Seong**, **Gibeen Gu**, **Seung-Woo Kim, Young-Jin Kim,** KAIST (Korea, Republic of)

13355-59 • 6:00 PM - 8:00 PM
Performance and applications of optical pin beams in turbulent long-range free space optical communications
Author(s): **Francesco Nardo,** Karlsruher Institut für Technologie (Germany), Airbus Defence and Space (Germany); **Jan Tepper**, **Ricardo Barrios,** Airbus Defence and Space (Germany); **Jonas Krimmer, Sebastian Randel,** Karlsruher Institut für Technologie (Germany)

13355-60 • 6:00 PM - 8:00 PM
Developing a space optical communication system for 3u CubeSats
Author(s): **YoungMin Ko**, **JongJu Moon**, **Seul-Hyun Park, Tae-Jung Ahn,** Chosun Univ. (Korea, Republic of)

13355-61 • 6:00 PM - 8:00 PM
Orbit determination using passive optical communication observations
Author(s): **Erik F. Halliwell**, **Knud S. Knudsen, Ian R. Mann,** Univ. of Alberta (Canada)

13355-62 • 6:00 PM - 8:00 PM
Panoramic steering modules for optical wireless communications on small UAS
Author(s): **Changkee Hong, Kyle Renshaw,** Univ. of Central Florida (United States)

13355-63 • 6:00 PM - 8:00 PM
Ultra-low optical input power 1μm-laser amplifier for WDM satellite communication
Author(s): **Sven Hochheim**, **Peter Weßels**, **Jörg Neumann, Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany)

13355-64 • 6:00 PM - 8:00 PM
Advanced control of ALPAO DMs leads to significant AO performance improvements
Author(s): **Idir Boudjema**, **Baptiste Sinquin**, **Armin Schimpf**, **Hisham Forrière**, **Bruno Martin, Julien Charton,** Bertin Alpao (France)

13355-65 • 6:00 PM - 8:00 PM
Miniaturized, radiation resistant, booster EDFA for compact CubeSat lasercom terminals
Author(s): **Giannis Psyllakis**, **Leontios Stampoulidis**, **Ilias Sourikopoulos**, **Ahmed Osman,** LEO Space Photonics (Greece); **Theodoros Triantis,** Institute of Nanoscience and Nanotechnology (Greece)

13355-66 • 6:00 PM - 8:00 PM
Robust optical communications using the coherence-rank of partially coherent light
Author(s): **Mitchell Harling**, **Chandler Stevenson,** Brown Univ. (United States); **Kimani C. Toussaint,** Brown Univ. (United States), Brown-Lifespan Ctr. for Digital Health (United States); **Ayman F. Abouraddy,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13355-68 • 6:00 PM - 8:00 PM
Packaged QCL chips and arrays for Air Force applications
Author(s): **Rowel Go**, **Enoc Flores**, **Matthew Suttinger**, **Chunte Lu, Joseph Hebbel,** Air Force Research Lab. (United States)

13355-70 • 6:00 PM - 8:00 PM
Wavefront corrections impacted by turbulence using beam modulation technique
Author(s): **Shouvik Sadhukhan, C. S. Narayanamurthy,** Indian Institute of Space Science and Technology (India)

13355-72 • 6:00 PM - 8:00 PM
SFP-driven multi-aperture spatially diverse free space optical communications
Author(s): **Mark Main**, **Adam Vallance**, **Malik Salloum**, **Ultan Daly,** Univ. of Glasgow (United Kingdom); **Mitchell A. Cox,** Univ. of the Witwatersrand, Johannesburg (South Africa); **Martin P. J. Lavery,** Univ. of Glasgow (United Kingdom)

13355-73 • 6:00 PM - 8:00 PM
Towards IA-based predictive controllers for adaptive optics for LEO and GEO communications
Author(s): **Jonathan Dray,** Bertin Alpao (France), Lab. d'Astrophysique de Marseille, CNRS (France); **Baptiste Sinquin,** Bertin Alpao (France); **Morgan Gray**, **Benoît Neichel,** Lab. d'Astrophysique de Marseille, CNRS (France); **Cédric Taïssir Héritier,** Lab. d'Astrophysique de Marseille, CNRS (France), ONERA (France); **Cyril Petit,** ONERA (France); **Carlos M. Correia,** Univ. do Porto (Portugal); **Thierry Fusco,** Lab. d'Astrophysique de Marseille (France), ONERA (France); **Armin Schimpf, Julien Charton,** Bertin Alpao (France)

13355-74 • 6:00 PM - 8:00 PM
Optical uplink pre-compensation phase optimisation demonstration using double star measurements and profile reconstruction: design and preliminary results
Author(s): **Perrine Lognoné**, **James Osborn**, **Ollie Farley, Kathryn Hartley,** Durham Univ. (United Kingdom)

13355-76 • 6:00 PM - 8:00 PM
Coherent beam combination for deep space optical communications
Author(s): **Antoni Mikos-Nuszkiewicz**, **Karol Łukanowski,** Univ. of Warsaw (Poland); **Marcin Jarzyna,** Ctr. of New Technologies (Poland); **Konrad Banaszek,** Univ. of Warsaw (Poland), Ctr. of New Technologies (Poland)

13355-78 • 6:00 PM - 8:00 PM
A wide bandwidth source of weak coherent pulses using feedback from superconducting nanowire single photon detectors
Author(s): **Nathaniel Wilson, Brian E. Vyhnalek,** NASA Glenn Research Ctr. (United States)

13355-79 • 6:00 PM - 8:00 PM
Multi-Gbps fiber-optic wavefront sensing coherent optical receiver
Author(s): **Brian E. Vyhnalek**, **Sarah A. Tedder, Yousef K. Chahine,** NASA Glenn Research Ctr. (United States)

13355-80 • 6:00 PM - 8:00 PM
In situ 100 MeV proton and gamma radiation testing of 25 Gbaud balanced photoreceivers
Author(s): **Abhay M. Joshi**, **Shubhashish Datta**, **Abigale R. Joshi,** Discovery Semiconductors, Inc. (United States); **Michael Sivertz**, **David Inzalaco,** NASA Space Radiation Lab. (United States); **James Jardine,** Brookhaven National Lab. (United States); **Joel Hatch,** The Ohio State Univ. (United States)

13355-82 • 6:00 PM - 8:00 PM
Active silicon photonic Van-Atta retroreflector platform for free-space optical communication
Author(s): **Jacob N. Bouchard**, **Marcel W. Pruessner**, **Nathan F. Tyndall, Todd H. Stievater,** U.S. Naval Research Lab. (United States)

13355-83 • 6:00 PM - 8:00 PM
Performance of 45-mode TILBA-ATMO for LEO-to-ground Turbulence Mitigation on turbulence emulation bench and on a 5-km ground-to-ground free-space testbed
Author(s): **Antonin Billaud**, **Cédric Dautancourt**, **Clara Abbouab,** CAILabs (France); **Duy-Hà Phung,** Univ. Côte d'Azur (France), Observatoire de la Côte d'Azur (France), Institut de Recherche pour le Développement, Geoazur (France); **Julien Chabé**, **Clément Courde**, **Hervé Mariey**, **Nils Raymond**, **Julien Scariot,** Univ. Côte d'Azur (France); **Aziz Ziad,** Univ. Côte d'Azur (France), Observatoire de la Côte d'Azur, CNRS (France), Lab. Lagrange (France); **Ahmed Khalifa**, **Guillaume Larché**, **Claire Autebert**, **Laure Etchegoinberry**, **Josselin Huby**, **Pu Jian, Guillaume Labroille,** CAILabs (France)

13355-84 • 6:00 PM - 8:00 PM
Temporal coherence affected by wavefront manipulation with Zernike polynomials in adaptive optics
Author(s): **Boyu Zhang**, **Changmin Kim,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States); **José Chirinos**, **Xianglei Mao,** Lawrence Berkeley National Lab. (United States); **Vassilia Zorba,** Lawrence Berkeley National Lab. (United States), Univ. of California, Berkeley (United States)

13355-85 • 6:00 PM - 8:00 PM
High-efficiency coherent beam combination for optical feeder links using MPLC
Author(s): **Clément Jacquard**, **Raphaël Piccon**, **Claire Autebert**, **Gauthier Trunet**, **Pu Jian, Guillaume Labroille,** CAILabs (France)

13355-86 • 6:00 PM - 8:00 PM
System model of a miniaturized laser communication terminal
Author(s): **Spyridon Gouvalas**, **Vittorio Franzese, Andreas Hein,** Univ. du Luxembourg (Luxembourg)

13355-87 • 6:00 PM - 8:00 PM
Evaluation of a photonic lantern spatial demultiplexer-based receiver for optical communication
Author(s): **Vincent Billault**, **Luc Leviandier**, **Jérôme Bourderionnet,** Thales Research & Technology (France); **Christophe Pierre**, **Raynald Sanquer**, **Marc Castaing,** ALPhANOV (France); **Arnaud Brignon,** Thales Research & Technology (France)

13355-89 • 6:00 PM - 8:00 PM
Characterization of an APD-based OEO receiver architecture with the NRL SDA OCT reference modem
Author(s): **Mike S. Ferraro**, **Austin Singh**, **Zachary T. Zern**, **Rita Mahon**, **James L. Murphy**, **William S. Rabinovich,** U.S. Naval Research Lab. (United States); **Wade T. Freeman,** Smart Logic, Inc. (United States)

13355-90 • 6:00 PM - 8:00 PM
2.5G large area avalanche photodiodes for free space optical communication
Author(s): **Mike S. Ferraro**, **Austin Singh**, **Zachary T. Zern**, **James L. Murphy**, **Rita Mahon**, **William S. Rabinovich,** U.S. Naval Research Lab. (United States); **Brian D. Krejca,** Optogration Inc. (United States)

13355-91 • 6:00 PM - 8:00 PM
Power spectral density characteristics through turbulent atmosphere
Author(s): **Austin Singh**, **Rita Mahon**, **Mike S. Ferraro**, **Zachary T. Zern, William S. Rabinovich,** U.S. Naval Research Lab. (United States)

13355-92 • 6:00 PM - 8:00 PM
Range measurements using the optical to orion table mountain ground terminal
Author(s): **Ryan Rogalin**, **Erik Alerstam**, **Nathaniel Richard, Stephanie Luk,** Jet Propulsion Lab. (United States)

13355-93 • 6:00 PM - 8:00 PM
Using numerical weather prediction to forecast optical turbulence
Author(s): **William S. Rabinovich**, **Rita Mahon**, **Mike S. Ferraro,** U.S. Naval Research Lab. (United States); **Angela M. Ulate,** University Corp. for Atmospheric Research (United States); **James R. Campbell**, **Annette Walker, David D. Flagg,** U.S. Naval Research Lab. (United States)

13355-94 • 6:00 PM - 8:00 PM
Wavelength-dependent performance of OAM-based optical communication in foggy conditions
Author(s): **Ayush Mehra, Shlomi Arnon,** Ben-Gurion Univ. of the Negev (Israel)

13355-95 • 6:00 PM - 8:00 PM
Determining Bessel-Gauss beams orbital angular momentum using diffraction patterns from various apertures
Author(s): **Ayush Mehra, Shlomi Arnon,** Ben-Gurion Univ. of the Negev (Israel)

13355-96 • 6:00 PM - 8:00 PM
Testing a small, deployable, optical ground terminal for LEO to ground laser communications
Author(s): **Owain Pryce-Jones**, **Simon Fowler**, **Robin Davies**, **Alessandro Tringali**, **Liam Foley**, **Simran Mardhani**, **Daniel O'Connell**, **Arnold Harpin**, **Nardhini Shanmugasundaram**, **Theo Hussey**, **James Nygaard**, **Jennifer Alston**, **Crisanto Quintana, Edem Fiamanya,** Archangel Lightworks (United Kingdom)

13355-97 • 6:00 PM - 8:00 PM
Lasercomm transmitter alignment using clouds
Author(s): **Michael Vilcheck**, **Christopher I. Moore**, **Rita Mahon**, **Jonathan W. Rabinovich,** U.S. Naval Research Lab. (United States); **Jeffrey Joyner,** Northrop Grumman Corp. (United States)

13355-98 • 6:00 PM - 8:00 PM
Adaptive LDPC coding in L-band outperforming adaptive optics in C-/L-bands in free-space optical communication under strong turbulence regime
Author(s): **Vijay Nafria, Ivan B. Djordjevic,** The Univ. of Arizona (United States)

13355-100 • 6:00 PM - 8:00 PM
400-Gb/s Mode Division Multiplexing-Based Bidirectional Free Space Optical Communication in Real-Time with Commercial Transponders
Author(s): **Giovanni Milione**, **Giacomo Borraccini**, **Andrea D'amico**, **Yue-Kai Huang**, **Ezra Ip**, **Jian Fang**, **Philip Ji,** NEC Labs. America, Inc. (United States); **Koji Asahi**, **Toshiharu Ito,** NEC Corporation (Japan); **Ting Wang,** NEC Labs. America, Inc. (United States)

Wednesday 29 January 2025

SESSION 5: COMPONENT/SUBSYSTEM/TRANSCEIVER TECHNOLOGY II

29 January 2025 • 8:50 AM - 9:50 AM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Abhijit Biswas**, Jet Propulsion Lab. (United States)

13355-17 • 8:50 AM - 9:10 AM
Comparative analysis of Bessel-Gaussian and Ince-Gaussian beams for free-space optical communication
Author(s): **Gokul Manavalan, Shlomi Arnon,** Ben-Gurion Univ. of the Negev (Israel)

13355-18 • 9:10 AM - 9:30 AM
Algorithms and principles for laser control and tuning for laser communications
Author(s): **Christopher C. Foy**, **Rachel Sampson**, **Jeffrey Minch**, **Vincent Scalesse**, **Derrick Feld**, **Peggy Boning**, **Richard Magliocco, Tim Yarnall,** MIT Lincoln Lab. (United States)

13355-20 • 9:30 AM - 9:50 AM
Operation of the NRL-SDA optical communication terminal testbed
Author(s): **Jonathan W. Rabinovich**, **Joshua Beun**, **J. Dickson-Burke**, **Rita Mahon,** U.S. Naval Research Lab. (United States); **Wade Freeman,** Smart Logic, Inc. (United States); **James Caron,** Research Support Instruments, Inc. (United States); **Patrick Dement,** Peraton, Inc. (United States); **Stephanos Rahimzadeh,** Space Development Agency (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 6: DEEP SPACE LINKS I

29 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Don M. Boroson**, MIT Lincoln Lab. (United States)

13355-21 • 10:20 AM - 10:50 AM
Overview of the Deep Space Optical Communications (DSOC) technology demonstration *(Invited Paper)*
Author(s): **Abhijit Biswas**, **Meera Srinivasan**, **Kenneth S. Andrews**, **Angel E. Velasco**, **Erik Alerstam**, **Jason P. Allmaras**, **Emma E. Wollman**, **Seán M. Meenehan**, **Malcolm W. Wright, Ryan Rogalin,** Jet Propulsion Lab. (United States), Caltech (United States)

13355-22 • 10:50 AM - 11:10 AM
Operational results from the deep space optical communications project ground laser transmitter
Author(s): **Seán M. Meenehan**, **Angel E. Velasco**, **Malcolm W. Wright**, **Yuri Beregovski**, **Mark Brewer**, **William Buehlman**, **Nathaniel Richard**, **Erik Alerstam**, **Abhijit Biswas**, **Ryan Rogalin**, **Gerardo Ortiz**, **Vachik Garkanian**, **Kittrin Matthews**, **Jason P. Allmaras, Meera Srinivasan,** Jet Propulsion Lab. (United States)

13355-23 • 11:10 AM - 11:30 AM
Downlink and uplink laser transmitters operational performance for the Deep Space Optical Communications project on the Psyche mission
Author(s): **Malcolm W. Wright,** Jet Propulsion Lab. (United States)

13355-24 • 11:30 AM - 11:50 AM
The deep space optical communications (DSOC) flight terminal
Author(s): **Kenneth S. Andrews**, **Jason P. Allmaras**, **Erik Alerstam**, **Oscar Alvarez-Salazar**, **Haley Bates-Tarasewicz**, **Abhijit Biswas**, **Herrick Chang**, **Christine Chen**, **Dylan Conway**, **Brett Douglas**, **Serge Dubovitsky**, **Torrance J. Eberhart**, **Hernan Erlig**, **Sarah Haque**, **William Klipstein**, **Oliver Lay**, **Arthur Na-Nakornpanom**, **Christopher Pong**, **Meera Srinivasan**, **Rogelio Rosas**, **Vincent van Rhein,** Jet Propulsion Lab. (United States); **Marcus Wilkerson,** Blue Origin LLC (United States); **Malcolm W. Wright, David Zhu,** Jet Propulsion Lab. (United States)

13355-25 • 11:50 AM - 12:10 PM
Ground laser receivers for the Deep Space Optical Communications demonstration: performance and lessons learned from first year of operations
Author(s): **Erik Alerstam**, **Ryan Rogalin**, **Emma E. Wollman**, **Seán M. Meenehan**, **Matthew Shaw**, **Angel E. Velasco**, **Abhijit Biswas**, **Nathaniel Richard**, **Daniel Cho**, **Vachik Garkanian**, **Jason P. Allmaras**, **Roger O'Brient**, **Gregory Miles**, **Edwin Grigorian, Meera Srinivasan,** Jet Propulsion Lab. (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 7: DEEP SPACE LINKS II

29 January 2025 • 1:40 PM - 2:40 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Don M. Boroson**, MIT Lincoln Lab. (United States)

13355-26 • 1:40 PM - 2:00 PM
Flight system acquisition, tracking, and pointing results from the Deep Space Optical Communications technology demonstration
Author(s): **Meera Srinivasan**, **Erik Alerstam**, **Jason P. Allmaras**, **Oscar Alvarez-Salazar**, **Kenneth S. Andrews**, **Abhijit Biswas**, **Herrick Chang**, **Dylan Conway**, **Brett Douglas**, **Serge Dubovitsky**, **Hernan Erlig**, **Sarah Haque**, **William Klipstein**, **Oliver Lay**, **Christopher Pong**, **Vincent van Rhein, David Zhu,** Jet Propulsion Lab. (United States)

13355-27 • 2:00 PM - 2:20 PM
The RF/ optical hybrid antenna for deep space communications
Author(s): **Barzia Tehrani**, **Daniel Hoppe**, **Julia Milton**, **Alexander Abramovici**, **Jason P. Allmaras**, **Sang Chung**, **Andy Klaib,** Jet Propulsion Lab. (United States); **Makan Mohageg,** Boeing (United States); **Ryan Rogalin, Kevin Whipp,** Jet Propulsion Lab. (United States)

13355-28 • 2:20 PM - 2:40 PM
Telescope arrays for Deep Space Optical Communication
Author(s): **Ryan Rogalin, Hua Xie,** Jet Propulsion Lab. (United States)

SESSION 8: SYSTEMS AND CONCEPTS

29 January 2025 • 2:40 PM - 3:30 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Linda M. Thomas**, U.S. Naval Research Lab. (United States)

13355-29 • 2:40 PM - 3:10 PM
Enabling the sharpest images of a black hole with laser communications *(Invited Paper)*
Author(s): **Michael D. Johnson,** Ctr. for Astrophysics | Harvard & Smithsonian (United States)

13355-30 • 3:10 PM - 3:30 PM
The European satellite-based QKD system EAGLE-1
Author(s): **Thomas Hiemstra**, **David Hasler**, **Domenico Paone**, **Fabian Reichert**, **Frank Heine, Julian Struck,** Tesat-Spacecom GmbH & Co. KG (Germany)

Coffee Break 3:30 PM - 4:00 PM

SESSION 9: MODULATION AND CODING

29 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **David T. Wayne**, Space Development Agency (United States); **Michael C. Butterfield**, Defense Advanced Research Projects Agency (United States)

13355-32 • 4:00 PM - 4:20 PM
Capacity-based analysis of physical-layer and link-layer techniques for reliable communication over free-space optical fading channels
Author(s): **Curt M. Schieler**, **Don M. Boroson, Bryan S. Robinson,** MIT Lincoln Lab. (United States)

13355-33 • 4:20 PM - 4:40 PM
High extinction ratio waveform generation using a directly modulated laser and transmissive fiber Bragg grating filter
Author(s): **David O. Caplan,** MIT Lincoln Lab. (United States); **Guillaume Brochu, Marc-André Laliberté,** TeraXion Inc. (Canada)

13355-34 • 4:40 PM - 5:00 PM
Interleaving to mitigate burst errors due to dynamic pointing and tracking losses
Author(s): **Jenny Sun,** MIT Lincoln Lab. (United States); **Thomas C. Royster,** LinQuest Corp. (United States); **Timothy Coull**, **Robert J. Murphy, Todd G. Ulmer,** MIT Lincoln Lab. (United States)

13355-35 • 5:00 PM - 5:20 PM
Space development agency burst mode on-off keyed waveform for long range intersatellite optical communications
Author(s): **Robert Carlson**, **Ianko Chterev**, **George Sefler**, **Todd S. Rose**, **Phillip T. Nee**, **Charles Klimcak**, **Shantanu Gupta,** The Aerospace Corp. (United States); **Wade Freeman,** Smart Logic, Inc. (United States); **David Wayne,** Space Development Agency (United States); **Nick Cote**, **Daniel Kepler,** Modern Technology Solutions, Inc. (United States); **Michael Butterfield,** GoLion LLC (United States); **Stephanos Rahimzadeh,** Space Development Agency (United States)

LASER COMMUNICATIONS

29 January 2025 • 7:30 PM - 9:00 PM | InterContinental Hotel, InterContinental Ballroom C (5th Floor)
Chairs: **Hamid Hemmati,** ViaSat, Inc. (United States) and **Bryan S. Robinson**, MIT Lincoln Lab. (United States)

This technical event on Laser Communications will hold its informal annual meeting in conjunction with the Free-Space Laser Communications conference. All professionals involved in theory and applications of free-space laser communications, remote sensing and supporting technologies are invited to participate in an open discussion on a variety of topics related to the challenges and advancement of the field. Attendees are invited to bring suggestions for discussion topics.

Thursday 30 January 2025

SESSION 10: BEAM CONTROL

30 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Yoshihiko Saito**, National Institute of Information and Communications Technology (Japan)

13355-36 • 8:30 AM - 8:50 AM
On-orbit pointing performance of the Modular Agile Scalable Optical Terminal (MAScOT) for the ILLUMA-T mission
Author(s): **Jessica S. Chang**, **Jamie Burnside**, **James Torres**, **Steven Gillmer**, **Farzana I. Khatri**, **Olga Mikulina**, **Jade P. Wang,** MIT Lincoln Lab. (United States); **Jacob Gregory**, **Zachary Gonnsen**, **Mahima Kaushik**, **Samuel Larson**, **Trisha Randazzo**, **Christian Rivera Rivera**, **Suzanne Smith**, **Kathy Strickler**, **Jennifer Sager**, **Jeffrey Towns**, **John Veselka**, **Matthew Magsamen**, **Douglas Ward**, **David Israel**, **Glenn Jackson,** NASA Goddard Space Flight Ctr. (United States); **Bryan S. Robinson,** MIT Lincoln Lab. (United States)

13355-37 • 8:50 AM - 9:10 AM
In-orbit optical calibration for acquisition and tracking on OSIRIS4CubeSat
Author(s): **René Rüddenklau**, **Fabian Rein**, **Christian Roubal**, **Benjamin Rödiger, Christopher Schmidt,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

13355-38 • 9:10 AM - 9:30 AM
Automated pointing, acquisition, and tracking control loop handoff and fade recovery demonstrated across a mobile-to-static 7.5 km terrestrial link
Author(s): **Krunal Patel,** Johns Hopkins Univ. Applied Physics Lab., LLC (United States); **Radha A Venkat**, **Michelle P O'Toole, Katherine T Newell,** Johns Hopkins Univ. Applied Physics Lab. (United States)

13355-39 • 9:30 AM - 9:50 AM
Few-mode Tracking for Free-space Optical (FSO) Communications
Author(s): **Julia E. Proctor**, **Richard Garner**, **David O. Caplan, Rachel A. Sampson,** MIT Lincoln Lab. (United States)

13355-40 • 9:50 AM - 10:10 AM
Lasercom acquisition in the presence of Jitter
Author(s): **Alicia M. Volpicelli**, **Julia E. Proctor**, **Brett Reynolds**, **Robert J. Murphy, Todd G. Ulmer,** MIT Lincoln Lab. (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 11: GROUND SATION TECHNOLOGIES/MEASUREMENTS

30 January 2025 • 10:40 AM - 12:10 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **William S. Rabinovich**, U.S. Naval Research Lab. (United States)

13355-42 • 10:40 AM - 11:00 AM
Initial results from NASA's Low-Cost Optical Terminal (LCOT) at Goddard Space Flight Center
Author(s): **Robert E. Lafon**, **Patrick Thompson**, **Yingxin Bai**, **Armen Caroglanian**, **Nikki Desch,** NASA Goddard Space Flight Ctr. (United States); **Songtao Du,** KBR, Inc. (United States); **Howard Garon,** Science Systems and Applications, Inc. (United States); **Raymmond Hall,** Peraton Inc. (United States); **Stephen A. Hall,** Cimarron Software Services, Inc. (United States), Peraton Inc. (United States); **Ron Miller**, **Daniel Paulson**, **Haleh Safavi**, **Predrag Sekulic,** NASA Goddard Space Flight Ctr. (United States); **John V. Speer,** Science Systems and Applications, Inc. (United States); **Victoria C. Wu,** NASA Goddard Space Flight Ctr. (United States); **Kristoffer C. Olsen,** Genesis Engineering Solutions, Inc. (United States); **Chensheng Wu,** KBR, Inc. (United States); **Terra C. Hardwick,** NASA Goddard Space Flight Ctr. (United States); **Kevin J. Phillips,** Tyto Athene, LLC (United States)

13355-43 • 11:00 AM - 11:20 AM
Design and performance of a 40W uplink laser transmitter for NASA's O2O laser communications mission
Author(s): **Katia Shtyrkova**, **Clement D. Burton,** MIT Lincoln Lab. (United States); **Robert T. Schulein,** Bay Engineering Innovations (United States); **Igor Gaschits**, **Barry Romkey**, **David O. Caplan**, **Daniel Murphy, Bryan S. Robinson,** MIT Lincoln Lab. (United States)

13355-44 • 11:20 AM - 11:40 AM
100W C-band amplifiers for Tbit/s satellite links: EPOS project
Author(s): **Matthew Welch**, **James Edmunds**, **Yudi Wu**, **Peter Kean,** Gooch & Housego (Torquay) Ltd. (United Kingdom); **Efstratios Kehayas,** Gooch & Housego (Torquay) Ltd. (United States)

13355-45 • 11:40 AM - 12:10 PM
Development of optical ground stations in Japan and application as testbeds *(Invited Paper)*
Author(s): **Yoshihiko Saito**, **Fumie Ono**, **Takayuki Usami**, **Takuya Okura**, **Junichi Nakazono**, **Shigeo Hosono, Hiroyuki Tsuji,** National Institute of Information and Communications Technology (Japan)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 12: ATMOSPHERIC BEAM PROPAGATION

30 January 2025 • 1:40 PM - 3:20 PM | Moscone South, Room 208 (Level 2)
Session Chair(s): **Kasia Balakier**, European Space Agency (Netherlands)

13355-47 • 1:40 PM - 2:00 PM
Up- and down- link atmospheric compensation experiment with Alphasat: design and initial results
Author(s): **Aaron Buckner**, **Klaus Kudielka**, **Edgar Fischer**, **Christoph Fischer**, **Matic Obid**, **Thomas Eckey,** General Atomics Synopta (Switzerland); **David Alaluf,** European Space Research and Technology Ctr. (Netherlands)

13355-48 • 2:00 PM - 2:20 PM
Hybrid validation of an adaptive optics system for geo downlink
Author(s): **Hisham Forrière**, **Bruno Martin,** Bertin Alpao (France); **Bouchra Benammar,** Ctr. National d'Études Spatiales (France); **Armin Schimpf, Julien Charton,** Bertin Alpao (France)

13355-49 • 2:20 PM - 2:40 PM
Generic adaptive optics module for optical communication and quantum key distribution
Author(s): **Tommaso Furieri,** Dynamic Optics S.r.l. (Italy); **Federico Pettazzi,** Officina Stellare S.p.A. (Italy); **Luca Ciaffoni**, **Luca Massaro**, **Simone Bregolato**, **Ionut Balasa,** Dynamic Optics S.r.l. (Italy); **Andrea Vettor**, **Mattia Minozzi**, **Marco Rossi**, **Paolo Lazzarini**, **Giulia Tollero**, **Luca Barbero,** Officina Stellare S.p.A. (Italy); **Stefano Bonora,** Dynamic Optics S.r.l. (Italy)

13355-50 • 2:40 PM - 3:00 PM
LEO-to-ground low elevation optical communication: optimization of an adaptive optics design robust to scintillation
Author(s): **Timothée Vene**, **Aurélie Montmerle-Bonnefois**, **Jean-Marc Conan, Laurent Mugnier,** ONERA (France), Univ. Paris-Saclay (France)

13355-51 • 3:00 PM - 3:20 PM
Approximation of wave optics calculation of scintillation in horizontal and slant path free space optical links
Author(s): **William S. Rabinovich**, **Rita Mahon, Mike S. Ferraro,** U.S. Naval Research Lab. (United States)

FREE-SPACE LASER COMMUNICATIONS BEST STUDENT PRESENTATION AWARD CEREMONY

30 January 2025 • 3:20 PM - 3:35 PM | Moscone South, Room 208 (Level 2)
Join us for the announcement of the award winner. Oral and poster presentations will be judged throughout the conference by the committee. The award is based on scientific merit, impact, as well as clarity of the student presenter's talk.

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13355-12

Development of a compact laser communication terminal for LEO satellite constellations

Author(s): **Yichao Yang**, **Zhixin Yan**, **Ruiqiang Li,** Laserlink (Shanghai) Aerospace Technology Co., Ltd. (China); **Heng Zhang,** Laserlink (Shanghai) Aerospace Technology Co.,Ltd. (China); **Changzheng Zhou**, **Qiang Zheng, Xiangli Shen,** Laserlink (Shanghai) Aerospace Technology Co., Ltd. (China)

CONFERENCE 13356

High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XIV

29 - 30 January 2025 | Moscone South, Room 212 (Level 2)

Conference Chair(s): **Stefan Kaierle,** Laser Zentrum Hannover e.V. (Germany); **Klaus R. Kleine,** Coherent Corp. (United States)

Program Committee: **Bo Gu,** Bos Photonics (United States); **Markus Kogel-Hollacher,** Precitec GmbH & Co. KG (Germany); **Henrikki Pantsar,** TRUMPF Inc. (United States); **Masahiro Tsukamoto,** Joining and Welding Research Institute, Osaka Univ. (Japan); **Brian Victor,** nLIGHT, Inc. (United States); **Olivia Wheeler-Williams,** Edmund Optics Inc. (United States)

Tuesday 28 January 2025

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13356-31 • 6:00 PM - 8:00 PM
Isotopic analysis of liquid lithium by laser-induced breakdown spectroscopy
Author(s): **Tuyen Ngoc Tran**, **Duksun Han**, **Sungyong Shim, Dae Hyun Choi,** Korea Institute of Fusion Energy (Korea, Republic of)

13356-32 • 6:00 PM - 8:00 PM
Analysis of laser scribing of grain-oriented electrical steel using a multimode fiber laser
Author(s): **Peter Rauscher**, **Achim Mahrle**, **Julius Zöllner,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Stefan Müller**, **Thorsten Krenke,** thyssenkrupp Electrical Steel GmbH (Germany); **Andrés Fabián Lasagni,** TU Dresden (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Jan Hauptmann, Andreas Wetzig,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13356-34 • 6:00 PM - 8:00 PM
Investigation of perforation speed and hole quality in ABS materials using a 1.08 μm fiber laser
Author(s): **Zoltán Várallyay,** Furukawa Electric Institute of Technology Ltd. (Hungary); **Attila Kohut**, **Zsolt Geretovszky,** Univ. of Szeged (Hungary); **Ádám Ónodi-Szabó**, **Máté Veress,** Femtonics Ltd. (Hungary); **Balázs Rozsa,** Institute of Experimental Medicine (Hungary), Pázmány Péter Catholic Univ. (Hungary), BrainVisionCenter Ltd. (Hungary)

Wednesday 29 January 2025

SESSION 1: SYSTEMS

29 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Stefan Kaierle**, Laser Zentrum Hannover e.V. (Germany)

13356-1 • 1:30 PM - 1:50 PM
Laser welding using mobile robots: an approach for the efficient processing of large components
Author(s): **Thomas Kaster**, **Jan-Hendrik Rissom**, **Elvis Breit**, **Jan-Niklas Schneider**, **Leon Gorissen, Christian Hinke,** RWTH Aachen Univ. (Germany)

13356-2 • 1:50 PM - 2:10 PM
Overcoming the duty cycle in polygon mirror scanning
Author(s): **Florian Roessler,** MOEWE Optical Solutions GmbH (Germany); **Sascha Kloetzer**, **Robby Ebert, André Streek,** MOEWE Optical Solutions GmbH (Germany), Hochschule Mittweida (Germany)

13356-3 • 2:10 PM - 2:30 PM
Hand-held laser processing machines (HLM): legal considerations for the European Union on this controversial innovation
Author(s): **Domenic Fromme,** AUVA HS (Austria)

13356-4 • 2:30 PM - 2:50 PM
Innovative all-reflective high-power laser beam shaping utilizing microstructured mirrors
Author(s): **Christian Wahl**, **Christopher Grossert**, **David Dung, Frederik Wolf,** Midel Photonics GmbH (Germany)

13356-5 • 2:50 PM - 3:10 PM
Laser-aided manufacturing of ultra-high-aspect ratio optical fibers
Author(s): **Pawel Maniewski,** KTH Royal Institute of Technology (Sweden), Optoelectronic Research Ctr. (United Kingdom); **Bruno Moog,** Optoelectronics Research Ctr. (United Kingdom); **Matthew Whitaker,** Optoelectronic Research Ctr. (United Kingdom); **Christopher Holmes,** Optoelectronics Research Ctr. (United Kingdom)

Coffee Break 3:10 PM - 3:40 PM

SESSION 2: HIGH POWER ULTRA SHORT PULSE PROCESSING

29 January 2025 • 3:40 PM - 6:00 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Klaus R. Kleine**, Coherent Corp. (United States)

13356-6 • 3:40 PM - 4:00 PM
Challenges of full power use for femtosecond lasers up to 300W
Author(s): **Vincent Rouffiange**, **Eric Audouard**, **Marie Fleureau**, **Benoit Morin, Quentin Mocaer,** Amplitude (France)

13356-7 • 4:00 PM - 4:20 PM
Glass engraving with high power UV short nanosecond pulses delivered by hollow-core fiber
Author(s): **Andrea Monzani,** Bloom Lasers (France); **Pieter Jansen,** Orion Laser Tech (Belgium); **Julien Didierjean**, **David Horain,** Bloom Lasers (France); **Fotis Fraggelakis,** Orion Laser Tech (Belgium); **Frederic Delahaye,** GLOphotonics (France); **Frederic Gérôme**, **Fetah Benabid,** XLIM (France), GLOphotonics (France); **Benoít Beaudou,** GLOphotonics (France); **Julien Saby,** Bloom Lasers (France)

13356-8 • 4:20 PM - 4:40 PM
Laser fusion cutting of ultra-thin glass (UTG) via mid-IR laser
Author(s): **Sho Itoh**, **Kohei Matsumoto**, **Masataka Sato**, **Souta Matsusaka, Hirofumi Hidai,** Chiba Univ. (Japan)

13356-9 • 4:40 PM - 5:00 PM
Pulsed laser deposition grown diamond-like carbon coatings for wear protection
Author(s): **Hagen Grüttner**, **Johannes Maus**, **David Haldan,** ANTACON GmbH (Germany); **Ralph F. Delmdahl,** Coherent LaserSystems GmbH & Co. KG (Germany)

13356-10 • 5:00 PM - 5:20 PM
The peculiarities of carbon fiber reinforced plastic processing by femtosecond laser pulses
Author(s): **Egidijus Vanagas**, **Sergej Orlov**, **Paulius Slevas**, **Orestas Ulčinas**, **Justinas Minkevičius,** Ctr. for Physical Sciences and Technology (Lithuania); **Oleksiy Myronyuk**, **Denys Baklan, Anna Bilousova,** National Technical Univ. of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (Ukraine)

13356-11 • 5:20 PM - 5:40 PM
High peak power mid-infrared ablation for laser-induced periodic surface structuring on highly nonlinear zinc selenide (ZnSe)
Author(s): **Joseph T. Harrington,** Texas A&M Univ. (United States), U.S. Army Space and Missile Defense Command (United States); **Anthony R. Valenzuela,** U.S. Army Space and Missile Defense Command (United States); **Vladislav V. Yakovlev,** Texas A&M Univ. (United States)

13356-29 • 5:40 PM - 6:00 PM
Transient reflection measurement during laser heating of copper using visible laser
Author(s): **Rikuto Kokubo**, **Toshifumi Kikuchi**, **Masahiro Koba**, **Kyosuke Muro,** Kyushu Univ. (Japan); **Toyoyuki Kondo**, **Hisanori Kaminaga**, **Masao Watanabe,** Tamari Industry Co., Ltd. (Japan); **Daisuke Nakamura,** Kyushu Univ. (Japan); **Hiroshi Ikenoue,** Kochi Univ. of Technology (Japan)

Thursday 30 January 2025

SESSION 3: PROCESS MONITORING AND CONTROL I

30 January 2025 • 8:20 AM - 10:00 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Markus Kogel-Hollacher**, Precitec GmbH & Co. KG (Germany)

13356-12 • 8:20 AM - 8:40 AM
A comparative study of evaluating Gaussian and top-hat laser beams in bone ablation
Author(s): **Mingyi Liu**, **Arsham Hamidi,** Ctr. for Intelligent Optics (CIO), Univ. Basel (Switzerland); **Darren Wilson,** Smith and Nephew (United Kingdom); **Kenneth Garcia,** Smith and Nephew Schweiz AG (Switzerland); **Georg Rauter,** Bio-Inspired RObots for MEDicine (BIROMED), Univ. Basel (Switzerland); **Philippe Cattin,** Ctr. for medical Image Analysis & Navigation (CIAN), Univ. Basel (Switzerland); **Ferda Canbaz,** Ctr. for Intelligent Optics (CIO), Univ. Basel (Switzerland)

13356-13 • 8:40 AM - 9:00 AM
Laser fusion cutting: how laser wavelength affects cut edge quality
Author(s): **Madlen Borkmann**, **Achim Mahrle**, **Patrick Herwig, Jan Hauptmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13356-14 • 9:00 AM - 9:20 AM
Approach to controlling laser processes with the help of AI
Author(s): **Andreas Wetzig,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Jeno Szep,** Fraunhofer USA Ctr. Mid-Atlantic CMA (United States); **Linda Ullmann**, **Julia Bach**, **Dirk Dittrich**, **Patrick Herwig**, **Frank Sonntag**, **Peter Rauscher,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Christoph Leyens,** TU Dresden (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13356-15 • 9:20 AM - 9:40 AM
Optical quality assurance in electric motor production: keyhole depth monitoring and fit-up assessment for copper hairpin welding using inline coherent imaging
Author(s): **Fraser McCauley,** Queen's Univ. (Canada); **Tristan G. Fleming**, **Oleksii Sherepenko**, **Juan Carlos Hernandez Castaneda**, **Paul J. L. Webster,** IPG Photonics (Canada) Inc. (Canada); **James M. Fraser,** Queen's Univ. (Canada)

13356-17 • 9:40 AM - 10:00 AM
Investigation of solidification crack formation in laser beam welding of stainless steel with high-speed x-ray imaging
Author(s): **Carola Forster**, **Markus Döring,** Lehrstuhl für Photonische Technologien, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Christoph Spurk,** RWTH Aachen Univ. (Germany); **Marc Hummel,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany); **Alexander Olowinsky,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Felix Beckmann**, **Julian Moosmann,** Helmholtz-Zentrum Hereon GmbH (Germany); **Michael Schmidt,** Lehrstuhl für Photonische Technologien, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: PROCESS MONITORING AND CONTROL II

30 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Bill Holtkamp**, TRUMPF Inc. (United States)

13356-18 • 10:30 AM - 10:50 AM
Localization of a workpiece position and orientation by means of off axis photodiodes
Author(s): **Milena Zuric,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13356-20 • 10:50 AM - 11:10 AM
Beam shaping, process monitoring, and AI join forces for the benefit of e-mobility
Author(s): **Markus Kogel-Hollacher,** Precitec GmbH & Co. KG (Germany); **Thomas Nicolay,** Precitec Optronik GmbH (Germany); **Jens Reiser**, **S. Boley,** Precitec GmbH & Co. KG (Germany); **Joachim Schwarz,** Precitec Vision Gmbh & Co. KG (Switzerland); **Gwenn Pallier,** CAILabs (France)

13356-21 • 11:10 AM - 11:30 AM
Photo-degradation of water and food pathogens using cheap handheld laser
Author(s): **Sara Mohamed,** The American Univ. in Cairo (Egypt); **Christen T. Aziz,** National Research Ctr. (Egypt); **A. Khalifa**, **Yasmine Elbagoury**, **Heba Refaat**, **Shimaa F. Ahmed**, **Ahmed Moustafa, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13356-22 • 11:30 AM - 11:50 AM
Beam splitter with constant 1% reflectance at 40-to-50-degrees incidence angle at 1070 nm laser for camera-type laser profilers
Author(s): **Kazunori Komori**, **Masaki Takemoto, Erika Katayama,** Tamron Co., Ltd. (Japan)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 5: JOINING AND WELDING

30 January 2025 • 1:20 PM - 2:20 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Masahiro Tsukamoto**, Joining and Welding Research Institute, Osaka Univ. (Japan)

13356-24 • 1:20 PM - 1:40 PM
Innovative laser direct joining of PEEK-CFRP and titanium alloy for net zero emissions
Author(s): **Tsuyoshi Nakamura**, **Yosuke Kawahito,** Japan Agency for Marine-Earth Science and Technology (Japan); **Tomio Iwasaki,** Hitachi, Ltd. (Japan); **Michiko Mori**, **Kazuya Kitada**, **Akira Masago, Hitomi Tonosaki,** Japan Agency for Marine-Earth Science and Technology (Japan)

13356-25 • 1:40 PM - 2:00 PM
Beam shaping for HLAW welding of thick stainless-steel plates with multi-plane light conversion
Author(s): **Aymeric Lucas**, **Adeline Orieux**, **Gwenn Pallier,** CAILabs (France); **David Lemaitre,** Institut Maupertuis (France); **Pu Jian, Guillaume Labroille,** CAILabs (France)

13356-26 • 2:00 PM - 2:20 PM
Increase robustness of copper laser welding with beam-shaping
Author(s): **Avinash Kumar**, **Adrien Douard**, **Adeline Orieux,** CAILabs (France); **David Lemaitre,** Institut Maupertuis (France); **Gwenn Pallier**, **Pu Jian, Guillaume Labroille,** CAILabs (France)

Coffee Break 2:20 PM - 2:50 PM

SESSION 6: JOINING AND CUTTING

30 January 2025 • 2:50 PM - 4:10 PM | Moscone South, Room 212 (Level 2)
Session Chair(s): **Olivia Wheeler-Williams**, Edmund Optics Inc. (United States)

13356-27 • 2:50 PM - 3:10 PM
Optimizing copper laser welding with multi-physics simulations of shaped laser beams
Author(s): **Avinash Kumar,** CAILabs (France); **Carlos Geovanny Duran Oscuez,** Technische Univ. Wien (Austria); **Adrien Douard**, **Adeline Orieux**, **Gwenn Pallier,** CAILabs (France); **Constantin Zenz**, **Tobias Florian,** Technische Univ. Wien (Austria); **Pu Jian, Guillaume Labroille,** CAILabs (France)

13356-28 • 3:10 PM - 3:30 PM
Modeling of selective evaporation induced composition change during high-power laser metal processing
Author(s): **Roshan Polasi, Tuhin Mukherjee,** Iowa State Univ. of Science and Technology (United States)

13356-30 • 3:30 PM - 3:50 PM
Laser cutting of anorthosite and norite in vacuum
Author(s): **Desmond O'Connor,** NASA Johnson Space Ctr. (United States)

13356-36 • 3:50 PM - 4:10 PM
Energy use and productivity assessment of laser welding for a digitalized production in thin film food packaging
Author(s): **Ali Gökhan Demir,** Politecnico di Milano (Italy); **Marco D'Agostino,** IMA Eurosicma (Italy)

CONFERENCE 13357

Photonic Technologies in Plant and Agricultural Science II

29 January 2025 | Moscone South, Room 215 (Level 2)

Conference Chair(s): **Dag Heinemann,** Hannoversches Zentrum für Optische Technologien (Germany); **Gerrit Polder,** Wageningen Univ. & Research (Netherlands)

Program Committee: **Giles Blaney,** Tufts Univ. (United States); **Thomas Dehoux,** Univ. Claude Bernard Lyon 1 (France); **Kareem Elsayad,** Medizinische Univ. Wien (Austria); **Hirofumi Kadono,** Saitama Univ. (Japan); **Tobias Kreklow,** HAIP Solutions GmbH (Germany); **Wouter Saeys,** KU Leuven (Belgium); **Hedde Van Hoorn,** The Hague Univ. of Applied Sciences (Netherlands); **Merve Wollweber,** Laser Zentrum Hannover e.V. (Germany); **Chenxu Yu,** Iowa State Univ. of Science and Technology (United States)

Tuesday 28 January 2025

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM

Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13357-22 • 6:00 PM - 8:00 PM

Near-infrared spectroscopy for olive cultivation: tracking water content in olive leaves

Author(s): **Leonardo Ciaccheri,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Graziano Sani,** Istituto per la Bio Economia (Italy); **Barbara Adinolfi**, **Andrea Azelio Mencaglia,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Clemente Pellegrini Strozzi,** Società Agricola Indaco S.R.L. (Italy); **Anna Grazia Mignani,** Istituto di Fisica Applicata "Nello Carrara" (Italy)

13357-23 • 6:00 PM - 8:00 PM

A real-time optical monitoring technology for sustainable hydroponic crop management

Author(s): **Maria Merin Antony**, **Keerthi K.**, **Nagarajan S.**, **Sreekanth Perumbilavil, Murukeshan Vadakke Matham,** Nanyang Technological Univ. (Singapore)

13357-24 • 6:00 PM - 8:00 PM

Lethality of shortwave visible spectrum light on *drosophila hydei*

Author(s): **Joshua C. Larsen**, **Shea Phillips**, **Anders Huseth**, **Lina Quesada, Michael W. Kudenov,** North Carolina State Univ. (United States)

13357-25 • 6:00 PM - 8:00 PM

Raman spectral analysis and quality classify: aided by artificial intelligence

Author(s): **Bruno Oliveira**, **Théo F. Guedes**, **Thales E. Q. Bastos**, **Renato F. Evangelista**, **Fátima M. M. Yasuoka, Jarbas C. Castro Neto,** Univ. de São Paulo (Brazil)

13357-26 • 6:00 PM - 8:00 PM

Development of an optoelectronic device with control of luminous intensity via open loop for colorimetric analysis of coffee beans

Author(s): **Felipe F. Montalvão**, **Bruno Oliveira**, **André N. Cruz**, **Fátima M. M. Yasuoka, Jarbas C. Castro Neto,** Univ. de São Paulo (Brazil)

Wednesday 29 January 2025

SESSION 1: RAMAN SPECTROSCOPY FOR AGRICULTURE AND FOOD SAFETY

29 January 2025 • 8:10 AM - 9:50 AM | Moscone South, Room 215 (Level 2)

Session Chair(s): **Merve Wollweber**, Laser Zentrum Hannover e.V. (Germany)

13357-1 • 8:10 AM - 8:30 AM
Deep ultraviolet resonant Raman (DUVRR) spectroscopy for spectroscopic evaluation and disinfection of food and agricultural samples
Author(s): **Joseph T. Harrington**, **Vsevolod Cheburkanov**, **Mykyta Kizilov**, **Ilya Kulagin**, **Georgi Petrov, Vladislav Yakovlev,** Texas A&M Univ. (United States)

13357-2 • 8:30 AM - 8:50 AM
In situ Raman investigation of plant pathogens for sustainable agriculture
Author(s): **Lorenzo Pandolfi,** Istituto Nazionale di Ottica (Italy); **Guido Faglia,** Univ. degli Studi di Brescia (Italy); **Niccolò Miotti**, **Massimo Turina**, **Marina Ciuffo,** Istituto per la Protezione Sostenibile delle Piante (Italy); **Emanuela Gobbi,** Univ. degli Studi di Brescia (Italy); **Camilla Baratto,** Istituto Nazionale di Ottica (Italy)

13357-3 • 8:50 AM - 9:10 AM
Investigating adaptive changes to abiotic stress in plant cell walls using Brillouin microscopy
Author(s): **Luis Alonso-Baez**, **Astrid Bjørkøy**, **Francesco Saffioti**, **Sara Morghen**, **Michaela Ticha**, **Bjørn Torger Stokke, Thorsten Hamann,** Norwegian Univ. of Science and Technology (Norway)

13357-4 • 9:10 AM - 9:30 AM
Untangling Brillouin scattering data of apple fruit cuticles utilizing Raman spectroscopy
Author(s): **Timm Landes,** Leibniz Univ. Hannover (Germany); **Ana Gonzalez Moreno,** Univ. de Málaga (Spain); **Bishnu Khanal**, **Hans Bethge**, **Miroslav Zabic,** Leibniz Univ. Hannover (Germany); **Eva Dominguez,** Univ. de Málaga (Spain); **Mortiz Knoche,** Leibniz Univ. Hannover (Germany); **Antonio Heredia,** Univ. de Málaga (Spain); **Dag Heinemann,** Leibniz Univ. Hannover (Germany)

13357-5 • 9:30 AM - 9:50 AM
Shifted excitation Raman difference spectroscopy for the analysis of milk and dairy products
Author(s): **Martin Maiwald**, **Kay Sowoidnich**, **André Müller, Bernd Sumpf,** Ferdinand-Braun-Institut (Germany)

Coffee Break 9:50 AM - 10:20 AM

SESSION 2: SPECTROSCOPIC AND IMAGING TECHNIQUES FOR FOOD QUALITY AND AGRICULTURE I

29 January 2025 • 10:20 AM - 12:10 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Kareem Elsayad**, Medizinische Univ. Wien (Austria)

13357-6 • 10:20 AM - 10:50 AM
Gas in scattering media absorption spectroscopy as a novel tool for pome fruit respiration monitoring *(Invited Paper)*
Author(s): **Manju Joseph**, **Hui Xiao**, **Annelies Postelmans**, **Maarten Hertog**, **Pieter Verboven**, **Bart Nicolaï, Wouter Saeys,** KU Leuven (Belgium)

13357-7 • 10:50 AM - 11:10 AM
Dual-ratio measurements of the absolute optical properties of apples
Author(s): **Giles Blaney**, **Angelo Sassaroli, Sergio Fantini,** Tufts Univ. (United States)

13357-8 • 11:10 AM - 11:30 AM
Diffuse reflection collection optics for analysing chicory content in coffee
Author(s): **Mathu Mathi Murugavel, Shanti Bhattacharya,** Indian Institute of Technology Madras (India)

13357-9 • 11:30 AM - 11:50 AM
First-principles methodology for developing robust NIR spectroscopic solutions for real-world applications
Author(s): **Vilde Vraalstad**, **Jon Tschudi**, **Marion O'Farrell**, **Anders Hansen,** SINTEF (Norway); **Jens Petter Wold,** Nofima (Norway)

13357-27 • 11:50 AM - 12:10 PM
Mapping vineyard quality using remote and proximal sensing
Author(s): **Francesca Rossi**, **Lorenza Tuccio**, **Giovanni Agati,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Giorgia Orlandi**, **Salvatore Filippo Di Gennaro**, **Alessandro Matese,** CNR-Istituto per la BioEconomia (Italy); **Andrea Berton,** Istituto di Geoscienze e Georisorse, Consiglio Nazionale delle Ricerche (Italy); **Rita Perria**, **Sergio Puccioni**, **Alessandra Zombardo**, **Marco Ammoniaci**, **Paolo Storchi,** Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (Italy); **Lucia Cavigli,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 3: SPECTROSCOPIC AND IMAGING TECHNIQUES FOR FOOD QUALITY AND AGRICULTURE II

29 January 2025 • 1:30 PM - 2:50 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Giles Blaney**, Tufts Univ. (United States)

13357-10 • 1:30 PM - 1:50 PM
Multi-spectral analyses in the VIS-NIR-SWIR for detection of ideal harvesting time and degree of ripeness
Author(s): **Abdel Karim Ruvalcaba Perez,** Friedrich-Schiller-Univ. Jena (Germany); **Gunter Siess**, **Norik Janunts,** ams-OSRAM AG (Germany); **Volker Boehm, Andreas Tuennermann,** Friedrich-Schiller-Univ. Jena (Germany)

13357-11 • 1:50 PM - 2:10 PM
Purity analysis of food raw materials using deep learning with anomaly detection algorithms
Author(s): **Jan Lukas Storck**, **Johannes Fiedler,** Hochschule Bielefeld Univ. of Applied Sciences (Germany); **Bernd Müller,** Kündig Nahrungsmittel GmbH & Co. KG (Germany); **Axel Beeck,** Axel Beeck CCS Equity Unternehmensberatung (Germany); **Reinhard Kaschuba,** Hochschule Bielefeld Univ. of Applied Sciences (Germany)

13357-12 • 2:10 PM - 2:30 PM
Optimization of the purity analysis of rapeseed by using hyperspectral imaging in the spectral range from 400 to 1600 nm
Author(s): **Johannes Fiedler,** Hochschule Bielefeld Univ. of Applied Sciences (Germany); **Maxim Kukushkin,** Leipzig University (Germany); **Karl Ruben Kuckelsberg**, **Jan Lukas Storck,** Hochschule Bielefeld Univ. of Applied Sciences (Germany); **Martin Bogdan**, **Thomas Schmid,** Leipzig University (Germany); **Reinhard Kaschuba,** Hochschule Bielefeld Univ. of Applied Sciences (Germany)

13357-13 • 2:30 PM - 2:50 PM
Mueller matrix spectral and polarimetric imaging for high throughput plant phenotyping
Author(s): **Michael W. Kudenov**, **Danny Krafft**, **Lucas Bauer**, **Clifton G. Scarboro**, **Colleen J. Doherty**, **Peter Balint-Kurti,** North Carolina State Univ. (United States); **Anna Locke,** USDA Agricultural Research Service (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: LASER PROCESSING IN PLANT SCIENCE AND AGRICULTURE

29 January 2025 • 3:20 PM - 4:00 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Dag Heinemann**, Hannoversches Zentrum für Optische Technologien (Germany)

13357-14 • 3:20 PM - 3:40 PM
Deep drilling of structural timber using quasi-continuous-wave lasers for straight guiding holes
Author(s): **Lars Wenning,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany); **Denis Grizmann, Clarissa Glawe,** RWTH Aachen Univ. (Germany)

13357-16 • 3:40 PM - 4:00 PM
Generation of laser-induced microcracks in apple fruit cuticles
Author(s): **Miroslav Zabic**, **Louis Gemmerlé**, **Kilian Stöckemann**, **Timm Landes**, **Hans Bethge**, **Bishnu P. Khanal, Dag Heinemann,** Leibniz Univ. Hannover (Germany)

Break 4:00 PM - 4:05 PM

SESSION 5: IMAGE PROCESSING AND MACHINE LEARNING TECHNIQUES IN PLANT SCIENCE AND AGRICULTURE

29 January 2025 • 4:05 PM - 5:45 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Gerrit Polder**, Wageningen Univ. & Research (Netherlands)

13357-17 • 4:05 PM - 4:25 PM
Automated image registration of RGB, hyperspectral and chlorophyll fluorescence data
Author(s): **Hans Bethge**, **Mauritz Dortmund**, **Inga Weisheit**, **Pascal Schuermann**, **Timm Landes**, **Miroslav Zabic, Dag Heinemann,** Leibniz Univ. Hannover (Germany)

13357-18 • 4:25 PM - 4:45 PM
Detection of airborne pathogenic wheat rust spores using machine-learning-assisted optical imaging
Author(s): **Sebastian Kalt,** Karlsruher Institut für Technologie (Germany); **Berthold Wegner**, **Max Strauß**, **Lenon Romano Modesto**, **Tzenka Miteva,** Sony Europe B.V. (Germany); **Martin Wegener,** Karlsruher Institut für Technologie (Germany)

13357-19 • 4:45 PM - 5:05 PM
Orchard caterpillar detection and tracking through YOLO-NAS and SORT for deployment in unmanned agricultural vehicles
Author(s): **Sumesh Nair**, **GuoFong Hong**, **ChiaWei Hsu, Shean-Jen Chen,** National Yang Ming Chiao Tung Univ. (Taiwan)

13357-20 • 5:05 PM - 5:25 PM

Handheld snapshot hyperspectral video spectroscopy for precision viticulture

Author(s): **Kenton Kwok**, **Elvira Castello**, **Laura Brooks**, **Eli Sheppard**, **Nikhil Jawade**, **Alex Spanellis**, **Daniel A. C. Pearce, Steve Chappell,** Living Optics (United Kingdom)

13357-21 • 5:25 PM - 5:45 PM

Quantifying the algae and toxic nanoparticle interactions using optical coherence tomography

Author(s): **Hongshan Liu,** Stevens Institute of Technology (United States); **Xin Yong,** Univ. at Buffalo, The State Univ. of New York (United States); **Ke Du,** Univ. of California, Riverside (United States); **Yu Gan,** Stevens Institute of Technology (United States)

CONFERENCE 13358

Optical Technologies for Inertial Fusion Energy

27 - 28 January 2025 | Moscone South, Room 76 (Lower Mezz)

Conference Chair(s): **Stavros G. Demos,** Univ. of Rochester (United States); **Carmen S. Menoni,** Colorado State Univ. (United States)

Program Committee: **David A. Alessi,** Lawrence Livermore National Lab. (United States); **Ahmed Diallo,** Princeton Plasma Physics Lab. (United States), Advanced Research Projects Agency-Energy (United States); **Rebecca Dylla-Spears,** Lawrence Livermore National Lab. (United States); **Erhard Gaul,** National Energetics (Germany); **Cristina Hernandez-Gomez,** STFC Rutherford Appleton Lab. (United Kingdom); **Manyalibo J. Matthews,** Lawrence Livermore National Lab. (United States); **Jérôme Néauport,** CEA-Cesta (France); **Stephen P. Obenschain,** LaserFusionX Inc. (United States); **Pravesh K. Patel,** Focused Energy Inc. (United States); **Antonia Schmalz,** (Germany); **Jonathan D. Zuegel,** Univ. of Rochester (United States)

Monday 27 January 2025

SESSION 1: CURRENT APPROACHES TO LASER FUSION ENERGY

27 January 2025 • 8:00 AM - 12:00 PM | Moscone South, Room 76 (Lower Mezz)
Session Chair(s): **E. Michael Campbell**, MCM Consultants (United States)

13358-1 • 8:00 AM - 8:30 AM
Status and prospects for Inertial Fusion Energy via lasers *(Invited Paper)*
Author(s): **Riccardo Betti,** Univ. of Rochester (United States)

13358-2 • 8:30 AM - 9:00 AM
Laser driver development efforts towards direct drive short pulse ignition *(Invited Paper)*
Author(s): **Erhard Gaul**, **Peter W Fischer**, **Giordano W Bodini**, **Dan W Gengenbach**, **Jana J Jung,** Marvel Fusion GmbH (Germany); **Frederik Buckstegge**, **Christopher Aleshire**, **Prashanth Jhetre**, **Oscar Naranjo**, **Antonia Schmalz,** Pulsed Light Technology GmbH (Germany); **Mathias Krüger**, **Jan H Buss**, **Marius Schollmeier**, **Hartmut Ruhl, Georg Korn,** Marvel Fusion GmbH (Germany)

13358-3 • 9:00 AM - 9:30 AM
Bridging the laser technology gap: advancing towards commercial direct drive inertial fusion energy *(Invited Paper)*
Author(s): **Clément Paradis,** Focused Energy Inc. (Germany), Pulsed Light Technologies GmbH (Germany); **Douglas Hammond,** Focused Energy Inc. (United States); **Jiří Thoma**, **André Loescher,** Focused Energy GmbH (Germany); **Geoffroy Le Touzé**, **Gavin Friedman**, **Bruno Le Garrec,** Pulsed Light Technologies GmbH (Germany); **Jim Gaffney**, **Pravesh Patel,** Focused Energy Inc. (United States); **Gilles Chériaux,** Focused Energy GmbH (Germany)

13358-4 • 9:30 AM - 10:00 AM
Recent progress for commercializing IFE based on a novel high efficiency 10 MJ laser and high gain fuel target *(Invited Paper)*
Author(s): **Trevor Cohen,** Blue Laser Fusion, Inc. (United States); **Jason Mance,** Blue Laser Fusion (United States); **Srinivas Gandrothula,** Blue Laser Fusion, Inc. (United States); **Koji Arai**, **Francisco Salces Carcoba,** Caltech (United States); **Hiroaki Ohta**, **P. M. Pattison**, **Paul Rudy**, **Nathan Svadlenak**, **Charlie Smith,** Blue Laser Fusion, Inc. (United States); **Ryan Fukuda,** Blue Laser Fusion (United States); **Seita Iizuka,** Blue Laser Fusion (Japan); **Yuya Ohara,** Blue Laser Fusion, Inc. (United States); **Koji Tsubakimoto,** Osaka Univ. (Japan); **Rana Adhikari,** Caltech (United States); **Shuji Nakamura,** Blue Laser Fusion, Inc. (United States)

Coffee Break • 10:00 AM - 10:30 AM

13358-5 • 10:30 AM - 11:00 AM
Bigger is better: a high-energy excimer-Raman-Brillouin laser system for inertial fusion energy *(Invited Paper)*
Author(s): **Conner Galloway,** Xcimer Energy, Inc. (United States)

13358-6 • 11:00 AM - 11:30 AM
Longview Fusion Energy Systems: the path from NIF to commercial fusion energy *(Invited Paper)*
Author(s): **Edward I. Moses,** Longview Fusion Energy Systems (United States)

13358-7 • 11:30 AM - 12:00 PM
Development path to an ArF laser-fusion pilot power plant *(Invited Paper)*
Author(s): **Stephen P. Obenschain, Malcolm W. McGeoch,** LaserFusionX Inc. (United States)

Lunch Break 12:00 PM - 1:45 PM

SESSION 2: NOVEL OPTICAL COMPONENTS AND DESIGNS

27 January 2025 • 1:45 PM - 3:15 PM | Moscone South, Room 76 (Lower Mezz)
Session Chair(s): **Carmen S. Menoni**, Colorado State Univ. (United States)

13358-8 • 1:45 PM - 2:00 PM
Theory and modeling of gaseous diffractive optics elements
Author(s): **Pierre A. Michel**, **Albertine Oudin,** Lawrence Livermore National Lab. (United States); **Livia Lancia,** Lab. pour l'Utilisation des Lasers Intenses (France); **Eugene Kur,** Lawrence Livermore National Lab. (United States); **Ke Ou**, **Victor Perez-Ramirez**, **Jin Lee**, **Sida Cao,** Stanford Univ. (United States); **Caterina Riconda,** Sorbonne Univ. (France); **Matthew Edwards,** Stanford Univ. (United States)

13358-9 • 2:00 PM - 2:15 PM
Modeling of a plasma mirror: laser ablation of material and the optical effects of ionized fluids
Author(s): **Steven Lacava**, **Eldon Staggs,** Ansys Government Initiatives, Inc. (United States); **Bruce Crawford,** Ansys, Inc. (United States)

13358-10 • 2:15 PM - 2:30 PM
Experimental creation of volume diffraction gratings in ozone using interfering ultraviolet lasers
Author(s): **Ke Ou**, **Victor Perez-Ramirez**, **Sida Cao**, **Caleb Redshaw,** Stanford Univ. (United States); **Michelle M. Wang,** Princeton Univ. (United States); **Pelin Dedeler**, **Ben Lees,** Stanford Univ. (United States); **Livia Lancia,** Lab. pour l'Utilisation des Lasers Intenses, CNRS (France), Sorbonne Univ. (France), Ecole Polytechnique, CEA (France); **Albertine Oudin**, **Eugene Kur,** Lawrence Livermore National Lab. (United States); **Caterina Riconda,** Lab. pour l'Utilisation des Lasers Intenses, CNRS (France), Sorbonne Univ. (France), Ecole Polytechnique, CEA (France); **Pierre A. Michel,** Lawrence Livermore National Lab. (United States); **Matthew Edwards,** Stanford Univ. (United States)

13358-11 • 2:30 PM - 2:45 PM
Large aperture metasurfaces for the next generation of high-energy lasers
Author(s): **Jérôme Néauport,** CEA-Cesta (France); **Nicolas Bonod,** Institut Fresnel, CNRS (France), Aix Marseille Univ. (France)

13358-12 • 2:45 PM - 3:00 PM
Exploring gallium alloys for the development of self-healing final mirrors for laser fusion energy power plants
Author(s): **Gregory S. Demos**, **Brittany N. Hoffman**, **Kyle R. P. Kafka**, **John C. Lambropoulos, Marcela Mireles Ramirez,** Univ. of Rochester (United States)

13358-14 • 3:00 PM - 3:15 PM
Anti-reflection structured surfaces (ARSS) on Lithium triborate (LBO): need, challenges, and recent successes
Author(s): **Hanna Cai**, **Lawrence B. Fischel**, **William Grossman,** GAMDAN Optics (United States); **Menelaos K. Poutous**, **Praneeth Gadamsetti,** The Univ. of North Carolina at Charlotte (United States); **Jude K. Yoshino,** The Univ. of North Carolina at Charlotte (United States), GAMDAN Optics (United States); **Thomas C. Hutchens,** GAMDAN Optics (United States), The Univ. of North Carolina at Charlotte (United States)

Coffee Break 3:15 PM - 3:45 PM

LASE PLENARY AND HOT TOPICS

27 January 2025 • 3:45 PM - 5:40 PM | Moscone South, Room 207/215 (Level 2)
3:45 PM - 3:50 PM: **Welcome and Opening Remarks**
LASE Symposium Chairs **Vassilia Zorba**, Lawrence Berkeley National Lab. (United States) and **Kaoru Minoshima**, Univ. of Electro-Communications (Japan)

3:50 PM - 4:00 PM: **Announcement of the 3D Printing Best Paper Awards**
Henry Helvajian, The Aerospace Corp. (United States)

Q&A for all talks 5:30 PM - 5:40 PM

13343-501 • 4:00 PM - 4:30 PM
Global advancements in laser fusion energy and their implications for the photonics market (Plenary Presentation)
Author(s): **Constantin L. Häfner,** Fraunhofer-Institut für Lasertechnik ILT (Germany)

13350-601 • 4:30 PM - 4:45 PM
Data-driven laser processing: What does the fusion of laser processing and data science bring? *(Hot Topic)* (Plenary Presentation)
Author(s): **Aiko Narazaki,** National Institute of Advanced Industrial Science and Technology (Japan)

13347-502 • 4:45 PM - 5:15 PM
Optical frequency combs for interferometry from the mid-infrared to the ultraviolet range (Plenary Presentation)
Author(s): **Nathalie Picqué,** Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany)

13354-602 • 5:15 PM - 5:30 PM
The changing landscape of outer space *(Hot Topic)* (Plenary Presentation)
Author(s): **Henry Helvajian,** The Aerospace Corp. (United States)

Tuesday 28 January 2025

SESSION 3: THE 50 YEARS OF MATERIAL AND LASER TECHNOLOGIES DEVELOPMENT AND LESSONS LEARNED I

28 January 2025 • 8:00 AM - 12:00 PM | Moscone South, Room 76 (Lower Mezz)
Session Chair(s): **William F. Krupke**, WFK Lasers, LLC (United States)

13358-15 • 8:00 AM - 8:30 AM
Laser requirements for inertial fusion energy target designs *(Invited Paper)*
Author(s): **Valeri N. Goncharov,** Univ. of Rochester (United States)

13358-16 • 8:30 AM - 9:00 AM
Evolution of MOPA beamline designs for laser fusion research *(Invited Paper)*
Author(s): **E. M. Campbell,** MCM Consultants (United States)

13358-17 • 9:00 AM - 9:30 AM
Laser glass development leading to the National Ignition Facility: a template for assessing gain media for proposed inertial-fusion-energy laser drivers *(Invited Paper)*
Author(s): **John Campbell,** Material Science Solutions (United States)

13358-18 • 9:30 AM - 10:00 AM
Growth of large KDP and KD*P crystals to support ICF lasers *(Invited Paper)*
Author(s): **Matthew T. Whittaker,** Gooch & Housego, Cleveland (United States)

Coffee Break • 10:00 AM - 10:30 AM

13358-19 • 10:30 AM - 11:00 AM
The advent of third-harmonic-generation laser systems: personal recollections *(Invited Paper)*
Author(s): **R. Stephen Craxton,** Univ. of Rochester (United States)

13358-20 • 11:00 AM - 11:30 AM
Advancements in high fluence multilayer dielectric gratings for ultrafast lasers *(Invited Paper)*
Author(s): **Hoang T. Nguyen**, **Jeff Bude**, **Brad Hickman**, **Candis Jackson**, **James Nissen**, **Craig Siders**, **Sean Tardiff**, **Jackson Williams, David Alessi,** Lawrence Livermore National Lab. (United States)

13358-21 • 11:30 AM - 12:00 PM
Injection laser system architecture, upgrades, and future at the National Ignition Facility *(Invited Paper)*
Author(s): **John E. Heebner,** Lawrence Livermore National Lab. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 4: THE 50 YEARS OF MATERIAL AND LASER TECHNOLOGIES DEVELOPMENT AND LESSONS LEARNED II

28 January 2025 • 1:30 PM - 2:30 PM | Moscone South, Room 76 (Lower Mezz)
Session Chair(s): **William F. Krupke**, WFK Lasers, LLC (United States)

13358-22 • 1:30 PM - 2:00 PM
Lessons learned and ongoing research at Electra: a rep-rate excimer laser facility *(Invited Paper)*
Author(s): **Matthew F. Wolford, Matthew C. Myers,** U.S. Naval Research Lab. (United States)

13358-23 • 2:00 PM - 2:30 PM
Development of high energy and high average power diode pumped laser drivers for Inertial Fusion Energy systems *(Invited Paper)*
Author(s): **Andrew J. Bayramian,** Seurat Technologies (United States)

SESSION 5: SIMULATIONS AND PROOF OF CONCEPT EXPERIMENTS

28 January 2025 • 2:30 PM - 5:30 PM | Moscone South, Room 76 (Lower Mezz)
Session Chair(s): **Stavros G. Demos**, Univ. of Rochester (United States)

13358-24 • 2:30 PM - 3:00 PM
Simulations and modeling for high power lasers *(Invited Paper)*
Author(s): **Herve Coic**, **Yanis Abdelmoumni-Prunes**, **Jean-Philippe AIRIAU**, **edouard Bordenave**, **Nathalie Blanchot**, **celine chappuis**, **Cyprien Heisel**, **Xavier Julien**, **Chloé Lacombe**, **Florian Lochon**, **Julien G. Moreau**, **Paul Quinoman**, **Xavier Ribeyre**, **Claude Rouyer**, **Jerome neauport,** Commissariat à l'Énergie Atomique (France)

13358-25 • 3:00 PM - 3:15 PM
High repetition rate Nd:glass amplifier module for kJ lasers for fusion research
Author(s): **Antoine Courjaud**, **Stéphane Branly**, **Florian Mollica**, **Franck Falcoz, Pierre-Mary Paul,** Amplitude Laser Group (France)

13358-26 • 3:15 PM - 3:30 PM
Optimization of the gain medium distribution in a diode-side-pumped bonded laser amplifier
Author(s): **Sébastien Montant**, **Thomas Dube,** CEA-Cesta (France); **Patrice Camy**, **Alain Braud,** Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); **Dominique Lupinski,** Cristal Laser S.A. (France)

Coffee Break • 3:30 PM - 4:15 PM

13358-28 • 4:15 PM - 4:30 PM
Characterization of nonlinear crystals for high-energy lasers
Author(s): **Christophe Dorrer, Rhett Wampler,** Univ. of Rochester (United States)

13358-29 • 4:30 PM - 4:45 PM
Characterization of ablator dynamics initiated by picket pulse conditions
Author(s): **Kyle R. P. Kafka**, **Valeri N. Goncharov**, **Suxing X. Hu, Stavros G. Demos,** Univ. of Rochester (United States)

13358-30 • 4:45 PM - 5:00 PM
The demands on optical materials in high power lasers for inertial fusion energy
Author(s): **Carmen S. Menoni,** Colorado State Univ. (United States)

13358-31 • 5:00 PM - 5:15 PM
Exploring multilayer dielectric mirror coating materials for optimizing long-term performance under 351-nm nanosecond pulses
Author(s): **Marek Stehlik**, **Alexei A. Kozlov**, **Kyle R. P. Kafka**, **Brittany N. Hoffman**, **Sara MacNally**, **Amy L. Rigatti, Stavros G. Demos,** Univ. of Rochester (United States)

13358-32 • 5:15 PM - 5:30 PM
Comparison of damage threshold of multilayer coating at 920 nm in femtosecond regime
Author(s): **Vladimir Pervak,** Ludwig-Maximilians-Univ. München (Germany); **Kyle R. P. Kafka**, **Stavros G. Demos,** Univ. of Rochester (United States); **Alexei Kobiak,** UltraFast Innovations GmbH (Germany)

CLOSING REMARKS

28 January 2025 • 5:30 PM - 5:35 PM | Moscone South, Room 76 (Lower Mezz)
Stavros Demos, Univ. of Rochester (United States)

CONFERENCE 13359

Optical Power Delivery

28 - 29 January 2025 | Moscone South, Room 215 (Tue); Moscone West, Room 2022 (Wed)

Conference Chair(s): **Bahram Jalali,** UCLA Samueli School of Engineering (United States)

Conference Co-Chair(s): **Carlos Algora,** Univ. Politécnica de Madrid (Spain); **Takeo Maruyama,** Kanazawa Univ. (Japan)

Program Committee: **Hamed Dalir,** Univ. of Florida (United States); **Simon Fafard,** Broadcom (Canada); **Nobutomo Hanzawa,** NTT - Tsukuba R&D Ctr. (Japan); **Henning Helmers,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Hamid Hemmati,** ViaSat, Inc. (United States); **Koichiro Kishima,** Pinpoint Photonics, Inc. (Japan); **Paul O. Leisher,** Luminar Technologies, Inc. (United States); **Tomoyuki Miyamoto,** Tokyo Institute of Technology (Japan); **Tom Nugent,** PowerLight Technologies (United States); **Jonathan Nydell,** PHION Technologies Corp. (United States); **Kayo Ogawa,** Japan Women's Univ. (Japan)

Tuesday 28 January 2025

SESSION 1: PHOTOVOLTAIC LASER POWER CONVERTERS

28 January 2025 • 8:15 AM - 9:55 AM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Carlos Algora**, Univ. Politécnica de Madrid (Spain)

13359-1 • 8:15 AM - 8:50 AM
Commercial laser power converters for power-over-fiber with Watts of output power capabilities over kilometers (Keynote Presentation)
Author(s): **Simon Fafard, Denis Masson,** Broadcom Inc. (Canada)

13359-2 • 8:50 AM - 9:15 AM
Simultaneous optical power and data transfer using photonic power converter devices: modeling and measurements *(Invited Paper)*
Author(s): **Carmine Pellegrino**, **Richard Nacke**, **David Lackner**, **Gerald Siefer,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Behnaz Majlesein**, **Sina Babadi**, **Iman Tavakkolnia**, **Harald Haas,** Univ. of Cambridge (United Kingdom); **Henning Helmers,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)

13359-3 • 9:15 AM - 9:30 AM
Efficient protocols for simultaneous optical wireless power transfer and communication
Author(s): **Behnaz Majlesein**, **Sina Babadi**, **Isaac Osahon**, **Othman Younus,** Univ. of Cambridge (United Kingdom); **Richard Nacke**, **Carmine Pellegrino**, **David Lackner**, **Gerald Siefer,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Iman Tavakkolnia,** Univ. of Cambridge (United Kingdom); **Henning Helmers,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Harald Haas,** Univ. of Cambridge (United Kingdom)

13359-4 • 9:30 AM - 9:55 AM
Eye-safe 1.5 and 2.0 micron laser power conversion using metamorphic InGaAs photovoltaic devices *(Invited Paper)*
Author(s): **John F. Geisz**, **Kevin L. Schulte**, **Daniel J. Friedman**, **Ryan M. France, Myles A. Steiner,** National Renewable Energy Lab. (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 2: POWER BEAMING SYSTEMS

28 January 2025 • 10:25 AM - 11:40 AM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Takeo Maruyama**, Kanazawa Univ. (Japan)

13359-5 • 10:25 AM - 10:40 AM
Low-latency enhanced light curtain for safe laser power beaming
Author(s): **Tom Nugent**, **Joseph Summers**, **Jonathan Gort, Warren Weinthal,** PowerLight Technologies (United States)

13359-6 • 10:40 AM - 10:55 AM
Statistical turbulence model for optical power beaming applications

Author(s): **Jonathan Gort**, **Joseph Summers, Tom Nugent,** PowerLight Technologies (United States)

13359-7 • 10:55 AM - 11:10 AM
Optical wireless power delivery: applications and challenges
Author(s): **Bahram Jalali,** Wireless Photonics (United States); **Hamid Hemmati,** ViaSat, Inc. (United States)

13359-8 • 11:10 AM - 11:25 AM
Remote energy delivery using laser power from directed energy weapons
Author(s): **Mitchell A. Kirby**, **Mathew Smith**, **Isaac Johnson**, **Waylon Puckett**, **Mike Hartnett**, **Warren Weinthal**, **Jonathan Gort, Tom Nugent,** PowerLight Technologies (United States)

13359-9 • 11:25 AM - 11:40 AM
Analysis and design of safe laser power beaming systems
Author(s): **Joseph Summers**, **Mathew Smith**, **Jonathan Gort**, **Thomas Bashford, Tom Nugent,** PowerLight Technologies (United States)

Lunch/Exhibition Break 11:40 AM - 1:40 PM

SESSION 3: POWER BEAMING AND POF SYSTEMS I

28 January 2025 • 1:40 PM - 3:00 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Bahram Jalali**, UCLA Samueli School of Engineering (United States)

13359-10 • 1:40 PM - 2:15 PM
Power beaming and DARPA's Persistent Optical Wireless Energy Relay (POWER) program (Keynote Presentation)
Author(s): **Paul Jaffe,** DARPA (United States)

13359-11 • 2:15 PM - 2:30 PM
Infrastructure-grade, high-power laser for free-space optical power delivery
Author(s): **Richard Hogg,** Aston Univ. (United Kingdom); **Charles Polk,** Orbiting Grid S.à r.l. (Luxembourg)

13359-12 • 2:30 PM - 2:45 PM
Toward a laser-based power delivery for space applications: preliminary qualification of radiation sensitivity
Author(s): **Anna Mauro**, **Aurora Bellone**, **Massimo Olivero,** Politecnico di Torino (Italy); **Wilfried Blanc**, **Mourad Benabdesselam**, **Frank Mady,** Univ. Côte d'Azur (France); **Alberto Vallan, Guido Perrone,** Politecnico di Torino (Italy)

13359-13 • 2:45 PM - 3:00 PM
Characterization of high power, kilometer-scale power over fiber cabling
Author(s): **Mitchell A. Kirby**, **Thomas J. Sayles**, **Mathew Smith**, **Warren Weinthal**, **Christopher Valencia, Tom Nugent,** PowerLight Technologies (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: POWER BEAMING AND POF SYSTEMS II

28 January 2025 • 3:30 PM - 4:45 PM | Moscone South, Room 215 (Level 2)
Session Chair(s): **Bahram Jalali**, UCLA Samueli School of Engineering (United States)

13359-14 • 3:30 PM - 4:05 PM
15 years of laser power beaming demonstrations (Keynote Presentation)
Author(s): **Tom Nugent**, **David J. Bashford**, **Thomas Bashford, Thomas J. Sayles,** PowerLight Technologies (United States)

13359-15 • 4:05 PM - 4:30 PM
Long-duration operation of 100W power over fiber unit *(Invited Paper)*
Author(s): **Thomas J. Sayles**, **Thomas Bashford**, **Max Saelzer**, **Mathew Smith**, **Isaac Johnson**, **Mitchell A. Kirby, Tom Nugent,** PowerLight Technologies (United States)

13359-16 • 4:30 PM - 4:45 PM
Power over fiber for undersea applications
Author(s): **Mitchell A. Kirby**, **Thomas J. Sayles**, **Isaac Johnson**, **Mathew Smith**, **Christopher Valencia**, **Warren Weinthal, Tom Nugent,** PowerLight Technologies (United States)

PANEL DISCUSSION: STANDARDIZATION AND SECURITY ASPECTS OF OPTICAL POWER SYSTEMS

28 January 2025 • 4:45 PM - 5:45 PM | Moscone South, Room 215 (Level 2)
Panel Moderator: **Bahram Jalali**, UCLA Samueli School of Engineering (United States)

Panelists:
Tom Nugent, PowerLight Technologies (United States)
Henning Helmers, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)
John Geisz, National Renewable Energy Lab. (United States)

POSTERS-TUESDAY

28 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the Tuesday LASE poster session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Tuesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines

13359-20 • 6:00 PM - 8:00 PM
Application scenarios and market assessment for simultaneous optical power and data transfer
Author(s): **Richard Nacke**, **Carmine Pellegrino**, **David Lackner**, **Gerald Siefer,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Behnaz Majlesein**, **Iman Tavakkolnia**, **Harald Haas,** Univ. of Cambridge (United Kingdom); **Henning Helmers,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)

Wednesday 29 January 2025

SESSION 5: PHOTONIC POWER: JOINT SESSION WITH 13359 AND 13361

29 January 2025 • 8:45 AM - 10:35 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Henning Helmers**, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Takeo Maruyama**, Kanazawa Univ. (Japan)

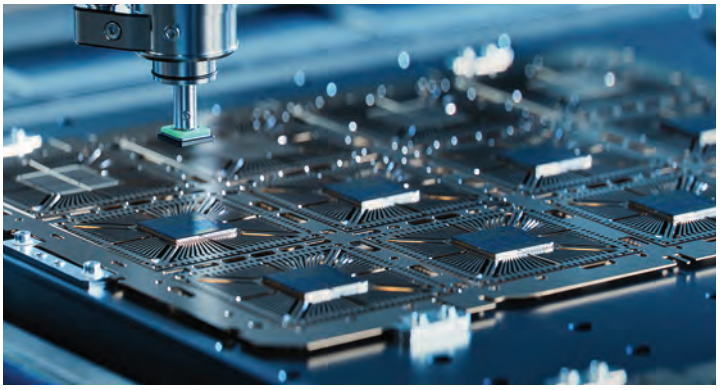
13361-10 • 8:45 AM - 9:15 AM
A GaAs PVLPC producing 21 W/cm2 at a conversion efficiency of 66.5% *(Invited Paper)*
Author(s): **Carlos Algora**, **Ivan García**, **Manuel Hinojosa, Marina Delgado,** Univ. Politécnica de Madrid (Spain)

13361-11 • 9:15 AM - 9:35 AM
High-performance laser power converters for simultaneous wireless information and power transfer
Author(s): **Yudan Gou**, **Jun Wang,** Sichuan Univ. (China); **Yongji Chen,** Southeast Univ.-Monash Univ. Suzhou Joint Graduate School (China); **Zhiqiang Mou,** Sichuan Univ. (China); **Di Feng,** Sichuan University (China)

13359-17 • 9:35 AM - 9:55 AM
Development and experimental characterization of a 53.5% efficient GaInP-based photovoltaic laser power converter
Author(s): **Pablo Sanmartín**, **Eduardo F. Fernández,** Univ. de Jaén (Spain); **Antonio García-Loureiro,** Ctr. Singular de Investigación en Tecnoloxías da Información (Spain); **Jesús Montes-Romero,** Univ. de Jaén (Spain); **Aitana Cano**, **Pablo Martín**, **Ignacio Rey-Stolle**, **Iván García,** Instituto de Energía Solar, Univ. Politécnica de Madrid (Spain); **Florencia Almonacid,** Univ. de Jaén (Spain)

13359-18 • 9:55 AM - 10:15 AM
1.1 eV GaInAs cell development for dual-use solar and 1070 nm laser power converters
Author(s): **Darin T. Meeker,** National Renewable Energy Lab. (United States), Colorado School of Mines (United States); **John F. Geisz**, **Kaitlyn T. VanSant**, **Sarah Collins**, **Daniel J. Friedman, Ryan M. France,** National Renewable Energy Lab. (United States)

13359-19 • 10:15 AM - 10:35 AM
InGaN photovoltaic laser power converters for atmospheric and submarine optical wireless power transfers
Author(s): **Pablo Sanmartín**, **Florencia Almonacid,** Univ. de Jaén (Spain); **Antonio García-Loureiro,** Univ. de Santiago de Compostela (Spain); **Eduardo F. Fernández,** Univ. de Jaén (Spain)



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Physics and Simulation of Optoelectronic Devices XXXIII

28 - 29 January 2025 | Moscone West, Room 2008 (Level 2)

Conference Chair(s): **Bernd Witzigmann,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Marek Osiński,** The Univ. of New Mexico (United States); **Yasuhiko Arakawa,** Institute of Industrial Science, The Univ. of Tokyo (Japan)

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Tuesday 28 January 2025

SESSION 1: ACTIVE MATERIALS

28 January 2025 • 8:30 AM - 10:10 AM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Bernd Witzigmann**, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13360-1 • 8:30 AM - 8:50 AM
Optically active InGaAs axial nanowire heterostructures for quantum integrated photonic circuits
Author(s): **Hyowon W. Jeong**, **Akhil Ajay**, **Nitin Srirang Mukhundhan,** Walter Schottky Institut (Germany); **Markus Döblinger**, **Sebastian Sturm**, **Richard Zell,** Ludwig-Maximilians-Univ. München (Germany); **Mikel Gomez-Ruiz**, **Jonas Lähnemann,** Paul-Drude-Institut für Festkörperelektronik (Germany); **Knut Müller-Caspary,** Ludwig-Maximilians-Univ. München (Germany); **Jonathan J. Finley, Gregor Koblmüller,** Walter Schottky Institut (Germany)

13360-2 • 8:50 AM - 9:10 AM
Interpolation of the properties of compound semiconductor alloys from those of their constituents
Author(s): **Jonathon T. Olesberg,** Sandia National Labs. (United States)

13360-3 • 9:10 AM - 9:30 AM
Atom probe composition and in situ electronic and optical structure of InAs quantum dot ensembles
Author(s): **Christopher Natale**, **Ethan Diak**, **Ray R. LaPierre, Ryan B. Lewis,** McMaster Univ. (Canada)

13360-4 • 9:30 AM - 9:50 AM
Simulation of the effect of geometric structure on electro-optic properties of KTN crystal device with fast response time
Author(s): **Tsubasa Watanabe**, **Hiroto Sakai, Hiroshi Tanaka,** Hamamatsu Photonics K.K. (Japan)

13360-5 • 9:50 AM - 10:10 AM
Graphene based highly efficient tunable C-shaped metasurface broadband solar absorber
Author(s): **Mayurkumar Ladumor,** Marwadi Univ. (India)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: SEMICONDUCTOR LASERS

28 January 2025 • 10:40 AM - 11:50 AM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Bernd Witzigmann**, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13360-6 • 10:40 AM - 11:10 AM
PCSEL modeling and simulation *(Invited Paper)*

Author(s): **Weidong Zhou,** The Univ. of Texas at Arlington (United States); **Mingsen Pan**, **Chhabindra Gautam**, **Ibrahim Tanriover,** Semergytech, Inc. (United States); **Cody Hammack,** The Univ. of Texas at Arlington (United States)

13360-7 • 11:10 AM - 11:30 AM
Optimization of pumping geometry of photonic crystal surface emitting lasers
Author(s): **Jingzhao Liu**, **Xingyu Zhao,** Univ. of Glasgow (United Kingdom); **Zijun Bian,** Aston Univ. (United Kingdom); **Stephen J. Sweeney,** Univ. of Glasgow (United Kingdom); **Richard A. Hogg,** Aston Univ. (United Kingdom)

13360-8 • 11:30 AM - 11:50 AM **(CANCELLED)**
Design and simulation of low threshold nanowire photonic crystal surface emitting lasers
Author(s): **Balthazar Temu,** Cardiff Univ. (United Kingdom)

Lunch/Exhibition Break 11:50 AM - 1:30 PM

SESSION 3: PLASMONS AND POLARITONS

28 January 2025 • 1:30 PM - 2:50 PM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Weidong Zhou**, The Univ. of Texas at Arlington (United States)

13360-10 • 1:30 PM - 1:50 PM
Plasmonics: a path towards HOT infrared detectors
Author(s): **Marco Vallone,** Politecnico di Torino (Italy); **Michele Goano,** Politecnico di Torino (Italy), Istituto di Elettronica e di Ingegneria dell'Informazione e delle Telecomunicazioni (Italy); **Stefan Hanna**, **Heinrich Figgemeier**, **Detlef Eich,** AIM INFRAROT-MODULE GmbH (Germany); **Francesco Bertazzi, Alberto Tibaldi,** Politecnico di Torino (Italy)

13360-11 • 1:50 PM - 2:10 PM
Schottky Au-InSb plasmonic photodiode for greenhouse gas detection
Author(s): **Jinal Tapar**, **Shuhao Wu**, **Khue Tian Lai**, **Maira Elksne,** Univ. of Glasgow (United Kingdom); **Nicholas Wood,** OME Thales UK Ltd. (United Kingdom); **David Cumming, Vincenzo Pusino,** Univ. of Glasgow (United Kingdom)

13360-12 • 2:10 PM - 2:30 PM
Design of Si1-xSnx alloy-based split-gate MOS field-effect phototransistors for infrared applications
Author(s): **Bhavika Agarwal**, **Harshvardhan Kumar,** The LNM Institute of Information Technology (India); **Shean-Jen Chen,** National Yang Ming Chiao Tung Univ. (Taiwan)

13360-13 • 2:30 PM - 2:50 PM
Radiation of surface polaritons by annular beams in cylindrical waveguides
Author(s): **Gor Chalyan, Aram Saharian,** Yerevan State Univ. (Armenia)

Coffee Break 2:50 PM - 3:20 PM

SESSION 4: PHOTODETECTORS

28 January 2025 • 3:20 PM - 4:40 PM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Bernd Witzigmann**, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13360-14 • 3:20 PM - 3:40 PM
Design of GeSn single photon avalanche photodiodes for short wave infrared detection
Author(s): **Alexander Skender, Partha P. Banerjee,** Univ. of Dayton (United States)

13360-15 • 3:40 PM - 4:00 PM
Measuring the quantum yield of silicon and modelling photo-detection efficiency from the UV to the NIR
Author(s): **Austin de St Croix**, **Fabrice Retiere, Harry Lewis,** TRIUMF (Canada)

13360-16 • 4:00 PM - 4:20 PM
Measurements and modelling of secondary photon emission from SPADs and SiPMs
Author(s): **Harry Lewis**, **Kurtis Raymond**, **Fabrice Retiere**, **Austin de St Croix,** TRIUMF (Canada); **Giacomo Gallina,** Princeton Univ. (United States); **Duncan McCarthy,** TRIUMF (Canada); **Frédéric Vachon**, **Tommy Rossignol**, **Samuel Parent**, **Jean-Francois Pratte, Serge A. Charlebois,** Université de Sherbrooke (Canada)

13360-18 • 4:20 PM - 4:40 PM
Statistical analysis of optical up-conversion passive imager receiver and image quality
Author(s): **Mario Bnyamin**, **Maksym Shkopas**, **Janusz A. Murakowski**, **Christopher A. Schuetz**, **Shouyuan Shi**, **Garrett J. Schneider, Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States)

Wednesday 29 January 2025

SESSION 5: OPTICAL SYSTEMS SIMULATION

29 January 2025 • 9:00 AM - 10:10 AM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Woncheol Lee**, Univ. of California, Santa Barbara (United States)

13360-19 • 9:00 AM - 9:30 AM
From design to manufacturing: complete inverse design flow for meta optics *(Invited Paper)*
Author(s): **Chenglin Xu,** Synopsys, Inc. (United States); **Maryvonne Chalony,** Synopsys, Inc. (France); **Yijun Ding**, **Larry S. Melvin,** Synopsys, Inc. (United States); **Bernd Küchler,** Synopsys, Inc. (Germany); **Bryan D. Stone,** Synopsys, Inc. (United States); **Li-Ce Hu,** Synopsys, Inc. (Taiwan); **Evan Heller**, **Mayank Bahl, Rob Scarmozzino,** Synopsys, Inc. (United States)

13360-20 • 9:30 AM - 9:50 AM
Stray light analysis: image quality of camera system in 3D scene
Author(s): **Sandra Gely**, **Aubry Grossetete,** Ansys France SAS (France); **Mina Nazari,** Ansys, Inc. (United States); **Tobias Lauinger**, **Sebastien Noygues**, **Etienne P. Lesage**, **Mathieu Reigneau**, **Christophe Weisse**, **Benoit Heraud,** Ansys France SAS (France); **TJ Gilleran,** Ansys, Inc. (United States)

13360-21 • 9:50 AM - 10:10 AM
Analysis of collocating and non-collocating on near-to-far-field transformation
Author(s): **Shih-Chen Yu, Snow H. Tseng,** National Taiwan Univ. (Taiwan)

Coffee Break 10:10 AM - 10:40 AM

SESSION 6: LIGHT EMITTING DIODES

29 January 2025 • 10:40 AM - 12:10 PM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Serge Massar**, Univ. Libre de Bruxelles (Belgium)

13360-24 • 10:40 AM - 11:10 AM
Excitons and exciton-phonon interaction in atomically thin nitrides *(Invited Paper)*
Author(s): **Woncheol Lee,** Univ. of California, Santa Barbara (United States); **Emmanouil Kioupakis,** Univ. of Michigan (United States)

13360-25 • 11:10 AM - 11:30 AM
Scaling theory of enhanced speed in N-Polar GaN MicroLEDs
Author(s): **Khaled Ahmed,** Intel Corp. (United States)

13360-26 • 11:30 AM - 11:50 AM
Analysis of effective carrier mobility in the multi-quantum wells of DUV AlGaN LEDs by carrier transport simulations
Author(s): **Ibrahim Marouf**, **Friedhard Römer,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Marcel Schilling**, **Franz Biebler**, **Jakob Höpfner**, **Massimo Grigoletto**, **Tim Wernicke**, **Michael Kneissl,** Technische Univ. Berlin (Germany); **Bernd Witzigmann,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

13360-27 • 11:50 AM - 12:10 PM
Overcoming angular dispersion in optical microcavities and filters by ultra-strong light-matter coupling with organic materials
Author(s): **Andreas Mischok**, **Florian Le Roux**, **Julian F. Butscher,** Univ. zu Köln (Germany); **Bernhard Siegmund,** Univ. Hasselt (Belgium); **Sabina Hillebrandt**, **Julia Witt**, **Seonil Kwon,** Univ. zu Köln (Germany); **Koen Vandewal,** Univ. Hasselt (Belgium); **Malte C. Gather,** Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 7: LASER DYNAMICS AND NEUROMORPHIC COMPUTING

29 January 2025 • 1:40 PM - 3:40 PM | Moscone West, Room 2008 (Level 2)
Session Chair(s): **Chenglin Xu**, Synopsys, Inc. (United States)

13360-28 • 1:40 PM - 2:10 PM
Frequency multiplexed photonic reservoir computers and extreme learning machines *(Invited Paper)*
Author(s): **Alessandro Lupo, Serge Massar,** Univ. Libre de Bruxelles (Belgium)

13360-30 • 2:10 PM - 2:40 PM **(CANCELLED)**
Dynamic optical injection of mode-locked quantum-dot lasers for high-speed optical sampling *(Invited Paper)*
Author(s): **Maria Ana Cataluna**, **Ana Filipa Ribeiro**, **Kirill Kabelev, Tiago Gomes,** Heriot-Watt Univ. (United Kingdom)

13360-31 • 2:40 PM - 3:00 PM
Long-range synchronization of nonlinear dynamics in a large 1D-array of blue semiconductor lasers with filtered optical feedback
Author(s): **Olivier Spitz**, **Parashu R. Nyaupane, Yehuda Braiman,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13360-32 • 3:00 PM - 3:20 PM
Temporal spiking Hebbian learning rule: a photonic implementation in biological neural systems
Author(s): **Hao Wang**, **Volker J. Sorger, Andrew Y. Qiu,** Univ. of Florida (United States)

13360-29 • 3:20 PM - 3:40 PM
Strategies for the alignment of electronic states in quantum-dot tunnel-injection lasers and their influence on the emission dynamics
Author(s): **Michael Lorke,** Univ. Duisburg-Essen (Germany), Univ. Bremen (Germany); **Igor Khanonkin,** Technion-Israel Institute of Technology (Israel); **Johann Peter Reithmeier,** Univ. Kassel (Germany); **Gadi Eisenstein,** Technion-Israel Institute of Technology (Israel); **Frank Jahnke,** Univ. Bremen (Germany)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13360-22 • 6:00 PM - 8:00 PM
Computer simulation of a 2D optical phased array in end-fire configuration
Author(s): **Alessandro Fantoni**, **Paulo Lourenço**, **Adelaide Texeira**, **Ernesto Velazquez,** Instituto Superior de Engenharia de Lisboa (Portugal); **Manuela P. Vieira,** UNINOVA (Portugal)

13360-33 • 6:00 PM - 8:00 PM
Fiber-confined single-photon source using a single rare-earth ion
Author(s): **Kaito Shimizu**, **Tomo Osada, Kaoru Sanaka,** Tokyo Univ. of Science (Japan)

13360-34 • 6:00 PM - 8:00 PM
Optimizing SiNWs shapes for improved solar cell performance
Author(s): **Mariam Elkoddosy**, **Mohamed A. Swillam, Mustafa M. El-Boghdady,** The American Univ. in Cairo (Egypt)

13360-35 • 6:00 PM - 8:00 PM
Through-focus scanning optical microscopy (TSOM) simulation with coupled mode theory
Author(s): **Shin-Woong Park**, **Jonghyun Lee**, **Myunggyu Choi, Hwi Kim,** Korea Univ. (Korea, Republic of)

13360-36 • 6:00 PM - 8:00 PM
Finite element modeling and design of InAs/GaSb/AlSb superlattices photosensor
Author(s): **Olivia Lu, Jaden Lu,** Hamilton High School (United States)

13360-37 • 6:00 PM - 8:00 PM
Reflectance of angled-facet optical waveguides by rotation and power overlap of the guided modes
Author(s): **Wender G. Daniel, Gilliard N. Malheiros-Silveira,** Univ. of Campinas (Brazil)

13360-38 • 6:00 PM - 8:00 PM
Deep learning-optimized bilayer gratings for enhanced MWIR T2SL photodetector polarimetry
Author(s): **Seungjin Jeong**, **Minseok Lee**, **Junghyun Lee,** Hongik Univ. (Korea, Republic of); **Jae Cheol Shin,** Dongguk Univ. (Korea, Republic of); **Jun Oh Kim,** Korea Research Institute of Standards and Science (Korea, Republic of); **Hyeon-June Kim,** Seoul National Univ. of Science and Technology (Korea, Republic of); **Bongjoong Kim,** Hongik Univ. (Korea, Republic of)

13360-39 • 6:00 PM - 8:00 PM **(CANCELLED)**
Understanding mode-locked quantum-dot lasers using the dispersion-scan technique
Author(s): **Tiago Gomes,** Heriot-Watt Univ. (United Kingdom), Univ. do Porto (Portugal); **Benjamín Alonso,** Univ. de Salamanca (Spain); **Helder Crespo,** STFC Rutherford Appleton Lab. (United Kingdom); **Maria Ana Cataluna,** Heriot-Watt Univ. (United Kingdom)

CONFERENCE 13361

Physics, Simulation, and Photonic Engineering of Photovoltaic Devices XIV

28 - 30 January 2025 | Moscone West, Room 2001 (Tue) and Room 2022 (Wed-Thu)

Conference Chair(s): **Alexandre Freundlich,** Univ. of Houston (United States); **Karin Hinzer,** Univ. of Ottawa (Canada); **Ian R. Sellers,** Univ. at Buffalo (United States)

Conference Co-Chair(s): **Henning Helmers,** Fraunhofer Institute for Solar Energy Systems ISE (Germany)

Program Committee: **Urs Aeberhard,** ETH Zurich (Switzerland), FLUXiM AG (Switzerland); **Mariana Bertoni,** Arizona State Univ. (United States); **Abderraouf Boucherif,** Univ. de Sherbrooke (Canada); **Federica Cappelluti,** Politecnico di Torino (Italy); **Stéphane Collin,** Ctr. de Nanosciences et de Nanotechnologies (France); **Gavin J. Conibeer,** The Univ. of New South Wales (Australia); **Olivier Durand,** Fonctions Optiques pour les Technologies de l'information (France); **Jean-François Guillemoles,** Institut Photovoltaïque d'Ile-de-France (France), NextPV LIA (Japan); **Oliver Höhn,** Fraunhofer Institute for Solar Energy Systems ISE (Germany); **Seth M. Hubbard,** Rochester Institute of Technology (United States); **Marina S. Leite,** Univ. of California, Davis (United States); **Masakazu Sugiyama,** The Univ. of Tokyo (Japan); **Samuel D. Stranks,** Univ. of Cambridge (United Kingdom)

Tuesday 28 January 2025

SESSION 1: NOVEL MATERIALS AND CHARACTERIZATION FOR PHOTOVOLTAICS

28 January 2025 • 1:00 PM - 2:30 PM | Moscone West, Room 2001 (Level 2)
Session Chair(s): **Karin Hinzer**, Univ. of Ottawa (Canada)

13361-1 • 1:00 PM - 1:30 PM
Metasurfaces for sustainable technologies: from materials to machine-learning assisted design *(Invited Paper)*
Author(s): **Alexandra Boltasseva,** Purdue Univ. (United States)

13361-2 • 1:30 PM - 1:50 PM
The effects of antimony incorporation on the optoelectronic properties of Cd(Se,Te) photovoltaics
Author(s): **Harvey L. Guthrey,** National Renewable Energy Lab. (United States); **Bin Du**, **Kevin Dobson, William Shafarman,** Univ. of Delaware (United States)

13361-3 • 1:50 PM - 2:10 PM
Terahertz Raman and infrared modes in metal halides for solar cells
Author(s): **Vincent Jae-Yeon Lim**, **Marcello Righetto**, **Siyu Yan,** Univ. of Oxford (United Kingdom); **Jay Patel,** King's College London (United Kingdom); **Thomas Siday**, **Benjamin Putland,** Univ. of Oxford (United Kingdom); **Kyle McCall,** ETH Zurich (Switzerland), EMPA (Switzerland); **Maximilian Sirtl,** Ludwig-Maximilians-Univ. München (Germany); **Yuliia Kominko,** ETH Zurich (Switzerland), EMPA (Switzerland); **Jiali Peng**, **Qianqian Lin,** Wuhan Univ. (China); **Thomas Bein,** Ludwig-Maximilians-Univ. München (Germany); **Maksym Kovalenko,** ETH Zurich (Switzerland), EMPA (Switzerland); **Henry J. Snaith**, **Michael B. Johnston,** Univ. of Oxford (United Kingdom); **Laura Herz,** Univ. of Oxford (United Kingdom), Technische Univ. München (Germany)

13361-4 • 2:10 PM - 2:30 PM
Non-destructive steady-state and time-resolved photoluminescence characterization of photovoltaic devices
Author(s): **Felix Koberling**, **Eugeny Ermilov**, **Volker Buschmann**, **Christian Oelsner**, **Jürgen Breitlow, Rainer Erdmann,** PicoQuant GmbH (Germany)

Coffee Break 2:30 PM - 3:00 PM

SESSION 2: PEROVSKITES: MATERIALS AND CHARACTERIZATION OF PHOTOVOLTAICS

28 January 2025 • 3:00 PM - 5:10 PM | Moscone West, Room 2001 (Level 2)

Session Chair(s): **Ian R. Sellers**, Univ. at Buffalo (United States)

13361-5 • 3:00 PM - 3:30 PM
Perovskites on the edge: Challenging and redefining radiation tolerance in metal-halide semiconductors *(Invited Paper)*
Author(s): **Ahmad Kirmani,** Rochester Institute of Technology (United States)

13361-6 • 3:30 PM - 3:50 PM
Unraveling carrier transfer and interfacial recombination at perovksite/transport layer interfaces via carrier dynamic simulations and ultrafast spectroscopy
Author(s): **Edward Butler-Caddle,** The Univ. of Warwick (United Kingdom); **Imalka Jayawardena,** Univ. of Surrey (United Kingdom); **Anjana Wijesekara**, **Rebecca L. Milot, James Lloyd-Hughes,** The Univ. of Warwick (United Kingdom)

13361-7 • 3:50 PM - 4:10 PM
Impacts of environmental stressors on charge carrier lifetimes in Pb-free halide perovskites
Author(s): **Mansha Dubey,** Univ. of California, Davis (United States); **Ece Aktas**, **Debendra P. Panda**, **Antonio Abate,** Univ. degli Studi di Napoli Federico II (Italy); **Marina S. Leite,** Univ. of California, Davis (United States)

13361-8 • 4:10 PM - 4:30 PM
Using automated experiments and machine learning to identify composition-property relationships in halide perovskites
Author(s): **Abigail Hering,** Univ. of California, Davis (United States); **Mansha Dubey,** Univ of California, Davis (United States); **Elahe Hosseini**, **Meghna Srivastava,** Univ. of California, Davis (United States); **Yu An**, **Juan-Pablo Correa-Baena,** Georgia Institute of Technology (United States); **Houman Homayoun, Marina S. Leite,** Univ. of California, Davis (United States)

13361-9 • 4:30 PM - 4:50 PM
Study and Interpretation of short-term temporary reverse-bias degradation in wide-bandgap $FAPbBr_3$ perovskite solar cells
Author(s): **Noah Tormena**, **Alessandro Caria**, **Matteo Buffolo**, **Carlo De Santi**, **Andrea Cester**, **Gaudenzio Meneghesso**, **Enrico Zanoni,** Univ. degli Studi di Padova (Italy); **Fabio Matteocci,** CHOSE - Polo Solare Organico della Regione Lazio (Italy); **Aldo Di Carlo,** Univ. degli Studi di Roma "Tor Vergata" (Italy); **Nicola Trivellin, Matteo Meneghini,** Univ. degli Studi di Padova (Italy)

13361-27 • 4:50 PM - 5:10 PM
Enhancement of hot carrier effects in core-shell InGaAs nanowires by auger heating
Author(s): **Hamidreza Esmaielpour**, **Nabi Isaev,** Technische Univ. München (Germany); **Jonathan J. Finley,** Walter Schottky Institut (Germany); **Gregor Koblmüller,** Technische Univ. München (Germany)

Wednesday 29 January 2025

SESSION 3: PHOTONIC POWER: JOINT SESSION WITH 13359 AND 13361

29 January 2025 • 8:45 AM - 10:35 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Henning Helmers**, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany); **Takeo Maruyama**, Kanazawa Univ. (Japan)

13361-10 • 8:45 AM - 9:15 AM
A GaAs PVLPC producing 21 W/cm2 at a conversion efficiency of 66.5% *(Invited Paper)*
Author(s): **Carlos Algora**, **Ivan García**, **Manuel Hinojosa, Marina Delgado,** Univ. Politécnica de Madrid (Spain)

13361-11 • 9:15 AM - 9:35 AM
High-performance laser power converters for simultaneous wireless information and power transfer
Author(s): **Yudan Gou**, **Jun Wang,** Sichuan Univ. (China); **Yongji Chen,** Southeast Univ.-Monash Univ. Suzhou Joint Graduate School (China); **Zhiqiang Mou,** Sichuan Univ. (China); **Di Feng,** Sichuan University (China)

13359-17 • 9:35 AM - 9:55 AM
Development and experimental characterization of a 53.5% efficient GaInP-based photovoltaic laser power converter
Author(s): **Pablo Sanmartín**, **Eduardo F. Fernández,** Univ. de Jaén (Spain); **Antonio García-Loureiro,** Ctr. Singular de Investigación en Tecnoloxías da Información (Spain); **Jesús Montes-Romero,** Univ. de Jaén (Spain); **Aitana Cano**, **Pablo Martín**, **Ignacio Rey-Stolle**, **Iván García,** Instituto de Energía Solar, Univ. Politécnica de Madrid (Spain); **Florencia Almonacid,** Univ. de Jaén (Spain)

13359-18 • 9:55 AM - 10:15 AM
1.1 eV GaInAs cell development for dual-use solar and 1070 nm laser power converters
Author(s): **Darin T. Meeker,** National Renewable Energy Lab. (United States), Colorado School of Mines (United States); **John F. Geisz**, **Kaitlyn T. VanSant**, **Sarah Collins**, **Daniel J. Friedman, Ryan M. France,** National Renewable Energy Lab. (United States)

13359-19 • 10:15 AM - 10:35 AM
InGaN photovoltaic laser power converters for atmospheric and submarine optical wireless power transfers
Author(s): **Pablo Sanmartín**, **Florencia Almonacid,** Univ. de Jaén (Spain); **Antonio García-Loureiro,** Univ. de Santiago de Compostela (Spain); **Eduardo F. Fernández,** Univ. de Jaén (Spain)

Lunch/Exhibition Break 10:35 AM - 1:15 PM

SESSION 4: MATERIAL GROWTH, DEVICE DESIGN, AND CHARACTERIZATION

29 January 2025 • 1:15 PM - 3:05 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Seth M. Hubbard**, Rochester Institute of Technology (United States)

13361-12 • 1:15 PM - 1:45 PM
Metamorphic epitaxy solutions for thermophotovoltaic and laser power conversion applications *(Invited Paper)*
Author(s): **Kevin L. Schulte**, **John F. Geisz**, **Daniel J. Friedman**, **Ryan M. France, Myles A. Steiner,** National Renewable Energy Lab. (United States)

13361-13 • 1:45 PM - 2:05 PM
Graphene assisted III-V epitaxy towards substrate recycling
Author(s): **Naomie Messudom**, **Antonella Cavanna**, **Ali Madouri,** Ctr. de Nanosciences et de Nanotechnologies (France); **Carlos Macias,** Instituto de Sistemas Optoelectrónicos y Microtecnología (Spain); **Nathalie Bardou**, **Laurent Travers**, **Stéphane Collin**, **Jean-Christophe Harmand, Amaury Delamarre,** Ctr. de Nanosciences et de Nanotechnologies (France)

13361-14 • 2:05 PM - 2:25 PM
Development of middle-contact three-terminal perovskite/silicon tandems
Author(s): **Gemma Giliberti**, **Antonio Fronteddu,** Politecnico di Torino (Italy); **Erica Magliano**, **Fabio Matteocci,** Univ. degli Studi di Roma "Tor Vergata" (Italy); **Francesco Di Giacomo,** Solertix Srl (Italy); **Lucia Mercaldo**, **Paola Delli Veneri,** ENEA (Italy); **Aldo Di Carlo,** Univ. degli Studi di Roma "Tor Vergata" (Italy); **Federica Cappelluti,** Politecnico di Torino (Italy)

13361-15 • 2:25 PM - 2:45 PM
ZnTe based solar cells using high-quality P-doped ZnTe layer grown by MBE using a cracked Zn_3P_2 dopant source
Author(s): **Muhamad Mustofa**, **Katsuhiko Saito**, **Qixin Guo, Tooru Tanaka,** Saga Univ. (Japan)

13361-16 • 2:45 PM - 3:05 PM
Tip enhanced Raman spectroscopy vs microRaman spectroscopy of InP/InGaP axially heterostructured nanowires for tandem solar cells
Author(s): **Irene Mediavilla**, **Julian Anaya**, **Jose Luis Pura,** Univ. de Valladolid (Spain); **Lukas Hrachowina**, **Magnus T. Borgström,** Lund University (Sweden); **Juan Jimenéz Lopez,** Univ. de Valladolid (Spain)

Coffee Break 3:05 PM - 3:35 PM

SESSION 5: THERMOPHOTOVOLTAICS

29 January 2025 • 3:35 PM - 4:45 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Henning Helmers**, Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)

13361-17 • 3:35 PM - 4:05 PM
Large area near-field thermophotovoltaics for low temperature applications *(Invited Paper)*
Author(s): **Jennifer Selvidge**, **Ryan M. France**, **John Goldsmith,** National Renewable Energy Lab. (United States); **Parth Solanki,** Univ. of Wisconsin-Madison (United States); **Myles A. Steiner,** National Renewable Energy Lab. (United States); **Eric J. Tervo,** National Renewable Energy Lab. (United States), Univ. of Wisconsin-Madison (United States)

13361-18 • 4:05 PM - 4:25 PM
Empirical TPV design rules and performance predictions
Author(s): **Titilope M. Dada**, **Eric J. Tervo,** Univ. of Wisconsin-Madison (United States); **Daniel J. Friedman, Myles A. Steiner,** National Renewable Energy Lab. (United States)

13361-19 • 4:25 PM - 4:45 PM
Optimizing thin film emitter thermophotovoltaics using materials selection
Author(s): **Declan Kopper, Marina S. Leite,** Univ. of California, Davis (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13361-30 • 6:00 PM - 8:00 PM
Comparison of thermal behaviors of silicon and perovskite solar cells through coupled optical-electrical-thermal 3D modeling using COMSOL
Author(s): **Teethiya Datta, Jing Bai,** Univ. of Minnesota Duluth (United States)

13361-31 • 6:00 PM - 8:00 PM
Numerical analysis on the influence of parasitic resistances and temperature on $Ag_2BaTiSe_4$ based solar cells using SCAPS-1D
Author(s): **Titu Thomas,** Mahatma Gandhi Univ. (India); **Sudakshina Babu,** T.M. Jacob Memorial Govt. College (India)

13361-32 • 6:00 PM - 8:00 PM
$CuBi_2O_4$-based solar cells for Cu_2O hole transport layer with CdS electron transport layer for ideal and non-ideal conditions: a simulation study
Author(s): **Muhammad Panachikkool, Pandiyarajan Thangaraj,** IIITDM Kurnool (India)

13361-36 • 6:00 PM - 8:00 PM
Design and optimization of photonic InP nanopillars for agrivoltaics applications: balancing photosynthesis and energy harvesting
Author(s): **Amrit Kumar Thakur**, **Shamim Ahamed**, **M. Saif Islam,** Univ. of California, Davis (United States); **Wayesh Qarony,** Univ. of Central Florida (United States)

Thursday 30 January 2025

SESSION 6: LIGHT MANAGEMENT

30 January 2025 • 8:30 AM - 10:10 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Kevin L. Schulte**, National Renewable Energy Lab. (United States)

13361-21 • 8:30 AM - 9:00 AM
Fundamentals and applications of free space diffuse irradiance collimation for enhancing photovoltaic yield *(Invited Paper)*
Author(s): **Rebecca Saive,** Univ. Twente (Netherlands)

13361-22 • 9:00 AM - 9:20 AM
Vertical bifacial photovoltaic system field data performance and model validation for various orientations and latitudes
Author(s): **Karin Hinzer**, **Erin M. Tonita,** Univ. of Ottawa (Canada); **Silvana Ovaitt,** National Renewable Energy Lab. (United States); **Henry Toal**, **Christopher Pike,** Univ. of Alaska Fairbanks (United States); **Chris Deline,** National Renewable Energy Lab. (United States)

13361-23 • 9:20 AM - 9:40 AM
Optimization strategies for colorful thin film solar cells
Author(s): **Jonas Schaible,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Ivan Sekulic**, **Philipp-Immanuel Schneider**, **Sven Burger,** Zuse Institute Berlin (Germany); **Christiane Becker, Klaus Jaeger,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

13361-24 • 9:40 AM - 10:10 AM
To be determined *(Invited Paper)*
Author(s): **Christiana B. Honsberg,** Arizona State Univ. (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: RADIATIVE COOLING, VALLEY PHOTOVOLTAICS, AND CARRIER DYNAMICS I

30 January 2025 • 10:30 AM - 11:40 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Rebecca Saive**, Univ. Twente (Netherlands)

13361-35 • 10:30 AM - 10:50 AM
Monte Carlo simulation of hot phonon dynamics in InAs/AlAsSb hot carrier solar cell absorbers
Author(s): **Izak Baranowski**, **Stephen M. Goodnick, Dragica Vasileska,** Arizona State Univ. (United States)

13361-25 • 10:50 AM - 11:20 AM
Bridging the energy gap: converting radiative heat to power with passive cooling *(Invited Paper)*
Author(s): **Tristan Deppe,** Univ. of California (United States); **Jeremy N. Munday,** Univ. of California, Davis (United States)

13361-26 • 11:20 AM - 11:40 AM
Impact of radiative cooling on the thermal behavior of multi-junction solar cells
Author(s): **Pietro Testa**, **Gemma Giliberti**, **Matteo Cagnoni, Federica Cappelluti,** Politecnico di Torino (Italy)

Lunch/Exhibition Break 11:40 AM - 1:10 PM

SESSION 8: RADIATIVE COOLING, VALLEY PHOTOVOLTAICS, AND CARRIER DYNAMICS II

30 January 2025 • 1:10 PM - 2:20 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Stephen M. Goodnick**, Arizona State Univ. (United States)

13361-34 • 1:10 PM - 1:40 PM
Effect of quantum well design parameters on radiation tolerance of InGaAs quantum well solar cells *(Invited Paper)*
Author(s): **Seth M. Hubbard**, **Elijah Sacchitella**, **Anthony Mazur**, **Rivka Stasavage, Stephen Polly,** Rochester Institute of Technology (United States)

13361-29 • 1:40 PM - 2:00 PM
Valley photovoltaics effects in satellite degenerate GaAs/Al0.16 Ga0.84 as heterostructure solar cells
Author(s): **Hasan Ahmed**, **Vincent R. Whiteside**, **Chiran W. Mudiyans**, **Umadini Ranasinghe,** Univ. at Buffalo (United States); **Stephen J. Polly,** Rochester Institute of Technology (United States); **Tim Thomay,** Univ. at Buffalo (United States); **David K. Ferry,** Arizona State Univ. (United States); **Seth M. Hubbard,** Rochester Institute of Technology (United States); **Ian R. Sellers,** Univ. at Buffalo (United States)

13361-28 • 2:00 PM - 2:20 PM
Charge carrier extraction and recombination effects in GaInAs/GaAsP MQW solar cells
Author(s): **Sethulakshmi Jayasree Sudhakaran**, **Hasan Ahmad**, **Vincent R. Whiteside**, **Ian R. Sellers,** Univ. at Buffalo (United States); **Ryan M. France,** National Renewable Energy Lab. (United States)

CONFERENCE 13362

Optical Components and Materials XXII

27 - 28 January 2025 | Moscone West, Room 2012 (Level 2)

Conference Chair(s): **Shibin Jiang,** AdValue Photonics, Inc. (United States); **Michel J. F. Digonnet,** Stanford Univ. (United States)

Program Committee: **Joel Bagwell,** Elbit Systems of America, LLC (United States); **Rolindes Balda,** Univ. del País Vasco (Spain); **Angel Flores,** Air Force Research Lab. (United States); **Jesse A. Frantz,** U.S. Naval Research Lab. (United States); **Parminder Ghuman,** NASA Earth Science Technology Office (United States); **Leonid B. Glebov,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Seppo K. Honkanen,** Microsoft Oy (Finland), Microsoft HoloLens (Finland); **Yang Li,** Tsinghua Univ. (China); **Jacques Lucas,** Univ. de Rennes 1 (France); **Yasutake Ohishi,** Toyota Technological Institute (Japan); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States); **Giancarlo C. Righini,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Setsuhisa Tanabe,** Kyoto Univ. (Japan); **Johann Troles,** Univ. de Rennes 1 (France); **John M. Zavada,** Polytechnic Institute of New York Univ. (United States); **Jun Zhang,** DEVCOM Army Research Lab. (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:40 AM

SESSION 1: RARE-EARTH-DOPED MATERIALS

27 January 2025 • 10:40 AM - 12:40 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Shibin Jiang**, AdValue Photonics, Inc. (United States)

13362-1 • 10:40 AM - 11:00 AM
Recent advances in spectroscopic investigations of Pr3+ doped low-phonon ternary chlorides and bromides for infrared laser sources
Author(s): **Ei E. Brown**, **Zackery D. Fleischman**, **Jason McKay**, **Larry D. Merkle,** DEVCOM Army Research Lab. (United States); **Uwe H. Hommerich,** Hampton Univ. (United States); **Althea G. Bluiett,** Norfolk State Univ. (United States); **Witold Palosz**, **Sudhir B. Trivedi,** Brimrose Technology Corp. (United States); **Mark Dubinskiy,** DEVCOM Army Research Lab. (United States)

13362-2 • 11:00 AM - 11:20 AM
Exploring glass powder doping of YPO_4:Yb3+ nanocrystal-doped fibers towards achieving optical gain
Author(s): **Dominik Dorosz,** AGH Univ. of Science and Technology (Poland); **Marcin Kochanowicz,** Bialystok Univ. of Technology (Poland); **Gloria L. Jimenez,** AGH Univ. of Science and Technology (Poland); **Piotr Miluski,** Bialystok Univ. of Technology (Poland); **Magdalena Lesniak,** AGH Univ. of Science and Technology (Poland); **Rafael Valiente**, **Andrea Diego-Rucabado**, **Nuria Sineriz-Niembro**, **Jose Espeso,** Univ. de Cantabria (Spain); **Konstantin L. Litvinenko**, **Andrew Prins**, **Markus Pollnau,** Univ. of Surrey (United Kingdom); **Sylvia Conzendorf**,

Zhongquan Liao, Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Robert Müller**, **Martin Lorenz**, **Anka Schwuchow**, **Martin Leich**, **Adrian Lorenz**, **Katrin Wondraczek, Matthias L. Jäger,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

13362-3 • 11:20 AM - 11:40 AM
Nd-doped lanthanum titanate glass laser
Author(s): **Jared Tolliver,** The Univ. of New Mexico (United States); **Stephen K. Wilke**, **Abdulrahman Alrubkhi,** Materials Development, Inc. (United States); **Alexander Neumann**, **Ganesh Balakrishnan,** The Univ. of New Mexico (United States); **Richard Weber,** Materials Development, Inc. (United States); **Brian Topper,** The Univ. of New Mexico (United States), Clemson Univ. (United States)

13362-4 • 11:40 AM - 12:00 PM
Numerical investigation of emission properties of a quadruply-doped germanate glass
Author(s): **Riccardo Ballarini, Stefano Taccheo,** Politecnico di Torino (Italy)

13362-5 • 12:00 PM - 12:20 PM
Optical gain properties in sodium-zinc and calcium-zinc phosphate glasses co-doped with erbium and ytterbium
Author(s): **Frida Rivera**, **Grethell Gerogina Perez−Sanchez**, **Dulce Yolotzin Medina Velazquez,** Univ. Autónoma Metropolitana (Mexico); **Ivan Aldaya Garde,** UNESP (Brazil); **Rodolfo Ezequiel López Romero,** Univ. Nacional Autónoma de México (Mexico)

13362-6 • 12:20 PM - 12:40 PM
Optical thermometry using temperature-dependent absorption in rare earth-doped crystals
Author(s): **Ashley E. Dwyer, Joseph Ganem,** Loyola Univ. Maryland (United States)

Lunch Break 12:40 PM - 2:00 PM

SESSION 2: PHOTONICS INTEGRATED CIRCUITS

27 January 2025 • 2:00 PM - 3:30 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Jesse A. Frantz**, U.S. Naval Research Lab. (United States)

13362-7 • 2:00 PM - 2:30 PM
Femtosecond written waveguides for evanescent excitation of resonant optical sensing devices *(Invited Paper)*
Author(s): **Vítor A. Amorim,** Sphere Ultrafast Photonics (Portugal); **João M. Maia,** Ctr. for Applied Photonics, INESC TEC (Portugal); **Gabriele Frigenti**, **Francesco Baldini**, **Simone Berneschi**, **Daniele Farnesi,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Pedro A. S. Jorge,** Ctr. for Applied Photonics, INESC TEC (Portugal), Univ. do Porto (Portugal); **Gualtiero Nunzi Conti,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Paulo S. S. dos Santos,** Ctr. for Applied Photonics, INESC TEC (Portugal), Univ. do Porto (Portugal); **Paulo V. S. Marques,** Institute for Systems and Computer Engineering, Technology, and Science (Portugal), Univ. do Porto (Portugal)

13362-8 • 2:30 PM - 3:00 PM
Full angular control over photoinduced anisotropy in highly birefringent thin films *(Invited Paper)*
Author(s): **Jakub Kolacz**, **Matthew D. Thum, Adam A. Meares,** U.S. Naval Research Lab. (United States)

13362-9 • 3:00 PM - 3:30 PM
Ultra-low loss large-scale photonic integrated circuits on thin film lithium niobate *(Invited Paper)*
Author(s): **Ya Cheng,** Chinese Academy of Sciences (CAS) (China), East China Normal Univ. (China)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: GRATINGS

27 January 2025 • 4:00 PM - 5:40 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Shibin Jiang**, AdValue Photonics, Inc. (United States)

13362-10 • 4:00 PM - 4:20 PM
Azimuthally and radially polarized beams generated in a helical fiber grating
Author(s): **Zhang Meng,** Shizuoka Univ. (Japan); **Peng Wang,** Nanjing Xiaozhuang Univ. (China); **Hua Zhao,** Nanjing Normal Univ. (China); **Hongpu Li,** Shizuoka Univ. (Japan)

13362-11 • 4:20 PM - 4:40 PM
Monolithic diffractive linear-polarization beam splitter-monitor
Author(s): **Uma K. Subash, Menelaos K. Poutous,** The Univ. of North Carolina at Charlotte (United States)

13362-12 • 4:40 PM - 5:00 PM
Lifetime prediction of type III fiber Bragg gratings inscribed by femtosecond laser in silica-based optical fiber
Author(s): **Matilde Sosa,** CEA-LIST (France), Institut de Chimie Moléculaire et des Matériaux d'Orsay (France), Univ. Paris-Saclay (France); **Maxime Cavillon,** Institut de Chimie Moléculaire et des Matériaux d'Orsay (France), Univ. Paris-Saclay (France); **Thomas Blanchet,** CEA-LIST (France); **Matthieu Lancry,** Institut de Chimie Moléculaire et des Matériaux d'Orsay (France), Univ. Paris-Saclay (France); **Guillaume Laffont,** CEA-LIST (France)

13362-13 • 5:00 PM - 5:20 PM
3D-spatial distribution diffractive composite beamsplitters
Author(s): **Uma K. Subash, Menelaos K. Poutous,** The Univ. of North Carolina at Charlotte (United States)

13362-14 • 5:20 PM - 5:40 PM
Dual-band microwave photonic filter utilizing equivalent chirped four-phase-shifted sampled Bragg grating for 52.1GHz–439.5GHz range
Author(s): **Simeng Zhu**, **Mohanad J. A. Al-Rubaiee**, **Bocheng Yuan**, **Yizhe Fan**, **Yiming Sun**, **John H. Marsh, Lianping Hou,** Univ. of Glasgow (United Kingdom)

Tuesday 28 January 2025

SESSION 4: PHOTORECEIVERS

28 January 2025 • 8:45 AM - 11:05 AM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Michel J. F. Digonnet**, Stanford Univ. (United States)

13362-15 • 8:45 AM - 9:05 AM
Using high mobility ZnON alyer to produce high-responsivity Sb_2Se_3-based phototransistors
Author(s): **Jong-Ho Kim**, **Hee-Kyoung You, Tae-Yeon Seong,** Korea Univ. (Korea, Republic of)

13362-16 • 9:05 AM - 9:25 AM
Lanthanide doped nanoparticles for sensitive photodetectors of short-wave radiation
Author(s): **Darayas N. Patel,** Oakwood Univ. (United States); **Sergey S. Sarkisov,** SSS Optical Technologies (United States); **Abdalla M. Darwish,** Dillard Univ. (United States); **Sabrina Collins**, **Havovi Patel**, **Peris Murangiri**, **Haley Whyte, LilyJasmine Notice,** Oakwood Univ. (United States)

13362-17 • 9:25 AM - 9:45 AM
Fabrication of Mg_2Si linear photodiode arrays for SWIR imaging
Author(s): **Haruhiko Udono**, **Kaito Ojima**, **Naoki Imaizumi**, **Hideto Takei, Shunya Sakane,** Ibaraki Univ. (Japan)

13362-18 • 9:45 AM - 10:05 AM
Room temperature GeSn nanowire array SWIR photodetectors on Si
Author(s): **Théophile Willoquet**, **Nicolas Pauc**, **Jean-Michel Hartmann**, **Vincent Calvo, Simone Assali,** CEA-Grenoble (France)

13362-19 • 10:05 AM - 10:25 AM
Pseudo-planar Ge-on-Si avalanche photodiode with >100 gain and low excess noise
Author(s): **Ross W. Millar**, **Muhammad Mirza**, **Jaroslaw Kirdoda**, **Derek C. S. Dumas**, **Charlie K. Smith**, **Charlie McCarthy,** Univ. of Glasgow (United Kingdom); **Fiona Fleming**, **Xin Yi**, **Mrudul Modak**, **Lisa Saalbach**, **David Muir,** Heriot-Watt Univ. (United Kingdom); **Xiao Jin**, **Qingyu Tian,** The Univ. of Sheffield (United Kingdom); **Levi Tegg**, **Sima A Yamini,** University of Sydney (Australia); **John P. R. David,** The Univ. of Sheffield (United Kingdom); **Gerald S. Buller,** Heriot-Watt Univ. (United Kingdom); **Douglas J. Paul,** Univ. of Glasgow (United Kingdom)

13362-20 • 10:25 AM - 10:45 AM
Dual-mode high gain InGaAs avalanche photodiode based on p-i-n photodetector design
Author(s): **Arshey Patadia, Richard S. Kim,** Laser Components Detector Group, Inc. (United States)

13362-21 • 10:45 AM - 11:05 AM
Novel electrode-free and highly-sensitive infrared photodetector based on graphene nanoplatelets-integrated fiber Bragg grating device
Author(s): **Sagi Shiva Sreenivasa Dheerendra Koushik**, **Sweta Rath, Shivananju Bannur Nanjunda,** Indian Institute of Technology Madras (India)

Coffee Break 11:05 AM - 11:25 AM

SESSION 5: FIBER LASERS AND AMPLIFIERS

28 January 2025 • 11:25 AM - 1:05 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Jun Zhang**, DEVCOM Army Research Lab. (United States)

13362-22 • 11:25 AM - 11:45 AM
2121nm 2W PM fiber amplifier for molecular hydrogen detection
Author(s): **Alexandre Amavigan**, **Glen M. Williams**, **Conrad Knight**, **Aydin Yeniay, Jean-Marc Delavaux,** Cybel, LLC (United States)

13362-23 • 11:45 AM - 12:05 PM
Design and performance of a high-power PM ytterbium-doped fiber amplifier for use between 1107nm and 1112nm
Author(s): **Alexandre Amavigan**, **Glen M. Williams**, **Hakim Tahi**, **Shivaraman Asoda**, **Gustavo Rivas, Jean-Marc Delavaux,** Cybel, LLC (United States)

13362-24 • 12:05 PM - 12:25 PM
high-peak-power, high-energy, frequency-doubled fiber lasers at 515nm, 780nm, and 935nm
Author(s): **Lei Pan, Jihong Geng,** AdValue Photonics, Inc. (United States)

13362-25 • 12:25 PM - 12:45 PM
Large-mode-area fiber tap coupler capable of performance monitoring and phase/polarization locking in multi-kW fiber lasers
Author(s): **Jihong Geng, Shibin Jiang,** AdValue Photonics, Inc. (United States)

13362-26 • 12:45 PM - 1:05 PM
Mid-infrared fibers made by additive manufacturing of chalcogenide glasses
Author(s): **Johann Troles**, **François Cheviré,** Univ. de Rennes 1 (France); **Leo Szymczyk,** Univ. de Rennes 1 (France), Umicore IR glass (France); **Antoine Gautier,** Univ. de Rennes 1 (France); **Frederic Charpentier**, **Yann M. Guimond**, **Mathieu Roze,** Umicore IR Glass (France); **Gilles Renversez,** Aix-Marseille Univ. (France); **Catherine Boussard,** Univ. de Rennes 1 (France)

Lunch/Exhibition Break 1:05 PM - 2:25 PM

SESSION 6: SUB-WAVELENGTH OPTICAL ELEMENTS

28 January 2025 • 2:25 PM - 3:45 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Angel S. Flores**, Air Force Research Lab. (United States)

13362-27 • 2:25 PM - 2:45 PM
Electrically controlled III-V metasurfaces for active beam control
Author(s): **Charles Pelzman**, **Jason N. Sun, Sang-Yeon Cho,** DEVCOM Army Research Lab. (United States)

13362-28 • 2:45 PM - 3:05 PM
Wide angle-of-incidence reflectivity suppression in the NIR by pseudo-randomly distributed binary phase nanostructures
Author(s): **Samir Paudel, Menelaos K. Poutous,** The Univ. of North Carolina at Charlotte (United States)

13362-29 • 3:05 PM - 3:25 PM
Effect of topological inclusions on properties of resonant optical lattices
Author(s): **Robert Magnusson**, **Soo H Lee,** The Univ. of Texas at Arlington (United States); **Yeong Hwan Ko,** Kongju National Univ. (Korea, Republic of); **Jae Woong Yoon, Soo-Chan An,** Hanyang Univ. (Korea, Republic of)

13362-30 • 3:25 PM - 3:45 PM
Phase changing oxides for emerging photonics
Author(s): **Shriram Ramanathan,** Rutgers, The State Univ. of New Jersey (United States)

Coffee Break 3:45 PM - 4:05 PM

SESSION 7: OPTICAL COMPONENTS

28 January 2025 • 4:05 PM - 5:15 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Michel J. F. Digonnet**, Stanford Univ. (United States)

13362-31 • 4:05 PM - 4:35 PM
Photoelectrochemical light conversion using mutimaterial devices *(Invited Paper)*
Author(s): **Gabriel Loget,** Ctr. National de la Recherche Scientifique (France)

13362-33 • 4:35 PM - 4:55 PM
PFAS-free materials for next-generation optical devices with high transmission
Author(s): **Reuben Chacko,** Brewer Science, Inc. (United States); **Yun-Yan Wang**, **Matthew J Kindhart**, **Madison R Barr**, **Stephen R Murphy**, **Julian Wortham**, **Runhui Huang, Chris Cox,** Brewer Science (United States)

13362-34 • 4:55 PM - 5:15 PM
Excess noise in AlxGa1-xAs0.56Sb0.44 lattice matched to InP at room temperature
Author(s): **Xin Yi,** Heriot-Watt Univ. (United Kingdom); **Xiao Jin,** The Univ. of Sheffield (United Kingdom); **Baolai L. Liang,** Univ. of California, Los Angeles (United States); **Harry Lewis**, **Qingyu Tian**, **Chee Hing Tan,** The Univ. of Sheffield (United Kingdom); **Shiyu Xie**, **Qiang Li**, **Zhao Yan,** Cardiff Univ. (United Kingdom); **Gerald Buller,** Heriot-Watt Univ. (United Kingdom); **John P. R. David,** The Univ. of Sheffield (United Kingdom)

Wednesday 29 January 2025

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13362-35 • 6:00 PM - 8:00 PM
Extraction of main effect process parameters affecting transmittance of hot isostatic pressing ZnS by design of experiments method

Author(s): **Seon Hoon Kim**, **Joonyoung Park**, **Jaehwan Hwang**, **Karam Han**, **Jung-Hwan In**, **So Young Kim, Ju Hyeon Choi,** Korea Photonics Technology Institute (Korea, Republic of)

13362-37 • 6:00 PM - 8:00 PM
High-power tapered diode lasers utilizing monolithic gratings
Author(s): **Luukas Kuusela**, **Timo Aho**, **Riina Ulkuniemi**, **Mika Mähönen**, **Jussi Hämelahti**, **Andreas Schramm**, **Soile Talmila**, **Jarkko Liimatainen**, **Pekko Sipilä, Petteri Uusimaa,** Modulight Corp. (Finland)

13362-39 • 6:00 PM - 8:00 PM
Exploring heterogeneous integration of thick micro-lens array for pluggable photonics packaging
Author(s): **Saif Wakeel**, **Padraic E. Morrissey**, **Kamil Gradkowski**, **How Yuan Hwang**, **Fatih Bilge Atar**, **Muhammet Genc,** Tyndall National Institute (Ireland); **Prasanna Ramaswamy,** Xceleprint (Ireland); **Brian Corbett, Peter O'Brien,** Tyndall National Institute (Ireland)

13362-40 • 6:00 PM - 8:00 PM
Polarization-maintaining tellurite oval core optical fiber for mid-infrared supercontinuum generation
Author(s): **Keita Takahata**, **Asuka Nakatani**, **Jonathan de Clermont-Gallerande**, **Takenobu Suzuki, Yasutake Ohishi,** Toyota Technological Institute (Japan)

13362-41 • 6:00 PM - 8:00 PM
A comparative study of europium doped phosphor materials for white light generation
Author(s): **Yannik Palmer-Tesema, Bommareddi Rami Reddy,** Alabama A&M Univ. (United States)

13362-42 • 6:00 PM - 8:00 PM
Effect of metallic silver particles on the luminescence spectrum of Sm3+-doped oxide glass
Author(s): **Kevin Bennett,** Alabama A&M Univ. (United States); **Viswa Mandadapu,** James Clemens High School (United States); **Bommareddi Rami Reddy,** Alabama A&M Univ. (United States)

13362-44 • 6:00 PM - 8:00 PM
Tunable PM Ho-doped ring fiber laser for the 2000-2100 nm band
Author(s): **Juan Adrian Zepeda-Galvez**, **Shivaraman Asoda**, **Wiktor T. Walasik**, **Alexandre Amavigan**, **Robert E. Tench, Jean-Marc Delavaux,** Cybel, LLC (United States)

13362-45 • 6:00 PM - 8:00 PM
20 W CW and 130W pulsed Tm-doped fiber amplifier at 2039 nm
Author(s): **Juan Adrian Zepeda-Galvez**, **Shivaraman Asoda**, **Wiktor T. Walasik**, **Johan L. Riaño**, **Alexandre Amavigan**, **Jean-Marc Delavaux, Robert E. Tench,** Cybel, LLC (United States)

13362-46 • 6:00 PM - 8:00 PM
Thin film materials and optical coatings in mid-wave infrared range
Author(s): **Alp Eren Sinan Ozhan**, **Oliver Hohn, Harro Hagedorn,** Bühler Alzenau GmbH (Germany)

13362-47 • 6:00 PM - 8:00 PM
5 wavelength transmitter at 2039nm for coherent pulsed Lidar
Author(s): **Juan Adrian Zepeda-Galvez**, **Shivaraman Asoda**, **Wiktor T. Walasik**, **Johan L. Riaño**, **Maria Fernanda Acevedo**, **Alexandre Amavigan**, **Aydin Yeniay,** Cybel, LLC (United States); **Andre J. Van Rynbach,** Air Force Research Lab. (United States); **Jean-Marc Delavaux,** Cybel, LLC (United States)

13362-48 • 6:00 PM - 8:00 PM
Programmable non-volatile spectral shaping in PCM-enhanced grating-assisted couplers
Author(s): **Lorenzo Tunesi,** Politecnico di Torino (Italy); **Mohammad Amin Mahdian**, **Amin Shafiee,** Colorado State Univ. (United States); **Andrea Carena**, **Vittorio Curri,** Politecnico di Torino (Italy); **Mahdi Nikdast,** Colorado State Univ. (United States); **Paolo Bardella,** Politecnico di Torino (Italy)

13362-49 • 6:00 PM - 8:00 PM
Fiber-optic VOC gas sensor operating in high humidity
Author(s): **Sung Yoon Cho**, **Ji Su Kim**, **Byeong Kwon Choi**, **Soyeon Ahn**, **Minjun Kim,** Chungnam National Univ. (Korea, Republic of); **Jong Min Lee,** Hallym Univ. (Korea, Republic of); **Min Yong Jeon,** Chungnam National Univ. (Korea, Republic of)

13362-50 • 6:00 PM - 8:00 PM
Novel high refractive glass materials based on TeO_2 for infrared lens applications
Author(s): **Ju Hyeon Choi**, **Karam Han**, **Yong Jun Kim**, **Jung-Hwan In**, **So Young Kim**, **Yoon Hee Nam, Seon Hoon Kim,** Korea Photonics Technology Institute (Korea, Republic of)

13362-51 • 6:00 PM - 8:00 PM
Noise characterization of InGaAs/GaAsSb T2SL SWIR detectors
Author(s): **Armando Gil,** Univ. of Michigan (United States); **Jamie Phillips,** Univ. of Delaware (United States); **Martin H. Ettenberg,** Princeton Infrared Technologies, Inc. (United States); **Cagliyan Kurdak,** Univ. of Michigan (United States)

13362-52 • 6:00 PM - 8:00 PM
Photoluminescence and resonance Raman study of tetrahedral Mn5+ and Mn6+ in high optical basicity glasses
Author(s): **Amir Ashjari**, **Jiao Li**, **Lenorah Haight-Stott,** Alfred Univ. (United States); **Jared Tolliver,** The Univ. of New Mexico (United States); **Brian Topper,** Clemson Univ. (United States); **Yiquan Wu, Doris Möncke,** Alfred Univ. (United States)

13362-53 • 6:00 PM - 8:00 PM
Modulation of structural color in inorganic-organic composite films using plasma treatment
Author(s): **Yuta Nakayama,** AGC Inc. (Japan)

13362-54 • 6:00 PM - 8:00 PM
Partial chromatic dispersion compensation of 12.5 gbps transmission with optimised chirped FBG design for access networks
Author(s): **Eronmhon Ogobor,** Univ. de Aveiro (Portugal), Instituto de Telecomunicações (Portugal); **Adebayo Abejide,** Univ. de Aveiro (Portugal); **Abdul Gafur**, **Mário Lima**, **Fernando PP Guiomar**, **Paulo A Monteiro, António Luís J. Teixeira,** Instituto de Telecomunicações (Portugal)

13362-55 • 6:00 PM - 8:00 PM
Fiber-compatible $LiNbO_3$ thin film membrane for broadband second harmonic generation
Author(s): **Aiman Zinaoui**, **Lucas Grosjean**, **Jean-David Fayssaud**, **Arthur De Sousa Lopes Moreira**, **Miguel Suarez Sanabria**, **Samuel Queste**, **Laurent Robert**, **Ludovic Gauthier-Manuel**, **Mathieu Chauvet, Nadège Courjal,** FEMTO-ST (France)

13362-57 • 6:00 PM - 8:00 PM
PbS quantum dot photodiodes for CMOS ROIC SWIR and FPD X-ray imaging sensors
Author(s): **Ronald Naber**, **Vincent Goossens**, **Thomas Ruzius**, **Nataliia Sukharevska**, **Suleyman Kahraman, Artem Shulga,** QDI Systems B.V. (Netherlands)

CONFERENCE 13363

Organic Photonic Materials and Devices XXVII

29 January 2025 | Moscone West, Room 2012 (Level 2)

Conference Chair(s): **William M. Shensky,** DEVCOM Army Research Lab. (United States); **Ileana Rau,** Univ. Politehnica din Bucuresti (Romania); **Okihiro Sugihara,** Utsunomiya Univ. (Japan)

Program Committee: **Chantal Andraud,** Ecole Normale Supérieure de Lyon (France); **Fabrice Charra,** CEA (France); **James G. Grote,** Photonics and Electronics Engineering Research Consultant (United States); **Alex K. Y. Jen,** Univ. of Washington (United States); **Toshikuni Kaino,** Tohoku Univ. (Japan); **François Kajzar,** Univ. Politehnica din Bucuresti (Romania); **Eunkyoung Kim,** Yonsei Univ. (Korea, Republic of); **Jang-Joo Kim,** Seoul National Univ. (Korea, Republic of); **Junya Kobayashi,** NTT Advanced Technology Corp. (Japan); **Yasuhiro Koike,** Keio Univ. (Japan); **Gilbert Kosgei,** U.S. Army Engineer Research and Development Ctr. (United States); **Isabelle Ledoux-Rak,** Ecole Normale Supérieure Paris-Saclay (France); **Kwang-Sup Lee,** Hannam Univ. (Korea, Republic of); **Misoon Y. Mah,** Air Force Office of Scientific Research (United States); **Jaroslaw Mysliwiec,** Wroclaw Univ. of Science and Technology (Poland); **Robert A. Norwood,** Wyant College of Optical Sciences (United States); **Jean-Michel Nunzi,** Queen's Univ. (Canada); **Shuji Okada,** Yamagata Univ. (Japan); **Akira Otomo,** National Institute of Information and Communications Technology (Japan); **Niyazi Serdar Sariciftci,** Johannes Kepler Univ. Linz (Austria); **Kenneth D. Singer,** Folio Photonics LLC (United States); **Jeong-Weon Wu,** Ewha Womans Univ. (Korea, Republic of); **Shiyoshi Yokoyama,** Kyushu Univ. (Japan); **Roberto Zamboni,** Istituto per la Sintesi Organica e la Fotoreattività (Italy)

Wednesday 29 January 2025

SESSION 1: NONLINEAR OPTICAL PROCESSES AND OLEDS I

29 January 2025 • 8:30 AM - 10:10 AM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **William M. Shensky**, DEVCOM Army Research Lab. (United States)

13363-4 • 8:30 AM - 9:00 AM
Organic cavity polaritons and coupled polaritons for photonic applications *(Invited Paper)*
Author(s): **Kenneth D. Singer,** Case Western Reserve Univ. (United States)

13363-1 • 9:00 AM - 9:20 AM
Effect of electron-donating and -withdrawing groups on the photophysical properties of iridium (iii) diphenyl quinoxaline complexes
Author(s): **Erica S. Knorr**, **Jordan C. Kelly,** DEVCOM Army Research Lab. (United States); **Daniel P. Harrison,** Virginia Military Institute (United States); **Thomas N. Rohrabaugh,** DEVCOM Army Research Lab. (United States)

13363-2 • 9:20 AM - 9:40 AM
Organogold nonlinear optical chromophores
Author(s): **Julia Marshall**, **Gergory Sutton**, **Evan P. Van Orman**, **Joseph J. Mihaly,** Case Western Reserve Univ. (United States); **Steven M. Wolf**, **Morris E. Olumba,** Air Force Research Lab. (United States); **Ethan Holt**, **Kimeberly D. de La Harpe,** U.S. Air Force Academy (United States); **Tod A. Grusenmeyer,** Air Force Research Lab. (United States); **Thomas G. Gray,** Case Western Reserve Univ. (United States)

13363-5 • 9:40 AM - 10:10 AM
Preparation of high-performance photorefractive liquid crystal blends and their application to laser ultrasonics *(Invited Paper)*
Author(s): **Takeo Sasaki**, **Le Khoa Van, Yumiko Naka,** Tokyo Univ. of Science (Japan)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: NONLINEAR OPTICAL PROCESSES AND OLEDS II

29 January 2025 • 10:40 AM - 11:20 AM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Erica S. Knorr**, DEVCOM Army Research Lab. (United States)

13363-7 • 10:40 AM - 11:00 AM
Multi-objective optimization of bottom-emitting OLEDs for low color shift displays
Author(s): **Maya Ramamurthy**, **Evgeny Pakhomenko**, **Siliang He**, **Abhinav Kapur,** Univ. of Minnesota, Twin Cities (United States); **Kyle W. Hershey**, **Gijun Seo**, **Ying Zheng,** Microsoft Corp. (United States); **Vivian E. Ferry, Russell J. Holmes,** Univ. of Minnesota, Twin Cities (United States)

13363-26 • 11:00 AM - 11:20 AM
Efficient and stable deep-blue OLEDs for micro-display applications
Author(s): **Guodan Wei,** Tsinghua Shenzhen International Graduate School (China); **Siqi Li, Chengcheng Wu,** Tsinghua Univ. Shenzhen International Graduate School (China)

SESSION 3: ORGANIC-INORGANIC HYBRID DEVICES I

29 January 2025 • 11:20 AM - 12:10 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Erica S. Knorr**, DEVCOM Army Research Lab. (United States)

13363-8 • 11:20 AM - 11:40 AM
Visible-light modulators and power limitators based on spin crossover material thin films
Author(s): **Jesukpego Anorld Capo Chichi**, **Isabelle Séguy**, **Henri Camon**, **Stéphane Calvez,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France), Univ. de Toulouse (France); **Alejandro Enriquez Cabrera**, **Lijun Zhang**, **Yuteng Zhang**, **Lionel Salmon**, **Gabor Molnar**, **Karl Ridier, Azzedine Bousseksou,** Lab. de Chimie de Coordination (France), CNRS (France), Univ. de Toulouse (France)

13363-9 • 11:40 AM - 12:10 PM
Exploiting metal-halide perovskites thermal evaporation for device customization and quantum confinement *(Invited Paper)*
Author(s): **Annalisa Bruno, Jesus Zuniga-Perez,** Energy Research Institute @ NTU (ERI@N) (Singapore)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 4: ORGANIC-INORGANIC HYBRID DEVICES II

29 January 2025 • 1:40 PM - 2:30 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **William M. Shensky**, DEVCOM Army Research Lab. (United States)

13363-12 • 1:40 PM - 2:00 PM
Organic hybrid plasmonic slot waveguide mach-zehnder modulator on the InP membrane on silicon platform
Author(s): **Amir Abbas Kashi,** imec (Netherlands); **Jos J. G. M. van der Tol**, **Kevin A. Williams**, **Yuqing Jiao, Sander Reniers,** Technische Univ. Eindhoven (Netherlands)

13363-13 • 2:00 PM - 2:30 PM
High refractive index and low birefringence specialty polymer Iupizeta EP series *(Invited Paper)*
Author(s): **Noriyuki Kato, Munenori Shiratake,** Mitsubishi Gas Chemical Co., Inc. (Japan)

Coffee Break 2:30 PM - 3:00 PM

SESSION 5: POLYMERIC OPTICAL WAVEGUIDES AND DEVICES

29 January 2025 • 3:00 PM - 4:50 PM | Moscone West, Room 2012 (Level 2)
Session Chair(s): **Okihiro Sugihara**, Utsunomiya Univ. (Japan)

13363-14 • 3:00 PM - 3:40 PM
Ultra-fast electro-optic modulator for multi-band transmission exceeding 300 Gbit/s (Keynote Presentation)
Author(s): **Shiyoshi Yokoyama**, **Sahar Alasvand Yazdani**, **Yuexin Yin**, **Hiromu Sato, Guo-Wei Lu,** Kyushu Univ. (Japan)

13363-15 • 3:40 PM - 4:10 PM
Polymeric waveguide resonators in integrated photonics *(Invited Paper)*
Author(s): **Yi Chang**, **Jia-Hao Cao,** National Central Univ. (Taiwan); **Jia-Huei Lin**, **I-Chang Liang**, **Cheng-Chi Wang,** Innolux Corporation (Taiwan); **Pei-Hsun Wang,** National Yang Ming Chiao Tung Univ. (Taiwan)

13363-16 • 4:10 PM - 4:30 PM
Structural limits of flexographic printing towards singlemode dimension waveguides
Author(s): **Jonathan Pleuß**, **Andreas Evertz, Ludger Overmeyer,** Leibniz Univ. Hannover (Germany)

13363-18 • 4:30 PM - 4:50 PM
Synaptic plasticity and light-triggered properties of azo-dye-doped DNA biopolymer devices
Author(s): **Chen-Ray Lee**, **Yuan-Chun Chung, Yu-Chueh Hung,** National Tsing Hua Univ. (Taiwan)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13363-19 • 6:00 PM - 8:00 PM
Characteristics of photoresponse in inorganic-organic phototransistor with PTCDI-C13 photoactive layer
Author(s): **Gergely Tarsoly**, **Jae-Yun Lee**, **Anvar Tukhtaev**, **Jonibek Elmurodovich Berdied**, **Baratov Nurali Azamovich**, **Beom Gu Lee, Sung-Jin Kim,** Chungbuk National Univ. (Korea, Republic of)

13363-20 • 6:00 PM - 8:00 PM
Thienoimidazole-pyridine based hole transporting materials for inverted perovskite solar cells
Author(s): **Chaochin Su**, **Hong-Jia Lin**, **Mu-Yi Lin**, **Zhi-Ting Wu, Chong-Wei Wu,** National Taipei Univ. of Technology (Taiwan)

13363-21 • 6:00 PM - 8:00 PM
Investigating the chelating effects of new hole transporting materials on the performance enhancement of perovskite solar cells
Author(s): **Wen-Ren Li,** National Central Univ. (Taiwan); **Yogesh S. Tingare,** National Taipei Univ. of Technology (Taiwan); **Chi-Wei Cheng**, **Chi-Ruei Guo,** National Central Univ. (Taiwan); **Zhi-Ting Wu,** National Taipei Univ. of Technology (Taiwan)

13363-22 • 6:00 PM - 8:00 PM
Improvement in efficiency and stability of dye-sensitized solar cell with natural dye from the peel of passion fruit
Author(s): **You-Jhen Lee**, **Yun-Yen Zhang**, **Ming-Ju Tsai**, **Wei-An Huang, Pin-I Liang,** Yanping High School (Taiwan)

CONFERENCE 13364

Ultrafast Phenomena and Nanophotonics XXIX

27 - 30 January 2025 | Moscone West, Room 2020 (Level 2)

Conference Chair(s): **Markus Betz,** Technische Univ. Dortmund (Germany); **Abdulhakem Y. Elezzabi,** Univ. of Alberta (Canada)

Program Committee: **Alan D. Bristow,** West Virginia Univ. (United States); **Kimberley C. Hall,** Dalhousie Univ. (Canada); **Rupert Huber,** Univ. Regensburg (Germany); **Min Seok Jang,** KAIST (Korea, Republic of); **Robert A. Kaindl,** Arizona State Univ. (United States); **Dai-Sik Kim,** Ulsan National Institute of Science and Technology (Korea, Republic of); **Uriel Levy,** The Hebrew Univ. of Jerusalem (Israel); **Xiaoqin Li,** The Univ. of Texas at Austin (United States); **Christoph Lienau,** Carl von Ossietzky Univ. Oldenburg (Germany); **Tran Trung Luu,** The Univ. of Hong Kong (Hong Kong, China); **Torsten Meier,** Univ. Paderborn (Germany); **Frank J. Meyer zu Heringdorf,** Univ. Duisburg-Essen (Germany); **Walter Pfeiffer,** Univ. Bielefeld (Germany); **Giacomo Scalari,** ETH Zurich (Switzerland); **Volker J. Sorger,** Univ. of Florida (United States); **Kam Sing Wong,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:50 AM

SESSION 1: ULTRAFAST PHENOMENA IN MONOLAYERS AND 2D MATERIALS I

27 January 2025 • 10:50 AM - 12:30 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Abdulhakem Y. Elezzabi**, Univ. of Alberta (Canada)

13364-1 • 10:50 AM - 11:20 AM
Light-wave-controlled Haldane model in monolayer hexagonal boron nitride *(Invited Paper)*
Author(s): **Matthias F. Kling,** SLAC National Accelerator Lab. (United States), Ludwig-Maximilians-Univ. München (Germany); **Sambit Mitra,** Max-Planck-Institut für Quantenoptik (Germany), Ludwig-Maximilians-Univ. München (Germany); **Alvaro Jimenez-Galan,** Instituto de Ciencia de Materiales de Madrid (Spain), Max-Born-Institute (Germany), National Research Council of Canada (Canada); **Mario Aulich**, **Marcel Neuhaus, Shubhadeep Biswas,** SLAC National Accelerator Lab. (United States), Max-Planck-Institut für Quantenoptik (Germany)

13364-3 • 11:20 AM - 11:40 AM
Engineering ultrafast photoconductive response in two-dimensional SnS_2 through metal intercalation
Author(s): **Sepideh Khanmohammadi**, **Camille Williams**, **Kateryna Kushnir Friedman**, **Ronald L. Grimm,** Worcester Polytechnic Institute (United States); **Kristie Koski,** Univ. of California, Davis (United States); **Lyubov V. Titova,** Worcester Polytechnic Institute (United States)

13364-4 • 11:40 AM - 12:00 PM
Ultrafast processes in 2D materials and polariton-enhanced nonlinear optical response
Author(s): **Fadil Iyikanat, F. Javier Garcia de Abajo,** ICFO - Institut de Ciències Fotòniques (Spain)

13364-10 • 12:00 PM - 12:30 PM
Higher-order Mie resonant metasurfaces for ultrafast all-optical light manipulation *(Invited Paper)*
Author(s): **Claudio Hail**, **Lior Michaeli, Harry A. Atwater,** Caltech (United States)

Lunch Break 12:30 PM - 2:00 PM

SESSION 2: TERAHERTZ RADIATION SPECTROSCOPY AND SENSING

27 January 2025 • 2:00 PM - 3:30 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Markus Borsch**, Univ. of Michigan (United States)

13364-5 • 2:00 PM - 2:30 PM
Cavity electrodynamics of van der Waals heterostructures *(Invited Paper)*
Author(s): **Hope Bretscher**, **Gunda Kipp,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **Benedikt Schulte,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Columbia Univ. (United States); **Dorothee Herrmann,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **Kateryna Kusyak**, **Matthew W. Day,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Columbia Univ. (United States); **Sivasruthi Kesavan**, **Toru Matsuyama**, **Xinyu Li**, **Sara Maria Langner**, **Jesse Hagelstein,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **Felix Sturm,** Columbia Univ. (United States); **Alexander M. Potts,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **Christian J. Eckhardt,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Institut für Theorie der Statistischen Physik (Germany); **Yunfei Huang,** Columbia Univ. (United States); **Kenji Watanabe**, **Takashi Taniguchi,** National Institute for Materials Science (Japan); **Angel Rubio,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Flatiron Institute (United States), Univ. del País Vasco (Spain); **Dante M. Kennes,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Institut für Theorie der Statistischen Physik (Germany); **Michael A. Sentef,** Univ. Bremen (Germany), Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **Emmanuel Baudin,** Ecole normale supérieure - PSL (France), Institut Univ. de France (France); **Guido Meier**, **Marios Michael,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); **James W. McIver,** Max-Planck-Institut für Struktur und Dynamik der Materie (Germany), Columbia Univ. (United States)

13364-6 • 2:30 PM - 3:00 PM
Engineering THz phonon and charge transfer in van der Waals heterostructures *(Invited Paper)*
Author(s): **Yoseob Yoon,** Northeastern Univ. (United States)

13364-7 • 3:00 PM - 3:30 PM
Emission and sensing of coherent electric fields ranging the terahertz-to-mid-infrared spectral regimes *(Invited Paper)*
Author(s): **Brett N. Carnio**, **Mingyuan Zhang,** Univ. of Alberta (Canada); **Kevin T. Zawilski**, **Peter G. Schunemann,** BAE Systems (United States); **Oussama Moutanabbir,** Polytechnique Montréal (Canada); **Abdulhakem Y. Elezzabi,** Univ. of Alberta (Canada)

SESSION 3: ULTRAFAST PHOTONICS: FROM ATOMIC INSIGHTS TO LIGHT WAVE MANIPULATION

27 January 2025 • 3:30 PM - 4:00 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Matthias Kling**, SLAC National Accelerator Lab. (United States)

13364-11 • 3:30 PM - 4:00 PM
High-precision detection of electric fields via lightwave electronics *(Invited Paper)*
Author(s): **Markus Borsch**, **Zetian Mi,** Univ. of Michigan (United States); **Rupert Huber,** Univ. Regensburg (Germany); **Mackillo Kira,** Univ. of Michigan (United States)

Tuesday 28 January 2025

SESSION 4: ULTRAFAST DYNAMICS IN MATERIALS AND HETEROSTRUCTURES

28 January 2025 • 9:00 AM - 10:20 AM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Markus Betz**, Technische Univ. Dortmund (Germany)

13364-12 • 9:00 AM - 9:30 AM
Floquet engineering of strongly driven excitons in 2D-crystals *(Invited Paper)*
Author(s): **Shambhu Ghimire,** SLAC National Accelerator Lab. (United States)

13364-13 • 9:30 AM - 10:00 AM
Dynamics of localized excitations in 2D moire heterostructures *(Invited Paper)*
Author(s): **Akshay Singh,** Indian Institute of Science, Bengaluru (India)

13364-15 • 10:00 AM - 10:20 AM
The nature of the carrier dynamics and contrast formation on the photoactive material surfaces: insights from ultrafast imaging to DFT calculations
Author(s): **Sarvarkhodzha Nematulloev**, **Razan O. Nughays**, **Saidkhodzha Nematulloev**, **Simil Thomas**, **Dipti Naphade**, **Thomas D. Anthopoulos**, **Osman M. Bakr, Omar F. Abdelsaboor,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

Coffee Break 10:20 AM - 11:10 AM

SESSION 5: ULTRAFAST LATTICE, COHERENT PHONONS, AND SPIN DYNAMICS

28 January 2025 • 11:10 AM - 12:00 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Shambhu Ghimire**, SLAC National Accelerator Lab. (United States)

13364-17 • 11:10 AM - 11:40 AM
Photoexcited ultrafast lattice motion of twisted TMDC bilayers *(Invited Paper)*
Author(s): **Fang Liu,** Stanford Univ. (United States)

13364-19 • 11:40 AM - 12:00 PM
Lamb-like waves in GaAs/AlAs multilayer structures
Author(s): **Chushuang Xiang**, **Edson R. Cardozo de Oliveira**, **Sathyan Sandeep, Norberto Daniel Lanzillotti-Kimura,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France)

Lunch/Exhibition Break 12:00 PM - 1:40 PM

SESSION 6: TERAHERTZ SPECTROSCOPY

28 January 2025 • 1:40 PM - 3:30 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Brett N. Carnio**, Univ. of Alberta (Canada)

13364-21 • 1:40 PM - 2:10 PM
Coherent excitation of chiral phonons using THz light *(Invited Paper)*
Author(s): **Megan Biggs**, **Enoch Ho**, **Aldair Alejandro**, **Matthew Lutz**, **Ravi Finn**, **Clayton Moss, Jeremy A. Johnson,** Brigham Young Univ. (United States)

13364-22 • 2:10 PM - 2:40 PM
MEMS-integrated metasurfaces for dynamic tuning of the propagation properties of spoof surface plasmon polaritons *(Invited Paper)*
Author(s): **Marco Rahm**, **Lars Franke, Steffen Klingel,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13364-23 • 2:40 PM - 3:10 PM
High average power few-cycle Terahertz sources *(Invited Paper)*
Author(s): **Clara J. Saraceno,** Ruhr-Univ. Bochum (Germany)

13364-24 • 3:10 PM - 3:30 PM
Coherent optical control of chiral quantum Hall edge states
Author(s): **Alexey Belyanin**, **Ashutosh Singh**, **Maria Sebastian,** Texas A&M Univ. (United States); **Mikhail D. Tokman,** Ariel Univ. (Israel)

Wednesday 29 January 2025

SESSION 7: NONLINEAR OPTICS AND STRONG FIELD PHENOMENA

29 January 2025 • 8:00 AM - 9:50 AM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Abdulhakem Y. Elezzabi**, Univ. of Alberta (Canada)

13364-8 • 8:00 AM - 8:30 AM
Active metasurfaces for dynamic wavefront modulation in space and time *(Invited Paper)*
Author(s): **Harry A. Atwater,** Caltech (United States)

13364-25 • 8:30 AM - 9:00 AM
New insights to the process of resonant high harmonic generation in plasma plume *(Invited Paper)*
Author(s): **Yoad Aharon**, **Adi Pick,** The Hebrew Univ. of Jerusalem (Israel); **Ofer Neufeld,** Technion (Israel); **Gilad Marcus,** The Hebrew Univ. of Jerusalem (Israel)

13364-27 • 9:00 AM - 9:30 AM
Seeing helimagnetism with nonlinear optics *(Invited Paper)*
Author(s): **Liuyan Zhao,** Univ. of Michigan (United States)

13364-28 • 9:30 AM - 9:50 AM
Electron tunneling driven by bright two-mode squeezed quantum pulses
Author(s): **Gabriel Demontigny**, **Patrick Cusson**, **Laurent Rivard,** Polytechnique Montréal (Canada); **Guillaume Beaudin**, **Paul G. Charette**, **Max Hofheinz,** Univ. de Sherbrooke (Canada); **Denis V. Seletskiy,** Polytechnique Montréal (Canada)

Coffee Break 9:50 AM - 10:20 AM

SESSION 8: ULTRAFAST SPECTROSCOPY AND COHERENT DYNAMICS

29 January 2025 • 10:20 AM - 11:50 AM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Liuyan Zhao**, Univ. of Michigan (United States)

13364-29 • 10:20 AM - 10:50 AM
Ultrafast coherent vibrational dynamics of atomic-scale defects in diamond *(Invited Paper)*
Author(s): **James Lloyd-Hughes,** The Univ. of Warwick (United Kingdom)

13364-30 • 10:50 AM - 11:20 AM
Two-dimensional electronic spectroscopy of many-body correlations in quantum materials *(Invited Paper)*
Author(s): **Christoph Lienau,** Carl von Ossietzky Univ. Oldenburg (Germany)

13364-31 • 11:20 AM - 11:50 AM
Photo-excited magnetization precession in Co/Pd multilayer films at low laser fluences *(Invited Paper)*
Author(s): **Giti A. Khodaparast,** Virginia Polytechnic Institute and State Univ. (United States)

Lunch/Exhibition Break 11:50 AM - 1:00 PM

SESSION 9: ULTRAFAST PLASMONICS

29 January 2025 • 1:00 PM - 2:00 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Christoph Lienau**, Carl von Ossietzky Univ. Oldenburg (Germany)

13364-14 • 1:00 PM - 1:20 PM
Ultrafast opto-acoustics in engineered metallic structures
Author(s): **Alba Viejo Rodriguez,** Univ. du Luxembourg (Luxembourg); **Yoav Urbina Elgueta,** CIC nanoGUNE (Spain); **Germàn Lanzavecchia**, **Denis Garoli,** Istituto Italiano di Tecnologia (Italy); **Daniele Brida,** Univ. du Luxembourg (Luxembourg); **Paolo Vavassori,** CIC nanoGUNE (Spain); **Nicolò Maccaferri,** Umeå Univ. (Sweden)

13364-34 • 1:20 PM - 1:40 PM
Ultrafast single photons from silicon vacancies in plasmonic diamond at room-temperature
Author(s): **Hengming Li**, **Deniz Acil**, **Andrew M. Boyce,** Duke Univ. (United States); **Nicholas Yama**, **Christian Pederson**, **Kai-Mei C. Fu,** Univ. of Washington (United States); **Maiken H. Mikkelsen,** Duke Univ. (United States)

13364-35 • 1:40 PM - 2:00 PM
Fast dynamics surface enhanced fluorescence through plasmonic nanoclusters
Author(s): **Belkis Gökbulut, Mehmet Naci Inci,** Bogaziçi Üniv. (Turkey)

Coffee Break 2:00 PM - 2:30 PM

SESSION 10: QUANTUM OPTICS: SYSTEMS AND SOURCES

29 January 2025 • 2:30 PM - 4:20 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Norbert Kroo**, Wigner Research Ctr. for Physics (Hungary)

13364-36 • 2:30 PM - 3:00 PM
Open quantum systems as a platform for quantum machine learning *(Invited Paper)*
Author(s): **Christopher Gies,** Univ. Bremen (Germany)

13364-37 • 3:00 PM - 3:30 PM
Robust parallel laser triggering of quantum light sources *(Invited Paper)*
Author(s): **Kimberley C. Hall**, **Ali Binai-Motlagh**, **Grant Wilbur**, **Giannis Tolis**, **Lilly Daw**, **Ajan Ramachandran,** Dalhousie Univ. (Canada); **Sabine O'Neal, Dennis G. Deppe,** Univ. of Central Florida (United States)

13364-38 • 3:30 PM - 4:00 PM
Bright few-cycle quantum light *(Invited Paper)*
Author(s): **Denis V. Seletskiy**, **Patrick Cusson,** Polytechnique Montréal (Canada); **Andrei Rasputnyi,** Max-Planck-Institut für die Physik des Lichts (Germany); **Stéphane Virally,** Polytechnique Montréal (Canada); **Francesco Tani, Maria V. Chekhova,** Max-Planck-Institut für die Physik des Lichts (Germany)

13364-39 • 4:00 PM - 4:20 PM
Near field investigation of plasmonic vortex lenses
Author(s): **Zhi Gao, Alexei Sokolov,** Texas A&M Univ. (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13364-20 • 6:00 PM - 8:00 PM
Laser and pressure-induced spin-crossover phase-change in levitating particles
Author(s): **Javier Hernandez Rueda,** Univ. Complutense de Madrid (Spain); **Lucas Mascaró-Burguera,** Univ. Politècnica de València (Spain); **Juan Ignacio Tomás Echavarría,** Univ. Complutense de Madrid (Spain); **Ramón Torres-Cavanillas,** Univ. de València (Spain); **Elena Pinilla-Cienfuegos,** Ctr. de Tecnología Nanofotónica de Valencia (Spain)

13364-45 • 6:00 PM - 8:00 PM
Non-linear optical interaction of ultra-broadband fs-laser pulses with 2D materials
Author(s): **Óscar Pérez-Benito**, **Rosa Weigand, Javier Hernandez Rueda,** Univ. Complutense de Madrid (Spain)

13364-53 • 6:00 PM - 8:00 PM
Ultrafast mid-infrared probe spectroscopy to explore the dynamics of excited-state carriers in semiconducting monolayer fluorographene
Author(s): **Prasenjit Jana,** Univ. of Hyderabad (India)

Thursday 30 January 2025

SESSION 11: ULTRAFAST PROCESSES IN DEVICES AND LASERS

30 January 2025 • 8:30 AM - 10:10 AM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Markus Betz**, Technische Univ. Dortmund (Germany)

13364-40 • 8:30 AM - 9:00 AM
Quasi-phase-matched up- and down-conversion in periodically poled layered semiconductors *(Invited Paper)*
Author(s): **Chiara Trovatello,** Columbia Univ. (United States)

13364-41 • 9:00 AM - 9:30 AM
Record pulse width and peak power in Bragg diode lasers; can this be a titanium sapphire laser replacement on chip? *(Invited Paper)*
Author(s): **Amr S. Helmy,** Univ. of Toronto (Canada)

13364-42 • 9:30 AM - 9:50 AM
Seven-fold pulse compression of mid-infrared beams using a series of titanium dioxide plates
Author(s): **Andre Cote**, **Kurosh Firouzi,** Simon Fraser Univ. (Canada); **Paul B. Corkum,** Univ. of Ottawa (Canada); **Gary Leach, Shawn Sederberg,** Simon Fraser Univ. (Canada)

13364-43 • 9:50 AM - 10:10 AM
Coherent quantum cavity state synthesis by free electron beams
Author(s): **Valerio Di Giulio, Claus Ropers,** Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany)

Coffee Break 10:10 AM - 10:40 AM

SESSION 12: ULTRAFAST PHENOMENA IN MONOLAYERS AND 2D MATERIALS II

30 January 2025 • 10:40 AM - 11:50 AM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Markus Betz**, Technische Univ. Dortmund (Germany)

13364-44 • 10:40 AM - 11:10 AM
Anomalous interlayer exciton diffusion in WS_2/WSe_2 moiré heterostructure *(Invited Paper)*
Author(s): **Archana Raja,** Lawrence Berkeley National Lab. (United States)

13364-46 • 11:10 AM - 11:30 AM
Coherent interaction of Rydberg excitons in WSe_2 monolayers
Author(s): **Max Wegerhoff**, **Moritz Scharfstaedt**, **Andrea Bergschneider, Stefan Linden,** Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany)

13364-47 • 11:30 AM - 11:50 AM
Exciton and carrier dynamics of binary layered Dion-Jacobson perovskites
Author(s): **Siedah J. Hall,** The City Univ. of New York (United States); **Jin Hou**, **Hao Zhang**, **Aditya D. Mohite,** Rice Univ. (United States); **Matthew Y. Sfeir,** The City Univ. of New York Advanced Science Research Ctr. (United States)

Lunch/Exhibition Break 11:50 AM - 1:30 PM

SESSION 13: COHERENT AND NONLINEAR DYNAMICS OF OPTICAL EXCITATIONS

30 January 2025 • 1:30 PM - 3:30 PM | Moscone West, Room 2020 (Level 2)
Session Chair(s): **Markus Betz**, Technische Univ. Dortmund (Germany)

13364-48 • 1:30 PM - 2:00 PM
Direct observation of phonon mode- and electron energy- resolved electron-phonon-coupling with 2D optical spectroscopy *(Invited Paper)*
Author(s): **Heejae Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13364-49 • 2:00 PM - 2:30 PM
Many-body interactions in semiconductors revealed by 2D electronic spectroscopy *(Invited Paper)*
Author(s): **Daniele Brida, Thomas Deckert,** Univ. du Luxembourg (Luxembourg)

13364-50 • 2:30 PM - 2:50 PM
Coherent many-body interactions of semiconductor microcavities polaritons
Author(s): **Alan D. Bristow**, **Hunter Louscher**, **Giuseppe Fumero**, **Jagannath Paul,** West Virginia Univ. (United States); **Jared K. Wahlstrand,** National Institute of Standards and Technology (United States)

13364-51 • 2:50 PM - 3:10 PM
Selective excitation of organic exciton-polaritons in open photonic cavities
Author(s): **Kamyar Rashidi,** The City Univ. of New York Advanced Science Research Ctr. (United States), The Graduate Ctr., CUNY (United States); **Evripidis Michail**, **Bernardo Salcido-Santacruz,** The City Univ. of New York (United States); **Vinod M. Menon,** The City College of New York (United States); **Matthew Y. Sfeir,** The City Univ. of New York Advanced Science Research Ctr. (United States), The Graduate Ctr., CUNY (United States)

13364-52 • 3:10 PM - 3:30 PM
Identification of origin of superfluorescence from multiexcitons in CuCl quantum dot assembly systems embedded in NaCl single crystals
Author(s): **Gen Fujioka**, **Yuki Otani**, **Xi Yu,** Tokyo Univ. of Science (Japan); **Jun Ishihara,** Tohoku University (Japan); **Akira Ishikawa,** Yamanashi University (Japan); **Kensuke Miyajima,** Tokyo Univ. of Science (Japan)

CONFERENCE 13365

Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XVIII

27 - 30 January 2025 | Moscone West, Room 2024 (Level 2)

Conference Chair(s): **Laurence P. Sadwick,** InnoSys, Inc. (United States); **Tianxin Yang,** Tianjin Univ. (China)

Program Committee: **René Beigang,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany); **Jianji Dong,** Huazhong Univ. of Science and Technology (China); **Frank Ellrich,** Technische Hochschule Bingen (Germany); **Fabian Friederich,** Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Robert H. Giles,** Univ. of Massachusetts Lowell (United States); **R. Jennifer Hwu,** InnoSys, Inc. (United States); **Mona Jarrahi,** UCLA Samueli School of Engineering (United States); **Karen K. Lin,** A*STAR Institute of Materials Research and Engineering (Singapore); **Daniel Molter,** Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Kyung Hyun Park,** Electronics and Telecommunications Research Institute (Korea, Republic of); **Marco Rahm,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany); **Jinghua Teng,** A*STAR Institute of Materials Research and Engineering (Singapore); **Maddy Woodson,** Freedom Photonics, LLC (United States); **Jiangfeng Zhou,** Univ. of South Florida (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: TERAHERTZ SOURCES I

27 January 2025 • 10:45 AM - 11:45 AM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-1 • 10:45 AM - 11:05 AM
Stable optical beats between laser longitudinal modes for THz waves using chaotic spurematcy
Author(s): **Fumiyoshi Kuwashima,** Fukui Univ. of Technology (Japan); **Mona Jarrahi**, **Semih Cakmakyapan,** Univ. of California, Los Angeles (United States); **Kenji Wada,** Osaka Metropolitan Univ. (Japan); **Masanobu Haraguchi,** Tokushima Univ. (Japan); **Yuki Kawakami,** National Institute of Technology, Fukui College (Japan); **Takeshi Moriyasu,** Univ. of Fukui (Japan); **Osamu Morikawa,** Japan Coast Guard Academy (Japan); **Kazuyoshi Kurihara**, **Hideaki Kitahara**, **Takashi Furuya,** Univ. of Fukui (Japan); **Makoto Nakajima,** Osaka Univ. (Japan); **Masahiko Tani,** Univ. of Fukui (Japan)

13365-2 • 11:05 AM - 11:25 AM

Spoof surface plasmon polariton (SSPP) split rings for THz bandpass filtering
Author(s): **Mohsen Haghighat**, **Thomas Darcie, Levi Smith,** Univ. of Victoria (Canada)

13365-3 • 11:25 AM - 11:45 AM
A coupled-cavity mini-array VCSEL for CW THz generation
Author(s): **Yinghui Hu**, **Carsten Brenner,** Ruhr-Univ. Bochum (Germany); **Nikolay N Ledentsov**, **Nikolay Ledentsov**, **Vitaly A. Shchukin,** VI Systems GmbH (Germany); **Martino D'Alessandro,** Politecnico di Torino (Italy), Consiglio Nazionale delle Ricerche (Italy); **Alberto Tibaldi,** Politecnico di Torino (Italy); **Martin R. Hofmann, Markus Lindemann,** Ruhr-Univ. Bochum (Germany)

Lunch Break 11:45 AM - 1:15 PM

SESSION 2: DETECTORS AND SENSORS I

27 January 2025 • 1:15 PM - 2:55 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-5 • 1:15 PM - 1:35 PM
Photonics-based microwave radiometer with 1 GHz resolution and 50 GHz bandwidth
Author(s): **Janusz A. Murakowski,** Phase Sensitive Innovations, Inc. (United States); **Michael Gehl,** Sandia National Labs. (United States); **Mehmet Ogut,** Jet Propulsion Lab. (United States), Caltech (United States); **Hannah Sinigaglio,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States); **Mathew Zablocki**, **Timothy Creazzo**, **Shouyuan Shi**, **Kevin Shreve**, **Charles Harrity**, **John Macaluso**, **Sabrina Rosenthal**, **Adam Gazdecki**, **Chad Newkirk**, **Andrea Schaaf**, **Josh Johnson**, **Maxwell Hinkle**, **Chase Stine**, **Christopher Michel**, **Samhit Dontamsetti**, **Sean Grahne,** Phase Sensitive Innovations, Inc. (United States); **Shannon T. Brown**, **Sidharth Misra**, **Pekka Kangaslahti**, **Eric A. Kittlaus,** Jet Propulsion Lab. (United States); **Dennis W. Prather,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States)

13365-6 • 1:35 PM - 1:55 PM
Ultra-low-noise, room-temperature terahertz receiver based on plasmonic photomixing
Author(s): **Joseph J. Hwang**, **Szu-An Tsao, Mona Jarrahi,** Univ. of California, Los Angeles (United States)

13365-7 • 1:55 PM - 2:15 PM
Terahertz parametric detection with pulse train pump beam
Author(s): **Toshiki Kinoshita,** Nagoya Univ. (Japan)

13365-8 • 2:15 PM - 2:35 PM **(CANCELLED)**
Low-cost THz electro-optic detection in single-shot and at MHz acquisition rates, using photonic time-stretch
Author(s): **Christelle Hanoun**, **Christophe Szwaj**, **Eléonore Roussel**, **Clément Evain**, **Marc Le Parquier,** Lab. de Physique des Lasers, Atomes et Molécules (France); **Pascale Roy**, **Jean-Blaise Brubach**, **Marie-Agnès Tordeux**, **Nicolas Hubert**, **Fernand Ribeiro**, **Marie Labat,** Synchrotron SOLEIL (France); **Serge Bielawski,** Lab. de Physique des Lasers, Atomes et Molécules (France)

13365-9 • 2:35 PM - 2:55 PM
Suspended honeycomb photonic crystal for high selective thermal emission at infrared wavelengths
Author(s): **Huanhuan Wang**, **Landobasa Tobing**, **Yuan-Hsing Fu**, **Zhonghua Gu**, **Md Hazwani Khairy**, **Jia Sheng Goh**, **Qingxin Zhang, Nanxi Li,** A*STAR Institute of Microelectronics (Singapore)

Coffee Break 2:55 PM - 3:25 PM

SESSION 3: RF, SUB-MILLIMETER-WAVE, AND MILLIMETER-WAVE SOURCES I

27 January 2025 • 3:25 PM - 5:25 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-10 • 3:25 PM - 3:45 PM
Integrated multiplexed sub-1nm optoelectronic millimeter wave CMOS technology for embedded non-volatile data storage, photonic IC with microwave VCSEL arrays, and high voltage, high cut-off frequency nano-wireless RF ASICs
Author(s): **James N. Pan,** Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

13365-11 • 3:45 PM - 4:05 PM
Optoelectronic primary standards for phase up to sub-THz frequencies
Author(s): **Bryan Bosworth**, **Anna Osella,** National Institute of Standards and Technology (United States); **Tadao Ishibashi,** Wavepackets LLC (Japan); **Ari Feldman, Nate Orloff,** National Institute of Standards and Technology (United States)

13365-12 • 4:05 PM - 4:25 PM
Photonics based RF comb generation up to 325GHz
Author(s): **Jonas Gläsel**, **Hendrik Boerma**, **Trung Thanh Tran,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Karolis Balskus**, **Edgar Fernandes**, **Benjamin Rudin**, **Florian Emaury,** Menhir Photonics AG (Switzerland); **Patrick Runge,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Martin Schell,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Berlin (Germany)

13365-13 • 4:25 PM - 4:45 PM
Ultra-compact tunable optical paired source for radiofrequency signal generation
Author(s): **Eric Shaw**, **Charles Harrity**, **Dominic Marinucci**, **Timothy Creazzo**, **Aqib Adib Mahmud**, **Thomas Mascitelli**, **Zachary El-Azom**, **Garrett Schneider**, **Christopher Schuetz, Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States)

13365-14 • 4:45 PM - 5:05 PM
Photonically-enabled holographic MIMO with multiple coherently distributed antennas
Author(s): **Shadia Islam Chowdhury**, **Hannah Sinigaglio**, **Md Saheed Ullah**, **Joseph N. Mait,** Univ. of Delaware (United States); **Xiao-Feng Qi**, **Shouyuan Shi**, **Garrett Schneider**, **Janusz A. Murakowski, Dennis W. Prather,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States)

13365-15 • 5:05 PM - 5:25 PM
High-gain integrated photoreceiver module for 60-GHz, low-phase noise optical-electrical oscillator
Author(s): **Toshimasa Umezawa**, **Atsushi Matsumoto,** NICT (Japan); **Atsushi Kanno,** Nagoya Institute of Technology (Japan); **Kouichi Akahane, Naokatsu Yamamoto,** NICT (Japan)

Tuesday 28 January 2025

SESSION 4: TERAHERTZ SOURCES II

28 January 2025 • 8:45 AM - 9:45 AM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-16 • 8:45 AM - 9:05 AM
Long-distance transfer and stability analysis of frequency-comb-rooted terahertz waves for 6G and beyond
Author(s): **Jaeyoon Kim**, **Guseon Kang,** KAIST (Korea, Republic of); **Joohyung Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of); **Seung-Woo Kim, Young-Jin Kim,** KAIST (Korea, Republic of)

13365-17 • 9:05 AM - 9:25 AM
Spectrometer design rules for low-aberration, high-bandwidth THz spectroscopy, and imaging
Author(s): **Nishtha Chopra, James Lloyd-Hughes,** The Univ. of Warwick (United Kingdom)

13365-18 • 9:25 AM - 9:45 AM
Frequency tunable Minkowski fractal antenna for resonant tunneling diode based terahertz transceivers
Author(s): **Karthickraj Muthuramalingam**, **Aditya Sharma,** National Tsing Hua Univ. (Taiwan); **Wei-Chih Wang,** Univ. of Washington (United States)

Coffee Break 9:45 AM - 10:15 AM

SESSION 5: DETECTORS AND SENSORS II

28 January 2025 • 10:15 AM - 12:05 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-19 • 10:15 AM - 10:45 AM
Terahertz testing of semiconductor devices and integrated circuits *(Invited Paper)*
Author(s): **Michael S. Shur,** Rensselaer Polytechnic Institute (United States)

13365-20 • 10:45 AM - 11:05 AM
Terahertz wave detection by doubly clamped MEMS beam resonators using piezoresistive effect in p-type modulation-doped AlGaAs/GaAs heterostructures
Author(s): **Kazuhiro Takahashi,** Hamamatsu Photonics K.K. (Japan), The Univ. of Tokyo (Japan); **Atsushi Nakanishi,** Hamamatsu Photonics K.K. (Japan); **Naomi Nagai,** The Univ. of Tokyo (Japan); **Hiroshi Satozono,** Hamamatsu Photonics K.K. (Japan); **Ya Zhang,** Tokyo Univ. of Agriculture and Technology (Japan); **Kazuhiko Hirakawa,** The Univ. of Tokyo (Japan)

13365-21 • 11:05 AM - 11:25 AM
Uncooled lead-Schottky PbSe/CdSe mid-infrared photovoltaic + photoconductor photodetector
Author(s): **Milad Rastkar Mirzaei, Zhisheng Shi,** The Univ. of Oklahoma (United States)

13365-22 • 11:25 AM - 11:45 AM
Lock-in detection of terahertz spectra captured by plasmonic heterodyne terahertz receivers
Author(s): **Szu-An Tsao**, **Joseph Hwang, Mona Jarrahi,** Univ. of California, Los Angeles (United States)

13365-23 • 11:45 AM - 12:05 PM
Terahertz sensing and imaging technology of cancer detection
Author(s): **Michael S. Shur,** Rensselaer Polytechnic Institute (United States)

Lunch/Exhibition Break 12:05 PM - 1:35 PM

SESSION 6: DETECTORS AND SENSORS III

28 January 2025 • 1:35 PM - 2:45 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-24 • 1:35 PM - 2:05 PM
Advancing terahertz pulsed imaging: a multi-pixel approach using plasmonic nanoantennas *(Invited Paper)*
Author(s): **Nezih Tolga Yardimci**, **Ali Charkhesht,** Lookin, Inc. (United States); **Mona Jarrahi,** Univ. of California, Los Angeles (United States)

13365-26 • 2:05 PM - 2:25 PM
Effects of AlN film thickness and operating frequency on sensing output of CO_2 pyroelectric-based non-dispersive infrared gas sensor
Author(s): **Doris Keh Ting Ng**, **Kristel Pei Xuan Wee**, **Md Hazwani Khairy**, **Landobasa Tobing**, **Wing Wai Chung**, **Isaac Siyuan Ling**, **Norhanani Jaafar**, **Jia Sheng Goh**, **Linfang Xu**, **Weiguo Chen**, **Qingxin Zhang, Nanxi Li,** A*STAR Institute of Microelectronics (Singapore)

13365-27 • 2:25 PM - 2:45 PM
3D metamaterial absorber based on nano-disks with nano-walls structures
Author(s): **Harry Miyosi Silalahi**, **Yu-Chih Chiang, Chia-Yi Huang,** Tunghai Univ. (Taiwan)

Coffee Break 2:45 PM - 3:15 PM

SESSION 7: TERAHERTZ SOURCES III

28 January 2025 • 3:15 PM - 5:05 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-28 • 3:15 PM - 3:45 PM
Frequency-comb-referenced high-precision THz frequency synthesizer and its application in high-precision metrology/inspection *(Invited Paper)*
Author(s): **Young-Jin Kim**, **Guseon Kang, Jaeyoon Kim,** KAIST (Korea, Republic of)

13365-29 • 3:45 PM - 4:05 PM
Plasmonic photoconductive terahertz source array for multi-spectral imaging
Author(s): **Tianyi Gan**, **Xurong Li**, **Mona Jarrahi,** Univ. of California, Los Angeles (United States); **Jean-Paul Guillet,** Univ. de Bordeaux (France)

13365-30 • 4:05 PM - 4:25 PM
Monolithically integrated terahertz optoelectronics enabled by quantum well structures
Author(s): **Yifan Zhao**, **Shahed E. Zumrat, Mona Jarrahi,** UCLA Samueli School of Engineering (United States)

13365-31 • 4:25 PM - 4:45 PM
560 GHz-band terahertz wireless communication based on sub-harmonic-mixing heterodyne detection of micro-comb-generated terahertz wave
Author(s): **Takumi Kikuhara,** Tokushima Univ. (Japan); **Yoshihiro Makimoto,** Tokushima Prefectural Industrial Technology Ctr. (Japan); **Yu Tokizane**, **Naoya Kuse**, **Eiji Hase**, **Yudai Matsumura**, **Hiroki Kishikawa,** Tokushima Univ. (Japan); **Yasuhiro Okamura,** Univ. of Yamanashi (Japan); **Atsushi Kanno,** National Institute of Information and Communications Technology (Japan), Nagoya Institute of Technology (Japan); **Shintaro Hisatake,** Gifu Univ. (Japan); **Takeshi Yasui,** Tokushima Univ. (Japan)

13365-32 • 4:45 PM - 5:05 PM
Efficient broadband terahertz generation with heterogeneous layered organic materials
Author(s): **Matthew J. Lutz**, **Aldair Alejandro**, **Paige K. Petersen**, **Daisy J. Ludlow**, **Meredith Shull**, **William J. Hom**, **Gus Phillips**, **David J. Michaelis, Jeremy Johnson,** Brigham Young Univ. (United States)

Wednesday 29 January 2025

SESSION 8: SPECTROSCOPY

29 January 2025 • 8:00 AM - 10:10 AM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Kyung Hyun Park**, Electronics and Telecommunications Research Institute (Korea, Republic of)

13365-34 • 8:00 AM - 8:20 AM
Identification of air gaps in terahertz time-domain spectral imaging and mitigation of artifact in reflection spectra using Hilbert transform
Author(s): **Arash Karimi**, **Zachery B. Harris, Hassan Arbab,** Stony Brook Univ. (United States)

13365-35 • 8:20 AM - 8:40 AM
Artificial neural networks for predicting complex conductivity of large-area graphene with terahertz time-domain spectroscopy
Author(s): **Nicholas T. Klokkou**, **Ben Beddoes,** Univ. of Southampton (United Kingdom); **Jon Gorecki,** Imperial College London (United Kingdom); **Patrick R. Whelan**, **Peter Bøggild**, **Peter Uhd Jepsen,** Technical Univ. of Denmark (Denmark); **Vasilis Apostolopoulos,** Univ. of Crete (Greece)

13365-36 • 8:40 AM - 9:00 AM
Frequency-comb-based fast and precise continuous-wave terahertz spectroscopy for non-destructive testing
Author(s): **Guseon Kang**, **Jaeyoon Kim**, **Dong-Chel Shin,** KAIST (Korea, Republic of); **Joohyung Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of); **Seung-Woo Kim, Young-Jin Kim,** KAIST (Korea, Republic of)

13365-37 • 9:00 AM - 9:20 AM
BRDF measurements of ultra-black materials with THz quantum cascade lasers
Author(s): **Patrick McArdle**, **Bradley Pelz**, **Christopher Yung**, **Nathan Tomlin**, **John Lehman, Michelle Stephens,** National Institute of Standards and Technology (United States)

13365-38 • 9:20 AM - 9:40 AM
Measurement of sub-wavelength coating thicknesses in multilayered carbon-fiber structures by sparse deconvolution of polarized terahertz time-domain pulses
Author(s): **Arash Karimi**, **Erica Heller**, **Zachery B. Harris, Hassan Arbab,** Stony Brook Univ. (United States)

13365-39 • 9:40 AM - 10:10 AM
All-optical microscopy with combined subcycle temporal and atomic-scale spatial resolution *(Invited Paper)*
Author(s): **Felix Schiegl**, **Thomas Siday**, **Johannes Hayes**, **Fabian Sandner**, **Peter Menden**, **Valentin Bergbauer**, **Martin Zizlsperger**, **Svenja Nerreter**, **Sonja Lingl**, **Jascha Repp**, **Jan Wilhelm**, **Markus A. Huber**, **Yaroslav Gerasimenko, Rupert Huber,** Univ. Regensburg (Germany)

Coffee Break 10:10 AM - 10:40 AM

SESSION 9: BEAM STEERING AND IMAGING

29 January 2025 • 10:40 AM - 12:05 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-40 • 10:40 AM - 11:25 AM
Beam steering metasurfaces across the spectrum (Keynote Presentation)
Author(s): **David R. Smith**, **Divya Pande,** Duke Univ. (United States); **Gleb M. Akselrod,** Lumotive (United States)

13365-42 • 11:25 AM - 11:45 AM
Man-portable, real-time, passive millimeter-wave imaging sensor
Author(s): **Charles Harrity**, **Dominic Marinucci**, **Samhit Dontamsetti**, **Timothy Creazzo**, **Sabrina Rosenthal**, **Dylan Laplace**, **Robert Wilcox**, **Eric Shaw**, **Kevin Shreve**, **Zachary El-Azom**, **Chad Newkirk**, **Melvin Tejada**, **Jesse Semmel**, **Christopher Schuetz,** Phase Sensitive Innovations, Inc. (United States); **Shouyuan Shi, Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States), Univ. of Delaware (United States)

13365-43 • 11:45 AM - 12:05 PM
High-speed characterization of pharmaceutical tablets through terahertz time-domain imaging
Author(s): **Xinghe Jiang, Mona Jarrahi,** Univ. of California, Los Angeles (United States)

Lunch/Exhibition Break 12:05 PM - 1:35 PM

SESSION 10: SUB-TERAHERTZ

29 January 2025 • 1:35 PM - 2:55 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-44 • 1:35 PM - 2:05 PM
Recent research activities and technical challenges for sub-terahertz band transmission technology based on photonics *(Invited Paper)*
Author(s): **Seung-Hyun Cho**, **Sang-Rok Moon**, **Minkyu Sung**, **Sooyeon Kim**, **Wonkyoung Lee, Joon Ki Lee,** Electronics and Telecommunications Research Institute (Korea, Republic of)

13365-46 • 2:05 PM - 2:25 PM
Frequency-modulated terahertz radiation from a layered superconductor
Author(s): **Itsuhiro Kakeya,** Kyoto Univ. (Japan)

13365-47 • 2:25 PM - 2:55 PM
High-brightness palmtop-integrated THz-wave source to accelerate non-destructive testing applications *(Invited Paper)*
Author(s): **Hiroaki Minamide, Yuma Takida,** RIKEN (Japan)

Coffee Break 2:55 PM - 3:25 PM

SESSION 11: HIGH POWER

29 January 2025 • 3:25 PM - 4:35 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-48 • 3:25 PM - 3:55 PM
From photonics-based terahertz imaging systems to MMIC chip-based shoe scanners: development status and future perspective *(Invited Paper)*
Author(s): **Kyung Hyun Park,** Electronics and Telecommunications Research Institute (Korea, Republic of)

13365-49 • 3:55 PM - 4:15 PM
Security enhancement of terahertz-band communication using optical exclusive OR circuit
Author(s): **Koichi Takiguchi, Wataru Ishihara,** Ritsumeikan Univ. (Japan)

13365-50 • 4:15 PM - 4:35 PM
A shot noise limited balanced microwave photonic link
Author(s): **Peng Yao**, **Matthew Konkol**, **Paul Kelly**, **John Macaluso**, **Kevin Shreve**, **Timothy Creazzo, Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States)

SESSION 12: INFRARED, TERAHERTZ, AND MATERIALS

29 January 2025 • 4:35 PM - 5:15 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-51 • 4:35 PM - 4:55 PM
Infrared optical elements using unique chalcogenide glass materials
Author(s): **Yoshimasa Matsushita**, **Mitsuru Tomita**, **Fumio Sato**, **Noriaki Masuda,** Nippon Electric Glass Co., Ltd. (Japan); **Masafumi Kimata,** Consultant (Japan)

13365-52 • 4:55 PM - 5:15 PM
W-band up-conversion module for passive millimeter-wave imager using folded thin-film lithium niobate modulators
Author(s): **Shouyuan Shi,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States); **Peng Yao**, **Christopher Schuetz**, **Timothy Creazzo,** Phase Sensitive Innovations, Inc. (United States); **Xiaofeng Zhu,** University of Delaware (United States); **Dennis W. Prather,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13365-73 • 6:00 PM - 8:00 PM
Machine learning-based object classification using mm-wave radar at 77GHz-81GHz
Author(s): **Yertas Zhumabekov**, **Aigerim Ashimbayeva**, **Hum Nath Parajuli,** Nazarbayev Univ. (Kazakhstan); **Rezwanul S.M. Islam**, **Bikash Nakarami,** Nanjing Univ. of Aeronautics and Astronautics (China); **Carlo Molardi,** Nazarbayev Univ. (Kazakhstan); **Ikechi Augustine Ukaegbu,** Saint Louis Univ. (United States)

13365-74 • 6:00 PM - 8:00 PM
Intelligent reflecting surface aided generalized spatial modulation mmWave massive MIMO system
Author(s): **Chia-Chang Hu**, **Tsung-Hsin Hsu**, **Yi-Chen Cheng, Yun-An Yang,** National Chung Cheng Univ. (Taiwan)

13365-75 • 6:00 PM - 8:00 PM
The influence due to relaxation resonant frequency improvement of an injected laser diode on FMCW microwave generation in period-one oscillation states
Author(s): **Tianxin Yang**, **Hang Yang**, **Yuxi Xiao**, **Jiewei Yang**, **Zhaoying Wang, Dongfang Jia,** Tianjin Univ. (China)

13365-76 • 6:00 PM - 8:00 PM
Terahertz spectroscopy of eggshells in the 0.1–4 THz range
Author(s): **Shabab Iqbal, Arkady Major,** Univ. of Manitoba (Canada)

Thursday 30 January 2025

SESSION 13: IMAGING AND COMPUTER VISION

30 January 2025 • 8:00 AM - 10:00 AM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Robert H. Giles**, Univ. of Massachusetts Lowell (United States); **Min Yong Jeon**, Chungnam National Univ. (Korea, Republic of)

13365-54 • 8:00 AM - 8:20 AM
Enhanced dual-mode THz homodyne imaging system with C-shaped metalenses
Author(s): **Vladislovas Čižas**, **Karolis Redeckas**, **Kasparas Stanaitis**, **Augustė Bielevičiūtė**, **Rusnė Ivaškevičiūtė-Povilauskienė**, **Ignas Grigelionis, Linas Minkevičius,** Ctr. for Physical Sciences and Technology (Lithuania)

13365-55 • 8:20 AM - 8:40 AM
GaAs/n-GaAs structures equipped with metasurfaces for thermal terahertz emitters
Author(s): **Barbora Škėlaitė**, **Vytautas Jakštas**, **Kęstutis Ikamas**, **Renata Butkute**, **Linas Minkevičius, Ignas Grigelionis,** Ctr. for Physical Sciences and Technology (Lithuania)

13365-56 • 8:40 AM - 9:00 AM
Demonstration of a liquid crystal-enhanced fishnet gradient metamaterial for dynamic terahertz wave manipulation
Author(s): **Wei-Chih Wang,** Univ. of Washington (United States); **Aditya Sharma,** National Tsing Hua Univ. (Taiwan); **Chileung Tsui,** Univ. of Washington (United States)

13365-57 • 9:00 AM - 9:20 AM
Structured light and laser ablated flat optics in nonparaxial terahertz imaging systems
Author(s): **Sergej Orlov**, **Rusnė Ivaškevičiūtė-Povilauskienė**, **Karolis Mundrys**, **Paulius Kizevičius**, **Ernestas Nacius**, **Domas Jokubauskis**, **Linas Minkevičius, Gintaras Valušis,** Ctr. for Physical Sciences and Technology (Lithuania)

13365-58 • 9:20 AM - 9:40 AM
Compact terahertz profiling in space and time
Author(s): **Jenna Fitzsimmons**, **Megan Jewell**, **Tanner Manwaring**, **Megan Biggs, Jeremy Johnson,** Brigham Young Univ. (United States)

13365-59 • 9:40 AM - 10:00 AM
Simulative studies on improvement properties of a direct modulation laser diode in FMCW LiDAR systems for 3D imaging
Author(s): **Yuxi Xiao**, **Hang Yang**, **Jiewei Yang**, **Zhaoying Wang**, **Dongfang Jia**, **Chunfeng Ge, Tianxin Yang,** Tianjin Univ. (China)

Coffee Break 10:00 AM - 10:30 AM

SESSION 14: MICROFABRICATION, ADDITIVE MANUFACTURING, AND 3D PRINTING

30 January 2025 • 10:30 AM - 11:30 AM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Laurence P. Sadwick**, InnoSys, Inc. (United States); **Tianxin Yang**, Tianjin Univ. (China)

13365-60 • 10:30 AM - 10:50 AM
Three-dimensional THz integrated circuits for the 200–400 GHz band using a 3D printer and metal plating
Author(s): **Kentaro Soeda**, **Kazunori Naganuma**, **Yoshinori Yamaguchi**, **Kuniaki Konishi**, **Hiroharu Tamaru**, **Norikatsu Mio**, **Tadao Nagatsuma**, **Hiroshi Ito, Junji Yumoto,** The Univ. of Tokyo (Japan)

13365-61 • 10:50 AM - 11:10 AM
A compact 100-GHz omnidirectional monopole probe dielectric resonator antenna enabled by micromachined silicon coaxial cavity
Author(s): **Kalliopi Spanidou**, **Daniel Headland, Guillermo Carpintero,** Univ. Carlos III de Madrid (Spain)

13365-63 • 11:10 AM - 11:30 AM
Investigation on THz response of dielectric substrates for integration and packaging of direct THz detectors
Author(s): **Rahul Yadav,** Technische Univ. Darmstadt (Germany), Technische Hochschule Mittelhessen (Germany); **Sascha Preu,** Technische Univ. Darmstadt (Germany); **Andreas Penirschke,** Technische Hochschule Mittelhessen (Germany)

Lunch/Exhibition Break 11:30 AM - 1:20 PM

SESSION 15: RF, SUB-MILLIMETER-WAVE, AND MILLIMETER-WAVE SOURCES II

30 January 2025 • 1:20 PM - 3:00 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Tianxin Yang**, Tianjin Univ. (China); **Laurence P. Sadwick**, InnoSys, Inc. (United States)

13365-64 • 1:20 PM - 1:40 PM
Highly sensitive polarization insensitive multi band perfect absorber for refractive index sensing in THz frequency
Author(s): **Harnoor Singh Kaler,** Engineers India Ltd. (India); **Geetika Mehandiratta, Rajinder Kaler,** Thapar Institute of Engineering and Technology (India)

13365-65 • 1:40 PM - 2:00 PM
Reservoir computing-based recurrent neural network for mitigating interference in multi-radar environment of photonics radars
Author(s): **Hum Nath Parajuli**, **Aigerim Ashimbayeva,** Nazarbayev Univ. (Kazakhstan); **S M Rezwanul Islam,** Nanjing Univ. of Aeronautics and Astronautics (China); **Ikechi Augustine Ukaegbu,** Saint Louis Univ. (United States); **Bikash Nakarmi,** Nanjing Univ. of Aeronautics and Astronautics (China); **Carlo Molardi,** Nazarbayev Univ. (Kazakhstan)

13365-66 • 2:00 PM - 2:20 PM
Enhancing Resolution with LSTM-RNN-based band fusion in microwave photonic radar systems
Author(s): **Aigerim Ashimbayeva,** Nazarbayev Univ. (Kazakhstan); **S M Rezwanul Islam,** Nanjing Univ. of Aeronautics and Astronautics (China); **Hum Nath Parajuli,** Nazarbayev Univ. (Kazakhstan); **Ikechi Augustine Ukaegbu,** Saint Louis Univ. (United States); **Carlo Molardi,** Nazarbayev Univ. (Kazakhstan); **Bikash Nakarmi,** Nanjing Univ. of Aeronautics and Astronautics (China)

13365-67 • 2:20 PM - 2:40 PM
Extendable Quadport MIMO design with wider bandwidth and high isolation of terahertz communication applications
Author(s): **Sunil Lavadiya**, **Jaydip Siyara,** Marwadi Univ. (India); **Mahesh Jivani,** Saurashtra Univ. (India); **Suhag Baldaniya,** Marwadi Univ. (India)

13365-68 • 2:40 PM - 3:00 PM
Graphene material-based MIMO antenna for terahertz regime for medical imaging and 6G communication
Author(s): **Sunil Lavadiya, Suhag Baldaniya,** Marwadi Univ. (India)

Coffee Break 3:00 PM - 3:30 PM

SESSION 16: TERAHERTZ SOURCES IV

30 January 2025 • 3:30 PM - 4:50 PM | Moscone West, Room 2024 (Level 2)
Session Chair(s): **Robert H. Giles**, Univ. of Massachusetts Lowell (United States); **Kyung Hyun Park**, Electronics and Telecommunications Research Institute (Korea, Republic of)

13365-69 • 3:30 PM - 3:50 PM
Metamaterial-inspired 4-port MIMO antenna structure for 5G communication applications
Author(s): **Sunil Lavadiya, Suhag Baldaniya,** Marwadi Univ. (India)

13365-70 • 3:50 PM - 4:10 PM
Design and analysis of MIMO antenna array for next-generation wireless communication for the terahertz region
Author(s): **Sunil Lavadiya, Suhag Baldaniya,** Marwadi Univ. (India)

13365-71 • 4:10 PM - 4:30 PM
Performance analysis of novel-shaped compact 4-port MIMO antenna with UWB and high gain feature for 6G communication
Author(s): **Sunil Lavadiya, Suhag Baldaniya,** Marwadi Univ. (India)

13365-72 • 4:30 PM - 4:50 PM

Multifrequency digital terahertz holography for diverse scattering material imaging

Author(s): **Rusnė Ivaškevičiūtė-Povilauskienė,** Ctr. for Physical Sciences and Technology (Lithuania); **Agnieszka Siemion,** Warsaw Univ. of Technology (Poland); **Ignas Grigelionis**, **Domas Jokubauskis,** Ctr. for Physical Sciences and Technology (Lithuania); **Kęstutis Ikamas**, **Alvydas Lisauskas,** Ctr. for Physical Sciences and Technology (Lithuania), Vilnius University (Lithuania); **Linas Minkevičius, Gintaras Valušis,** Ctr. for Physical Sciences and Technology (Lithuania)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13365-33

Terahertz grating with bound states in the continuum for ultra-high Q-factor performance

Author(s): **Tung-Yang Chao**, **Yi-An Wei**, **Bo-Chieng Peng**, **Fang-Jou Wang**, **Chin-Pao Cheng, Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan)

13365-53

Polarization-insensitive meta-absorbers operating at terahertz frequencies

Author(s): **Ricky W. Chuang**, **Yi-Jhih Guo**, **Zi-hao Huang, Cheng-Liang Huang,** National Cheng Kung Univ. (Taiwan)

13365-78

Optoelectronic properties of terahertz high entropy alloy films and their modulation applications

Author(s): **Zhuang Bo-Xiang**, **Wei-Hsiang Chen,** National Taiwan Normal Univ. (Taiwan); **Chuan-Feng Shih,** National Cheng Kung Univ. (Taiwan); **Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan)

CONFERENCE 13366

Gallium Nitride Materials and Devices XX

27 - 30 January 2025 | Moscone West, Room 2018 (Level 2)

Conference Chair(s): **Hiroshi Fujioka,** Institute of Industrial Science, The Univ. of Tokyo (Japan); **Hadis Morkoç,** Virginia Commonwealth Univ. (United States); **Ulrich T. Schwarz,** Technische Univ. Chemnitz (Germany)

Program Committee: **Frank Bertram,** Otto-von-Guericke-Univ. Magdeburg (Germany); **Michal Bockowski,** Institute of High Pressure Physics (Poland); **Jen-Inn Chyi,** National Central Univ. (Taiwan); **Martin Feneberg,** Otto-von-Guericke-Univ. Magdeburg (Germany); **Mitsuru Funato,** Kyoto Univ. (Japan); **Bernard Gil,** Lab. Charles Coulomb (France); **Nicolas Grandjean,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Åsa Haglund,** Chalmers Univ. of Technology (Sweden); **Jung Han,** Yale Univ. (United States); **Hideki Hirayama,** RIKEN (Japan); **Ray-Hua Horng,** National Yang Ming Chiao Tung Univ. (Taiwan); **Motoaki Iwaya,** Meijo Univ. (Japan); **Gwénolé Jacopin,** Institut NÉEL, CNRS (France); **Jong Kyu Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Michael Kneissl,** Technische Univ. Berlin (Germany); **Maki Kushimoto**, **Koh Matsumoto,** Nagoya Univ. (Japan); **Hideto Miyake,** Mie Univ. (Japan); **Eva Monroy,** CEA-DRF (France); **Yasushi Nanishi,** Ritsumeikan Univ. (Japan); **Kazuhiro Ohkawa,** King Abdullah Univ. of Science and Technology (Saudi Arabia); **Ümit Özgür,** Virginia Commonwealth Univ. (United States); **Piotr Perlin,** Institute of High Pressure Physics (Poland); **Fan Ren,** Univ. of Florida (United States); **Tae-Yeon Seong,** Korea Univ. (Korea, Republic of); **Maria Tchernycheva,** Ctr. de Nanosciences et de Nanotechnologies (France); **Akio Wakejima,** Nagoya Institute of Technology (Japan); **Xinqiang Wang,** Peking Univ. (China); **Chih-Chung Yang,** National Taiwan Univ. (Taiwan)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: GROWTH

27 January 2025 • 10:45 AM - 12:45 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Hiroshi Fujioka**, Institute of Industrial Science, The Univ. of Tokyo (Japan)

13366-1 • 10:45 AM - 11:15 AM
Recent progress in HVPE-based GaN substrate fabrication *(Invited Paper)*
Author(s): **Hajime Fujikura**, **Taichiro Konno**, **Shota Kaneki**, **Masafumi Yokoyama**, **Karen Matsuda**, **Tetsuji Fujimoto, Takashi Sato,** Sumitomo Chemical Co., Ltd. (Japan)

13366-2 • 11:15 AM - 11:45 AM

Ammonia-MBE growth of ScAlN for high power/high frequency electronics *(Invited Paper)*
Author(s): **Yvon Cordier,** Univ. Côte d'Azur (France), CRHEA, CNRS (France); **Maxime Hugues**, **Caroline Elias**, **Sébastien Chenot**, **Florian Bartoli**, **Aimeric Courville, Philippe Vennéguès,** CRHEA (France)

13366-3 • 11:45 AM - 12:15 PM
Growth and applications of AlScN and AlYN grown by MOCVD *(Invited Paper)*
Author(s): **Stefano Leone**, **Teresa Duarte**, **Patrik Stranak**, **Lutz Kirste,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); **Kazuki Nomoto,** Cornell University (United States); **Georg Schoenweger**, **Niklas Wolff,** Christian-Albrechts-Univ. zu Kiel (Germany); **Isabel Streicher,** Consiglio Nazionale delle Ricerche (Italy); **Simon Fichtner,** Christian-Albrechts-Univ. zu Kiel (Germany); **Debdeep Jena,** Cornell University (United States); **Ruediger Quay,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

13366-4 • 12:15 PM - 12:45 PM
In-situ monitoring using reflection high-energy electron diffraction and X-ray diffraction in RF molecular beam epitaxy growth of GaInN *(Invited Paper)*
Author(s): **Tomohiro Yamaguchi,** Kogakuin Univ. (Japan); **Takuo Sasaki,** National Institutes for Quantum Science and Technology (Japan); **Mitsuki Moriya**, **Takeyoshi Onuma**, **Tohru Honda,** Kogakuin Univ. (Japan); **Masamitu Takahasi,** National Institutes for Quantum Science and Technology (Japan); **Yasushi Nanishi,** Ritsumeikan Univ. (Japan)

Lunch Break 12:45 PM - 2:15 PM

SESSION 2: CHARACTERIZATION I

27 January 2025 • 2:15 PM - 3:25 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Agata Kaminska**, Cardinal Stefan Wyszynski Univ. in Warsaw (Poland)

13366-5 • 2:15 PM - 2:45 PM
High hydrostatic pressure studies of group III-element nitrides *(Invited Paper)*
Author(s): **Agata Kaminska,** Cardinal Stefan Wyszynski Univ. in Warsaw (Poland)

13366-6 • 2:45 PM - 3:05 PM
Structural characterization of scandium aluminum nitride/gallium nitride heterostructures for photonic applications
Author(s): **Govardan Gopakumar**, **Rajendra Kumar**, **Zain U. Abdin**, **Michael J. Manfra, Oana Malis,** Purdue Univ. (United States)

13366-7 • 3:05 PM - 3:25 PM
Elastic strain relaxation in InGaN nanopillars on nanoporous GaN
Author(s): **Mateusz Hajdel**, **Oliwia Golyga,** Institute of High Pressure Physics (Poland); **Anna Feduniewicz-Zmuda,** Institute of High Pressure Physics (Poland); **Nirmal Anand,** Institut National de la Recherche Scientifique (Canada), Univ. du Québec à Montréal (Canada); **Mateusz Słowikowski,** Warsaw Univ. of Technology (Poland); **Cedric Corley-Wiciak,** ESRF - The European Synchrotron (France); **Carsten Richter,** Leibniz-Institut für Kristallzüchtung (Germany); **Sharif Md. Sadaf,** Institut National de la Recherche Scientifique (Canada), Univ. du Québec à Montréal (Canada); **Marta Sawicka, Grzegorz Muziol,** Institute of High Pressure Physics (Poland)

Coffee Break 3:25 PM - 3:55 PM

SESSION 3: CHARACTERIZATION II

27 January 2025 • 3:55 PM - 5:35 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Yvon Cordier**, CRHEA (France)

13366-8 • 3:55 PM - 4:25 PM
GaN quantum emitters: basic physics, spin structure, and optically detected magnetic resonance *(Invited Paper)*
Author(s): **Jianlun Luo**, **Yifei Geng**, **Farhan Rana, Gregory D. Fuchs,** Cornell Univ. (United States)

13366-9 • 4:25 PM - 4:45 PM
Band parameters and transport from low energy photoemission and electro-emission experiments on nitride materials and devices
Author(s): **Claude Weisbuch**, **James S. Speck**, **Tanay Tak**, **Wan Ying Ho,** Univ. of California, Santa Barbara (United States); **Justin Iveland,** Univ. of California (United States); **Daniel Myers,** Meta (United States); **Marco Piccardo,** Instituto Superior Técnico (Portugal); **Saulius Marcinkevicius,** KTH Royal Institute of Technology (Sweden); **Lucio Martinelli,** CNRS (France); **Mylene Sauty,** CEA (France); **Jacques Peretti,** Ecole Polytechnique (France)

13366-11 • 4:45 PM - 5:05 PM
Broadly tunable cubic phase InGaN/GaN quantum wells grown by metal-organic chemical vapor deposition.
Author(s): **Daniel Dyer**, **William Fieldhouse-Allen,** The Univ. of Manchester (United Kingdom); **Menno Kappers,** University of Cambridge (United Kingdom); **David Wallis,** University of Cambridge (United Kingdom), Cardiff University (United Kingdom); **Rachel Oliver,** University of Cambridge (United Kingdom); **David J. Binks,** The Univ. of Manchester (United Kingdom)

13366-50 • 5:05 PM - 5:35 PM
UV LEDs by van der Waals epitaxy using 2D hexagonal boron nitride *(Invited Paper)*
Author(s): **Abdallah Ougazzaden,** Georgia Tech-Lorraine (France); **Rajat Gujrati1,** Georgia Tech - CNRS (France); **Andre Perepeliuc,** Georgia Tech-Lorraine (France); **Suresh Sundaram**, **Phuong Vuong,** Georgia Tech - CNRS (France); **Aly Zaiter,** Univ. Côte d'Azur (France), CNRS (France); **Julien Brault,** CRHEA (France); **Jean Paul Salvestrini,** Georgia Tech - CNRS (France)

Tuesday 28 January 2025

SESSION 4: NEW DEVICES I

28 January 2025 • 8:45 AM - 10:25 AM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Thomas Wunderer**, PARC, part of SRI International (United States)

13366-12 • 8:45 AM - 9:15 AM
Comparison of the far-UV performance of AlGaN/AlN nanostructures: quantum dots, dots in a nanowire, and ultra-thin quantum wells *(Invited Paper)*
Author(s): **Ettore Coccato**, **Jesus Cañas,** CEA-IRIG (France); **Névine Rochat**, **Alexis Palais**, **David Cooper,** CEA-LETI (France); **Edith Bellet-Amalric,** CEA-IRIG (France); **Lorenzo Rigutti,** Univ. de Rouen Normandie (France); **Stephen T. Purcell,** Univ. de Lyon (France); **Eva Monroy,** CEA-IRIG (France)

13366-13 • 9:15 AM - 9:45 AM
III-nitride semiconductors are more flexible than other compound semiconductors for integrated photonics and efficient nonlinear interactions *(Invited Paper)*
Author(s): **Maksym Gromovyi**, **Nagesh Bhat,** CRHEA, CNRS (France); **Hervé Tronche**, **Pascal A. Baldi,** Univ. Côte d'Azur (France); **Moustafa El Kurdi**, **Xavier Checoury,** Univ. Paris-Saclay (France), Ctr. de Nanosciences et de Nanotechnologies (France); **Antoine Reserbat-Plantey,** CRHEA, CNRS (France); **Minh Tuan Dau**, **Mohamed Al Khalfioui,** Univ. Côte d'Azur (France), CRHEA (France); **Blandine Alloing**, **Fabrice Semond**, **Benjamin Damilano, Philippe Boucaud,** CRHEA, CNRS (France)

13366-14 • 9:45 AM - 10:05 AM
Insights from forward bias in GaN quantum well photodetectors
Author(s): **Khaled Ahmed,** Intel Corp. (United States)

13366-15 • 10:05 AM - 10:25 AM
Fabrication of GaN-based monolithic integrated LET-PD module for display applications
Author(s): **Jae Hun Kim, Ilgu Yun,** Yonsei Univ. (Korea, Republic of)

Coffee Break 10:25 AM - 10:55 AM

SESSION 5: NEW DEVICES II

28 January 2025 • 10:55 AM - 12:45 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Eva Monroy**, CEA-DRF (France)

13366-16 • 10:55 AM - 11:25 AM
Frequency tunable photonic integrated UV-A and visible laser diodes *(Invited Paper)*
Author(s): **Thomas Wunderer,** SRI (United States); **Anat Siddharth,** EPFL (Switzerland); **Mark Teepe**, **Zhihong Yang,** SRI (United States); **Simone Bianconi,** EPFL (Switzerland); **Christopher L. Chua,** SRI (United States); **Tobias Kippenberg,** EPFL (Switzerland)

13366-17 • 11:25 AM - 11:45 AM **(CANCELLED)**
Impact of out-of-plane thermal strain on electron charge density in AlGaN/GaN HEMTs
Author(s): **Qingxia Li**, **Jing Wang, Chong Li,** Univ. of Glasgow (United Kingdom)

13366-18 • 11:45 AM - 12:05 PM
Improved performance of GaN p-i-n homojunction avalanche photodiodes with shallow-bevel-mesa edge termination
Author(s): **Russell D. Dupuis**, **Zhiyu Xu**, **Theeradetch Detchprohm**, **Shyh-Chiang Shen, Nepomuk Otte,** Georgia Institute of Technology (United States)

13366-19 • 12:05 PM - 12:25 PM
Improvement of triboelectric touch sensor fabricated with InN nanowires using strain-nanoridge structure
Author(s): **Siyun Noh**, **Jaehyeok Shin**, **Seungwhan Jhee,** Jeonbuk National Univ. (Korea, Republic of); **Mee-Yi Ryu,** Kangwon National Univ. (Korea, Republic of); **Jin Soo Kim,** Jeonbuk National Univ. (Korea, Republic of)

13366-20 • 12:25 PM - 12:45 PM
Preparation of GaN and AlGaN by pulsed sputtering
Author(s): **Hiroshi Fujioka, Kohei Ueno,** Institute of Industrial Science, The Univ. of Tokyo (Japan)

Lunch/Exhibition Break 12:45 PM - 2:15 PM

SESSION 6: LDS I

28 January 2025 • 2:15 PM - 3:25 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Russell D. Dupuis**, Georgia Institute of Technology (United States)

13366-21 • 2:15 PM - 2:45 PM
Highly efficient GaN-based VCSELs grown with in-situ reflectivity spectra measurement *(Invited Paper)*
Author(s): **Tetsuya Takeuchi**, **Satoshi Kamiyama, Motoaki Iwaya,** Meijo Univ. (Japan)

13366-22 • 2:45 PM - 3:05 PM
Extending the emission wavelength of SLEDs to the pure-green spectral region
Author(s): **Marco Malinverni**, **Marco Rossetti**, **Antonino Castiglia**, **Adin Ferhatovic, Marcus Duelk,** EXALOS AG (Switzerland)

13366-23 • 3:05 PM - 3:25 PM
Advancements in GaN-based horizontal-cavity and surface-emitting superluminescent diodes for next-generation holographic displays
Author(s): **Muhammet Genc**, **Zhi Li**, **Juan Morales**, **Abhinandan Hazarika**, **How Yuan Hwang,** Tyndall National Institute (Ireland); **Kaan Aksit,** Univ. College London (United Kingdom); **Gerry O'Carroll**, **Brendan Roycroft, Brian Corbett,** Tyndall National Institute (Ireland)

Coffee Break 3:25 PM - 3:55 PM

SESSION 7: LDS II

28 January 2025 • 3:55 PM - 5:15 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Motoaki Iwaya**, Meijo Univ. (Japan)

13366-24 • 3:55 PM - 4:25 PM
Recent progress in the development of AlGaN-based deep-ultraviolet laser diodes *(Invited Paper)*
Author(s): **Ziyi Zhang,** Asahi Kasei Corp. (Japan); **Maki Kushimoto,** Nagoya Univ. (Japan); **Akira Yoshikawa,** Asahi Kasei Corp. (Japan); **Chiaki Sasaoka**, **Hiroshi Amano, Koji Aoto,** Nagoya Univ. (Japan)

13366-25 • 4:25 PM - 4:55 PM
AlGaN-based wavelength converters with structural singularities: multiple polarity inversion and strained-layer superlattices *(Invited Paper)*
Author(s): **Ryuji Katayama**, **Masahiro Uemukai, Tomoyuki Tanikawa,** Osaka Univ. (Japan)

13366-26 • 4:55 PM - 5:15 PM
Gain guided InGaN laser diode with plasma induced isolation.
Author(s): **Piotr Perlin,** Institute of High Pressure Physics (Poland); **Tomasz Czyszanowski**, **Łukasz Piskorski,** Lodz Univ. of Technology (Poland); **Lucja Marona**, **Szymon Grzanka**, **Szymon Stanczyk**, **Katarzyna Piotrowska-Wolińska, Piotr Kruszewski,** Institute of High Pressure Physics (Poland)

Wednesday 29 January 2025

SESSION 8: LDS III

29 January 2025 • 8:00 AM - 9:40 AM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Tetsuya Takeuchi**, Meijo Univ. (Japan)

13366-27 • 8:00 AM - 8:30 AM
GaN waveguide polariton lasers: from quasi-CW to mode-locked lasing *(Invited Paper)*
Author(s): **Jesús Zúñiga-Pérez,** CRHEA (France), Majulab (Singapore), Nanyang Technological Univ. (Singapore)

13366-28 • 8:30 AM - 9:00 AM
High-power GaN-based edge-emitting laser diodes *(Invited Paper)*
Author(s): **Ryotaro Konishi**, **Yoji Nagao**, **Tsuyoshi Hirao**, **Katsuhiro Kishimoto**, **Teruyuki Morito**, **Tomonori Morizumi**, **Yoshitaka Nakatsu**, **Tomoya Yanamoto, Shin-ichi Nagahama,** Nichia Corp. (Japan)

13366-30 • 9:00 AM - 9:20 AM
Toward a better understanding of nitride laser diode degradation
Author(s): **Lucja Marona,** Institute of High Pressure Physics (Poland)

13366-31 • 9:20 AM - 9:40 AM
Enhanced optical gain of InGaN laser diodes via local anisotropic strain relaxation on a strain relaxed template with reduced threading dislocation density
Author(s): **Hsun-Ming Chang**, **Norleakvisoth Lim**, **Vincent Rienzi**, **Michael J. Gordon**, **Steven P. DenBaars, Shuji Nakamura,** Univ. of California, Santa Barbara (United States)

Coffee Break 9:40 AM - 10:30 AM

SESSION 9: VISIBLE LEDS I

29 January 2025 • 10:30 AM - 11:50 AM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Kazuhiro Ohkawa**, King Abdullah Univ. of Science and Technology (Saudi Arabia)

13366-32 • 10:30 AM - 11:00 AM
Long range diffusion of carriers in tunnel junction micro-LEDs *(Invited Paper)*
Author(s): **Czeslaw Skierbiszewski**, **Julia Slawinska, Grzegorz Muziol,** Institute of High Pressure Physics (Poland)

13366-33 • 11:00 AM - 11:30 AM
Challenges of MOCVD in volume production of MicroLED *(Invited Paper)*
Author(s): **Jyun-De Wu**, **Hsin-Chiao Fang**, **Kuang-Yuan Hsu**, **Ying-Tsang Liu, Yun-Li Li,** PlayNitride Display Co., Ltd. (Taiwan)

13366-34 • 11:30 AM - 11:50 AM
Heterogeneous integration of 20x10μm blue micro-LEDs/pixels on GaN HEMTs for visible light communication
Author(s): **Muhammet Genc,** Tyndall National Institute (Ireland); **Sheikh Ifatur Rahman,** The Ohio State Univ. (United States); **Zhi Li**, **Brendan J. Roycroft**, **Yeasir Arafat**, **Peter J. Parbrook,** Tyndall National Institute (Ireland); **Steven A. Ringel,** The Ohio State Univ. (United States); **Graeme Maxwell**, **Brian Corbett,** Tyndall National Institute (Ireland); **Siddharth Rajan,** The Ohio State Univ. (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 10: VISIBLE LEDS II

29 January 2025 • 1:20 PM - 3:10 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Siddharth Rajan**, The Ohio State Univ. (United States)

13366-35 • 1:20 PM - 1:50 PM
Development of RGB monolithic GaInN-based μLED arrays *(Invited Paper)*
Author(s): **Motoaki Iwaya**, **Yoshinobu Suehiro**, **Tetsuya Takeuchi**, **Satoshi Kamiyama,** Meijo Univ. (Japan); **Daisuke Iida, Kazuhiro Ohkawa,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13366-36 • 1:50 PM - 2:20 PM
MOVPE growth of high-In-content InGaN for red LEDs and LDs *(Invited Paper)*
Author(s): **Kazuhiro Ohkawa**, **Daisuke Iida, Mohammed A. Najmi,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13366-37 • 2:20 PM - 2:50 PM
Potential and current performance of GaInN-nanopyramid-based red μ-LEDs *(Invited Paper)*
Author(s): **Satoshi Kamiyama**, **Tetsuya Takeuchi, Motoaki Iwaya,** Meijo Univ. (Japan)

13366-38 • 2:50 PM - 3:10 PM
Hole injection through V-defects in long wavelength GaN LEDs
Author(s): **Saulius Marcinkevicius**, **Rinat Yapparov,** KTH Royal Institute of Technology (Sweden); **Tanay Tak**, **Jacob Ewing**, **Feng Wu**, **Steven P. DenBaars**, **Shuji Nakamura, James S. Speck,** Univ. of California, Santa Barbara (United States)

Coffee Break 3:10 PM - 3:40 PM

SESSION 11: VISIBLE LEDS III

29 January 2025 • 3:40 PM - 5:20 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Czeslaw Skierbiszewski**, Institute of High Pressure Physics (Poland)

13366-39 • 3:40 PM - 4:10 PM
Integration of light emitting diodes and transistors for next-generation display and lighting *(Invited Paper)*
Author(s): **Sheikh Ifatur Rahman,** The Ohio State Univ. (United States); **Muhammet Genc,** Tyndall National Institute (Ireland); **Muhammad Awwad**, **Joishi Chandan,** The Ohio State Univ. (United States); **Brian Corbett,** Tyndall National Institute (Ireland); **Andrew M. Armstrong,** Sandia National Labs. (United States); **Siddharth Rajan,** The Ohio State Univ. (United States)

13366-41 • 4:10 PM - 4:40 PM
Bidirectional light-emitting diode as a visible light source driven by alternating current *(Invited Paper)*
Author(s): **Mikołaj Żak**, **Grzegorz Muziol**, **Marcin Siekacz**, **Mateusz Hajdel**, **Oliwia Golyga**, **Paweł Wolny,** Institute of High Pressure Physics (Poland); **Jannina Tepass**, **Lukas Uhlig,** Technische Univ. Chemnitz (Germany); **Henryk Turski**, **Czeslaw Skierbiszewski,** Institute of High Pressure Physics (Poland); **Ulrich Theodor Schwarz,** Technische Univ. Chemnitz (Germany)

13366-42 • 4:40 PM - 5:00 PM
Revealing the dependency of efficiency on the lateral carrier diffusion length in InGaN/GaN blue and green micro-LEDs
Author(s): **A. B. M. Hamidul Islam,** Korea Institute of Energy Technology (Korea, Republic of); **Tae Kyoung Kim,** WaveLord Co., Ltd. (Korea, Republic of); **Yu-Jung Cha,** Korea Institute of Energy Technology (Korea, Republic of); **Joohan Bae,** Hanyang Univ. (Korea, Republic of); **Hyeondong Lee**, **Minji Kim**, **Chan Park**, **Jae Won Seo**, **Jiun Oh,** Korea Institute of Energy Technology (Korea, Republic of); **June-O Song,** WaveLord Co., Ltd. (Korea, Republic of); **Jong-In Shim**, **Dong-Soo Shin,** Hanyang Univ. (Korea, Republic of); **Joon Seop Kwak,** Korea Institute of Energy Technology (Korea, Republic of)

13366-60 • 5:00 PM - 5:20 PM
Optimization of GaN-on-Si epitaxial wafers for high-bandwidth μLEDs in optical communication using contactless optical characterization
Author(s): **Anthony Cibié**, **Amélie Dussaigne**, **Simon Litschgi**, **Patrick Le Maitre**, **Fabian Rol**, **Sultan El Badaoui**, **Julia Simon**, **Bastien Miralles**, **Clément Ballot**, **Bernard Aventurier, Paolo De Martino,** CEA (France)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13366-54 • 6:00 PM - 8:00 PM
Study on size effect of GaN based nanoLED
Author(s): **Hyung-il Jang**, **Seyoeng Park**, **Jamiela Sakuddin,** Chosun Univ. (Korea, Republic of); **Ja-Yeon Kim,** Korea Photonics Technology Institute (Korea, Republic of); **Min-Ki Kwon,** Chosun Univ. (Korea, Republic of)

13366-55 • 6:00 PM - 8:00 PM
Triboelectric nanogenerators fabricated with GaN nanowires as a response medium
Author(s): **Hyerin So**, **Gyeongjo Shin**, **Yukyum Sim**, **Siyun Noh, Jin Soo Kim,** Jeonbuk National Univ. (Korea, Republic of)

13366-56 • 6:00 PM - 8:00 PM
Effect of carrier channel of flexible photosensors fabricated with GaN nanowires and graphene
Author(s): **Jaeseo Kim**, **Ryeonggyeong Goo**, **Chansol Lim**, **Jamin Ha**, **Siyun Noh, Jin Soo Kim,** Jeonbuk National Univ. (Korea, Republic of)

13366-57 • 6:00 PM - 8:00 PM
Study on the performance of InGaN-based Micro-LED by plasma combined with etching ion implantation process
Author(s): **Yun-Cheng Hsu**, **Ray-Hua Horng, Yu-Hsuan Hsu,** National Yang Ming Chiao Tung Univ. (Taiwan)

13366-58 • 6:00 PM - 8:00 PM
Improvement in photoelectrochemical water splitting using InGaN/GaN heterostructure nanowires and MXene nanosheet
Author(s): **Jaemin Lee**, **Sanghyeop Baek**, **Uiseong Hong**, **Siyun Noh, Jin Soo Kim,** Jeonbuk National Univ. (Korea, Republic of)

13366-59 • 6:00 PM - 8:00 PM
Wafer-scale fabrication of vertically aligned GaN nano-/micro-rod arrays using nanoimprinted template for optoelectronic applications
Author(s): **Hak-Jong Choi**, **Soongeun Kwon**, **Hyungjun Lim,** Korea Institute of Machinery & Materials (Korea, Republic of); **Sang-Hyeon Lee,** Chonnam National Univ. (Korea, Republic of)

Thursday 30 January 2025

SESSION 12: UV LEDS I

30 January 2025 • 8:00 AM - 10:00 AM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Sharif Md Sadaf**, Institut National de la Recherche Scientifique (Canada)

13366-43 • 8:00 AM - 8:30 AM
Efficiency increase in 220-230 nm far-UVC LEDs and 200 mW class 230 nm power LED module grown on c-sapphire substrate *(Invited Paper)*
Author(s): **Hideki Hirayama**, **Muhammad Ajmal Khan,** RIKEN (Japan); **Mitsuhiro Muta,** Nippon Tungsten Co., Ltd. (Japan); **Yukio Kashima**, **Eriko Matsuura,** RIKEN (Japan); **Yasushi Iwaisako,** Nippon Tungsten Co., Ltd. (Japan)

13366-44 • 8:30 AM - 9:00 AM
AlGaN short-period superlattice based far-UVC LEDs on AlN templates *(Invited Paper)*
Author(s): **Jordan Nicholls**, **Liam Anderson**, **Darren Aung**, **Ashokraj Baskaran**, **Matthias Belloeil**, **Yushan Cai**, **Jyoti Campbell**, **Jessica Chai**, **Nathaniel Corpuz**, **Oisin Donoghue**, **Volter Entoma**, **Brian Hayden**, **Matthew Horrocks**, **Tab Hung**, **Douglas King**, **William Lee**, **Andy Liu**, **Daniel McMahon**, **Sujesh Mohan**, **Kayleigh Moloney**, **Viet Nguyen**, **SweeFong Pan**, **Erick Romero**, **Philip Tang**, **Samuel Tedman-Jones**, **Wen Jun Toe**, **Ray Tsai**, **Hai Ping Wang**, **Felix Wu**, **Shu Yan**, **Ryan Yang**, **Kevin Yeo**, **Norbert Krause**, **Robbie B. Charters**, **Johnny Tang, Petar Atanackovic,** Silanna UV (Australia)

13366-45 • 9:00 AM - 9:30 AM
Polarity control of AlN via a combination of sputtering and face-to-face annealing *(Invited Paper)*
Author(s): **Hideto Miyake**, **Tomohiro Tamano**, **Ryota Akaike**, **Hiroki Yasunaga**, **Toru Akiyama**, **Takao Nakamura,** Mie Univ. (Japan); **Kanako Shojiki,** Kyoto Univ. (Japan), Mie Univ. (Japan)

13366-46 • 9:30 AM - 10:00 AM
Defects and reliability of UVC-LEDs *(Invited Paper)*
Author(s): **Matteo Buffolo,** Univ. degli Studi di Padova (Italy); **Francesco Piva**, **Nicola Roccato**, **Carlo De Santi,** University of Padova, Department of Information Engineering (Italy); **Tim Wernicke**, **Jakob Höpfner**, **Marcel Marcel Schilling**, **Anton Muhin**, **Norman Susilo**, **Daniel Hauer-Vidal**, **Luca Sulmoni,** Technische Universität Berlin, Institute of Solid State Physics (Germany); **Michael Kneissl,** Technische Universität Berlin, Institute of Solid State Physics (Germany), Ferdinand-Braun-Institut (FBH) (Germany); **Nicola Trivellin,** University of Padova, Department of Industrial Engineering (Italy), University of Padova, Department of Information Engineering (Italy); **Gaudenzio Meneghesso**, **Enrico Zanoni,** University of Padova, Department of Information Engineering (Italy); **Matteo Meneghini,** University of Padova, Department of Information Engineering (Italy), University of Padova, Department of Physics and Astronomy (Italy)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: UV LEDS II

30 January 2025 • 10:30 AM - 12:00 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Matteo Buffolo**, Univ. degli Studi di Padova (Italy)

13366-47 • 10:30 AM - 11:00 AM
Power degradation mechanism of UV-C LEDs under current stress *(Invited Paper)*
Author(s): **Yoshio Honda,** Nagoya Univ. (Japan); **Shigefusa F. Chichibu**, **Kohei K. Shima,** Tohoku Univ. (Japan); **Atsushi Miyazaki**, **Shinya Boyama**, **Koji Okuno**, **Yoshiki Saito,** Toyoda Gosei Co., Ltd. (Japan); **Atsushi Tanaka,** Nagoya Univ. (Japan); **Tetsuya Takeuchi,** Meijo Univ. (Japan); **Maki Kushimoto, Hiroshi Amano,** Nagoya Univ. (Japan)

13366-48 • 11:00 AM - 11:30 AM
Spectral study to estimate effects on human skin of irradiation at 226-240nm far UV-C LEDs *(Invited Paper)*
Author(s): **Kosuke Sato**, **Hirotsugu Kobayashi, Yoshihisa Kunimi,** Asahi Kasei Corp. (Japan)

13366-49 • 11:30 AM - 12:00 PM
Ultraviolet-C band AlGaN heterostructures grown on nanopatterned sapphire substrates for lighting and photodetection applications *(Invited Paper)*
Author(s): **Sharif Md. Sadaf,** Institut National de la Recherche Scientifique (Canada); **Nirmal Anand,** Institut national de la recherche scientifique (INRS) (Canada); **Christy Giji Jenson**, **Md Zunaid Baten**, **Dipon Kumar Ghosh, Md. Afjalur Rahman,** Institut National de la Recherche Scientifique (Canada)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 14: UV LEDS III

30 January 2025 • 1:30 PM - 2:50 PM | Moscone West, Room 2018 (Level 2)
Session Chair(s): **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

13366-51 • 1:30 PM - 2:00 PM
UV LEDs: new avenues with nanowires *(Invited Paper)*
Author(s): **Christophe Durand**, **Lucie Valéra**, **Vincent Grenier,** Univ. Grenoble Alpes (France), CEA (France); **Sylvain Finot,** Univ. Grenoble Alpes (France), Institut NÉEL, CNRS (France); **Nuno Amador-Mendez,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France); **Joël Eymery,** Univ. Grenoble Alpes (France), MEM/CEA (France); **Maria Tchernycheva,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France); **Gwénolé Jacopin,** Univ. Grenoble Alpes (France), Institut NÉEL, CNRS (France)

13366-52 • 2:00 PM - 2:30 PM
Development for long lifetime and high efficiency DUV LEDs *(Invited Paper)*
Author(s): **Yoshiki Saito**, **Atsushi Miyazaki**, **Shinya Boyama**, **Koji Okuno**, **Masaki Oya,** Toyoda Gosei Co., Ltd. (Japan); **Keita Kataoka**, **Tetsuo Narita**, **Kayo Horibuchi,** Toyota Central R&D Labs., Inc. (Japan); **Maki Kushimoto**, **Yoshio Honda**, **Hiroshi Amano,** Nagoya Univ. (Japan); **Hisanori Ishiguro**, **Tetsuya Takeuchi,** Meijo Univ. (Japan); **Kohei K. Shima, Shigefusa F. Chichibu,** Tohoku Univ. (Japan)

13366-53 • 2:30 PM - 2:50 PM
AlGaN based UVC LEDs on AlN with reflective contacts
Author(s): **Ronny Kirste,** Adroit Materials Inc. (United States); **James Loveless,** North Carolina State Univ. (United States); **Pramod Reddy**, **Dolar Khachariya,** Adroit Materials Inc. (United States); **Ramon Collazo, Zlatko Sitar,** North Carolina State Univ. (United States)

CONFERENCE 13367

Oxide-based Materials and Devices XVI

26 - 29 January 2025 | Moscone West, Room 2014 (Level 2)

Conference Chair(s): **David J. Rogers, Féréchteh H. Teherani,** Nanovation (France)

Program Committee: **Vitaliy S. Avrutin,** Virginia Commonwealth Univ. (United States); **Philippe Bove,** Nanovation (France); **James Connolly,** GeePs, CentraleSupelec, Uni. Paris-Saclay (France); **Nicolas de France,** Univ. de Lille (France); **Jean-Jacques Delaunay,** The Univ. of Tokyo (Japan); **Aleksandra B. Djurišic,** The Univ. of Hong Kong (Hong Kong, China); **Ian T. Ferguson,** Kennesaw State Univ. (United States); **Adrián Hierro,** Univ. Politécnica de Madrid (Spain); **Seref Kalem,** Bahçesehir Univ. (Turkey); **David C. Look,** Wright State Univ. (United States); **Luna Lu,** Purdue Univ. (United States); **Bianchi Méndez Martín,** Univ. Complutense de Madrid (Spain); **Norbert H. Nickel,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Ümit Özgür,** Virginia Commonwealth Univ. (United States); **Seong-Ju Park,** Gwangju Institute of Science and Technology (Korea, Republic of); **Manijeh Razeghi,** Northwestern Univ. (United States); **Vinod Eric Sandana,** Nanovation (France); **Michael L. Schuette,** Air Force Research Lab. (United States); **Henryk Teisseyre,** Institute of Physics, Polish Academy of Sciences (Poland); **Cuong Ton-That,** Univ. of Technology, Sydney (Australia); **Chris G. Van de Walle,** Univ. of California, Santa Barbara (United States); **Bruno Viana,** Institut de Recherche de Chimie Paris (France); **Markus R. Wagner,** Technische Univ. Berlin (Germany); **Magnus Willander,** Linköping Univ. (Sweden); **Hideki Yamamoto,** NTT Basic Research Labs. (Japan)

Sunday 26 January 2025

SESSION 1: GA2O3: MODELING (DOPING, DEFECTS, AND BAND GAP ENGINEERING)

26 January 2025 • 9:00 AM - 12:05 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **James S. Speck**, Univ. of California, Santa Barbara (United States); **David J. Rogers**, Nanovation (France)

13367-1 • 9:00 AM - 9:45 AM
Donor and acceptor doping of gallium oxide and aluminum gallium oxide (Keynote Presentation)
Author(s): **Chris G. Van de Walle,** Univ. of California, Santa Barbara (United States)

13367-3 • 9:45 AM - 10:15 AM
Computational design of optimal heterostructures with monoclinic Ga_2O_3 *(Invited Paper)*
Author(s): **Hartwin Peelaers,** The Univ. of Kansas (United States)

Coffee Break • 10:15 AM - 10:45 AM

13367-4 • 10:45 AM - 11:15 AM
Role of gallium vacancies in Ga_2O_3 at finite temperatures *(Invited Paper)*
Author(s): **Sai Mu,** Univ. of South Carolina (United States); **Mark E. Turiansky,** Univ. of California, Santa Barbara (United States); **Mengen Wang,** Binghamton Univ. (United States); **Chris G. Van de Walle,** Univ. of California, Santa Barbara (United States)

13367-5 • 11:15 AM - 11:35 AM
First-principles study of the structural, electronic, and optical properties of doped Ga_2O_3
Author(s): **Andrés Felipe Bermúdez Mendoza**, **Ruth Martínez Casado**, **Emilio Nogales, Bianchi Méndez Martín,** Univ. Complutense de Madrid (Spain)

13367-56 • 11:35 AM - 12:05 PM
Doping and defects in wide-band-gap perovskite semiconductors *(Invited Paper)*
Author(s): **Anderson Janotti**, **Intuon Chatratin, Igor Evangelista,** Univ. of Delaware (United States)

Lunch/Exhibition Break 12:05 PM - 1:35 PM

SESSION 2: GA2O3: BULK AND THIN FILM GROWTH, DOPING, CHARACTERIZATION, AND PROPERTIES I

26 January 2025 • 1:35 PM - 5:20 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Chris G. Van de Walle**, Univ. of California, Santa Barbara (United States); **Hartwin Peelaers**, The Univ. of Kansas (United States)

13367-6 • 1:35 PM - 2:20 PM
Fundamental study of p-type doping in MOCVD-grown Ga2O3 (Keynote Presentation)
Author(s): **Manijeh Razeghi,** Northwestern Univ. (United States)

13367-7 • 2:20 PM - 2:50 PM
Low background impurity and highly uniform β-Ga_2O_3 growth on 4-inch substrate in a close-coupled showerhead reactor using dynamic gap adjustments *(Invited Paper)*
Author(s): **Indraneel Sanyal**, **Clifford McAleese,** AIXTRON Ltd. (United Kingdom); **Salwan Omar,** AIXTRON Inc. (United States); **Aadil Waseem,** The Univ. of Texas at Austin (United States); **Simonas Krotkus**, **O. Rockenfeller,** AIXTRON SE (Germany); **Ken Teo**, **Andrew Pakes,** AIXTRON Ltd. (United Kingdom); **Jian Li,** Air Force Research Lab. (United States); **Michael Heuken,** AIXTRON SE (Germany); **Xiuling Li,** The Univ. of Texas at Austin (United States)

13367-8 • 2:50 PM - 3:20 PM
MOCVD of β-Ga_2O_3: growth, doping, scalability, and surface preparation *(Invited Paper)*
Author(s): **William Brand**, **Fikadu Alema, Andrei Osinsky,** Agnitron Technology, Inc. (United States)

Coffee Break • 3:20 PM - 3:50 PM

13367-9 • 3:50 PM - 4:20 PM
Progress in growth and processing of (001) beta-Ga_2O_3 for power electronics *(Invited Paper)*
Author(s): **James S. Speck,** Univ. of California, Santa Barbara (United States)

13367-10 • 4:20 PM - 4:50 PM
Growth, electrical, and thermoelectric characterization of (010) β-Ga_2O_3 thin films doped with Si and Ba *(Invited Paper)*
Author(s): **Andrea Ardenghi,** Paul-Drude-Institut für Festkörperelektronik (Germany); **Piero Mazzolini,** Univ. degli Studi di Parma (Italy); **Joel Basile Varley,** Lawrence Livermore National Lab. (United States); **Lasse Vines,** Univ. of Oslo (Norway); **Andreas Falkenstein**, **Manfred Martin,** RWTH Aachen Univ. (Germany); **Georg Hoffmann**, **Jonas Lähnemann,** Paul-Drude-Institut für Festkörperelektronik (Germany); **Kenichiro Mizohata**, **Filip Tuomisto,** Univ. of Helsinki (Finland); **Andreas Popp**, **Zbigniew Galazka,** Leibniz-Institut für Kristallzüchtung (Germany); **Oliver Bierwagen,** Paul-Drude-Institut für Festkörperelektronik (Germany)

13367-11 • 4:50 PM - 5:20 PM
Optical and structural properties of threading dislocations in α-Ga_2O_3 *(Invited Paper)*
Author(s): **Fabien Massabuau**, **Mugove Maruzane**, **Ross Mullen**, **Olha Makydonska**, **Paul R. Edwards,** Univ. of Strathclyde (United Kingdom); **Yuichi Oshima,** National Institute for Materials Science (Japan); **Joseph Roberts**, **Paul R. Chalker,** Univ. of Liverpool (United Kingdom); **Rachel A. Oliver,** Univ. of Cambridge (United Kingdom); **Ben Hourahine, Robert W. Martin,** Univ. of Strathclyde (United Kingdom)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 3: GA2O3: BULK AND THIN FILM GROWTH, DOPING, CHARACTERIZATION, AND PROPERTIES II

27 January 2025 • 10:45 AM - 12:45 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Fabien Massabuau**, Univ. of Strathclyde (United Kingdom); **Hartwin Peelaers**, The Univ. of Kansas (United States)

13367-12 • 10:45 AM - 11:15 AM
MOCVD synthesis and in situ processing of polymorphs and heterostructures of gallium oxide *(Invited Paper)*
Author(s): **Hari Nair,** Cornell Univ. (United States)

13367-13 • 11:15 AM - 11:45 AM
Thermal transport in ion beam modified Ga_2O_3 polymorphs *(Invited Paper)*
Author(s): **Azat Abdullaev**, **Kairolla Sekerbayev**, **Lyazzat Mukhangaliyeva**, **Rustem Tlegenov,** National Lab. Astana (Kazakhstan); **Zhandos Utegulov,** Nazarbayev Univ. (Kazakhstan); **Andrej Kuznetsov,** Univ. of Oslo (Norway)

13367-14 • 11:45 AM - 12:15 PM
Spectroscopic approaches for determining spatial distributions of dopants and impurities in melt-grown β-Ga_2O_3 single crystals *(Invited Paper)*
Author(s): **Benjamin L. Dutton**, **Nathan T. Sakaguchi,** Washington State Univ. (United States); **Joel B. Varley,** Lawrence Livermore National Lab. (United States); **Matthew McCluskey, John McCloy,** Washington State Univ. (United States)

13367-57 • 12:15 PM - 12:45 PM
Investigations of compensating deep acceptor defects in β-Ga_2O_3 by thermal and optical defect spectroscopy methods *(Invited Paper)*
Author(s): **Hemant J. Ghadi**, **Joe F. McGlone,** The Ohio State Univ. (United States); **Shivam Sharma**, **Uttam Singisetti,** Univ. at Buffalo (United States); **Lingyu Meng**, **dong su Yu**, **Hongping Zhao**, **Siddharth Rajan,** The Ohio State Univ. (United States); **Ymir Kalmann Frodason,** Univ. of Oslo (Norway); **Hartwin Peelaers,** The Univ. of Kansas (United States); **John L. Lyons,** U.S. Naval Research Lab. (United States); **Joel B. Varley,** Lawrence Livermore National Lab. (United States); **Chris G. Van de Walle,** Univ. of California, Santa Barbara (United States); **Steven A. Ringel,** Ohio State Univ (United States)

Lunch Break 12:45 PM - 2:15 PM

SESSION 4: GA2O3: HETEROJUNCTIONS

27 January 2025 • 2:15 PM - 3:35 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Pedro Hidalgo Alcalde**, Univ. Complutense de Madrid (Spain); **Emilio Nogales Díaz**, Univ. Complutense de Madrid (Spain)

13367-15 • 2:15 PM - 2:35 PM
Self powered oxide heterojunctions for remote optical fire sensing
Author(s): **Eric Sandana**, **David J. Rogers**, **Féréchteh Teherani,** Nanovation (France); **Manijeh Razeghi,** Northwestern Univ. (United States)

13367-16 • 2:35 PM - 3:05 PM
MOCVD Growth of Ga_2O_3 *(Invited Paper)*
Author(s): **Hongping Zhao,** The Ohio State Univ. (United States)

13367-17 • 3:05 PM - 3:35 PM
Understanding and controlling the atomic structure at NiO/Ga_2O_3 PN junction interface *(Invited Paper)*
Author(s): **Jinwoo Hwang,** The Ohio State Univ. (United States)

Coffee Break 3:35 PM - 4:05 PM

SESSION 5: GA2O3: APPLICATIONS

27 January 2025 • 4:05 PM - 5:05 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Vinod Eric Sandana**, Nanovation (France); **Hongping Zhao**, The Ohio State Univ. (United States)

13367-18 • 4:05 PM - 4:35 PM
Next-generation gallium oxide-based semiconductor devices *(Invited Paper)*
Author(s): **Siddharth Rajan,** The Ohio State Univ. (United States)

13367-19 • 4:35 PM - 5:05 PM
High performance gallium oxide transistors *(Invited Paper)*
Author(s): **Uttam Singisetti,** Univ. at Buffalo (United States)

SESSION 6: ENERGY HARVESTING I

27 January 2025 • 5:05 PM - 5:25 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **David J. Rogers**, Nanovation (France); **Seref Kalem**

13367-31 • 5:05 PM - 5:25 PM
Metal-oxide films for transparent photovoltaic-pyroelectric hybrid power generation
Author(s): **Malkeshkumar Patel, Joondong Kim,** Incheon National Univ. (Korea, Republic of)

Tuesday 28 January 2025

SESSION 7: LIGHT MANAGEMENT

28 January 2025 • 9:05 AM - 10:15 AM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Adrián Hierro**, Univ. Politécnica de Madrid (Spain)

13367-20 • 9:05 AM - 9:25 AM
Improvement of the LIDT of high-reflection mirrors with inserted quantized nanolaminates manufactured by ion beam sputtering
Author(s): **Sina Malobabic, Sebastian Wiehler,** Laser Components Germany GmbH (Germany)

13367-22 • 9:25 AM - 9:45 AM
Functionalization of structured optical components via atomic layer deposition
Author(s): **Darija Astrauskyte**, **Mantas Slipkauskas, Lina Grineviciute,** Ctr. for Physical Sciences and Technology (Lithuania)

13367-23 • 9:45 AM - 10:15 AM
Scaling the nanoimprint lithography process of inorganic-based materials for photonic metasurfaces *(Invited Paper)*
Author(s): **Marco Abbarchi**, **David Grosso**, **Badre Kerzabi**, **Mohammed Bouabdellaoui**, **Elias Daher, Anthony Gourdin,** Solnil (France)

Coffee Break 10:15 AM - 10:45 AM

SESSION 8: GAS SENSING

28 January 2025 • 10:45 AM - 12:05 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Vinod Eric Sandana**, Nanovation (France)

13367-24 • 10:45 AM - 11:15 AM
Nickel-incorporated oxide composites for fiber optic-based gas sensing *(Invited Paper)*
Author(s): **Jeffrey K. Wuenschell**, **Scott Crawford**, **Ki-Joong Kim,** National Energy Technology Lab. (United States); **Gary Lander,** National Energy Technology Lab. (United States), Leidos, Inc. (United States); **Michael Buric,** National Energy Technology Lab. (United States)

13367-25 • 11:15 AM - 11:35 AM
Terahertz metamaterials gas sensor based on ZIF-8/Pt-$MoSe_2$ composite for NO_2 detection
Author(s): **Chin Lin Lin**, **You Jen Chen**, **Pei Jung Wu**, **Chii Rong Yang,** National Taiwan Normal Univ. (Taiwan); **Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan), Applied High Entropy Technology (AHET) Ctr., National Cheng Kung Univ. (Taiwan)

13367-66 • 11:35 AM - 12:05 PM
Polaritonic materials for narrowband thermal emitters *(Invited Paper)*
Author(s): **Joshua Ryan Nolen,** Sensorium Technological Labs. Inc. (United States), Vanderbilt Univ. (United States)

Lunch/Exhibition Break 12:05 PM - 1:15 PM

SESSION 9: LIGHT SENSING

28 January 2025 • 1:15 PM - 3:05 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Vinod Eric Sandana**, Nanovation (France); **Henryk Teisseyre**, Institute of Physics, Polish Academy of Sciences (Poland)

13367-26 • 1:15 PM - 1:35 PM
Processing of transparent oxide ceramic materials for infrared sensor applications
Author(s): **Martin Drüe**, **Andreas Frickel,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany); **Johannes Krech,** 5microns GmbH (Germany); **Annett Isserstedt-Trinke**, **Patrick Sachse**, **Stefan Apel,** Micro-Hybrid Electronic GmbH (Germany); **Sabine Begand,** Fraunhofer-Institut für Keramische Technologien und Systeme IKTS (Germany)

13367-27 • 1:35 PM - 1:55 PM
Bulk-conductive microchannel plates and enhanced image intensifier
Author(s): **Jay J. Yi,** Boyd Fiber Optics, Ltd. (United States); **Gui-Hua Wang,** Nanjing Univ. of Science and Technology (China)

13367-28 • 1:55 PM - 2:15 PM
UVC imaging array based on gallium oxide
Author(s): **David J. Rogers**, **Eric Sandana**, **Féréchteh Teherani,** Nanovation (France); **Manijeh Razeghi,** Northwestern Univ. (United States)

13367-29 • 2:15 PM - 2:45 PM
Emerging strategies based on solution-processable ultra-wide bandgap metal oxides for DUV photodetection and related applications *(Invited Paper)*
Author(s): **Taehyun Park, Hocheon Yoo,** Gachon Univ. (Korea, Republic of)

13367-55 • 2:45 PM - 3:05 PM
Solar-blind metal-semiconductor-metal and p-n junction photodetectors with β-Ga_2O_3/Si (111) layers, grown by pulsed lased deposition
Author(s): **Sana Ayyuby**, **Amandeep Kaur**, **Subhabrata Dhar, Suddhasatta Mahapatra,** Indian Institute of Technology Bombay (India)

Coffee Break 3:05 PM - 3:35 PM

SESSION 10: ENERGY HARVESTING II

28 January 2025 • 3:35 PM - 4:15 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Vinod Eric Sandana**, Nanovation (France); **Seref Kalem**

13367-30 • 3:35 PM - 3:55 PM
A flexible self-powered multi-nanomaterials 3D-printed triboelectric nanogenerator-based force sensor
Author(s): **Shingirirai M. Chakoma**, **Jerome Rajendran**, **Xiaochang M. Pei**, **Anita Ghandehari**, **Jorge Alfonso Tavares Negrete, Rahim Esfandyarpour,** Univ. of California, Irvine (United States)

13367-32 • 3:55 PM - 4:15 PM
Mesoporous silica nanospheres-containing encapsulation layer for tin-based light-emitting perovskite thin-films towards prolonged ambient stability
Author(s): **Muhammad Umair Ali**, **Abdul Khaleed**, **Zhengtian Yuan, Aleksandra B. Djurišic,** The Univ. of Hong Kong (Hong Kong, China)

SESSION 11: PLASMONICS

28 January 2025 • 4:15 PM - 5:15 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Adrián Hierro**, Univ. Politécnica de Madrid (Spain)

13367-33 • 4:15 PM - 4:45 PM
Plasmonic optoelectronic devices and metasurfaces exploiting epsilon-near-zero effects in indium tin oxide *(Invited Paper)*
Author(s): **Pierre Berini,** Univ. of Ottawa (Canada)

13367-34 • 4:45 PM - 5:15 PM
CdO-based plasmonic nanoparticles and their applications in light amplification and sensing *(Invited Paper)*
Author(s): **Adrian Hierro**, **Pablo Ibañez-Romero**, **Eduardo Martinez Castellano,** Univ. Politécnica de Madrid (Spain); **Javier Yeste,** Univ. de València (Spain); **Julia Ingles,** Univ. Politécnica de Madrid (Spain); **Fernando Gonzalez-Posada**, **Thierry Taliercio,** Univ. de Montpellier (France); **Vicente Muñoz-Sanjose,** Univ. de València (Spain); **Miguel Montes Bajo,** Univ. Politécnica de Madrid (Spain)

Wednesday 29 January 2025

SESSION 12: 2D AND NANOMATERIALS I

29 January 2025 • 8:30 AM - 9:50 AM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Norbert H. Nickel**, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **Emilio Nogales Díaz**, Univ. Complutense de Madrid (Spain)

13367-35 • 8:30 AM - 9:00 AM
Hybrid orbital formation of hydrogen atoms and molecules in Ti3C2 MXene *(Invited Paper)*
Author(s): **Norbert H. Nickel,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

13367-36 • 9:00 AM - 9:30 AM
Quasi-freestanding graphene on silicon carbide *(Invited Paper)*
Author(s): **Thomas Seyller,** Technische Univ. Chemnitz (Germany)

13367-37 • 9:30 AM - 9:50 AM
Graphene-Integrated Cr_2AlC MAX Phase: a sol gel synthesis and Its biomedical implication
Author(s): **Zobia Zulfiqar**, **Muhammad Shahbaz, Nadeem Sabir,** Government College Univ. Faisalabad (Pakistan)

Coffee Break 9:50 AM - 10:20 AM

SESSION 13: 2D AND NANOMATERIALS II

29 January 2025 • 10:20 AM - 12:00 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Pedro Hidalgo Alcalde**, Univ. Complutense de Madrid (Spain); **Vinod Eric Sandana**, Nanovation (France)

13367-38 • 10:20 AM - 10:50 AM
Raman and IR polarimetric analysis of functionalized graphene layers *(Invited Paper)*
Author(s): **Karsten Hinrichs**, **Fatima Akhtar**, **Norbert H. Nickel, Jörg Rappich,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

13367-39 • 10:50 AM - 11:20 AM
Investigating carrier dynamics in TMD monolayer heterostructures for different stacking configurations *(Invited Paper)*
Author(s): **Majvor Mack,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Institut für Silizium Photovoltaik (Germany); **Jia-Yuan Sun,** Department of Electrophysics, National Yang Ming Chiao Tung University (Taiwan); **Chih-Wei Luo,** Department of Electrophysics (Taiwan), National Synchrotron Radiation Research Center (Taiwan), Institute of Physics and Center for Emergent Functional Matter Science (Taiwan); **Stephen Boandoh**, **Norbert H Nickel,** Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); **YuTsung Tsai,** Univ. of Wyoming (United States)

13367-40 • 11:20 AM - 11:40 AM
β-Ga_2O_3 nanomembranes, micro- and nanowires for photonics
Author(s): **Daniel Carrasco,** Univ. Complutense de Madrid (Spain); **Manuel Alonso-Orts,** Univ. Bremen (Germany); **Paula Pérez-Peinado,** Univ. Complutense de Madrid (Spain); **Ruben J. T. Neelissen,** Univ. Bremen (Germany); **Pedro L. Alcázar,** Univ. Complutense de Madrid (Spain), Ctr. Superior de Investigaciones Científicas (Spain); **Jaime Dolado**, **Gema Martínez-Criado,** ESRF - The European Synchrotron (France); **Jorge Quereda,** Ctr. Superior de Investigaciones Científicas (Spain); **Francisco Dominguez-Adame,** Univ. Complutense de Madrid (Spain); **Martin Eickhoff,** Univ. Bremen (Germany); **Bianchi Méndez Martín, Emilio Nogales,** Univ. Complutense de Madrid (Spain)

13367-41 • 11:40 AM - 12:00 PM
Oxidation of Si/Ge nanowires grown wafers
Author(s): **Seref Kalem,** Bahçesehir Univ. (Turkey)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 14: NOVEL OXIDES AND APPLICATIONS I

29 January 2025 • 1:30 PM - 3:00 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Henryk Teisseyre**, Institute of Physics, Polish Academy of Sciences (Poland); **Ian T. Ferguson**, Kennesaw State Univ. (United States)

13367-42 • 1:30 PM - 2:00 PM
Harnessing electron correlation to realize UV transparent conductors *(Invited Paper)*
Author(s): **Roman Engel-Herbert,** Paul-Drude-Institut für Festkörperelektronik (Germany)

13367-43 • 2:00 PM - 2:20 PM
Micro- and nano- Zn_2GeO_4 as new material for optoelectronic applications
Author(s): **Pedro Hidalgo Alcalde,** Univ. Complutense de Madrid (Spain); **Jaime Dolado,** ESRF - The European Synchrotron (France); **Ruth Martínez Casado, Bianchi Méndez Martín,** Univ. Complutense de Madrid (Spain)

13367-44 • 2:20 PM - 2:40 PM
Insulator to metal phase transition in VO_2 for optical limiting: the influence of multilayers on transition temperature
Author(s): **Camilla Baratto**, **Lorenzo Pandolfi,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Monica Bollani,** L-NESS Lab., CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Daniel Chrastina,** L-NESS Lab., Politecnico di Milano (Italy); **Paolo Franceschini**, **Marco Gandolfi**, **Costantino De Angelis,** Univ. degli Studi di Brescia (Italy); **Maria del Rocio Camacho Morales**, **Dragomir Neshev,** TMOS, the ARC Ctr. of Excellence for Transformative Meta-Optical Systems (Australia); **Ivan Buchvarov,** Sofia Univ. "St. Kliment Ohridski" (Bulgaria); **Stefan Georgiev**, **Anton Trifonov,** Sofia Univ. "St. Kliment Ohridksi" (Bulgaria); **Stephan Shishkov,** Sofia Univ. "St. Kliment Ohridski" (Bulgaria); **Andrea Tognazzi,** Univ. degli Studi di Palermo (Italy)

13367-45 • 2:40 PM - 3:00 PM
WO_3 thin films prepared by DC sputtering and annealed for terahertz metamaterial device design
Author(s): **Rui-Zhe Hou**, **Po-Yun Hsiao**, **Chin-Pao Cheng,** National Taiwan Normal Univ. (Taiwan); **Chan-Shan Yang,** National Taiwan Normal Univ. (Taiwan), Applied High Entropy Technology (AHET) Ctr., National Cheng Kung Univ. (Taiwan)

Coffee Break 3:00 PM - 3:30 PM

SESSION 15: NOVEL OXIDES AND APPLICATIONS II

29 January 2025 • 3:30 PM - 5:10 PM | Moscone West, Room 2014 (Level 2)
Session Chair(s): **Henryk Teisseyre**, Institute of Physics, Polish Academy of Sciences (Poland); **David J. Rogers**, Nanovation (France)

13367-60 • 3:30 PM - 4:00 PM
Is the development of non-toxic and Earth-abundant ZnO-based materials and devices an oxide-moron? *(Invited Paper)*
Author(s): **Ian T. Ferguson,** Kennesaw State Univ. (United States)

13367-48 • 4:00 PM - 4:20 PM
Plasma separation for iron-based superconductor
Author(s): **Nadezhda P. Netesova,** M. V. Lomonosov Moscow State Univ. (Russian Federation)

13367-49 • 4:20 PM - 4:40 PM
Bulk crystal growth development of fluoride materials for lasers and other applications
Author(s): **Allen Brady**, **Kelvin Chang**, **Adam Lindsey, Gregory Foundos,** Northrop Grumman SYNOPTICS (United States)

13367-63 • 4:40 PM - 5:10 PM
Thin film barium strontium titanate for dielectric varactors *(Invited Paper)*
Author(s): **Takuya Toyohara,** Tecdia, Inc. (United States); **Alexandros Kyriakidis,** Tecdia (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13367-50 • 6:00 PM - 8:00 PM
Use of impedance spectroscopy for failure analysis of mid-infrared PbS photoconductive detector
Author(s): **Richard S. Kim**, **Yang Zhang**, **Sai Guduru,** Laser Components Detector Group, Inc. (United States); **Kyunghwa Lee**, **Jeung Hun Park,** USMX Technologies (United States); **Sung Jin Kim,** Univ. of Louisville (United States)

13367-51 • 6:00 PM - 8:00 PM
Plasma separation superconducting crystals
Author(s): **Nadezhda P. Netesova,** M. V. Lomonosov Moscow State Univ. (Russian Federation)

13367-53 • 6:00 PM - 8:00 PM
Achieving spectral selectivity in all oxide metal-dielectric hybrid thin film stacks for optical solar reflectors
Author(s): **Silpa S., Vinayak B. Kamble,** Indian Institute of Science Education and Research Thiruvananthapuram (India)

13367-54 • 6:00 PM - 8:00 PM
Impact of Tungsten (W) incorporation on structural, optical and surface wettability properties in RF sputtered TiO_2 thin films
Author(s): **Rajib Saha,** Indian Institute of Technology Bombay (India); **Soumya Mahapatra,** Ramakrishna Mission Residential College (India); **Robin Sangla,** Thapar Institute of Engineering and Technology (India); **Subhananda Chakrabarti,** Indian Institute of Technology Bombay (India)

13367-21 • 6:00 PM - 8:00 PM
Study of the optimization of SiO_2 and Nb_2O_5 multilayer thin films for enhanced airport lighting
Author(s): **Soyoung Kim**, **Jung-Hwan In**, **Seon Hoon Kim**, **Jehwan Hwang**, **Karam Han**, **Wonbae Sohn, Ju Hyeon Choi,** Korea Photonics Technology Institute (Korea, Republic of)

13367-58 • 6:00 PM - 8:00 PM
Analysis of a thermochromic device based on transition metal oxides
Author(s): **Kelly Cristine Barreto Alves Santos,** Escola Politécnica da Univ. Federal da Bahia (Brazil); **Joaquim Junior Isidio de Lima,** Univ. Federal do Vale do São Francisco (Brazil); **Gilliard N. Malheiros-Silveira,** UNICAMP (Brazil); **Vitaly F. Rodriguez-Esquerre,** Escola Politécnica da Univ. Federal da Bahia (Brazil)

13367-59 • 6:00 PM - 8:00 PM
Novel ternary approach to create ultra-wide bandgap heterojunctions for power electronics
Author(s): **David J. Rogers**, **Eric Sandana, Ferechteh H. Teherani,** Nanovation (France)

13367-62 • 6:00 PM - 8:00 PM
Investigation of ALD-deposited Nb_2O_5/HfO_2 stacks on III-V (GaAs) substrate for metal-oxide-semiconductor (MOS) device applications
Author(s): **ajay Kumar,** ; **Prabhat Prajapati**, **Rajib Saha**, **Saurabh Lodha, Subhananda Chakrabarti,** Indian Institute of Technology Bombay (India)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13367-47

Bismuth ferrite ($BiFeO_3$) optical waveguide memristor realized in lithium niobate ($LiNbO_3$)

Author(s): **Ricky W. Chuang**, **Chiao-Cheng Cheng**, **Pin-Zhi Chen, Cheng-Liang Huang,** National Cheng Kung Univ. (Taiwan)

CONFERENCE 13368

2D Photonic Materials and Devices VIII

27 - 29 January 2025 | Moscone West, Room 2010 (Level 2)

Conference Chair(s): **Arka Majumdar,** Univ. of Washington (United States); **Carlos M. Torres,** Naval Information Warfare Ctr. Pacific (United States); **Hui Deng,** Univ. of Michigan (United States)

Program Committee: **Ritesh Agarwal,** Univ. of Pennsylvania (United States); **Igor Aharonovich,** Univ. of Technology Sydney (Australia); **Joshua R. Hendrickson,** Air Force Research Lab. (United States); **Maiken H. Mikkelsen,** Duke Univ. (United States); **Galan Moody,** Univ. of California, Santa Barbara (United States); **Joan M. Redwing,** The Pennsylvania State Univ. (United States); **John R. Schaibley,** The Univ. of Arizona (United States); **A. Nick Vamivakas,** The Institute of Optics, Univ. of Rochester (United States); **Feng Wang,** Univ. of California, Berkeley (United States); **Xiaodong Xu,** Univ. of Washington (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: 2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS I

27 January 2025 • 10:45 AM - 12:55 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Carlos M. Torres**, Naval Information Warfare Ctr. Pacific (United States)

13368-1 • 10:45 AM - 11:25 AM
Graphene and layered materials for photonics and optoelectronics (Keynote Presentation)
Author(s): **Andrea C. Ferrari,** Univ. of Cambridge (United Kingdom)

13368-2 • 11:25 AM - 11:55 AM
2D semiconductor optoelectronics: advances, challenges, and opportunities *(Invited Paper)*
Author(s): **Ali Javey,** Univ. of California, Berkeley (United States)

13368-3 • 11:55 AM - 12:25 PM
Giant tunability of intersubband transitions and quantum hall quartets in few-layer InSe quantum wells *(Invited Paper)*
Author(s): **Jeanie Lau,** The Ohio State Univ. (United States)

13368-4 • 12:25 PM - 12:55 PM
Nanoscale van der Waals vacuum cells for confining atoms and crystals *(Invited Paper)*
Author(s): **Javier Sanchez-Yamagishi,** Univ. of California, Irvine (United States)

Lunch Break 12:55 PM - 2:15 PM

SESSION 2: 2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS II

27 January 2025 • 2:15 PM - 3:35 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Javier Sanchez-Yamagishi**, Univ. of California, Irvine (United States)

13368-5 • 2:15 PM - 2:45 PM
Photophysics of quantum defects in layered materials *(Invited Paper)*
Author(s): **Sanjay Behura,** San Diego State Univ. (United States)

13368-6 • 2:45 PM - 3:15 PM
Photonic applications of ferroelectric group IV monochalcogenides (MXs) with in-plane anisotropy *(Invited Paper)*
Author(s): **Jie Yao,** Univ. of California, Berkeley (United States)

13368-7 • 3:15 PM - 3:35 PM
Carrier losses due to radiative- and Auger-recombination in monolayer TMDCs
Author(s): **Jörg Hader, Jerome V. Moloney,** Wyant College of Optical Sciences (United States)

Coffee Break 3:35 PM - 4:05 PM

SESSION 3: TWISTRONIC-ENABLED NOVEL PHOTONIC FUNCTIONALITIES

27 January 2025 • 4:05 PM - 6:05 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Chun Ning Lau**, The Ohio State Univ. (United States)

13368-8 • 4:05 PM - 4:35 PM
(Sub)nanoscale hyperspectral imaging of excitons in two-dimensional materials *(Invited Paper)*
Author(s): **Medha Dandu,** Lawrence Berkeley National Lab. (United States); **Sriram Sankar,** Arizona State Univ. (United States); **Takashi Taniguchi,** National Institute for Materials Science, Tsukuba, Japan (Japan); **Kenji Watanabe,** National Institute for Materials Science (Japan); **Peter Ercius,** Lawrence Berkeley National Lab. (United States); **Jordan Hachtel,** Oak Ridge National Lab. (United States); **Mit Naik,** University of Texas, Austin (United States); **Archana Raja,** Lawrence Berkeley National Lab. (United States); **Sandhya Susarla,** Arizona State Univ. (United States)

13368-9 • 4:35 PM - 5:05 PM
Engineering correlated excitons in semiconductor moiré superlattices *(Invited Paper)*
Author(s): **Richen Xiong**, **Sam L, Brantly**, **Kaixiang Su**, **Jacob H. Nie**, **Zihan Zhang,** Univ. of California (United States); **Rounak Banerjee**, **Hayley Ruddick,** Arizona State University (United States); **Kenji Watanabe**, **Takashi Taniguchi,** National Institute for Materials Science (Japan); **Seth A. Tongay,** Arizona State University (United States); **Cenke Xu,** Univ. of California (United States); **Chenhao Jin,** Univ. of California, Santa Barbara (United States)

13368-10 • 5:05 PM - 5:35 PM
Correlated electronic states in multilayer moire superlattice of transition metal dichalcogenides *(Invited Paper)*
Author(s): **Yongtao Cui,** Univ. of California, Riverside (United States)

13368-25 • 5:35 PM - 6:05 PM
Direct heterogeneous integration of transition metal dichalcogenides *(Invited Paper)*
Author(s): **Zakaria Al Balushi,** Univ. of California, Berkeley (United States)

Tuesday 28 January 2025

SESSION 4: ATOMICALLY THIN CLASSICAL AND QUANTUM LIGHT SOURCES

28 January 2025 • 9:00 AM - 10:30 AM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Carlos M. Torres**, Naval Information Warfare Ctr. Pacific (United States)

13368-11 • 9:00 AM - 9:30 AM
Can we expect great single photon sources from two-dimensional semiconductors? *(Invited Paper)*
Author(s): **Christopher Gies, Alexander Steinhoff,** Univ. Bremen (Germany)

13368-12 • 9:30 AM - 10:00 AM
Fabrication, integration, and control of color centers in hexagon boron nitride *(Invited Paper)*
Author(s): **Sahil D. Patel**, **Sean Doan**, **Kamyar Parto**, **Michael Choquer**, **Nick Lewis, Galan Moody,** Univ. of California, Santa Barbara (United States)

13368-13 • 10:00 AM - 10:30 AM
2D materials for near-infrared quantum emission *(Invited Paper)*
Author(s): **Huan Zhao**, **Liangbo Liang**, **Saban Hus**, **Steven Randolph**, **An-Ping Li**, **Ben Lawrie,** Oak Ridge National Lab. (United States); **Han Htoon,** Los Alamos National Lab. (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 5: ATOMICALLY LAYERED MATERIALS FOR QUANTUM TECHNOLOGIES I

28 January 2025 • 11:00 AM - 12:30 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Sandhya Susarla**, Arizona State Univ. (United States)

13368-14 • 11:00 AM - 11:30 AM
Atomically-thin single-photon sources for quantum communication *(Invited Paper)*
Author(s): **Timm Gao**, **Martin von Helversen,** Technische Univ. Berlin (Germany); **Carlos Antón-Solanas,** Univ. Autónoma de Madrid (Spain); **Christian Schneider,** Carl von Ossietzky Univ. Oldenburg (Germany); **Tobias Heindel,** Technische Univ. Berlin (Germany)

13368-15 • 11:30 AM - 12:00 PM
Multi-degree-of-freedom control of nonlinear optical two-dimensional quantum materials *(Invited Paper)*
Author(s): **Haoning Tang**, **Yiting Wang**, **Xueqi Ni,** Harvard Univ. (United States); **Kenji Watanabe**, **Takashi Taniguchi,** National Institute for Materials Science (Japan); **Shanhui Fan,** Stanford University (United States); **Eric Mazur**, **Amir Yacoby,** Harvard Univ. (United States); **Yuan Cao,** University of California, Berkeley (United States)

13368-33 • 12:00 PM - 12:30 PM
Optical and spin dynamics of visible quantum emitters in hexagonal boron nitride *(Invited Paper)*
Author(s): **Lee C. Bassett,** Univ. of Pennsylvania (United States)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 6: ATOMICALLY LAYERED MATERIALS FOR QUANTUM TECHNOLOGIES II

28 January 2025 • 1:30 PM - 2:30 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Sandhya Susarla**, Arizona State Univ. (United States)

13368-41 • 1:30 PM - 2:00 PM
Nanophotonics and strong light-matter interaction with multilayer van der Waals materials *(Invited Paper)*
Author(s): **Alexander I. Tartakovskii,** The Univ. of Sheffield (United Kingdom)

13368-17 • 2:00 PM - 2:30 PM
Weak light induced optical phases in correlated materials and their device implication *(Invited Paper)*
Author(s): **Ritesh Agarwal,** Univ. of Pennsylvania (United States)

Coffee Break 2:30 PM - 3:00 PM

SESSION 7: PHOTONICS WITH 2D HETEROSTRUCTURES

28 January 2025 • 3:00 PM - 5:30 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Haoning Tang**, Harvard Univ. (United States)

13368-19 • 3:00 PM - 3:30 PM
Polaritonic metastructures based on broken symmetries *(Invited Paper)*
Author(s): **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States)

13368-20 • 3:30 PM - 4:00 PM
Indirect excitons *(Invited Paper)*
Author(s): **Leonid Butov,** Univ. of California, San Diego (United States)

13368-21 • 4:00 PM - 4:30 PM
Charge-transfer polaritons in van der Waals heterojunctions *(Invited Paper)*
Author(s): **Brian Kim,** The Univ. of Arizona (United States)

13368-22 • 4:30 PM - 4:50 PM
Coulomb engineering of exciton broadening in monolayer transition metal dichalcogenides
Author(s): **Sung-Gyu Lee,** Nanyang Technological Univ. (Singapore), Sungkyunkwan Univ. (Korea, Republic of); **Byeong Wook Cho,** Sungkyunkwan Univ. (Korea, Republic of), Heriot-Watt Univ. (United Kingdom); **Xuran Dai**, **Abdullah Rasmita,** Nanyang Technological Univ. (Singapore); **Young Hee Lee,** Sungkyunkwan Univ. (Korea, Republic of); **Weibo Gao, Sanghoon Chae,** Nanyang Technological Univ. (Singapore)

13368-23 • 4:50 PM - 5:10 PM
Real-time optical extraction of twist-angle in 2D transition metal dichalcogenides heterobilayers
Author(s): **Sotiris Psilodimitrakopoulos**, **Leonidas Mouchliadis**, **George-Miltos Maragkakis**, **George Kourmoulakis**, **Andreas Lemonis, Emmanuel Stratakis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

13368-42 • 5:10 PM - 5:30 PM
Near Infrared detection of graphene/metal intercalated graphene photodetector
Author(s): **Farhad Larki,** Isfahan Univ. of Technology (Iran, Islamic Republic of), Laye Rooyan PART at Isfahan Science and Technology Town (Iran, Islamic Republic of), Institute of Microengineering and Nanoelectronics (IMEN) (Malaysia); **Arash Dehzangi,** Northwestern Univ. (United States); **Alam Abedini,** Isfahan Univ. of Technology (Iran, Islamic Republic of); **Muhamad Ramdzan Buyong,** Univ. Kebangsaan Malaysia (Malaysia); **Hossein Tavakol**, **Parviz Kameli, Hadi Salamati,** Isfahan Univ. of Technology (Iran, Islamic Republic of)

Wednesday 29 January 2025

SESSION 8: SCALABLE GROWTH OF 2D MATERIAL FOR LARGE-SCALE INTEGRATION

29 January 2025 • 9:00 AM - 10:30 AM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Andrew J. Mannix**, Stanford Univ. (United States)

13368-24 • 9:00 AM - 9:30 AM
Epitaxial growth and optical properties of 2D TMD quantum dot heterostructures *(Invited Paper)*
Author(s): **Joan M. Redwing, Meghan Leger,** The Pennsylvania State Univ. (United States)

13368-26 • 9:30 AM - 10:00 AM
Van der Waals epitaxial growth of 2D materials and heterostructures with in situ diagnostics *(Invited Paper)*
Author(s): **Kai Xiao**, **Yiling Yu**, **Chenze Liu**, **Alexander Puretzky**, **Christopher Rouleau,** Oak Ridge National Lab. (United States); **Gerd Duscher,** The Univ. of Tennessee Knoxville (United States); **Mina Yoon, David Geohegan,** Oak Ridge National Lab. (United States)

13368-27 • 10:00 AM - 10:30 AM
Large-scale synthesis and characterization of complex oxide membranes and heterostructures *(Invited Paper)*
Author(s): **Seung Sae Hong,** Univ. of California, Davis (United States)

Coffee Break 10:30 AM - 11:00 AM

SESSION 9: 2D MATERIAL NONLINEAR OPTICAL DEVICES AND CAVITY-ENHANCED NONLINEAR OPTICS

29 January 2025 • 11:00 AM - 12:10 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Brian Kim**, The Univ. of Arizona (United States)

13368-28 • 11:00 AM - 11:30 AM
Cavity-driven ultrafast chiral optical switching *(Invited Paper)*
Author(s): **Lingxiao Zhou**, **Bin Liu**, **Yuze Liu**, **Yang Lu**, **Qiuyang Li**, **Xin Xie**, **Nathanial Lydick**, **Ruofan Hao**, **Chenxi Liu,** Univ. of Michigan (United States); **Kenji Watanabe**, **Takashi Taniguchi,** National Institute for Materials Science (Japan); **Yu-Hsun Chou,** National Cheng Kung Univ. (Taiwan); **Stephen Forrest, Hui Deng,** Univ. of Michigan (United States)

13368-29 • 11:30 AM - 11:50 AM
Nonlinear optical activities in ternary TMDC $MoNbSe_2$
Author(s): **Sumaiya Umme Hani**, **Tawsif Ibne Alam, Yuen Hong Tsang,** The Hong Kong Polytechnic Univ. (Hong Kong, China)

13368-30 • 11:50 AM - 12:10 PM
On-chip nonvolatile tunable second-harmonic-generation through integration of $NbOBr_2$
Author(s): **Xiangxin Gong**, **Ruihuan Duan**, **Tina Xin Guo**, **Wenduo Chen**, **Zheng Liu, Sanghoon Chae,** Nanyang Technological Univ. (Singapore)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 10: CHALCOGENIDES AND BORON NITRIDE MONOLAYER-BASED DEVICES

29 January 2025 • 1:40 PM - 2:30 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Carlos M. Torres**, Naval Information Warfare Ctr. Pacific (United States)

13368-31 • 1:40 PM - 2:10 PM
Tailoring synthesis of 2D semiconductors for precision control over composition, polytype, and ferroelectricity *(Invited Paper)*
Author(s): **Andrew J. Mannix,** Stanford Univ. (United States)

13368-32 • 2:10 PM - 2:30 PM
A novel screened exchange potential approach
Author(s): **Michael Lorke,** Univ. Duisburg-Essen (Germany)

Coffee Break 2:30 PM - 3:00 PM

SESSION 11: 2D MATERIAL OPTOELECTRONICS AND INTEGRATED NANOPHOTONICS III

29 January 2025 • 3:00 PM - 5:00 PM | Moscone West, Room 2010 (Level 2)
Session Chair(s): **Carlos M. Torres**, Naval Information Warfare Ctr. Pacific (United States)

13368-34 • 3:00 PM - 3:20 PM
2D material metrology using wavefront microscopy
Author(s): **Nathan Ullberg**, **Baptiste Marthy,** Institut Fresnel (France); **Vincent Derycke,** Univ. Paris-Saclay (France), CEA (France), Ctr. National de la Recherche Scientifique (France); **Guillaume Baffou,** Institut Fresnel (France)

13368-37 • 3:20 PM - 3:40 PM
Wafer-scale and multi-Layer molybdenum disulfide film growth with layer number controllability up to 30 and its application in photodetectors with short response times
Author(s): **Yu-Han Huang,** National Taiwan Univ. (Taiwan), Academia Sinica (Taiwan)

13368-38 • 3:40 PM - 4:00 PM
The influence of the electrode crystallinity and channel layer numbers to the contact resistance of molybdenum disulfide transistors
Author(s): **Che-Jia Chang**, **Tzu-Hsuan Chang,** National Taiwan Univ. (Taiwan); **Shih-Yen Lin,** Academia Sinica (Taiwan)

13368-35 • 4:00 PM - 4:20 PM
Quantum efficiency dependence on semiconductor 2D dopants in TMDC-MoS_2 based Schottky-photodiode
Author(s): **Ahmed Abdelhady A. Khalil,** NILES, Cairo Univ. (Egypt), The American Univ. in Cairo (Egypt); **Maram T. H. Abou Kana,** NILES, Cairo Univ. (Egypt); **Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13368-39 • 4:20 PM - 4:40 PM
Large-scale fabrication and characterization of 2D materials
Author(s): **Faizan Ahmad,** Slovak Academy of Sciences (Slovakia)

13368-40 • 4:40 PM - 5:00 PM
Synergistically engineered all van der Waals photodetectors for robust photodetection
Author(s): **Tawsif I. Alam**, **Sumaiya Umme Hani, Yuen Hong Tsang,** The Hong Kong Polytechnic Univ. (Hong Kong, China)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13368-36 • 6:00 PM - 8:00 PM
2D materials based heterojunction for a photodetector with high responsivity
Author(s): **Hyeong-il Jang**, **Seyoeng Park**, **MinKi Kwon, Jamiela Sakuddin,** Chosun Univ. (Korea, Republic of)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13368-18

Characterization of hexagonal boron nitride quantum emitters in nanoflakes after post-processing treatments

Author(s): **Leonora Sewidan,** Physikalisch-Technische Bundesanstalt (Germany); **Elisa Redolfi,** Univ. degli Studi di Torino (Italy), Istituto
Nazionale di Fisica Nucleare (Italy), Istituto Nazionale di Ricerca Metrologica (Italy); **Hristina Georgieva,** Physikalisch-Technische Bundesanstalt (Germany); **Jacopo Forneris,** Univ. degli Studi di Torino (Italy); **Marco López, Stefan Kück,** Physikalisch-Technische Bundesanstalt (Germany)

CONFERENCE 13369

Integrated Optics: Devices, Materials, and Technologies XXIX

27 - 30 January 2025 | Moscone South, Room 307 (Level 3)

Conference Chair(s): **Sonia M. García-Blanco,** Univ. Twente (Netherlands); **Pavel Cheben,** National Research Council Canada (Canada)

Program Committee: **Carlos A. Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies (France); **Daniel Benedikovic,** Univ. of Žilina (Slovakia); **Pierre Berini,** Univ. of Ottawa (Canada); **Romeo Bernini,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); **Andrea Blanco-Redondo,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Alexandra Boltasseva,** Purdue Univ. (United States); **Jean-Emmanuel Broquin,** Univ. Grenoble Alpes (France); **Florenta A. Costache,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); **Xudong Fan,** Univ. of Michigan (United States); **Robert Halir,** Univ. de Málaga (Spain); **Gualtiero Nunzi Conti,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Alessia Pasquazi,** Loughborough Univ. (United Kingdom); **François Royer,** Univ. Jean Monnet Saint-Etienne (France); **Jens H. Schmid,** National Research Council Canada (Canada); **Yakov Sidorin,** Quarles & Brady LLP (United States); **Winnie N. Ye,** Carleton Univ. (Canada); **Avinoam Zadok,** Bar-Ilan Univ. (Israel)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: DEVICES I

27 January 2025 • 10:45 AM - 12:30 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Pavel Cheben**, National Research Council Canada (Canada)

13369-1 • 10:45 AM - 11:30 AM
Ultrahigh bandwidth signal processing and neuromorphic computing based on integrated Kerr microcombs (Keynote Presentation)
Author(s): **Yang Sun**, **jiayang wu**, **Yang Li,** Swinburne Univ. of Technology (Australia); **xingyuan xu,** bupt (China); **sim tan,** beihang university (China); **roberto morandotti,** INRS (Canada); **arnan mitchell,** rmit (Australia); **David J. Moss,** Swinburne Univ. of Technology (Australia)

13369-2 • 11:30 AM - 12:00 PM
Heterogeneous integration-enabled energy-efficient optical communication and computing *(Invited Paper)*
Author(s): **Di Liang,** Hewlett Packard Enterprise Co. (United States), Univ. of Michigan (United States); **Sudharsanan Srinivasan**, **Geza Kurczveil**, **Bassem Tossoun**, **Yingtao Hu**, **Stanley Cheung**, **Yuan Yuan**, **Antoine Descos**, **Zhihong Huang**, **Marco Fiorentino, Raymond Beausoleil,** Hewlett Packard Enterprise Co. (United States)

13369-3 • 12:00 PM - 12:30 PM
Optimization of photonic devices for integrated and free-space optical systems *(Invited Paper)*
Author(s): **Daniele Melati**, **Zindine Mokeddem**, **Sarra Salhi**, **Jian Cao**, **Sandeep-Yadav Golla**, **Laurent Vivien**, **Carlos Alonso-Ramos**, **Delphine Marris-Morini**, **Eric Cassan,** Ctr. de Nanosciences et de Nanotechnologies (France); **Winnie Ye**, **Shahrzad Khajavi**, **Xiaochen Xin,** Carleton Univ. (Canada); **Pavel Cheben**, **Jens H. Schmid**, **Dan-Xia Xu**, **Yuri Grinberg, Muhammad Al-Digeil,** National Research Council Canada (Canada)

Lunch Break 12:30 PM - 2:00 PM

SESSION 2: INTEGRATED LASERS I

27 January 2025 • 2:00 PM - 3:10 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Andrea Blanco-Redondo**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13369-4 • 2:00 PM - 2:30 PM
Pulsed and CW lasers integrated on glass: technology, applications, and challenges *(Invited Paper)*
Author(s): **Lionel Bastard**, **Julien Poëtte**, **Malik Kemiche, Jean-Emmanuel Broquin,** Grenoble INP (France)

13369-5 • 2:30 PM - 2:50 PM
Large optical gain in Er-doped Gd2O3 single crystal thin films on silicon at cryogenic temperatures
Author(s): **Xuejun Xu**, **Tomohiro Inaba**, **Takuma Aihara,** Nippon Telegraph and Telephone Corp. (Japan); **Atsushi Ishizawa**, **Takehiko Tawara,** Nihon Univ. (Japan); **Haruki Sanada,** Nippon Telegraph and Telephone Corp. (Japan)

13369-7 • 2:50 PM - 3:10 PM
Sputter-deposited neodymium-doped aluminium oxide for waveguide amplifiers in the O-band
Author(s): **Bjorn Jongebloed**, **Carlos Osornio Martínez**, **Kai Wang**, **Meindert Dijkstra, Sonia M. García-Blanco,** Univ. Twente (Netherlands)

Coffee Break 3:10 PM - 3:40 PM

SESSION 3: INTEGRATED LASERS II

27 January 2025 • 3:40 PM - 5:55 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Jean-Emmanuel Broquin**, Univ. Grenoble Alpes (France)

13369-8 • 3:40 PM - 4:25 PM
Advances in quantum dot light sources for silicon photonics and quantum photonics (Keynote Presentation)
Author(s): **Yasuhiko Arakawa,** The Univ. of Tokyo (Japan)

13369-9 • 4:25 PM - 4:55 PM
Integrated lasers and amplifiers on titanium:sapphire-on-insulator *(Invited Paper)*
Author(s): **Jelena Vuckovic,** Stanford Univ. (United States)

13369-10 • 4:55 PM - 5:15 PM
Mode-locked chip-integrated diode lasers in the visible spectral range
Author(s): **Govert Neijts,** Univ. Twente (Netherlands); **Lisa V. Winkler,** Univ. Twente (Netherlands), TOPTICA Photonics AG (Germany); **Hubertus M. J. Bastiaens**, **Melissa J. Goodwin,** Univ. Twente (Netherlands); **Albert van Rees,** Univ. Twente (Netherlands), Chilas B.V. (Netherlands); **Philip P. J. Schrinner**, **Marcel Hoekman**, **Ronald Dekker,** LioniX International BV (Netherlands); **Adriano R. do Nascimento,** PHIX Photonics Assembly (Netherlands); **Peter J. M. van der Slot,** Univ. Twente (Netherlands); **Christian Nölleke,** TOPTICA Photonics AG (Germany); **Klaus-J. Boller,** Univ. Twente (Netherlands)

13369-11 • 5:15 PM - 5:35 PM
High-power and widely tunable laser integrated with a multichannel SOA array on a silicon nitride platform
Author(s): **Fathema Farjana**, **Albert van Rees**, **Sami Musa,** Chilas B.V. (Netherlands); **Liu Jingwei,** China Science Photon Chip (Haining) Technology Co., Ltd. (China); **Dimitri Geskus,** Chilas B.V. (Netherlands)

13369-12 • 5:35 PM - 5:55 PM
Low threshold polymeric integrated optofluidic microlaser
Author(s): **Genni Testa**, **Gianluca Persichetti, Romeo Bernini,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy)

Tuesday 28 January 2025

SESSION 4: INTEGRATED QUANTUM PHOTONICS

28 January 2025 • 8:00 AM - 9:30 AM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Di D. Liang**, Hewlett Packard Enterprise Co. (United States), Univ. of Michigan (United States)

13369-13 • 8:00 AM - 8:20 AM
Integrated focusing grating coupler deep-adjoint-designed for multi-ion manipulation and readout
Author(s): **Melika Momenzadeh**, **David Dang**, **Howard Lee, Maxim Shcherbakov,** Univ. of California, Irvine (United States)

13369-14 • 8:20 AM - 8:40 AM
integrated squeezed light sources for photonic quantum computing
Author(s): **Philipp Lohmann,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany); **Daniel Wendland,** Univ. Münster (Germany); **Francesco Lenzini,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Wolfram Pernice,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany)

13369-15 • 8:40 AM - 9:00 AM
Photonic processor for neutral atom quantum computing
Author(s): **Julian Rasmus Bankwitz**, **Erik Jung**, **Philipp Lohmann**, **Julius Römer**, **Jelle Dijkstra**, **Liam McRae**, **Jan Brandes**, **Akhil Varri**, **Xinyu Ma, Wolfram Pernice,** Ruprecht-Karls-Univ. Heidelberg (Germany)

13369-17 • 9:00 AM - 9:30 AM
A silicon nitride photonic platform integrated with Si detectors for classical and quantum applications *(Invited Paper)*
Author(s): **Mher Ghulinyan,** Fondazione Bruno Kessler (Italy)

Coffee Break 9:30 AM - 9:50 AM

SESSION 5: DEVICES II

28 January 2025 • 9:50 AM - 11:40 AM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Andrea Blanco-Redondo**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13369-18 • 9:50 AM - 10:20 AM
Spectrally stitched nonlinear frequency division multiplexed transmission systems using photonic integrated circuits *(Invited Paper)*
Author(s): **Alvaro Moscoso Martir,** Institut für Integrierte Photonik, RWTH Aachen Univ. (Germany); **Olaf Schulz,** Christian-Albrechts-Univ. zu Kiel (Germany); **Benedikt Gilbert,** Institut für Integrierte Photonik, RWTH Aachen Univ (Germany); **Stephan Pachnicke,** Christian-Albrechts-Univ. zu Kiel (Germany); **Jeremy Witzens,** Institut für Integrierte Photonik, RWTH Aachen Univ. (Germany)

13369-19 • 10:20 AM - 10:40 AM
LNOI based architecture for local buffered photonic computing
Author(s): **Liam McRae,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Frank Brückerhoff-Plückelmann,** Univ. Münster (Germany); **Julius Römer**, **Lennart Meyer**, **Falk Ebert**, **Julian Rasmus Bankwitz**, **Philipp Schultzen**, **Rongyang Xu, Wolfram Pernice,** Ruprecht-Karls-Univ. Heidelberg (Germany)

13369-20 • 10:40 AM - 11:00 AM
Optical signal processing realized: maturing LPO with photonics-integrated all-optical interconnect
Author(s): **Yosef Ben-Ezra,** NewPhotonics (Israel)

13369-21 • 11:00 AM - 11:20 AM
Ultra high speed integrated millimeter wave photonic vertical NAND FLASH with multiple VCSELs
Author(s): **James N. Pan,** Northrop Grumman Corp. (United States)

13369-22 • 11:20 AM - 11:40 AM
Advanced multilevel photonic random-access memory utilizing low-loss GSSe phase-change material
Author(s): **Hao Wang,** Univ. of Florida (United States); **Jiawei Meng,** George Washington Univ. (United States); **Volker J. Sorger,** Univ. of Florida (United States)

Lunch/Exhibition Break 11:40 AM - 12:50 PM

SESSION 6: PHOTONICS INTEGRATION

28 January 2025 • 12:50 PM - 3:10 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Carlos Alonso-Ramos**, Ctr. de Nanosciences et de Nanotechnologies (France)

13369-30 • 12:50 PM - 1:20 PM
Ultrafast laser beam shaping: engineering 3D photonics devices for integration in bulk to fibre glasses *(Invited Paper)*
Author(s): **Peter R. Herman**, **Pok Man Chow**, **Gligor Djogo**, **Stephen Ho**, **Jianzhou Li**, **Yueqi Wang, Polina Zavyalova,** Univ. of Toronto (Canada)

13369-27 • 1:20 PM - 1:50 PM
Silicon nitride integrated photonics: enabling versatile PICs for diverse applications *(Invited Paper)*
Author(s): **Thalia Domínguez Bucio**, **Ilias Skandalos**, **Elliot Sandell,** Univ. of Southampton (United Kingdom); **Marçal Blasco**, **Joaquin Faneca,** Instituto de Microelectrónica de Barcelona (Spain); **Frederic Gardes,** Univ. of Southampton (United Kingdom)

13369-28 • 1:50 PM - 2:20 PM
Optimized thin-film-lithium-niobate photonic devices: enhancing integration and tunability *(Invited Paper)*
Author(s): **Nadège Courjal**, **Aiman Zinaoui**, **Jean-David Fayssaud**, **Lucas Grosjean**, **Miguel Suárez**, **Roland Salut**, **Ludovic Gauthier-Manuel**, **Fadi Baida**, **Maria-Pilar Bernal**, **Mathieu Chauvet,** FEMTO-ST (France); **Antoine Coste,** Exail SAS (France)

13369-29 • 2:20 PM - 2:50 PM
Programmable photonic circuits for signal processing *(Invited Paper)*
Author(s): **Wim Bogaerts**, **Hong Deng**, **Yu Zhang**, **Xiangfeng Chen**, **Lukas Van Iseghem**, **Katta Prodeep Kumar Nagarjun**, **Iman Zand**, **Adam Barzanji**, **Antonio Ribeiro**, **Ferre Vanden Kerchove**, **Umar Khan**, **Hasan Salmanian**, **Jing Zhang**, **Emadreza Soltanian,** Univ. Gent (Belgium), imec (Belgium); **Pierre Edinger**, **August Djuphammer**, **Gaehun Jo**, **Simon J. Bleiker,** KTH Royal Institute of Technology (Sweden); **Arun Kumar Mallik**, **Jun Su Lee**, **Cleitus Antony**, **Denis Kelly**, **Jahid Hasan**, **Padraic Morrissey**, **Peter O'Brien,** Tyndall National Institute (Ireland); **Didier Colle**, **Mario Pickavet,** Univ. Gent (Belgium), imec (Belgium); **Frank Niklaus**, **Kristinn B. Gylfason,** KTH Royal Institute of Technology (Sweden); **Guy Torfs,** Univ. Gent (Belgium), imec (Belgium); **Jeroen Beeckman,** Univ. Gent (Belgium); **Gunther Roelkens,** Univ. Gent (Belgium), imec (Belgium)

13369-31 • 2:50 PM - 3:10 PM
Compact edge coupler with ⪅1dB/facet insertion loss in the C-band
Author(s): **Landobasa Y. M. Tobing**, **Yanmei Cao**, **Chen Lau**, **Amy Sen Kay Tong**, **Steven Hou Jang Lee**, **Yat Fung Tsang**, **Jia Sheng Goh**, **Yeow Teck Toh**, **Xianshu Luo, Nanxi Li,** A*STAR Institute of Microelectronics (Singapore)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: SENSORS AND PLASMONICS

28 January 2025 • 3:40 PM - 6:20 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Ksenia Dolgaleva**, Univ. of Ottawa (Canada)

13369-23 • 3:40 PM - 4:10 PM
Integrated optical phased arrays for AR displays, 3D printing, biophotonics, and beyond *(Invited Paper)*
Author(s): **Jelena Notaros,** Massachusetts Institute of Technology (United States)

13369-24 • 4:10 PM - 4:30 PM
Waveguide system for eye tracking in augmented reality glasses form factor
Author(s): **Jaeyeol Ryu,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Gavril Vostrikov**, **Andrey Malkin**, **Alexey Anikanov,** Samsung Research (Russian Federation); **Stanislav Shtykov,** SAMSUNG Electronics Co., Ltd. (Russian Federation); **Bonkon Koo,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Sanghyun Yi,** SAMSUNG Electronics Co. (Korea, Republic of); **Myongjo Choi**, **Jong Chul Choi**, **Kyusub Kwak, Garam Young,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of)

13369-25 • 4:30 PM - 4:50 PM
Photonic integrated circuit microchip-based optical gyroscopes for high-precision inertial measurement units
Author(s): **Ziad Shukri**, **Hoda Rezaei**, **Mohammadreza Fasihanifard**, **Sina Ghofrani**, **Jonathan Bissonnette**, **Thibaut Gravey**, **Sean Romanuik**, **Ramanand Tewari, Kazem Zandi,** One Silicon Chip Photonics Inc. (Canada)

13369-26 • 4:50 PM - 5:10 PM
Integrated photonic ultrasound transducers for medical imaging
Author(s): **Peter J. Harmsma**, **Maurits S. van der Heiden**, **Robert K. Altmann**, **Anne Maaike Gerritsma,** TNO (Netherlands); **Sabiju Valiya Valappil,** Technische Univ. Delft (Netherlands); **Benoit A. J. Quesson,** TNO (Netherlands); **Mikko Harjanne**, **Srivathsa Bhat**, **Sami Ylinen**, **Yisbel Marin**, **Päivi Heimala,** VTT Technical Research Ctr. of Finland Ltd. (Finland); **Anton Stroganov**, **Andreas Frigg,** Ligentec SA (Switzerland); **Paul van Neer,** TNO (Netherlands)

13369-32 • 5:10 PM - 5:30 PM
Design and optimization of a plasmonic XOR logic gate for dual use applications
Author(s): **Marjan Bazian, Mark C. Harrison,** Chapman Univ. (United States)

13369-33 • 5:30 PM - 5:50 PM
Critical coupling for efficient energy trapping in gold plasmonic chain
Author(s): **Marius Crouzier**, **Fei Mao,** Ctr. de Nanosciences et de Nanotechnologies (France); **Giovanni Magno,** Politecnico di Bari (Italy); **Vy Yam, Béatrice Dagens,** Ctr. de Nanosciences et de Nanotechnologies (France)

13369-105 • 5:50 PM - 6:20 PM
Silicon slot waveguide for detection of methane with 300 ppb detection limit *(Invited Paper)*
Author(s): **Marek Vlk,** UiT The Arctic Univ. of Norway (Norway), Stanford Univ. (United States); **Henock Demessie Yallew**, **Roman A. Zakoldaev**, **Sebastián Alberti**, **Anurup Datta, Jana Jágerská,** UiT The Arctic Univ. of Norway (Norway)

Wednesday 29 January 2025

SESSION 8: MID-IR INTEGRATED PHOTONICS

29 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Avinoam Zadok**, Technion-Israel Institute of Technology (Israel)

13369-35 • 8:00 AM - 8:20 AM
Mid-infrared photonic integrated platform on III-V semiconductors
Author(s): **Luca Lucia**, **Gia Long Ngo**, **Mathilde Urbain**, **Mathieu Jeannin**, **Jean-Michel Manceau**, **Grégoire Beaudoin**, **Isabelle Sagnes,** Ctr. de Nanosciences et de Nanotechnologies (France); **Lianhe Li**, **Edmund Linfield,** Univ. of Leeds (United Kingdom); **Martina Morassi**, **Aristide Lemaître**, **Raffaele Colombelli, Adel Bousseksou,** Ctr. de Nanosciences et de Nanotechnologies (France)

13369-36 • 8:20 AM - 8:40 AM
HyperPIC: on the road to mid-infrared photonic integrated circuits
Author(s): **Ryszard Piramidowicz**, **Stanislaw Stopinski**, **Krzysztof Anders,** VIGO Photonics S.A. (Poland), Warsaw Univ. of Technology (Poland), LightHouse Sp. z o.o. (Poland); **Jaroslaw Jurenczyk**, **Marek Liebert**, **Jacek Olszewski,** VIGO Photonics S.A. (Poland); **Andrzej Polatynski,** Warsaw Univ. of Technology (Poland), VPIphotonics GmbH (Germany); **Marcin Lelit**, **Mateusz Slowikowski**, **Marcin Juchniewicz**, **Piotr Wisniewski,** Warsaw Univ. of Technology (Poland); **Dorota Pierscinska, Kamil Pierscinski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

13369-37 • 8:40 AM - 9:10 AM
Graded index silicon germanium photonics circuits in the mid-infrared *(Invited Paper)*
Author(s): **Delphine Marris-Morini**, **Thi Hao Nhi Nguyen**, **Victor Turpaud**, **Annabelle Bricout**, **Hamza Dely**, **Andres Remis,** Ctr. de Nanosciences et de Nanotechnologies (France); **Jacopo Frigerio**, **Stefano Calcaterra**, **Davide Impelluso,** Politecnico di Milano (Italy); **Jean-Michel Hartmann**, **Julia Krawczyk**, **Gabriel Lima,** CEA-LETI (France); **Jean-René Coudevylle**, **David Bouville**, **Samson Edmond**, **Etienne Herth**, **Nooman El Bouchikhi**, **Javier Huertas Pedroche**, **Carlos Alonso-Ramos**, **Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies (France); **Giovanni Isella,** Politecnico di Milano (Italy)

13369-38 • 9:10 AM - 9:40 AM
Towards reconfigurable photonics in Ge-based platforms for nonlinear mid-infrared broadband sources *(Invited Paper)*
Author(s): **Marko Perestjuk**, **Adam Bieganski,** Ecole Centrale de Lyon (France), RMIT Univ. (Australia); **Remi Armand,** Ecole Centrale de Lyon (France); **Lamine Ferhat,** Institut des Nanotechnologies de Lyon, CNRS (France); **Miguel Campos**, **Alberto Della Torre**, **Capucine Laprais,** Ecole Centrale de Lyon (France); **Vincent Reboud**, **Nicolas Bresson**, **Pierre Brianceau**, **Jean-Michel Hartmann,** Univ. Grenoble Alpes (France), CEA-LETI (France); **Guanghui Ren,** RMIT Univ. (Australia); **Andreas Boes,** The Institute for Photonics and Advanced Sensing, The Univ. of Adelaide (Australia); **Thach Nguyen**, **Arnan Mitchell,** RMIT Univ. (Australia); **Sébastien Cueff,** Institut des Nanotechnologies de Lyon, CNRS (France); **Christelle Monat,** Ecole Centrale de Lyon (France); **Christian Grillet,** Institut des Nanotechnologies de Lyon, CNRS (France), Ecole Centrale de Lyon (France)

13369-39 • 9:40 AM - 10:10 AM
Integrated III-V devices for dual-comb spectroscopy in the mid-IR *(Invited Paper)*
Author(s): **Miguel Montesinos Ballester**, **Lucius Miller**, **Elsa Jöchl**, **Mathieu Bertrand,** ETH Zurich (Switzerland); **Victor Turpaud**, **Delphine Marris-Morini,** Ctr. de Nanosciences et de Nanotechnologies (France); **Emilio Gini**, **Mattias Beck, Jérôme Faist,** ETH Zurich (Switzerland)

Coffee Break 10:10 AM - 10:40 AM

SESSION 9: DEVICES III

29 January 2025 • 10:40 AM - 12:30 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Pierre Berini**, Univ. of Ottawa (Canada)

13369-40 • 10:40 AM - 11:10 AM
Silicon-integrated optical modulators: surpassing the limitations of plasma-dispersion effect *(Invited Paper)*
Author(s): **Jonathan Peltier,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France), Univ. Grenoble Alpes (France); **Clément Ben Braham,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France), Univ. Grenoble Alpes, CEA-LETI, MINATEC (France); **Ali El Boutaybi**, **Christian Lafforgue**, **Daniele Melati**, **Samson Edmond,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Ali Belarouci,** Institut des Nanotechnologies de Lyon, Univ. de Lyon, CNRS (France), Institut National des Sciences Appliquées de Lyon (France); **Eirini Parmenopoulou**, **Eric Cassan**, **Delphine Marris-Morini,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Ausrine Bartasyte,** FEMTO-ST, Univ. de Franche-Comté, CNRS (France); **Weiwei Zhang,** Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); **Guy Aubin**, **Philippe Lecoeur**, **Sylvia Matzen**, **Thomas Maroutian,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Régis Orobtchouk,** Institut National des Sciences Appliquées de Lyon (France), Institut des Nanotechnologies de Lyon, Univ. de Lyon (France); **Callum G. Littlejohns**, **David J. Thomson**, **Graham Reed,** Optoelectronics Research Ctr. (United Kingdom); **Léopold Virot**, **Karim Hassan**, **Yohan Desieres,** Univ. Grenoble Alpes, CEA-LETI, MINATEC (France); **Carlos Alonso-Ramos, Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)

13369-41 • 11:10 AM - 11:30 AM
Counter-propagating spontaneous parametric down-conversion source in lithium niobate on insulator
Author(s): **Jost Kellner**, **Alessandra Sabatti**, **Tristan Kuttner**, **Robert Chapman, Rachel Grange,** ETH Zurich (Switzerland)

13369-42 • 11:30 AM - 11:50 AM
Small footprint integrated optical parametric oscillator with a Fabry-Perot resonator
Author(s): **Alessandra Sabatti**, **Jost Kellner**, **Andreas Maeder, Rachel Grange,** ETH Zurich (Switzerland)

13369-43 • 11:50 AM - 12:10 PM
WI-SNSPD: enabling quantum through scalable and cost effective detector solutions
Author(s): **Chaiyasit Nenbangkaeo, Wladick Hartmann,** Pixel Photonics GmbH (Germany)

13369-44 • 12:10 PM - 12:30 PM
Low-thermal-budget monolithic integration of optical isolators for silicon photonics
Author(s): **Khoi Dao**, **Jorge Marquez Chavez**, **Kensuke Hayashi**, **Qingyang Du**, **JueJun Hu, Caroline A. Ross,** Massachusetts Institute of Technology (United States)

Lunch/Exhibition Break 12:30 PM - 1:30 PM

SESSION 10: METAMATERIALS

29 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Pavel Cheben**, National Research Council Canada (Canada)

13369-45 • 1:30 PM - 2:00 PM
Silicon optomechanical nanostructures *(Invited Paper)*
Author(s): **Carlos Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies (France)

13369-46 • 2:00 PM - 2:30 PM
Inverse design of high-performance photonics devices using anisotropic SWG metamaterials *(Invited Paper)*
Author(s): **José Manuel Luque-González**, **Alejandro Sánchez-Sánchez**, **Carlos Pérez-Armenta**, **Alejandro Sánchez-Postigo**, **Alejandro Ortega-Moñux**, **Laureano Morena-Pozas**, **Diego Pérez-Galacho,** Univ. de Málaga (Spain); **Jens H. Schmid**, **Pavel Cheben,** National Research Council Canada (Canada); **Iñigo Molina-Fernández**, **J. Gonzalo Wangüemert-Pérez, Robert Halir,** Univ. de Málaga (Spain)

13369-47 • 2:30 PM - 3:00 PM
Holographic microcavity modes enabled by metasurfaces *(Invited Paper)*
Author(s): **Marcus Ossiander,** Technische Univ. Graz (Austria), Harvard Univ. (United States); **Sydney Mason,** Harvard Univ. (United States), Stanford Univ. (United States); **Maryna Leonidivna Meretska,** Karlsruher Institut für Technologie (Germany); **Christina Spägele, Federico Capasso,** Harvard Univ. (United States)

13369-48 • 3:00 PM - 3:20 PM
Review on cavity-resonant integrated grating filters
Author(s): **Stéphane Calvez**, **Antoine Rouxel**, **Kumar Kinjalk**, **Antoine Monmayrant,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); **Evgeni Popov,** Institut Fresnel, Aix-Marseille Univ. (France); **Anne-Laure Fehrembach,** Aix Marseille Univ., CNRS, Centrale Marseille, Institut Fresnel (France); **Olivier Gauthier-Lafaye,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France)

Coffee Break 3:20 PM - 3:50 PM

SESSION 11: NOVEL MATERIALS

29 January 2025 • 3:50 PM - 6:10 PM | Moscone South, Room 307 (Level 3)
Session Chair(s): **Bjorn Jongebloed**, Univ. Twente (Netherlands)

13369-49 • 3:50 PM - 4:10 PM
On the influence of the buffer layer on the optical quality of AlN-on-sapphire epilayers for photonic integrated devices
Author(s): **Samuele Brunetta**, **Samantha Sbarra**, **Jean-François Carlin**, **Nicolas Grandjean**, **Camille-Sophie Brès, Raphaël Butté,** EPFL (Switzerland)

13369-50 • 4:10 PM - 4:30 PM
CMOS-compatible Al2O3 low loss waveguides for ultraviolet photonics integrated circuits
Author(s): **Erfan Mafakheri**, **Zeinab Jafari**, **Gaudhaman Jeevanandam**, **Pieter Neutens**, **Nga Pham,** imec (Belgium); **Chupao Lin,** Univ. Gent (Belgium), Ctr. for Nano- and Biophotonics, Univ. Gent (Belgium), imec (Belgium); **Tangla D. Kongnyuy,** imec (Belgium); **Shiqi Fan**, **Xiujun Zheng**, **Nicolas Le Thomas,** Univ. Gent (Belgium), Ctr. for Nano- and Biophotonics, Univ. Gent (Belgium), imec (Belgium); **Philippe Helin**, **Pol Van Dorpe**, **Roelof Jansen**, **Christian Haffner, Stijn Jooken,** imec (Belgium)

13369-51 • 4:30 PM - 4:50 PM
MMI-type RGB coupler with 100-mW blue light input using ZrO2-doped silica-based planar lightwave circuit
Author(s): **Junji Sakamoto**, **Yuji Fujiwara**, **Satomi Katayose, Toshikazu Hashimoto,** NTT Device Technology Labs. (Japan)

13369-52 • 4:50 PM - 5:10 PM
Porous gallium nitride as novel material for integrated photonics
Author(s): **Stefanie Kroker**, **Jyoti Bej**, **Matthias Hoormann**, **Frederik Lüßmann**, **Florian Meierhofer,** Technische Univ. Braunschweig (Germany); **Karla Paz**, **Carsten Ronning,** Friedrich-Schiller-Univ. Jena (Germany); **Anastasiia Sorokina, Andreas Waag,** Technische Univ. Braunschweig (Germany)

13369-55 • 5:10 PM - 5:30 PM
3D integration of YSO crystal on ion-exchanged glass waveguides for optical quantum memories
Author(s): **Malik Kemiche**, **Antonin Patricio-Gomes,** Univ. Grenoble Alpes (France); **Thierry Chanelière,** CNRS (France); **Jean-Emmanuel Broquin,** Univ. Grenoble Alpes (France)

13369-53 • 5:30 PM - 5:50 PM
Thermal phase modulation of ultraviolet light in aluminium oxide waveguides
Author(s): **Bjorn Jongebloed**, **Jitse Boonstra**, **Ward Hendriks**, **Meindert Dijkstra, Sonia M. García-Blanco,** Univ. Twente (Netherlands)

13369-54 • 5:50 PM - 6:10 PM
Optical properties of scandium-doped aluminum nitride thin film for integrated photonics
Author(s): **Nanxi Li,** A*STAR Institute of Microelectronics (Singapore); **Yangyang Zhuge,** A*STAR Institute of Microelectronics (Singapore), Department of Electrical and Computer Engineering, National University of Singapore (Singapore); **Wing Wai Chung,** A*STAR Institute of Microelectronics (Singapore); **Xiangxin Gong,** A*STAR Institute of Microelectronics (Singapore), School of Electrical and Electronic Engineering, Nanyang Technological University (Singapore); **Siyu Xu,** A*STAR Institute of Microelectronics (Singapore), Department of Electrical and Computer Engineering (Singapore); **Yanmei Cao**, **Minghua Li**, **Yat Fung Tsang**, **Yeow Teck Toh**, **Steven Hou Jang Lee**, **Huamao Lin,** A*STAR Institute of Microelectronics (Singapore); **Landobasa Y M Tobing,** A*STAR Institute of Microelectronics (Singapore), National Semiconductor Translation and Innovation Centre (NSTIC) (Singapore); **Chong Pei Ho,** A*STAR Institute of Microelectronics (Singapore); **Sang Hoon Chae,** School of Electrical and Electronic Engineering (Singapore), School of Materials Science and Engineering, Nanyang Technological University (Singapore); **Xianshu Luo,** A*STAR Institute of Microelectronics (Singapore); **Chengkuo Lee,** Department of Electrical and Computer Engineering (Singapore)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13369-56 • 6:00 PM - 8:00 PM
Analysis of measurement for electro-optic coefficient based on transmission ellipsometric method
Author(s): **Yasufumi Enami,** Nagasaki Univ. (Japan)

13369-57 • 6:00 PM - 8:00 PM
OFDR of a 1050 nm photonic integrated circuit
Author(s): **Bart C. Johnson,** Excelitas Technologies Corp. (United States); **Taran Huffman**, **Ajay Srinivasan**, **Thien-An Nguyen**, **Tina Trimble,** ORCA Computing (United States); **Peter Whitney,** Excelitas Technologies Corp. (United States)

13369-58 • 6:00 PM - 8:00 PM
Accurate alignment system for photonic-based biosensor cartridges
Author(s): **Roy de Kinkelder**, **Gerald Ebberink**, **Victor Sluiter,** Saxion Univ. of Applied Sciences (Netherlands); **Lantian Chang,** Univ. Twente (Netherlands); **Cas Damen,** Saxion Univ. of Applied Sciences (Netherlands)

13369-60 • 6:00 PM - 8:00 PM
Reconfigurable microwave photonic demultiplexer filter based on integrated coupled ring resonators for flexible and broadband satellite payloads
Author(s): **Charoula Mitsolidou**, **Roelof Bernardus Timens**, **Carlos Alfredo Ruiz Pineda**, **Marcel Hoekman**, **Rick Heuvink**, **Paul Kapteijn,** LioniX International BV (Netherlands); **Alberto Zarzuelo**, **Guillermo Carpintero,** Univ. Carlos III de Madrid (Spain); **Alicia Lopez,** SENER Aeroespacial S.A. (Spain); **Paulus W. L. Van Dijk, Chris G. H. Roeloffzen,** LioniX International BV (Netherlands)

13369-62 • 6:00 PM - 8:00 PM
3D integrated optics enabled by inverse design and two-photon polymerization
Author(s): **Abhishek Nanda,** Hannoversches Zentrum für Optische Technologien (Germany), Leibniz Univ. Hannover (Germany); **Alexandra Rittmeier**, **Moritz Hinkelmann,** Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany); **Michael Kues, Antonio Calà Lesina,** Leibniz Univ. Hannover (Germany)

13369-63 • 6:00 PM - 8:00 PM
Optical torsion deformation monitoring with TIR prism rods for application in higly stressed machine elements
Author(s): **Ulf Lennart Wüllner,** Leibniz Univ. Hannover (Germany); **Lennart Mesecke,** Institute of Product Development, Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD, Leibniz University Hannover (Germany); **Zhuoqun Dai**, **Tobias Biermann, Roland Lachmayer,** Leibniz Univ. Hannover (Germany)

13369-64 • 6:00 PM - 8:00 PM
Toward disposable photonic biosensors for early lung cancer detection
Author(s): **Mohammad Talebi Khoshmehr**, **Mahdi M. Mozdoor Dashtabi,** Vrije Univ. Amsterdam (Netherlands); **Hamed Nikbakht,** Rapid Photonics (Netherlands); **Ton Blaazer**, **Rogier Brand**, **Jeroen Kool, B. Imran Akca,** Vrije Univ. Amsterdam (Netherlands)

13369-66 • 6:00 PM - 8:00 PM
High-performance photon-pair source using a two-photon polymerized strip-loaded lithium niobate waveguide
Author(s): **Muhamed A. Sewidan,** Institut für Photonik, Leibniz Univ. Hannover (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Alexandra Rittmeier,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Laura Bollmers,** Integrated Quantum Optics Group, Department of Physics, Paderborn University (Germany), Institute for Photonic Quantum Systems, Paderborn University (Germany); **Elisavet Chatzizyrli,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Laura Padberg,** Integrated Quantum Optics Group (Germany); **Christof Eigner,** Integrated Quantum Optics Group, Department of Physics, Paderborn University (Germany), Institute for Photonic Quantum Systems (Germany); **Christine Silberhorn,** Integrated Quantum Optics Group (Germany); **Douglas Bremner,** ALTER TECHNOLOGY TÜV NORD UK Ltd. (United Kingdom); **Moritz Hinkelmann**, **Andreas Wienke**, **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Michael Kues,** Institut für Photonik, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

13369-67 • 6:00 PM - 8:00 PM
Cascaded DOEs for optical information encryption
Author(s): **Yanqiu Li**, **Lei Zheng,** Leibniz Univ. Hannover (Germany); **Reinhard Caspary,** Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Bernhard Roth,** Leibniz Univ. Hannover (Germany)

13369-68 • 6:00 PM - 8:00 PM
Design and fabrication of optical super-resolving diffractive elements
Author(s): **Markus E. Testorf,** Dartmouth College (United States); **Praneeth Gadamsetti,** The Univ. of North Carolina at Charlotte (United States); **Paolo Batoni,** NuSpot Technologies LLC (United States); **Menelaos K. Poutous,** The Univ. of North Carolina at Charlotte (United States)

13369-70 • 6:00 PM - 8:00 PM
MZI-based sensor for liquid recognition on the SiO_2/TiO_2 platform
Author(s): **Andrzej Polatynski,** VPIphotonics GmbH (Germany), Warsaw Univ. of Technology (Poland); **Andrzej Kazmierczak,** Warsaw Univ. of Technology (Poland); **Stanislaw Stopinski,** Warsaw Univ. of Technology (Poland), VIGO Photonics S.A. (Poland), Lighthouse Sp. z o.o. (Poland); **Mateusz Slowikowski**, **Piotr Wisniewski**, **Marcin Juchniewicz,** Warsaw Univ. of Technology (Poland); **Ryszard Piramidowicz,** Warsaw Univ. of Technology (Poland), VIGO Photonics S.A. (Poland), Lighthouse Sp. z o.o. (Poland); **André Richter,** VPIphotonics GmbH (Germany)

13369-71 • 6:00 PM - 8:00 PM
Widely tunable hybrid external cavity laser around 1700 nm with sub-kHz linewidth
Author(s): **Fathema Farjana**, **Albert van Rees, Dimitri Geskus,** Chilas B.V. (Netherlands)

13369-72 • 6:00 PM - 8:00 PM
Design of grating coupler with large and flat illumination farfield profile for FMCW flash LIDAR
Author(s): **Paul Camus**, **Desire Muhire**, **Anis Daami,** CEA-LETI (France); **Eric Lacot,** Univ. Grenoble Alpes (France); **Laurent Frey,** CEA-LETI (France)

13369-73 • 6:00 PM - 8:00 PM **(CANCELLED)**
Dot product operator for photonic and edge computing applications
Author(s): **Kanat Temirbek**, **Nazym Alipbayeva**, **Galymzhan Bakhtiyarov,** Nazarbayev Univ. (Kazakhstan); **Bikash Nakarmi,** Nanjing Univ. of Aeronautics and Astronautics (China); **Ikechi Augustine Ukaegbu,** Saint Louis Univ. (United States); **Carlo Molardi,** Nazarbayev Univ. (Kazakhstan)

13369-74 • 6:00 PM - 8:00 PM
A compactly integrated bidirectional optical true-time delay network for radio frequency beam steering
Author(s): **Xuebing Zhang**, **Ruud Oldenbeuving,** imec (Netherlands); **Ton Koonen,** Technische Univ. Eindhoven (Netherlands)

13369-76 • 6:00 PM - 8:00 PM
Exceptional points in integrated mode-converting multi-mode Fabry Pérot resonators
Author(s): **Janice Jizhe**, **Jinsheng Lu,** Harvard Univ. (United States); **Vincent Ginis,** Vrije Univ. Brussel (Belgium); **Federico Capasso,** Harvard Univ. (United States)

13369-79 • 6:00 PM - 8:00 PM
Development of 3D-printed microlenses at the edge of waveguides of flow cytometry and optical coherence tomography photonic integrated circuits
Author(s): **Adamantia Maria Grammatikaki**, **Lefteris Gounaridis**, **Dimitris Gounaridis,** National Technical Univ. of Athens (Greece); **Karol Obara,** PHIX Photonics Assembly (Netherlands); **Arnoud Everhardt,** LioniX International BV (Netherlands); **Adam Raptakis,** National Technical Univ. of Athens (Greece); **Ton van Leeuwen**, **Edwin van der Pol,** Amsterdam UMC (Netherlands); **Hercules Avramopoulos, Christos Kouloumentas,** National Technical Univ. of Athens (Greece)

13369-80 • 6:00 PM - 8:00 PM
Interaction between spherical dielectric particles and surface integrated waveguides: a semi-analytical complex angle approach
Author(s): **Mathilde Gardies**, **Malik Kemiche**, **Davide Bucci, Elise Ghibaudo,** CROMA (France)

13369-81 • 6:00 PM - 8:00 PM
Integrated micro-ring resonator-based Bragg grating for gas sensing applications
Author(s): **Maira Khafagy**, **Merna Khafagy**, **Sarah Shafaay**, **Mohamed Swillam, Seif Swillam,** The American Univ. in Cairo (Egypt)

13369-82 • 6:00 PM - 8:00 PM
A 2×2 electro-optical switch in thin-film lithium niobate foundry process
Author(s): **Alberto Della Torre**, **Homa Zarebidaki**, **Arno Mettraux**, **Jacopo Leo**, **Florian Dubois**, **Dorian Herle**, **Ivan Prieto**, **Yves Pétremand**, **Olivier Dubochet**, **Michel Despont, Hamed Sattari,** CSEM SA (Switzerland)

13369-83 • 6:00 PM - 8:00 PM
Automatic active alignment of substrate-free thin-film filters on a photonic platform using single photon detectors
Author(s): **Philipp Gehrke**, **Anna K. Rüsseler**, **Jonas Matthes,** Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany); **Laura Fütterer,** Institut für Transport- und Automatisierungstechnik, Leibniz Univ. Hannover (Germany); **Eva Raffalt,** Institut für Mikroproduktionstechnik, Leibniz Univ. Hannover (Germany); **Axel Günther,** Hannoversches Zentrum für Optische Technologien (Germany), Leibniz Univ. Hannover (Germany); **Robert Johanning,** Institut für Photonik, Leibniz Univ. Hannover (Germany); **Gerd A. Hoffmann**, **Andreas Wienke**, **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany); **Michael Kues,** Institut für Photonik, Leibniz Univ. Hannover (Germany)

13369-84 • 6:00 PM - 8:00 PM
Experimental verification of selective refractive index sensor using single micro-ring resonator
Author(s): **Raghi S. El Shamy,** McMaster Univ. (Canada); **Mohamed Swillam,** The American Univ. in Cairo (Egypt); **Xun Li,** McMaster Univ. (Canada); **Thomas J. Mikhail,** The American Univ. in Cairo (Egypt)

13369-85 • 6:00 PM - 8:00 PM
Low loss waveguides in standardized thin-film lithium niobate platform
Author(s): **Arno Mettraux**, **Alberto Della Torre**, **Jacopo Leo**, **Fatemeh Arefi**, **Homa Zarebidaki**, **Gregory Choong**, **Mattia Orvietani**, **Yves Pétremand**, **Ivan Prieto**, **Olivier Dubochet**, **Michel Despont, Hamed Sattari,** CSEM SA (Switzerland)

13369-86 • 6:00 PM - 8:00 PM
Design and analysis of optofluidic metasurface for glucose detection
Author(s): **Amira Shafaay**, **Abdelrahman Ghanim**, **Mohamed Swillam, Mustafa M. El-Boghdady,** The American Univ. in Cairo (Egypt)

13369-87 • 6:00 PM - 8:00 PM
Wave optics simulation of surface roughness for integrated photonics fabricated through multiphoton lithography
Author(s): **Elisavet Chatzizyrli**, **Alexandra Rittmeier,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Sophie Böse,** Laser Zentrum Hannover e.V. (Germany); **Jörg Neumann,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany), Institut Für Photonik, Leibniz Univ. Hannover (Germany); **Moritz Hinkelmann,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

13369-88 • 6:00 PM - 8:00 PM
Multiphoton lithography of strip-loaded thin-film lithium niobate waveguides
Author(s): **Alexandra Rittmeier**, **Elisavet Chatzizyrli**, **Philipp Gehrke,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Muhamed A. Sewidan,** Institut für Photonik, Leibniz Univ. Hannover (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Martin Braun,** Laser Zentrum Hannover e.V. (Germany); **Angeliki Afentaki**, **Gerd A. Hoffmann**, **Jörg Neumann**, **Andreas Wienke,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany); **Dietmar Kracht,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany), Institut für Photonik, Leibniz Univ. Hannover (Germany); **Michael Kues,** Institut für Photonik, Leibniz Univ. Hannover (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany); **Moritz Hinkelmann,** Laser Zentrum Hannover e.V. (Germany), Exzellenzcluster PhoenixD, Leibniz Univ. Hannover (Germany)

13369-89 • 6:00 PM - 8:00 PM
Broad spectrum integrated optics for scalable quantum computing
Author(s): **Sia Andersson**, **Dong Xiao**, **Brynmor E. Jones**, **Isabel Scott,** Fraunhofer Ctr. for Applied Photonics (United Kingdom); **Artur Hermans**, **Chris J. Lewins,** Oxford Ionics Ltd. (United Kingdom); **Loyd J. McKnight,** Fraunhofer Ctr. for Applied Photonics (United Kingdom)

13369-90 • 6:00 PM - 8:00 PM
High-quality diamond nanobeam resonators for quantum registers
Author(s): **Mark Ulanov,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany); **Lin Jin,** Heidelberg Univ. (Germany), Univ. Münster (Germany); **Wolfram H. P. Pernice,** Ruprecht-Karls-Univ. Heidelberg (Germany)

13369-91 • 6:00 PM - 8:00 PM
Vacuum-enhanced reconfiguration of femtosecond laser written universal photonic processors
Author(s): **Niki Di Giano,** Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Ciro Pentangelo**, **Marco Gardina**, **Valerio Galli**, **Vittorio Grimaldi,** Ephos, Inc. (United States); **Antonino Caime,** Politecnico di Milano (Italy); **Giacomo Corrielli**, **Francesco Ceccarelli, Roberto Osellame,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy), Ephos, Inc. (United States)

13369-93 • 6:00 PM - 8:00 PM
Ultra-low loss dispersion-engineered silicon nitride waveguides on 300 mm wafers
Author(s): **Erin Kim,** Air Force Research Lab. (United States), Carnegie Mellon Univ. (United States); **Lewis Carpenter,** Univ. at Albany (United States); **Amos M. Smith**, **Christopher C. Tison,** Air Force Research Lab. (United States); **Daniel Coleman**, **Gerald Leake,** Univ. at Albany (United States); **Michael Fanto,** Air Force Research Lab. (United States); **Anthony J. Rizzo,** Air Force Research Lab. (United States), Dartmouth College (United States)

13369-94 • 6:00 PM - 8:00 PM
High-speed quantum key distribution system
Author(s): **Julius Römer**, **Erik Jung**, **Linus Kürpick**, **Filip Imielowski**, **Simon Thamm,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany); **Wolfram Pernice,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany), Physikalisches Institut, Univ. Münster (Germany)

13369-95 • 6:00 PM - 8:00 PM
Out-of-plane phase change memory cell switching for optical computing
Author(s): **Lennart Meyer**, **Erik Jung,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany); **Dominik Ditz,** Kirchhoff-Institut für Physik (Germany); **Wolfram Pernice,** Kirchhoff-Institut für Physik, Ruprecht-Karls-Univ. Heidelberg (Germany)

13369-96 • 6:00 PM - 8:00 PM
Demonstration of an integrated polarization controller based on standard foundry components
Author(s): **Hiva Shahoei**, **Duncan MacFarlane**, **Mason Tuller**, **Mitchell Thornton,** Southern Methodist Univ. (United States); **Evan Stewart, William Oxford,** Anametric, Inc. (United States)

13369-97 • 6:00 PM - 8:00 PM
Passive waveguides and multimode interferometers on InP platform for LWIR free-space optical communications at 9 µm
Author(s): **Salvatore Pes,** III-V Lab. (France); **Thomas Poletti**, **Nour Nawfal,** III-V Lab. (France), Télécom Paris (France); **Nicolas Fessard**, **Claire Theveneau,** III-V Lab. (France); **Djamal Gacemi,** Lab. de Physique de l'Ecole Normale Supérieure (France); **Michel Garcia**, **Olivier Parillaud**, **Jean-Luc Reverchon,** III-V Lab. (France); **Carlo Sirtori,** Lab. de Physique de l'Ecole Normale Supérieure (France)

13369-98 • 6:00 PM - 8:00 PM
Barium Titanate: an emerging ferroelectric material for efficient electro-optic modulation
Author(s): **M. Ifaz Ahmad Isti**, **Xiaofeng Zhu**, **Marco Moller de Freital,** Univ. of Delaware (United States); **Peng Yao,** Phase Sensitive Innovations, Inc. (United States); **Shouyuan Shi,** Phase Sensitive Innovations, Inc. (United States), Univ. of Delaware (United States); **M. Jobayer Hossain**, **Timothy Creazzo,** Phase Sensitive Innovations, Inc. (United States); **Dennis Prather,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States)

13369-99 • 6:00 PM - 8:00 PM
Broadband silicon nitride systems for photonic chip-based optical coherence tomography at 1060nm and 800nm
Author(s): **Aaron J. Adkins**, **Senyue Hao**, **Jiawei Meng**, **Weiyan Zhou**, **Mutian Shen, Chao Zhou,** Washington Univ. in St. Louis (United States)

13369-100 • 6:00 PM - 8:00 PM
Design and modelling of integrated photonic devices for sensing and switching applications
Author(s): **Wridheeman Bhattacharya**, **Rajib Ghosh**, **Umang Chaturvedi**, **Merbin John, Anuj Dhawan,** Indian Institute of Technology Delhi (India)

13369-101 • 6:00 PM - 8:00 PM
3D photonic integrated interposer enabling connectivity between multicore fibers and photonic integrated circuits
Author(s): **Madeleine Weigel**, **Martin Kresse**, **Crispin Zawadzki**, **Philipp Winklhofer**, **Lea Flach**, **Klara Mihov**, **Jakob Reck**, **David de Felipe**, **Tianwen Qian**, **Moritz Kleinert**, **Norbert Keil, Martin Schell,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

13369-102 • 6:00 PM - 8:00 PM
Ultrabroadband integrated photonic filters on thin-film lithium niobate
Author(s): **Pooja Kulkarni**, **Parash Thapalia, Sasan Fathpour,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13369-104 • 6:00 PM - 8:00 PM
Development of silicon nitride phase shifted Bragg grating cantilever for AFM-IR
Author(s): **Savda Sam,** Munster Technological University (Ireland), Technische Universität Wien (Austria), Tyndall National Institute (Ireland); **Yide Zhang,** Technische Universität Wien (Austria); **Artem Vorobev,** Munster Technological Univ. (Ireland), Tyndall National Institute (Ireland); **Diego Foglini,** Munster Technological Univ. (Ireland); **Maria Kotlyar,** Cork Institute of Technology (Ireland), Tyndall National Institute (Ireland); **Simone Iadanza,** Munster Technological Univ. (Ireland); **Chinna Devarapu,** Cork Institute of Technology (Ireland); **Georg Ramer**, **Bernhard Lendl,** Technische Univ. Wien (Austria); **Liam O'Faolain,** Munster Technological Univ. (Ireland), Tyndall National Institute (Ireland)

CONFERENCE 13370

Smart Photonic and Optoelectronic Integrated Circuits 2025

27 - 29 January 2025 | Moscone South, Room 305 (Level 3)

Conference Chair(s): **Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies (France); **Sailing He,** Zhejiang Univ. (China), KTH Royal Institute of Technology (Sweden)

Program Committee: **Pavel Cheben,** National Research Council Canada (Canada); **Hugo Enrique Hernandez-Figueroa,** Univ. of Campinas (Brazil); **Chennupati Jagadish,** The Australian National Univ. (Australia); **Bart Kuyken,** Univ. Gent (Belgium); **Stefan A. Maier,** Monash Univ. (Australia); **Ashok Maliakal,** Acacia Communications, Inc. (United States); **Daniele Melati,** Ctr. de Nanosciences et de Nanotechnologies (France); **Lorenzo Pavesi,** Univ. degli Studi di Trento (Italy); **Bertrand Szelag,** CEA-LETI (France); **Alan X. Wang,** Baylor Univ. (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: LIDAR AND SENSORS

27 January 2025 • 10:45 AM - 12:25 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Laurent Vivien**, Ctr. de Nanosciences et de Nanotechnologies (France)

13370-17 • 10:45 AM - 11:15 AM
Recent developments in optical phased arrays for LiDAR applications *(Invited Paper)*
Author(s): **Sylvain Guerber**, **Daivid Fowler**, **Léopold Virot**, **Olivier Castany**, **Jonathan Faugier-Tovar**, **Warren Kut King Kan**, **Bertrand Szelag**, **Karim Hassan**, **Kim Abdoul-Carime**, **Vincent Moulin**, **Bertrand Dupont**, **Vincent Berg**, **Frederic Sermet**, **Jean Hue**, **Antoine Hamelin**, **Gwenael Le Rhun**, **Christel Dieppedale**, **Laurent Mollard**, **Nadia Miloud-Ali**, **Natacha Raphoz**, **Yacoub Sahouane**, **Damien Saint-Patrice**, **Thierry Mourier,** CEA-LETI (France); **Cyrille Barrera**, **Jerome Meilhan**, **François Simoens,** Steerlight (France); **Louise-Eugénie Bataille**, **Frederic Boeuf,** STMicroelectronics S.A. (France); **Michel Krakowski,** III-V Lab. (France)

13370-18 • 11:15 AM - 11:35 AM
Ultracompact high-reflectivity on-chip reflectors with wideband operation and fabrication feasibility
Author(s): **Joel Sved**, **Xiaoyi Tian**, **Yeming Chen**, **Liwei Li, Xiaoke Yi,** The Univ. of Sydney (Australia)

13370-19 • 11:35 AM - 11:55 AM
Subwavelength gratings micro-resonator for gas sensing applications
Author(s): **Abdelrahman Nasser**, **Seif Swillam**, **Omar Hagras**, **Raghi S. El Shamy, Mohamed A. Swillam,** The American Univ. in Cairo

(Egypt)

13370-20 • 11:55 AM - 12:25 PM
Smart sensing with photonic deep learning *(Invited Paper)*
Author(s): **Zaijun Chen,** The Univ. of Southern California (United States)

Lunch Break 12:25 PM - 1:35 PM

SESSION 2: SILICON CARBIDE (SIC) PHOTONICS I

27 January 2025 • 1:35 PM - 3:05 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Bertrand Szelag**, CEA-LETI (France)

13370-5 • 1:35 PM - 2:05 PM
Integrated quantum photonics in 3C-SiCOI platforms *(Invited Paper)*
Author(s): **Andrew W. Poon**, **Qianni Zhang, Jiantao Wang,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

13370-6 • 2:05 PM - 2:35 PM
Photonic integrated circuits based on cubic silicon carbide *(Invited Paper)*
Author(s): **Xiaoke Yi,** The Univ. of Sydney (Australia); **Marko Loncar,** Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States)

13370-7 • 2:35 PM - 3:05 PM
Low temperature, and high-quality silicon carbide photonics for hybrid photonic integration *(Invited Paper)*
Author(s): **Bruno Lopez Rodriguez**, **Zizheng Li**, **Naresh Sharma**, **Roald van der Kolk**, **Jasper van der Boom**, **Hugo Voncken**, **Thomas Scholte**, **Simon Groeblacher**, **Dmytro Kolenov, Iman Esmaeil Zadeh,** Technische Univ. Delft (Netherlands)

Coffee Break 3:05 PM - 3:35 PM

SESSION 3: METAMATERIALS, METASURFACE, AND METASTRUCTURES

27 January 2025 • 3:35 PM - 6:15 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Daniele Melati**, Ctr. de Nanosciences et de Nanotechnologies (France)

13370-8 • 3:35 PM - 4:15 PM
Recent progress in metamaterial integrated photonics (Keynote Presentation)
Author(s): **Pavel Cheben,** National Research Council Canada (Canada)

13370-9 • 4:15 PM - 4:45 PM
Advancements in low-loss silicon nitride surface grating couplers *(Invited Paper)*
Author(s): **Radovan Korcek,** Univ. of Žilina (Slovakia); **William Fraser,** Carleton Univ. (Canada); **David M. Quiroz**, **Samson Edmond,** Univ. Paris-Saclay (France); **Quentin Wilmart,** Univ. Grenoble Alpes (France); **Thalia Dominguez-Bucio,** Univ. of Southampton (United Kingdom); **Pavel Cheben**, **Jens H. Schmid,** National Research Council Canada (Canada); **Carlos Alonso-Ramos**, **Laurent Vivien,** Univ. Paris-Saclay (France); **Winnie N. Ye,** Carleton Univ. (Canada); **Daniel Benedikovic,** Univ. of Žilina (Slovakia)

13370-10 • 4:45 PM - 5:15 PM
Active organic and inorganic electrically switched metasurfaces *(Invited Paper)*
Author(s): **Harald Giessen,** Univ. Stuttgart (Germany)

13370-11 • 5:15 PM - 5:45 PM
Inverse design for integrated optics and meta-waveguides *(Invited Paper)*
Author(s): **Antonio Calà Lesina,** Leibniz Univ. Hannover (Germany)

13370-12 • 5:45 PM - 6:15 PM
Permittivity-driven photonic bound states in the continuum *(Invited Paper)*
Author(s): **Andreas Tittl,** Ludwig-Maximilians-Univ. München (Germany)

Tuesday 28 January 2025

SESSION 4: PHOTONIC RELIABILITY: JOINT SESSION WITH CONFERENCES 13370 AND 13371

28 January 2025 • 8:15 AM - 10:15 AM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Ashok Maliakal**, Acacia Communications, Inc. (United States)

13370-13 • 8:15 AM - 8:45 AM
Do's and don'ts for SiPho heater qualification *(Invited Paper)*
Author(s): **Kristof Croes**, **YouQi Ding**, **Olalla Varela Pedreira**, **David Coenen**, **Artemisia Tsiara**, **Philippe Roussel**, **Ahmed Saleh**, **Melina Lofrano**, **Houman Zahedmanesh,** imec (Belgium); **Tony Chavez**, **Hosain Farr,** Qualitau, Inc. (United States); **Ingrid De Wolf,** imec (Belgium)

13370-14 • 8:45 AM - 9:15 AM
Understanding gradual degradation due to dislocations in GaAs based lasers *(Invited Paper)*
Author(s): **Kunal Mukherjee,** Stanford Univ. (United States)

13370-15 • 9:15 AM - 9:45 AM
The impact of semiconductor laser reliability on silicon-photonic-based systems and paths for future improvement *(Invited Paper)*
Author(s): **Robert W. Herrick,** Robert Herrick Consulting (United States)

13370-16 • 9:45 AM - 10:15 AM
Reliability qualification of integrated laser sources for silicon photonics *(Invited Paper)*
Author(s): **K. John Thomson**, **Angelo Miele, Farnood Khalilzadeh-Rezaie,** Cisco Systems, Inc. (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 5: HYBRID PHOTONICS DEVICES AND CIRCUITS

28 January 2025 • 10:45 AM - 12:25 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Sylvain Guerber**, CEA-LETI (France)

13370-1 • 10:45 AM - 11:15 AM
InP-based high-speed transceivers for silicon photonics *(Invited Paper)*
Author(s): **Joan Manel Ramirez**, **Amin Souleiman,** III-V Lab. (France), Nokia Mobile Networks (France); **Delphine Néel,** III-V Lab. (France); **Nicolas Vaissière**, **Simon Girardot,** III-V Lab. (France), Nokia Mobile Networks (France); **Claire Besancon,** III-V Lab. (France); **Stéphane Malhouitre**, **Karim Hassan,** CEA-LETI (France); **Jean Decobert,** III-V Lab. (France); **Kamel Merghem,** Télécom SudParis (France)

13370-2 • 11:15 AM - 11:35 AM
SWIR InP-on-silicon tunable laser based on micro-transfer printing
Author(s): **Xin Guo**, **Emadreza Soltanian**, **Jing Zhang,** imec, Univ. Gent (Belgium); **Nicolas Vaissière**, **Delphine Néel**, **Joan Manel Ramirez**, **Jean Decobert,** III-V Lab. (France); **Sarah Uvin, Gunther Roelkens,** imec, Univ. Gent (Belgium)

13370-3 • 11:35 AM - 11:55 AM
Fourier-domain mode-locked lasers on a hybrid-integrated silicon photonic chip
Author(s): **Ching Chi Kwan, Andrew W. Poon,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

13370-4 • 11:55 AM - 12:25 PM
Nanomaterial integrated Micro-LEDs for full-color display and visible light communication applications *(Invited Paper)*
Author(s): **Wengang Bi,** The Chinese Univ. of Hong Kong, Shenzhen (China)

Lunch/Exhibition Break 12:25 PM - 1:55 PM

SESSION 6: INTEGRATED NONLINEAR OPTICAL DEVICES AND STRUCTURES I

28 January 2025 • 1:55 PM - 3:25 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Joan Manel Ramirez**, Nokia Bell Labs. (France)

13370-21 • 1:55 PM - 2:35 PM
Applications of epsilon-near-zero materials in photonics (Keynote Presentation)
Author(s): **Robert W. Boyd,** Univ. of Ottawa (Canada)

13370-22 • 2:35 PM - 3:05 PM
Overview of the most promising nonlinear photonics platforms at the telecom C-band *(Invited Paper)*
Author(s): **Ksenia Dolgaleva**, **Lais Fujii dos Santos**, **Gabriel Flizikowski**, **Ozan Oner**, **Athulya Thulaseedharan,** Univ. of Ottawa (Canada); **Robert W. Boyd,** Univ. of Rochester (United States), Univ. of Ottawa (Canada); **Surendar Vijayakumar,** Univ. of Rochester (United States); **Daniel H. G. Espinosa, Kaustubh Vyas,** Univ. of Ottawa (Canada)

13370-23 • 3:05 PM - 3:25 PM
High-Q AlGaAs-on-insulator microresonators for spontaneous parametric down-conversion
Author(s): **Bo Xue Tan**, **Jiantao Wang, Andrew W. Poon,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

Coffee Break 3:25 PM - 3:55 PM

SESSION 7: INTEGRATED DEVICES AND CIRCUITS FROM DESIGN TO FABRICATION

28 January 2025 • 3:55 PM - 5:35 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Wengang Bi**, The Chinese Univ. of Hong Kong, Shenzhen (China)

13370-24 • 3:55 PM - 4:15 PM
Low-loss photonic junction design for multi-die PICs
Author(s): **Yatiraj Ramanujam, Di Liang,** Univ. of Michigan (United States)

13370-25 • 4:15 PM - 4:35 PM
Interfacing a laser-written programmable photonic integrated circuit with a silicon SPAD array
Author(s): **Giulio Gualandi,** Politecnico di Milano (Italy); **Simone Atzeni**, **Marco Gardina,** Consiglio Nazionale delle Ricerche (Italy); **Antonino Caime,** Politecnico di Milano (Italy); **Giacomo Corrielli,** Consiglio Nazionale delle Ricerche (Italy); **Ivan Labanca**, **Angelo Gulinatti,** Politecnico di Milano (Italy); **Roberto Osellame,** Consiglio Nazionale delle Ricerche (Italy); **Giulia Acconcia,** Politecnico di Milano (Italy); **Francesco Ceccarelli,** Consiglio Nazionale delle Ricerche (Italy)

13370-26 • 4:35 PM - 4:55 PM
Simulation platform and model library for MIRPIC: a new photonic integration platform for the mid-IR spectral range
Author(s): **Andrzej Polatynski,** VPIphotonics GmbH (Germany), Warsaw Univ. of Technology (Poland); **Marcin Lelit**, **Aleksandra Paśnikowska**, **Aleksandra Bieniek-Kaczorek**, **Paweł Bortnowski**, **Łukasz Kozłowski,** Warsaw Univ. of Technology (Poland); **Krzysztof Anders**, **Stanisław Stopiński,** Warsaw Univ. of Technology (Poland), VIGO Photonics S.A. (Poland), Lighthouse Sp. z o.o. (Poland); **Piotr Wiśniewski**, **Mateusz Słowikowski**, **Marcin Juchniewicz,** Warsaw Univ. of Technology (Poland); **Dorota Pierścińska**, **Kamil Pierściński,** Lukasiewicz Research Network (Poland); **André Richter,** VPIphotonics GmbH (Germany); **Ryszard Piramidowicz,** Warsaw Univ. of Technology (Poland), VIGO Photonics S.A. (Poland), Lighthouse Sp. z o.o. (Poland)

13370-27 • 4:55 PM - 5:15 PM
Accurate EO co-simulation of Si photonics using a standard electronic circuit simulator
Author(s): **Keisuke Kawahara, Toshihiko Baba,** Yokohama National Univ. (Japan)

13370-29 • 5:15 PM - 5:35 PM
Empowering super-resolution microscopy via engineered microscope slide for on chip patterned excitation
Author(s): **Anna Pecorari,** Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Francesco Ceccarelli,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Alessia Candeo**, **Andrea Bassi,** Politecnico di Milano (Italy); **Roberto Osellame**, **Francesca Bragheri,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Petra Paiè,** Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy)

Wednesday 29 January 2025

SESSION 8: INTEGRATED NONLINEAR OPTICAL DEVICES AND STRUCTURES II

29 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Ksenia Dolgaleva**, Univ. of Ottawa (Canada)

13370-30 • 8:30 AM - 9:10 AM
New directions for high-Q integrated photonics (Keynote Presentation)
Author(s): **Kerry J. Vahala,** Caltech (United States)

13370-31 • 9:10 AM - 9:30 AM
Towards fully integrated frequency comb based transceivers
Author(s): **Baptiste Routier,** CEA-LETI (France), Institut des Nanotechnologies de Lyon (France); **Nicolas Dunoyer**, **Jonathan Faugier-Tovar**, **Philippe Grosse,** CEA-LETI (France); **Rémi Armand,** Institut des Nanotechnologies de Lyon (France); **Sylvain Guerber**, **Stéphane Brision,** CEA-LETI (France); **Christian Grillet,** Institut des Nanotechnologies de Lyon (France); **Léopold Virot**, **Quentin Wilmart,** CEA-LETI (France); **Christelle Monat,** Institut des Nanotechnologies de Lyon (France)

13370-32 • 9:30 AM - 9:50 AM
Numerical simulations on the simultaneous generation of even- and odd-mode double-frequency-spaced optical combs by dual-polarization in-phase/quadrature electro-optic modulator
Author(s): **Shun Harada**, **Tatsuki Ishijima, Takahide Sakamoto,** Tokyo Metropolitan Univ. (Japan)

13370-33 • 9:50 AM - 10:20 AM
Broadband intermodal four-wave mixing in a fully integrated Si-rich silicon nitride wavelength converter *(Invited Paper)*
Author(s): **Periklis Petropoulos,** Univ. of Southampton (United Kingdom); **Valerio Vitali,** Univ. degli Studi di Pavia (Italy); **Thalia Dominguez-Bucio**, **Hao Liu**, **Kyle Bottrill,** Univ. of Southampton (United Kingdom); **Jose Manuel Luque Gonzalez**, **Alejandro Ortega-Monux,** Univ. de Málaga (Spain); **Glenn Churchill**, **James C. Gates,** Univ. of Southampton (United Kingdom); **James Hillier**, **Nikolaos Kalfagiannis,** Nottingham Trent Univ. (United Kingdom); **Daniele Melati,** Univ. Paris-Saclay (France); **Jens H. Schmid,** National Research Council Canada (Canada); **Ilaria Cristiani,** Univ. degli Studi di Pavia (Italy); **Pavel Cheben,** National Research Council Canada (Canada); **J. Gonzalo Wanguemert-Perez**, **Inigo Molina-Fernandez,** Univ. de Málaga (Spain); **Cosimo Lacava,** Univ. degli Studi di Pavia (Italy); **Frederic Gardes,** Univ. of Southampton (United Kingdom)

Coffee Break 10:20 AM - 10:50 AM

SESSION 9: OPTICAL LIGHT SOURCES AND AMPLIFIERS

29 January 2025 • 10:50 AM - 12:30 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Joan Manel Ramirez**, Nokia Bell Labs. (France)

13370-35 • 10:50 AM - 11:20 AM
Hybrid monolithic silicon photonic waveguides for on-chip light sources *(Invited Paper)*
Author(s): **Jonathan Bradley**, **Batoul Hashemi**, **Pooya Torab Ahmadi**, **Niloofar Majidian Taleghani**, **Manuel A. Méndez-Rosales**, **Purviben Shukla**, **Stefanie Markevich**, **Bruno Luis L. Segat Frare**, **Cameron M. Naraine**, **Hamidu M. Mbonde**, **Evan Jonker**, **Parimal Edke**, **Dawson Bonneville**, **Khadijeh Miarabbas Kiani**, **Henry C. Frankis**, **Renjie Wang**, **Jeremy W. Miller**, **Chenglin Zhang,** McMaster Univ. (Canada); **Neetesh Singh**, **Milan Sinobad**, **Thibault Wildi,** Ctr. for Free Electron Laser Science, Deutsches Elektronen-Synchrotron (Germany), Univ. Hamburg (Germany); **Yvan Klaver**, **Roel Botter**, **Randy te Morsche**, **Kaixuan Ye**, **Akhileshwar Mishra**, **Redlef Braamhaar,** Univ. Twente (Netherlands); **Jocelyn N. Westwood-Bachman**, **Cameron Horvath**, **Nandini Debnath**, **Kevin Setzer**, **Alexandria McKinlay**, **Mirwais Aktary,** Applied NanoTools Inc. (Canada); **Michael Chesaux**, **Jacek Wojcik**, **Dino Deligiannis,** Intlvac Thin Film (Canada); **David Marpaung,** Univ. Twente (Netherlands); **Tobias Herr**, **Franz X. Kärtner,** Ctr. for Free Electron Laser Science, Deutsches Elektronen-Synchrotron (Germany), Univ. Hamburg (Germany); **Jens H. Schmid,** National Research Council Canada (Canada); **Pavel Cheben,** National Research Council Canada (Canada), Univ. of Ottawa (Canada); **Ponnambalam Ravi Selvaganapathy**, **Peter Mascher, Andrew P. Knights,** McMaster Univ. (Canada)

13370-36 • 11:20 AM - 11:40 AM
Emission enhancement in carbon nanotubes within a nanobeam cavity
Author(s): **Zijun Xiao,** Ctr. de Nanosciences et de Nanotechnologies (France); **Jianhao Zhang,** National Research Council Canada (Canada); **Weiwei Zhang,** Univ. of Southampton (United Kingdom); **Eric Cassan,** Univ. Paris-Saclay (France); **Daniele Melati,** Ctr. de Nanosciences et de Nanotechnologies (France); **Delphine Marris-Morini,** Univ. Paris-Saclay (France); **Carlos Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies (France); **Nicolas Dubreuil,** Institut d'Optique Graduate School (France); **Arianna Filoramo,** CEA (France); **Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies (France)

13370-28 • 11:40 AM - 12:00 PM
High-quality 6-inch engineered InP-on-GaAs substrates for low-cost optoelectronic device fabrication
Author(s): **Carmine Pellegrino**, **David Lackner**, **Jens Ohlmann**, **Henning Helmers, Frank Dimroth,** Fraunhofer-Institut für Solare Energiesysteme ISE (Germany)

13370-34 • 12:00 PM - 12:30 PM
Non-classical optical sources in laser diodes *(Invited Paper)*
Author(s): **Zacharie M. Léger,** Univ. of Toronto (United States); **Zhizhong Yan, Amr S. Helmy,** Univ. of Toronto (Canada)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 10: SILICON CARBIDE (SIC) PHOTONICS II

29 January 2025 • 2:00 PM - 3:20 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Bertrand Szelag**, CEA-LETI (France)

13370-37 • 2:00 PM - 2:30 PM
How SiC quantum photonics can help us explore new Hamiltonians in cavity QED *(Invited Paper)*
Author(s): **Daniil Lukin,** Stanford Univ. (United States)

13370-38 • 2:30 PM - 3:00 PM
Hybrid SiC-LiNbO3 platform for active integrated photonics *(Invited Paper)*
Author(s): **Rakesh Krishna**, **Zhongdi Peng**, **Ashkan Zandi**, **Hamed Abiri**, **Tianren Fan**, **Xi Wu, Ali Adibi,** Georgia Institute of Technology (United States)

13370-39 • 3:00 PM - 3:20 PM
Highly-efficient fiber-to-chip edge coupler for silicon carbide photonic integrated circuits
Author(s): **Shijie Song,** The Univ. of Sydney (Australia); **Romain Demur,** Thales Research & Technology (France); **Liwei Li**, **Robert Minasian, Xiaoke Yi,** The Univ. of Sydney (Australia)

Coffee Break 3:20 PM - 3:50 PM

SESSION 11: COMPUTING AND NEUROMORPHIC

29 January 2025 • 3:50 PM - 5:40 PM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Periklis Petropoulos**, Optoelectronics Research Ctr. (United Kingdom)

13370-40 • 3:50 PM - 4:20 PM
Photonic computing with thin-film lithium niobate *(Invited Paper)*
Author(s): **Bhavin J. Shastri,** Queen's Univ. (Canada)

13370-41 • 4:20 PM - 4:40 PM
External-feedback-coupled microring lasers on a III-V-on-Si photonic chip for reservoir computing
Author(s): **Yue Niu, Andrew W. Poon,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

13370-43 • 4:40 PM - 5:00 PM
Non-volatile logic operations using phase change materials in silicon photonics
Author(s): **Rajib Ghosh**, **Wridheeman Bhattacharya**, **Umang Chaturvedi**, **Merbin John, Anuj Dhawan,** Indian Institute of Technology Delhi (India)

13370-44 • 5:00 PM - 5:20 PM
A new era of sub-1nm microwave photonics nano-wireless ultra large scale integration (Nano Wireless ULSI): very low power and superior performance advantages for millimeter wave photonics computing
Author(s): **James N. Pan,** Northrop Grumman Corp. (United States), American Enterprise and License Co. (United States)

13370-45 • 5:20 PM - 5:40 PM
Scalable in-memory compute optical processor
Author(s): **Sugeet Sunder,** The Univ. of Southern California (United States); **Md. Abdullah-Al Kaiser,** Univ. of Wisconsin-Madison (United States); **Sasindu Wijeratne**, **Clynn Mathew**, **Viktor Prasanna,** The Univ. of Southern California (United States); **Akhilesh Jaiswal,** Univ. of Wisconsin-Madison (United States); **Ajey Jacob,** The Univ. of Southern California (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13370-46 • 6:00 PM - 8:00 PM
Effects of input optical power in lateral Ge-on-Si waveguide photodetectors: a 3D multiphysics modeling study
Author(s): **Matteo G. Alasio**, **Giuseppe Divincenzo**, **Marco Vallone,** Politecnico di Torino (Italy); **Francesco Bertazzi,** Politecnico di Torino (Italy), Consiglio Nazionale delle Ricerche (Italy); **Mariangela Gioannini,** Politecnico di Torino (Italy); **Michele Goano,** Politecnico di Torino (Italy), Consiglio Nazionale delle Ricerche (Italy)

13370-47 • 6:00 PM - 8:00 PM
On-chip spectrometer using 2D MMI based on machine learning of the speckle pattern
Author(s): **Passant Hesham**, **Abdelrahman Nasser**, **Thomas J. Mikhail, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13370-48 • 6:00 PM - 8:00 PM
Optical gas sensor using subwavelength grating loop-terminated Mach-Zender interferometer
Author(s): **Abdelrahman Nasser**, **Raghi S. El Shamy**, **Mohamed A. Swillam, Seif Swillam,** The American Univ. in Cairo (Egypt)

13370-49 • 6:00 PM - 8:00 PM
Optoelectronic in-sensor computing based on PD-RRAM array
Author(s): **Wen Pan,** Tsinghua Univ. (China); **Zhibiao Hao**, **Changzheng Sun**, **Xiong Bing**, **Jian Wang**, **Yanjun Han**, **Hongtao Li**, **Lin Gan**, **Yi Luo, Lai Wang,** Tsinghua University (China)

13370-50 • 6:00 PM - 8:00 PM
Mira: event-based imaging in the SWIR band
Author(s): **Michael Richardson,** Quantum Imaging, Inc. (United States)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13370-42
Enhanced reservoir computing for robust optical network monitoring: a case study on modulation format identification
Author(s): **Mahdi Kaveh,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Guillermo von Hünefeld,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Berlin (Germany); **Enes Seker,** AMO GmbH (Germany), RWTH Aachen Univ. (Germany); **Joseph Hopfmüller,** ID Photonics GmbH (Germany); **Pooyan Safari,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Rijil Thomas,** AMO GmbH (Germany); **Mahtab Aghaeipour,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Stephan Suckow,** AMO GmbH (Germany); **Max Lemme,** RWTH Aachen Univ. (Germany); **Colja Schubert,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **David Stahl,** ID Photonics GmbH (Germany); **Johannes K. Fischer,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Ronald Freund,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany), Technische Univ. Berlin (Germany)

CONFERENCE 13371

Silicon Photonics XX

28 - 30 January 2025 | Moscone South, Room 306 (Session 1 Room 305)

Conference Chair(s): **Graham T. Reed,** Optoelectronics Research Ctr. (United Kingdom); **Jonathan Bradley,** McMaster Univ. (Canada)

Program Committee: **Andrew P. Knights,** McMaster Univ. (Canada); **Delphine Marris-Morini,** Ctr. de Nanosciences et de Nanotechnologies (France); **Goran Z. Mashanovich,** Univ. of Southampton (United Kingdom); **Jurgen Michel,** Massachusetts Institute of Technology (United States); **Liam O'Faolain,** Munster Technological Univ. (Ireland); **Jason Ching Eng Png,** A*STAR Institute of High Performance Computing (Singapore); **Andrew W. Poon,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Haisheng Rong,** Intel Corp. (United States); **Bhavin J. Shastri,** Queen's Univ. (Canada); **Dries Van Thourhout,** Univ. Gent (Belgium); **Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies (France); **Jeremy Witzens,** RWTH Aachen Univ. (Germany); **Winnie N. Ye,** Carleton Univ. (Canada); **Shui-Qing Yu,** Univ. of Arkansas (United States); **Zhiping Zhou,** Peking Univ. (China); **Aaron J. Zilkie,** Texas Instruments Inc. (United States)

Tuesday 28 January 2025

SESSION 1: PHOTONIC RELIABILITY: JOINT SESSION WITH CONFERENCES 13370 AND 13371

28 January 2025 • 8:15 AM - 10:15 AM | Moscone South, Room 305 (Level 3)
Session Chair(s): **Ashok Maliakal**, Acacia Communications, Inc. (United States)

13370-13 • 8:15 AM - 8:45 AM
Do's and don'ts for SiPho heater qualification *(Invited Paper)*
Author(s): **Kristof Croes**, **YouQi Ding**, **Olalla Varela Pedreira**, **David Coenen**, **Artemisia Tsiara**, **Philippe Roussel**, **Ahmed Saleh**, **Melina Lofrano**, **Houman Zahedmanesh,** imec (Belgium); **Tony Chavez**, **Hosain Farr,** Qualitau, Inc. (United States); **Ingrid De Wolf,** imec (Belgium)

13370-14 • 8:45 AM - 9:15 AM
Understanding gradual degradation due to dislocations in GaAs based lasers *(Invited Paper)*
Author(s): **Kunal Mukherjee,** Stanford Univ. (United States)

13370-15 • 9:15 AM - 9:45 AM
The impact of semiconductor laser reliability on silicon-photonic-based systems and paths for future improvement *(Invited Paper)*
Author(s): **Robert W. Herrick,** Robert Herrick Consulting (United States)

13370-16 • 9:45 AM - 10:15 AM
Reliability qualification of integrated laser sources for silicon photonics *(Invited Paper)*
Author(s): **K. John Thomson**, **Angelo Miele, Farnood Khalilzadeh-Rezaie,** Cisco Systems, Inc. (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 2: WAVEGUIDE DEVICES AND APPLICATIONS I

28 January 2025 • 10:45 AM - 12:15 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Graham T. Reed**, Optoelectronics Research Ctr. (United Kingdom)

13371-1 • 10:45 AM - 11:05 AM
Waveguide escalator on ultra-low-loss thick-SOI platform: towards monolithic integration of active devices
Author(s): **Arijit Bera**, **Jaswant Rathore**, **Somnath Paul**, **Mikko T. Harjanne**, **Päivi Heimala**, **Timo Aalto, Markku Kapulainen,** VTT Technical Research Ctr. of Finland Ltd. (Finland)

13371-2 • 11:05 AM - 11:25 AM
Silicon photonic Bragg Grating Filter developed in a generic foundry process
Author(s): **Chase Stine**, **Braden Wieand**, **Timothy Creazzo**, **Kamran Shayan**, **Christian Wood, Dennis Prather,** Phase Sensitive Innovations, Inc. (United States)

13371-3 • 11:25 AM - 11:55 AM

Mid-infrared frequency comb generation for sensing applications *(Invited Paper)*
Author(s): **Delphine Marris-Morini**, **Victor Turpaud**, **Thi Hao Nhi Nguyen**, **Annabelle Bricout**, **Hamza Dely**, **Andres Remis,** Ctr. de Nanosciences et de Nanotechnologies (France); **Jacopo Frigerio**, **Stefano Calcaterra**, **Davide Impelluso,** Politecnico di Milano (Italy); **Jean-René Coudevylle**, **David Bouville**, **Samson Edmond**, **Etienne Herth**, **Nooman El Bouchikhi**, **Javier Huertas Pedroche**, **Carlos Alonso-Ramos**, **Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies (France); **Giovanni Isella,** Politecnico di Milano (Italy)

13371-4 • 11:55 AM - 12:15 PM
High throughput testing of Si photonics components using OFDR
Author(s): **Shota Nawa**, **Mikiya Kamata, Toshihiko Baba,** Yokohama National Univ. (Japan)

Lunch/Exhibition Break 12:15 PM - 1:45 PM

SESSION 3: ACTIVE INTEGRATION I

28 January 2025 • 1:45 PM - 3:15 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Delphine Marris-Morini**, Ctr. de Nanosciences et de Nanotechnologies (France)

13371-5 • 1:45 PM - 2:15 PM
Engineering atomic ordering towards high-performance SiGeSn mid-infrared integrated photonic devices *(Invited Paper)*
Author(s): **Jifeng Liu**, **Shang Liu**, **Xiaoxin Wang,** Thayer School of Engineering at Dartmouth (United States); **Xiaochen Jin**, **Shunda Chen**, **Tianshu Li,** The George Washington Univ. (United States); **Yunfan Liang**, **Damien West**, **Shengbai Zhang,** Rensselaer Polytechnic Institute (United States); **Lilian Vogl**, **Andrew Minor,** Univ. of California, Berkeley (United States); **Haochen Zhao**, **Yuping Zeng,** Univ. of Delaware (United States); **Anis Attiaoui**, **J. Zachary Lentz**, **Paul McIntyre,** Stanford Univ. (United States); **Tyler McCarthy**, **Yong-Hang Zhang,** Arizona State Univ. (United States); **Nirosh M. Eldose**, **Gregory Salamo, Shui-Qing Yu,** Univ. of Arkansas (United States)

13371-6 • 2:15 PM - 2:35 PM
Widely tunable external cavity lasers based on the 3 µm-thick silicon-on-insulator platform for operation in the C and L bands in the DYNAMOS EU project
Author(s): **Katherine Bryant**, **Mikko T. Harjanne,** VTT Technical Research Ctr. of Finland Ltd. (Finland); **Antonin Gallet,** Huawei Technologies France (France); **Sheherazade Lamkadmi,** Huawei Technologies (France); **Hélène Debrégeas,** Almae Technologies (France); **Timo Aalto,** VTT Technical Research Ctr. of Finland Ltd. (Finland)

13371-7 • 2:35 PM - 2:55 PM
Reliability of III-V/Si heterogeneously integrated lasers
Author(s): **Felipe Vallini**, **Karthik Narayanan**, **Christopher Helms**, **Wendai Wang**, **George A. Ghiurcan**, **Pierre Doussiere**, **Richard Jones**, **Isako Hoshino**, **Quan A. Tran, Kishore Kamath,** Intel Corp. (United States)

13371-8 • 2:55 PM - 3:15 PM
Photonics for Space: Radiation Testing of Silicon Photonic Modulator via International Space Station Flight
Author(s):

Coffee Break 3:15 PM - 3:45 PM

SESSION 4: OPTICAL COMPUTING AND VOLUME MANUFACTURING

28 January 2025 • 3:45 PM - 5:35 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Daniel Benedikovic**, Univ. of Žilina (Slovakia)

13371-9 • 3:45 PM - 4:15 PM
Recent progress in high speed silicon optical modulators *(Invited Paper)*
Author(s): **David J. Thomson**, **Weiwei Zhang**, **Ke Li**, **Tzu-Yun Chang**, **Yifu Chen**, **April Logan**, **Martin Ebert**, **Bigeng Chen**, **Shenghao Liu**, **Wei Cao**, **Fanfan Meng**, **Xingzhao Yan**, **Mehdi Banakar**, **Xia Chen**, **Xingshi Yu**, **Ravindra Singh Pokharia**, **Bharat Pant**, **Callum G. Littlejohns, Graham T. Reed,** Optoelectronics Research Ctr. (United Kingdom)

13371-10 • 4:15 PM - 4:35 PM
Programmable coupled optical ring resonator filter
Author(s): **Kamran Shayan**, **Timothy Creazzo,** Phase Sensitive Innovations, Inc. (United States); **Benjamin M. Mazur,** Massachusetts Institute of Technology (United States); **Braden Wieand**, **Christian Wood**, **Chase Stine,** Phase Sensitive Innovations, Inc. (United States); **Dennis Prather,** Phase Sensitive Innovations, Inc. (United States), Univ. of Delaware (United States)

13371-11 • 4:35 PM - 4:55 PM
Machine learning enabled prediction of meta-atom robustness to fabrication error
Author(s): **Elissa Klopfer**, **Ighor Idehenre**, **Deanna Sessions**, **Micheal J. Carter**, **Philip R. Buskohl, Eric S. Harper,** Air Force Research Lab. (United States)

13371-12 • 4:55 PM - 5:15 PM
Measuring the birefringence and diattenuation of silicon waveguides using optical test points
Author(s): **Icel Z. Sukovaty,** Lockheed Martin Corp. (United States); **Tyler V. Howard, Thomas G. Brown,** Univ. of Rochester (United States)

13371-13 • 5:15 PM - 5:35 PM
High-speed DACs and ADCs for multi-channel silicon photonic accelerators
Author(s): **Salem Altaleb**, **Belal Jahannia**, **Hangbo Yang**, **Nicola Peserico**, **Volker J. Sorger, Hamed Dalir,** Univ. of Florida (United States)

Wednesday 29 January 2025

SESSION 5: WAVEGUIDE DEVICES AND APPLICATIONS II

29 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Carlos Alonso-Ramos**, Ctr. de Nanosciences et de Nanotechnologies (France)

13371-14 • 8:30 AM - 9:00 AM
Metamaterial-engineered fiber-chip couplers in silicon and silicon nitride waveguides *(Invited Paper)*
Author(s): **Daniel Benedikovic,** Univ. of Žilina (Slovakia); **William Fraser,** Carleton Univ. (Canada); **Radovan Korcek,** Univ. of Žilina (Slovakia); **Sarra Salhi,** Ctr. de Nanosciences et de Nanotechnologies (France); **Xiaochen Xin,** Carleton Univ. (Canada); **David Medina,** Ctr. de Nanosciences et de Nanotechnologies (France); **Ján Litvik**, **Ivan Glesk,** Univ. of Žilina (Slovakia); **Thalia Domínguez Bucio**, **Frederic Y. Gardes,** Univ. of Southampton (United Kingdom); **Adam Petrovic**, **Viktoria Pikulikova**, **Matej Sajban,** Univ. of Žilina (Slovakia); **Quentin Wilmart,** CEA-LETI (France); **Samson Edmond,** Ctr. de Nanosciences et de Nanotechnologies (France); **Pavel Cheben**, **Jens H. Schmid,** National Research Council Canada (Canada); **Daniele Melati**, **Laurent Vivien**, **Carlos Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies (France); **Winnie Ye,** Carleton Univ. (Canada)

13371-15 • 9:00 AM - 9:20 AM
Enhanced silicon photonic switch fabrics with variation-aware optimized Mach-Zehnder interferometers
Author(s): **Zahra Ghanaatian**, **Amin Shafiee, Mahdi Nikdast,** Colorado State Univ. (United States)

13371-16 • 9:20 AM - 9:40 AM **(CANCELLED)**
Optimized photon routing with a silicon 3 × 3 waveguide coupler device
Author(s): **Salamat Ali**, **Stefano Biasi**, **Riccardo Franchi**, **Bulent Aslan, Lorenzo Pavesi,** Univ. degli Studi di Trento (Italy)

13371-17 • 9:40 AM - 10:00 AM
Phase behaviors of several types of MMI couplers and their application to flatband CWDM demultiplexers
Author(s): **Seok-Hwan Jeong,** The Univ. of Suwon (Korea, Republic of); **Heuk Park, Joon Ki Lee,** Electronics and Telecommunications Research Institute (Korea, Republic of)

13371-18 • 10:00 AM - 10:20 AM
High efficiency silicon photonics grating coupler compatible to standard foundry service
Author(s): **Naoki Tahara**, **Shota Nawa**, **Rikuto Taira**, **Saneyuki Suyama**, **Keisuke Hirotani**, **Mikiya Kamata,** Yokohama National Univ. (Japan); **Yuriko Maegami**, **Tai Tsuchizawa**, **Noritsugu Yamamoto**, **Koji Yamada,** National Institute of Advanced Industrial Science and Technology (Japan); **Toshihiko Baba,** Yokohama National Univ. (Japan)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: QUANTUM AND NONLINEAR PHOTONICS

29 January 2025 • 10:50 AM - 12:20 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Thalia Domínguez Bucio**, Univ. of Southampton (United Kingdom)

13371-19 • 10:50 AM - 11:20 AM
Harnessing optical nonlinearities with silicon nanostructures *(Invited Paper)*
Author(s): **Carlos Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies (France)

13371-20 • 11:20 AM - 11:40 AM
Optical phased arrays for rubidium cold atom trapping with photonic integrated circuits
Author(s): **Jeremi Januszewicz**, **Eugenio Di Gaetano**, **Zack McConkey**, **Martin Sinclair,** Univ. of Glasgow (United Kingdom); **Sean Dyer**, **James McGilligan**, **Paul F. Griffin**, **Erling Riis,** Univ. of Strathclyde (United Kingdom); **Marc Sorel**, **Douglas J. Paul, Kevin Gallacher,** Univ. of Glasgow (United Kingdom)

13371-21 • 11:40 AM - 12:00 PM
Monolithic integration of aluminum nitride in a 300 mm silicon photonic process: QFLEX
Author(s): **Lewis G. Carpenter,** AIM Photonics (United States); **Anthony J. Rizzo,** Air Force Research Lab. (United States); **Tuan Vo**, **Matthew Smalley**, **Jayson Briscoe,** AIM Photonics (United States); **Eric Thornton,** Rochester Institute of Technology (United States); **Amos M. Smith,** Air Force Research Lab. - Rome (United States); **Christopher C. Tison,** Air Force Research Lab. (United States); **Amit Dikshit**, **Jin Wallner**, **M. Rakib Uddin**, **Anthony Aiello**, **Javery Mann**, **Daniel Coleman**, **Christopher Baiocco**, **David L. Harame,** AIM Photonics (United States); **Stefan Preble,** Rochester Institute of Technology (United States); **Michael L. Fanto,** Air Force Research Lab. (United States); **Gerald Leake,** AIM Photonics (United States)

13371-22 • 12:00 PM - 12:20 PM
Visible-wavelength quantum photonics in a 4H silicon carbide platform
Author(s): **Qianni Zhang, Andrew W. Poon,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 7: INTEGRATED DETECTORS AND SENSORS

29 January 2025 • 1:50 PM - 3:20 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Graham T. Reed**, Optoelectronics Research Ctr. (United Kingdom)

13371-23 • 1:50 PM - 2:20 PM
Monolithically grown germanium-tin infrared avalanche photodiodes on silicon *(Invited Paper)*
Author(s): **Rajesh Kumar**, **Justin Rudie**, **Sylvester Amoah,** Univ. of Arkansas (United States); **Xiaoxin Wang,** Thayer School of Engineering at Dartmouth (United States); **Grey Abernathy,** Arktonics, LLC (United States); **Steven Akwabli,** Univ. of Arkansas (United States); **Perry C. Grant,** Arktonics, LLC (United States); **Jifeng Liu,** Thayer School of Engineering at Dartmouth (United States); **Baohua Li,** Arktonics, LLC (United States); **Wei Du, Shui-Qing Yu,** Univ. of Arkansas (United States)

13371-24 • 2:20 PM - 2:40 PM
Development of high-performance short-wave infrared Ge-on-Si linear mode avalanche photodiodes
Author(s): **Mrudul Modak**, **Xin Yi**, **Lisa Saalbach,** Heriot-Watt Univ. (United Kingdom); **Muhammad M.A. Mirza,** Univ. of Glasgow (United Kingdom); **Xiao Jin,** The Univ. of Sheffield (United Kingdom); **Fiona Fleming,** Heriot-Watt Univ. (United Kingdom); **Jarosław Kirdoda**, **Derek C. S. Dumas,** Univ. of Glasgow (United Kingdom); **Qingyu Tian,** The Univ. of Sheffield (United Kingdom); **David A. S. Muir,** Heriot-Watt Univ. (United Kingdom); **Charlie K. Smith**, **Douglas J. Paul,** Univ. of Glasgow (United Kingdom); **John P. R. David,** The Univ. of Sheffield (United Kingdom); **Ross W. Millar,** Univ. of Glasgow (United Kingdom); **Gerald S. Buller,** Heriot-Watt Univ. (United Kingdom)

13371-25 • 2:40 PM - 3:00 PM
UV to NIR detection with p+n-type PureB Ge-on-Si photodiodes fabricated on lightly-doped n-type Si substrates
Author(s): **Vinayak Vishwanath Hassan**, **Asma Attariabad,** Univ. Twente (Netherlands); **Tihomir Knežević,** Ruder Boškovic Institute (Croatia); **Lis Nanver,** Univ. Twente (Netherlands)

13371-26 • 3:00 PM - 3:20 PM
Leveraging a SiPh Mid-IR platform for integrated thermal source and detector to measure CO2 and CH4 levels, AEOLUS
Author(s): **Charalampos Zervos**, **Georgios Syriopoulos**, **Evrydiki Kyriazi**, **Thenia Prousalidi,** National Technical Univ. of Athens (Greece); **Pen-Sheng Lin**, **Frank Niklaus**, **Kristinn B. Gylfason,** KTH Royal Institute of Technology (Sweden); **Nour Negm**, **Shayan Parhizkar,** AMO GmbH (Germany), RWTH Aachen Univ. (Germany); **Floria Ottonello Briano**, **Stephan Schroeder,** Senseair AB (Sweden); **Stephan Suckow,** AMO GmbH (Germany); **Max C. Lemme,** RWTH Aachen Univ. (Germany), AMO GmbH (Sweden); **Giannis Poulopoulos**, **Dimitrios Apostolopoulos, Hercules Avramopoulos,** National Technical Univ. of Athens (Greece)

Coffee Break 3:20 PM - 3:50 PM

SESSION 8: ACTIVE INTEGRATION II

29 January 2025 • 3:50 PM - 5:30 PM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Jonathan Bradley**, McMaster Univ. (Canada)

13371-27 • 3:50 PM - 4:20 PM
III-V heteroepitaxy on the Si platform via ultrathin SiGe buffer layers *(Invited Paper)*
Author(s): **Ryan B. Lewis,** McMaster Univ. (Canada)

13371-52 • 4:20 PM - 4:50 PM
Development of SiGeSn for low-cost eSWIR/MWIR sensing *(Invited Paper)*
Author(s): **Bruce B. Claflin,** Air Force Research Lab. (United States); **Gordon Grzybowski,** KBRwyle (United States)

13371-28 • 4:50 PM - 5:10 PM
Heterogeneous integration of O-band GaAs QD-on-SiN Fabry-Pérot laser with observed mode-locking
Author(s): **Dongbo Wang**, **Thi Ngoc Lam Tran**, **Stijn Poelman**, **Tom Reep**, **Jing Zhang**, **Günther Roelkens, Bart Kuyken,** Univ. Gent (Belgium)

13371-29 • 5:10 PM - 5:30 PM
Design and integration of hybrid IIIV/Si mid-infrared laser sources and photonic circuits for chemical sensing applications
Author(s): **Maxime LePage**, **Toufiq Bria**, **Mattéo Chobé**, **Vincent Mathieu**, **Jérémy Da Fonseca**, **Tristan Faure**, **Christophe Jany**, **Jean-Michel Hartmann,** CEA-LETI (France); **Christian Seassal,** Ecole Centrale de Lyon (France); **Badhise Ben Bakir,** CEA-LETI (France)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13371-36 • 6:00 PM - 8:00 PM
Study of microring nonlinearities in silicon photonics for neuromorphic computing
Author(s): **Salvatore Salpietro**, **Marco Novarese, Mariangela Gioannini,** Politecnico di Torino (Italy)

13371-37 • 6:00 PM - 8:00 PM
Design enablement in emerging areas in 300 mm silicon photonics technologies: quantum and sensors
Author(s): **Amit Dikshit**, **Jin Wallner**, **M. Rakib Uddin**, **Javery Mann**, **Anthony Aiello**, **Lewis G. Carpenter**, **Alin Antohe**, **Gerald Leake**, **Colin McDonough**, **Yukta Timalsina,** AIM Photonics (United States); **Nathan F. Tyndall**, **Marcel W. Pruessner**, **Todd H. Stievater,** U.S. Naval Research Lab. (United States); **Anthony J. Rizzo**, **Michael L. Fanto**, **Christopher C. Tison,** Air Force Research Lab. (United States); **Amos M. Smith,** Air Force Research Lab. - Rome (United States); **Richard Birrittella,** Booz Allen Hamilton (United States); **Evan Manfreda-Schulz**, **Vijay Soorya Shunmuga Sundaram**, **Stefan Preble,** Rochester Institute of Technology (United States); **Cooper Hurley**, **Sean Nelan**, **Samuel Bechtold**, **Eliezer Shahid**, **Kevin McComber,** Spark Photonics Design, Inc. (United States); **Christopher Baiocco, David L. Harame,** AIM Photonics (United States)

13371-38 • 6:00 PM - 8:00 PM
Demonstration of a tunable add-drop filter developed in AIM Photonics process technology
Author(s): **M. Rakib Uddin,** AIM Photonics (United States), SUNY Polytechnic Institute (United States); **Jin Wallner**, **Amit Dikshit**, **Javery Mann**, **Anthony Aiello**, **Yukta Timalsina**, **Alin Antohe**, **Lewis G. Carpenter**, **Gerald Leake**, **Christopher Baiocco, David L. Harame,** AIM Photonics (United States)

13371-39 • 6:00 PM - 8:00 PM
The application of silicon-based Schottky infrared photodetectors in gas detection
Author(s): **Yao-Han Dong**, **Zih-Chun Su**, **Ting-Kai Chang**, **Han-Shi Weng**, **Cheng-Lin Chen, Ching-Fuh Lin,** National Taiwan Univ. (Taiwan)

13371-40 • 6:00 PM - 8:00 PM
Modelling of a narrow linewidth monolithically integrated quantum dot on silicon extended cavity laser
Author(s): **Christina Vivian**, **James Seddon,** Univ. College London (United Kingdom); **Ilias Skandalos,** Univ. of Southampton (United Kingdom); **Mingchu Tang,** Univ. College London (United Kingdom); **Frederic Y. Gardes,** Univ. of Southampton (United Kingdom); **Huiyun Liu, Alwyn J. Seeds,** Univ. College London (United Kingdom)

13371-41 • 6:00 PM - 8:00 PM
Beyond 10 Gbps all-optical broadband and bit-loading multiband QAM-UFMC data switching modulated by high-speed free carrier absorption in Si-rich SiC micro-ring
Author(s): **Chih-Hsien Cheng**, **Atsushi Matsumoto**, **Naokatsu Yamamoto,** National Institute of Information and Communications Technology (Japan); **Gong-Ru Lin,** National Taiwan Univ. (Taiwan); **Kouichi Akahane,** National Institute of Information and Communications Technology (Japan)

13371-42 • 6:00 PM - 8:00 PM
Development of silicon photonics process using UV nanoimprinting
Author(s): **Shu Nagamatsu,** Tokyo Institute of Technology (Japan); **Risako Mori**, **Yasushi Fujii**, **Takahiro Asai,** Tokyo Ohka Kogyo Co., Ltd. (Japan); **Yuki Atsumi,** National Institute of Advanced Industrial Science and Technology (Japan); **Dai Shiota,** Tokyo Ohka Kogyo Co., Ltd. (Japan); **Nobuhiko Nishiyama, Tomohiro Amemiya,** Tokyo Institute of Technology (Japan)

13371-43 • 6:00 PM - 8:00 PM
New design of electrically pumped GeSn-On-Insulator laser integrated on a Si-photonics platform
Author(s): **Maria Alejandra Mendez Rincon**, **Hector Reynoso,** Ctr. de Nanosciences et de Nanotechnologies (France); **Omar Concepción**, **Dan Buca,** Forschungszentrum Jülich GmbH (Germany); **Moustafa El Kurdi,** Ctr. de Nanosciences et de Nanotechnologies (France)

13371-44 • 6:00 PM - 8:00 PM
Optical signature of short-range ordering in group IV core/shell nanowires
Author(s): **Anis Attiaoui,** Stanford Univ. (United States), Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Lab. (United States); **J. Zach Lentz,** Stanford Univ. (United States); **Lilian Vogl,** Lawrence Berkeley National Lab. (United States); **Jarod Meyer**, **Kunal Mukherjee,** Stanford Univ. (United States); **Andrew Minor,** Lawrence Berkeley National Lab. (United States); **Paul McIntyre,** Stanford Univ. (United States), Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Lab. (United States)

13371-46 • 6:00 PM - 8:00 PM
Polarization monitoring of photonic components using optical test points
Author(s): **Tyler V. Howard, Thomas G. Brown,** Univ. of Rochester (United States)

13371-47 • 6:00 PM - 8:00 PM
W-Shaped PN junction for high efficiency and fast optical phase shifters
Author(s): **Aser El-Dahshan**, **Mahmoud Hamouda**, **Carine Mankarious**, **Alaa Fathy**, **Hussein E. Kotb,** Ain Shams Univ. (Egypt); **Eslam El-Fiky,** Alexandria Univ. (Egypt); **Diaa Khalil,** Ain Shams Univ. (Egypt)

13371-48 • 6:00 PM - 8:00 PM
Toggleable transparency states in thermally-shifted multiMRR cascaded filters
Author(s): **Lorenzo Tunesi**, **Hasan Awad**, **Andrea Carena**, **Vittorio Curri, Paolo Bardella,** Politecnico di Torino (Italy)

13371-49 • 6:00 PM - 8:00 PM
On demand control of the strain state in Ge-GeSn microbridges
Author(s): **Antoine Bard,** Institut de recherche interdisciplinaire de Grenoble, Univ. Grenoble Alpes, CEA (France), Lab. Photonique Electronique et Ingénierie Quantiques, Grenoble INP (France); **Vincent Calvo,** Institut de recherche interdisciplinaire de Grenoble (France), Lab. Photonique Electronique et Ingénierie Quantiques (France); **Vincent Reboud**, **Gwenael Le Rhun**, **Jean-Michel Hartmann,** CEA-LETI (France); **Nicolas Pauc,** Institut de recherche interdisciplinaire de Grenoble, Univ. Grenoble Alpes, CEA (France), Lab. Photonique Electronique et Ingénierie Quantiques, Grenoble INP (France)

13371-50 • 6:00 PM - 8:00 PM
Design of low loss and small footprint 1 x 8 power splitter for photonic integrated circuits
Author(s): **Gaurav Kumar, Devendra Chack,** Indian Institute of Technology (Indian School of Mines), Dhanbad (India)

13371-51 • 6:00 PM - 8:00 PM
Compact and high directionality silicon waveguide grating antenna for optical phased array applications
Author(s): **Diksha Maurya**, **Devendra Chack**, **Vickey G., Rajarshi Guchhait,** Indian Institute of Technology (Indian School of Mines), Dhanbad (India)

Thursday 30 January 2025

SESSION 9: ACTIVE INTEGRATION III

30 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 306 (Level 3)
Session Chair(s): **Ryan B. Lewis**, McMaster Univ. (Canada)

13371-31 • 8:30 AM - 8:50 AM
A 50 Gb/s optical PAM4 transceiver heterogeneously integrated with microring modulator and avalanche photodiode
Author(s): **Ankur Kumar**, **Ruida Liu,** Texas A&M Univ. (United States); **Yuan Yuan**, **Chaerin Hong,** Hewlett Packard Enterprise Co. (United States); **Inhyun Kim,** Texas A&M Univ. (United States); **Zhihong Huang**, **Marco Fiorentino**, **Raymond G. Beausoleil,** Hewlett Packard Enterprise Co. (United States); **Samuel M. Palermo,** Texas A&M Univ. (United States)

13371-32 • 8:50 AM - 9:10 AM
A 5-μm radius compact ring modulator with a wide free spectral range, large extinction ratio, and high wavelength modulation developed in AIM Photonics' 300 mm process technology
Author(s): **M. Rakib Uddin,** AIM Photonics (United States), SUNY Polytechnic Institute (United States); **Jin Wallner**, **Amit Dikshit**, **Javery Mann**, **Anthony Aiello**, **Yukta Timalsina**, **Alin Antohe**, **Lewis G. Carpenter**, **Gerald Leake**, **Christopher Baiocco, David L. Harame,** AIM Photonics (United States)

13371-33 • 9:10 AM - 9:30 AM
Micro-transfer printing of InP SOAs on advanced silicon photonics platform for C-band pre-amplified receivers
Author(s): **Senbiao Qin**, **Emadreza Soltanian,** Univ. Gent (Belgium); **Joan Ramirez**, **Delphine Neel**, **Nicolas Vaissiere**, **Jean Decobert,** III-V Lab (France); **Jing Zhang, Günther Roelkens,** Univ. Gent (Belgium)

13371-34 • 9:30 AM - 9:50 AM

Strained GeSn-on-insulator quantum well laser for the extended-NIR silicon photonics

Author(s): **Antoine Meyer**, **Maria Alejandra Mendez Rincon,** Univ. Paris-Saclay (France); **Omar Concepción**, **Dan Buca,** Forschungszentrum Jülich GmbH (Germany); **Moustafa El Kurdi,** Univ. Paris-Saclay (France)

13371-35 • 9:50 AM - 10:10 AM

Scalable synthesis of InAs/InGaAs DWELL for infrared emission

Author(s): **Driss Mouloua**, **Mickael Martin,** Lab. des Technologies de la Microélectronique (France); **Veronica Letka,** STMicroelectronics S.A. (France); **Hadi Hijazi**, **Mattéo Chobé,** CEA-LETI (France); **Remy Tribout**, **Leo Mallet-Dida**, **Jérémy Moeyart**, **Franck Bassani**, **Sebastien Cavalaglio**, **Natalia Massara**, **Juliette Mignot,** Lab. des Technologies de la Microélectronique (France); **Jerome Richy**, **Nevine Rochat**, **Christophe Licitra**, **Romain Thibon**, **Sophie Barbet,** CEA-LETI (France); **Frédéric Boeuf,** STMicroelectronics S.A. (France); **Bouraoui Ilahi,** DistriQ (Canada); **Karim Hassan**, **Christophe Jany,** CEA-LETI (France); **Bassem Salem, Thierry Baron,** Lab. des Technologies de la Microélectronique (France)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13371-30

Slow-light lasing in 1D photonic crystal InGaAs/GaAs nano-ridges epitaxially grown on a Si wafer

Author(s): **Eslam Mostafa Bakry Fahmy**, **Zhongtao Ouyang**, **Davide Colucci,** imec, Univ. Gent (Belgium); **Joris Van Campenhout**, **Bernardette Kunert,** imec (Belgium); **Dries Van Thourhout,** imec, Univ. Gent (Belgium)

CONFERENCE 13372

Optical Interconnects and Packaging 2025

28 - 30 January 2025 | Moscone South, Room 204 (Level 2)

Conference Chair(s): **Ray T. Chen,** The Univ. of Texas at Austin (United States); **Henning Schröder,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany)

Program Committee: **Darrell Childers,** US Conec Ltd. (United States); **Douwe H. Geuzebroek,** Brilliance B.V. (Netherlands); **Tingyi Gu,** Univ. of Delaware (United States); **Ruth Houbertz,** ThinkMade Engineering & Consulting (Germany); **Marika P. Immonen,** TTM Technologies, Inc. (Finland); **Takaaki Ishigure,** Keio Univ. (Japan); **Wei Jiang,** Nanjing Univ. (China); **Mikko Karppinen,** VTT Technical Research Ctr. of Finland Ltd. (Finland); **Sanjay Krishna,** The Ohio State Univ. (United States); **Tobias Lamprecht,** OST – Ostschweizer Fachhochschule (Switzerland); **Frank Lerch,** EPIGAP OSA Photonics GmbH (Germany); **Matthias Lorenz,** AEMtec GmbH (Germany); **Christopher T. Middlebrook,** Michigan Technological Univ. (United States); **Peter O'Brien,** Tyndall National Institute (Ireland); **Hyo-Hoon Park,** KAIST (Korea, Republic of); **Nikos Pleros,** Aristotle Univ. of Thessaloniki (Greece); **Richard C. A. Pitwon,** Resolute Photonics Ltd. (Ireland); **Moritz Seyfried,** ficonTEC Service GmbH (Germany); **Harish Subbaraman,** Oregon State Univ. (United States); **Michael Thiel,** Nanoscribe GmbH & Co. KG (Germany); **David J. Thomson,** Optoelectronics Research Ctr. (United Kingdom); **Andreas Umbach,** AUCCEPT Consulting (Germany); **Alan X. Wang,** Baylor Univ. (United States); **Ian H. White,** Univ. of Cambridge (United Kingdom); **Chris Q. Wu,** Corning Incorporated (United States); **Yi Zou,** ShanghaiTech Univ. (China)

Tuesday 28 January 2025

SESSION 1: NOVEL OPTICAL INTERCONNECT AND NEURAL NETWORK SYSTEMS

28 January 2025 • 8:00 AM - 10:20 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Ray T. Chen**, The Univ. of Texas at Austin (United States)

13372-1 • 8:00 AM - 8:30 AM
Integrated nanophotonic devices and architectures for high-speed optical computing and interconnects *(Invited Paper)*
Author(s): **Zhoufeng Ying, Chenghao Feng,** Alpine Optoelectronics, Inc. (United States)

13372-2 • 8:30 AM - 9:00 AM
Overcoming challenges of co-integrated optics to advance accelerated computing *(Invited Paper)*
Author(s): **Nandish Mehta, Benjamin Lee,** NVIDIA Corp. (United States)

13372-3 • 9:00 AM - 9:20 AM
A compact optical neuron based on multi-operand microring resonators
Author(s): **Shupeng Ning**, **Chenghao Feng,** The Univ. of Texas at Austin (United States); **Jiaqi Gu,** The Univ. of Texas at Austin (United States), Arizona State Univ. (United States); **Hanqing Zhu**, **Rongxing Tang**, **David Z. Pan, Ray T. Chen,** The Univ. of Texas at Austin (United States)

13372-4 • 9:20 AM - 9:50 AM
Ultra-high bandwidth-density integrated coherent optics *(Invited Paper)*
Author(s): **Wei Shi**, **Alireza Geravand**, **Zibo Zheng**, **Erwan Weckenmann**, **Farshid Shateri**, **Simon Levasseur, Leslie Rusch,** Univ. Laval (Canada)

13372-5 • 9:50 AM - 10:20 AM
Ultrahigh speed artificial intelligence and signal processing using Kerr soliton crystal microcombs *(Invited Paper)*
Author(s): **David J. Moss,** Swinburne Univ. of Technology (Australia)

Coffee Break 10:20 AM - 10:45 AM

SESSION 2: PIC INTEGRATION AND COUPLING

28 January 2025 • 10:45 AM - 12:25 PM | Moscone South, Room 204 (Level 2)

Session Chair(s): **Ruth Houbertz**, ThinkMade Engineering & Consulting (Germany)

13372-6 • 10:45 AM - 11:15 AM
Coupling manipulation enabled high-performance devices *(Invited Paper)*
Author(s): **Ting Li**, **Hong Zhang**, **Chang Chang**, **Yuhan Sun**, **Weixiong Huang**, **Yulin Wu**, **Lipeng Xia**, **Yuheng Liu**, **Yixiang Zhang**, **Peiji Zhou, Yi Zou,** ShanghaiTech Univ. (China)

13372-7 • 11:15 AM - 11:45 AM
Innovations in fibre array coupling and integration for high-bandwidth FPGA multichip packages *(Invited Paper)*
Author(s): **Matthew Hall**, **Xiuyun He,** Tyndall National Institute (Ireland); **Chia-Pin Chiu,** Intel Corp. (United States); **Padraic E. Morrissey**, **Kamil Gradkowski,** Tyndall National Institute (Ireland); **Vidya Jayaram**, **Feifei Cheng**, **Tim Tri Hoang,** Intel Corp. (United States); **Keren Bergman,** Columbia Univ. (United States); **Peter O'Brien,** Tyndall National Institute (Ireland); **Kaveh Hosseini,** Intel Corp. (United States)

13372-8 • 11:45 AM - 12:05 PM **(CANCELLED)**
Realization of low coupling loss in multi fiber-emitter channels via silicon v-groove for fully integrated co-packaged optics
Author(s): **Frank F. Wu**, **Libin Liang, Xiaoyu Hong,** Intel Corp. (United States)

13372-9 • 12:05 PM - 12:25 PM
PANDA polarization-maintaining fiber for tight-bend applications and reflow-soldering
Author(s): **Kenji Yamashiro**, **Hiroto Niiyama**, **Satoshi Matsunaga**, **Kotaro Yoshimaru**, **Norihito Hasegawa**, **Shoichiro Matsuo,** Fujikura Ltd. (Japan); **Rachid Gafsi**, **Kevin Bennett**, **Gabrielle Buono**, **Garth W. Scannell**, **Scott R. Bickham, Carl Crossland,** Corning Incorporated (United States)

Lunch/Exhibition Break 12:25 PM - 1:55 PM

SESSION 3: PHOTONIC PACKAGING AND SYSTEM INTEGRATION

28 January 2025 • 1:55 PM - 3:35 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Ray T. Chen**, The Univ. of Texas at Austin (United States)

13372-10 • 1:55 PM - 2:25 PM
Fully integrated single-chip silicon photonic processor for analog optical and microwave signals *(Invited Paper)*
Author(s): **Hong Deng**, **Jing Zhang**, **Emadreza Soltanian**, **Xiangfeng Chen**, **Chao Pang,** Univ. Gent (Belgium); **Nicolas Vaissiere**, **Delphine Neel**, **Joan Ramirez**, **Jean Decobert,** III-V Lab. (France); **Guy Torfs,** imec, Univ. Gent (Belgium); **Günther Roelkens, Wim Bogaerts,** Univ. Gent (Belgium)

13372-11 • 2:25 PM - 2:55 PM
Detachable fiber connectivity solution for co-packaged optics and advanced semiconductor packaging integration *(Invited Paper)*
Author(s): **Avi Israel**, **Hesham Taha**, **Elad Schleifer**, **Guy Livnat**, **Aysha Shaloudi**, **Lior Rechtman**, **Ameer Bkirat, Shay Yulzary,** Teramount Ltd. (Israel)

13372-13 • 2:55 PM - 3:15 PM
Versatile micro optical coupling platform created by selective laser etching and smoothing of thin glass
Author(s): **Gunnar Böttger**, **Stefan Link**, **Carlos Gomez**, **Lasse F. Weissenburg**, **Henning Schröder, Martin Schneider-Ramelow,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany)

13372-55 • 3:15 PM - 3:35 PM
Semiconductorisation of photonic chip packaging
Author(s): **Taynara de Oliveira,** TNO (Netherlands); **Alexander Dorrestein,** Chip Integration Technology Ctr. (Netherlands); **Valentin Strässle, Nikolaus Flöry,** vario-optics ag (Switzerland)

Coffee Break 3:35 PM - 4:00 PM

SESSION 4: WAFER SCALE TESTING AND GLASS WAVEGUIDES FOR BOARD LEVEL INTERCONNECTS

28 January 2025 • 4:00 PM - 6:00 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Jason Midkiff**, Omega Optics, Inc. (United States)

13372-14 • 4:00 PM - 4:30 PM
Optical wafer-level testing *(Invited Paper)*
Author(s): **Philipp-Immanuel Dietrich**, **Andrés Machado, Florian Rupp,** Keystone Photonics GmbH (Germany)

13372-15 • 4:30 PM - 4:50 PM
Design and manufacturing of glass miniaturized optical systems for compact fiber-to-chip connectivity
Author(s): **Andrea Lovera**, **Davide Farina**, **Pietro Bernasconi, Rolando Ferrini,** FEMTOprint SA (Switzerland)

13372-16 • 4:50 PM - 5:10 PM
Glass substrate with integrated adiabatic waveguide bends for high-density fiber-to-chip coupling
Author(s): **Jorge A. Holguín-Lerma**, **Lars Brusberg**, **Lucas W. Yeary**, **Marissa Granados-Baez**, **Chad C. Terwilliger**, **Mark Hong**, **Betsy J. Johnson, Katerina Rousseva,** Corning Research & Development Corporation (United States)

13372-17 • 5:10 PM - 5:30 PM
Wafer-scale fabrication of opto-electronic glass substrates for co-packaged optics
Author(s): **Jason R. Grenier,** Corning Research & Development Corporation (United States), Corning Incorporated (United States); **Garima C. Nagar,** Corning Incorporated (United States); **Lars Brusberg**, **Chad C. Terwilliger**, **Chuanche Wang, Sean Garner,** Corning Research & Development Corporation (United States)

13372-18 • 5:30 PM - 6:00 PM
Short wavelength division mulitplexed optical backplane for avionics *(Invited Paper)*
Author(s): **Jason Midkiff,** Omega Optics, Inc. (United States); **Ray T. Chen,** The Univ. of Texas at Austin (United States); **May Hlaing,** Omega Optics, Inc. (United States)

Wednesday 29 January 2025

SESSION 5: HETEROGENEOUS INTEGRATION AND 3D PACKAGING

29 January 2025 • 8:00 AM - 10:20 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Harish Subbaraman**, Oregon State Univ. (United States)

13372-19 • 8:00 AM - 8:30 AM
Active alignment of densely spaced optical fibers for high-accuracy fiber arrays manufacturing *(Invited Paper)*
Author(s): **Simone Cardarelli**, **Jaap Verheggen**, **Polina Bolotova**, **Guillaume Lollia**, **Halszka Walkiewicz**, **Laura Molloy**, **Tim Stevens, Marco Fattori,** MicroAlign (Netherlands)

13372-20 • 8:30 AM - 9:00 AM
Hybrid integration of crystalline doped oxides on silicon photonics platform for optical communications *(Invited Paper)*
Author(s): **Ana-Maria Statie**, **Alicia Ruiz-Caridad**, **Ali El Boutaybi**, **Christian Lafforgue**, **Guillaume Marcaud,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Mikhail Dyatlov,** Lab. Photonique, Numérique et Nanosciences, Univ. de Bordeaux, CNRS (France); **Carlos Alonso-Ramos,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Karamanis Panaghiotis,** Institut des Sciences Analytiques et de Physico-Chimie pour l'environment et les Materiaux, CNRS (France); **Daniele Melati**, **Samson Edmond**, **Guillaume Agnus**, **Stefano Pirotta**, **Ludovic Largeau**, **Eric Cassan**, **Delphine Marris-Morini,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); **Nicolas Dubreuil,** Lab. Photonique, Numérique et Nanosciences, Univ. de Bordeaux, CNRS (France); **Michel Rerat,** Institut des Sciences Analytiques et de Physico-Chimie pour l'environment et les Materiaux (France); **Philippe Lecoeur**, **Sylvia Matzen**, **Thomas Maroutian, Laurent Vivien,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)

13372-21 • 9:00 AM - 9:20 AM
Optimizing grating couplers for photonic 3D heterogeneous integration
Author(s): **Md. Mahfuzur Rahman**, **Russell L. T. Schwartz**, **Nicola Peserico**, **Hangbo Yang, Volker J. Sorger,** Univ. of Florida (United States)

13372-22 • 9:20 AM - 9:40 AM
Heterogeneous integration of GaAsSb and silicon via direct wafer bonding for high-speed avalanche photodiodes
Author(s): **Naga Swetha Nallamothu**, **Manisha Muduli**, **Yongkang Xia,** The Ohio State Univ. (United States); **Seunghyun Lee,** The Ohio State Univ. (United States), The Univ. of Texas at Arlington (United States); **Shamsul Arafin**, **Sanjay Krishna, Ronald M. Reano,** The Ohio State Univ. (United States)

13372-23 • 9:40 AM - 10:00 AM
Heterogeneous integration of InGaAs/GaAsSb superlattices with Si for e-SWIR sensors
Author(s): **Manisha Muduli**, **Nathan Gajowski**, **Yongkang Xia,** The Ohio State Univ. (United States); **Seunghyun Lee,** The Univ. of Texas at Arlington (United States); **Shamsul Arafin, Sanjay Krishna,** The Ohio State Univ. (United States)

13372-36 • 10:00 AM - 10:20 AM
Processing considerations for polishing PICs and waveguides
Author(s): **Al Cheswick,** KrellTech (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: PACKAGING TECHNOLOGY ADVANCEMENT

29 January 2025 • 10:50 AM - 12:50 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Takaaki Ishigure**, Keio Univ. (Japan)

13372-24 • 10:50 AM - 11:20 AM
Recent advances in fiber-to-PIC packaging technologies for scalable manufacturing *(Invited Paper)*
Author(s): **Kamil Gradkowski,** Tyndall National Institute (Ireland); **Hsiang-Chu Wang,** Focuslight Switzerland SA (Switzerland); **Das S Kumar**, **Sean Collins**, **Sharon Butler**, **How-Yuan Hwang,** Tyndall National Institute (Ireland); **Wilfried Noell,** Focuslight Switzerland SA (Switzerland); **Kevin Shortiss**, **Josue Parra,** ficonTEC Ireland (Ireland); **Gerrit Fiol**, **Karl-Otoo Velthaus,** Fraunhofer HHI (Germany); **Peter O'Brien,** Tyndall National Institute (Ireland)

13372-25 • 11:20 AM - 11:40 AM
Recent advances in optical interfacing microstructures fabricated through two-photon polymerization-based laser direct writing
Author(s): **Jürgen Van Erps**, **Koen Vanmol**, **Arié Nacar**, **Francesco Ferranti**, **Hugo Thienpont, Tigran Baghdasaryan,** Vrije Univ. Brussel (Belgium)

13372-26 • 11:40 AM - 12:00 PM
Automated direct surface coupling of optical fibers to integrated photonics by laser welding
Author(s): **Marco Queisser**, **Vincent Glen**, **Ahmed Al-Shami,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Christian Janeczka,** Technische Univ. Berlin (Germany); **Alethea Vanessa Zamora,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany), Technische Univ. Berlin (Germany); **Henning Schröder,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Martin Schneider-Ramelow,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany), Technische Univ. Berlin (Germany)

13372-27 • 12:00 PM - 12:20 PM
Optical performance of Photonic Wire Bonds under temperature and humidity cycling
Author(s): **Chase Stine,** Phase Sensitive Innovations, Inc. (United States); **Venkatesh Deenadayalan**, **Mario Ciminelli**, **Thomas Palone,** Rochester Institute of Technology (United States); **Braden Wieand**, **Timothy Creazzo**, **Kamran Shayan,** Phase Sensitive Innovations, Inc. (United States); **Stefan Preble,** Rochester Institute of Technology (United States); **Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States)

13372-28 • 12:20 PM - 12:50 PM
Development of advanced packaging assembly for integrating high-density electrical and optical interconnects in silicon chips for high-speed communications *(Invited Paper)*
Author(s): **Arun Kumar Mallik**, **Jun Su Lee**, **Kamil Gradkowski**, **Sean Collins,** Tyndall National Institute (Ireland); **James Robinson,** Columbia Univ. (United States); **Maarten Hattink,** Xscape Photonics Inc. (United States); **Keren Bergman,** Columbia Univ. (United States); **Padraic E. Morrissey, Peter O'Brien,** Tyndall National Institute (Ireland)

Lunch/Exhibition Break 12:50 PM - 1:50 PM

SESSION 7: NOVEL DEVICES AND MATERIALS FOR OPTICAL INTERCONNECTS

29 January 2025 • 1:50 PM - 5:40 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Ray T. Chen**, The Univ. of Texas at Austin (United States)

13372-29 • 1:50 PM - 2:20 PM
Ferroelectrics for emergent silicon-integrated optical computing *(Invited Paper)*
Author(s): **Alex Demkov,** The Univ. of Texas at Austin (United States)

13372-30 • 2:20 PM - 2:50 PM
Silicon-organic hybrid (SOH) modulators for advanced photonic integration *(Invited Paper)*
Author(s): **Wolfgang Freude**, **Alexander Kotz**, **Hend Kholeif**, **Adrian Schwarzenberger**, **Artem Kuzmin,** Karlsruher Institut für Technologie (Germany); **Carsten Eschenbaum**, **Adrian Mertens,** SilOriX GmbH (Germany); **Sidra Sarwar,** Karlsruher Institut für Technologie (Germany); **Peter Erk,** erConTec GmbH (Germany), SilOriX GmbH (Germany), Karlsruher Institut für Technologie (Germany); **Stefan Bräse,** Karlsruher Institut für Technologie (Germany); **Christian Koos,** Karlsruher Institut für Technologie (Germany), SilOriX GmbH (Germany)

13372-34 • 2:50 PM - 3:20 PM
Silicon plasmonic platform for interconnect applications *(Invited Paper)*
Author(s): **Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

Coffee Break • 3:20 PM - 3:50 PM

13372-31 • 3:50 PM - 4:20 PM
Silicon photonics for the mid-IR *(Invited Paper)*
Author(s): **Goran Z. Mashanovich**, **Colin J. Mitchell**, **Chen Wei**, **Samuel McQuillan**, **Rand Ismaeel,** Univ. of Southampton (United Kingdom); **Jon Heffernan**, **Kristian M. Groom,** The Univ. of Sheffield (United Kingdom); **Tianhui Hu**, **Dolnapa Yamano**, **Sam Thomspon,** Univ. of Southampton (United Kingdom); **David Miall**, **Matthew C. Mowlem,** National Oceanography Ctr. (United Kingdom); **David J. Rowe, Milos Nedeljkovic,** Univ. of Southampton (United Kingdom)

13372-32 • 4:20 PM - 4:50 PM
μ-transfer-printed photonic crystal hybrid external cavity laser realized using μ-transfer-printing *(Invited Paper)*
Author(s): **Liam O'Faolain,** Munster Technological Univ. (Ireland)

13372-33 • 4:50 PM - 5:20 PM
High power wavelength tunable external cavity laser for optical transmission *(Invited Paper)*
Author(s): **Ilka Visscher**, **Arjan Meijerink**, **Roel Botter**, **Muhammad Mohsin Zafar**, **Charoula Mitsolidou,** LioniX International BV (Netherlands); **Efstathios Andrianopoulos**, **Eva Loukisa**, **Georgios Megas**, **Nikolaos K. Lyras**, **Maria Massaouti**, **Christos Tsokos**, **Hercules Avramopoulos,** Photonics Communications Research Lab., National Technical Univ. of Athens (Greece); **Paulus W. L. van Dijk**, **Chris G. H. Roeloffzen, Raimond Frentrop,** LioniX International BV (Netherlands)

13372-37 • 5:20 PM - 5:40 PM
Key properties of adhesives for successful photonic packaging
Author(s): **Alexander Hartwig,** DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany); **See Chian Lim,** DELO Industrial Adhesives Pte. Ltd. (Singapore); **Simon Seethaler,** DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany); **Tina Guo Xin**, **Chongyang Liu,** Nanyang Technological University (Singapore); **Oliver Matyssek,** DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13372-54 • 6:00 PM - 8:00 PM
Bend-optimized optical fiber with low MPI in the O-band
Author(s): **Scott R. Bickham**, **Riley S. Freeland**, **Stephen Q. Smith**, **Madison A. Shipman**, **Xin Chen**, **Jason E. Hurley**, **Snigdharaj K. Mishra**, **Garth W. Scannell**, **Aramais R. Zakharian, Martin Hempstead,** Corning Research & Development Corporation (United States)

Thursday 30 January 2025

SESSION 8: O-E AND E-O CONVERSION AND 3D COUPLING

30 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Sanjay Krishna**, The Ohio State Univ. (United States)

13372-38 • 8:00 AM - 8:30 AM
InP-based photodetector technologies for datacom applications *(Invited Paper)*
Author(s): **Patrick Runge,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Alexander Schindler**, **Jonas Gläsel**, **Tom Kieckhefel, Hendrik Boerma,** Fraunhofer-Institut für Nachrichtentechnik (Germany)

13372-39 • 8:30 AM - 8:50 AM
A 20Gbps all-silicon APD-based receiver with CMOS IC
Author(s): **Ruida Liu,** Texas A&M Univ. (United States); **Yiwei Peng,** Hewlett Packard Labs, Hewlett Packard Enterprise (United States); **Ankur Kumar,** Texas A&M Univ. (United States); **Yuan Yuan,** Hewlett Packard Labs (United States); **Inhyun Kim,** Texas A&M Univ. (United States); **Chaerin Hong**, **Zhihong Huang**, **Marco Fiorentino**, **Raymond Beausoleil,** Hewlett Packard Labs (United States); **Samuel Palermo,** Texas A&M Univ. (United States)

13372-40 • 8:50 AM - 9:10 AM
Machine-learning-driven optimization of vertical fiber-to-chip coupling system for co-packaged optics and in-package optical I/O applications
Author(s): **Federico Duque Gomez,** Ansys Canada Ltd. (Canada); **Sabrina Niemeyer,** ANSYS Germany GmbH (Germany); **Ahsan Alam,** Ansys Canada Ltd. (Canada); **Han-Hsiang Cheng,** Ansys Japan K.K. (Japan); **Sean Lin**, **Yi-Hao Chen,** Ansys, Inc. (Taiwan); **Taylor Robertson,** Ansys Canada Ltd. (Canada)

13372-41 • 9:10 AM - 9:30 AM
3D nanoprinting of beam shaping micro-optics on VCSEL chips integrated on a laser-written glass interposer
Author(s): **Athanasios Kyriazis,** Ctr. for Microsystems Technology, Univ. Gent (Belgium), B-Phot, Vrije Univ. Brussel (Belgium); **Salah Eddine Guessoum,** B-Phot, Vrije Univ. Brussel (Belgium), Ctr. for Microsystems Technology, Univ. Gent (Belgium); **Tushar Malica**, **Martin Virte**, **Jürgen Van Erps,** B-Phot, Vrije Univ. Brussel (Belgium); **Geert Van Steenberge,** Ctr. for Microsystems Technology, Univ. Gent (Belgium)

13372-42 • 9:30 AM - 9:50 AM
On-chip holographic gaussian-to-flat-top beam conversion for high-power photodiode
Author(s): **Mohammed Farhan Jawad,** Univ. of Delaware (United States); **Shouyuan Shi,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States); **Matthew Konkol**, **Peng Yao,** Phase Sensitive Innovations, Inc. (United States); **Dennis W. Prather,** Univ. of Delaware (United States), Phase Sensitive Innovations, Inc. (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 9: MODULATOR, SWITCHING DEVICES, AND LOW LOSS INTERCONNECTS

30 January 2025 • 10:20 AM - 12:30 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Richard C. A. Pitwon**, Resolute Photonics Ltd. (Ireland)

13372-43 • 10:20 AM - 10:50 AM
Developments in thin-film lithium niobate modulators for low vpi, small profile and integrated antennas *(Invited Paper)*
Author(s): **Dennis W. Prather**, **Xiaofeng Zhu**, **Marco Tulio**, **Shouyuan Shi,** Univ. of Delaware (United States); **Peng Yao**, **Maxwell Hinkle**, **Fuquan Wang, Christopher Cullen,** Phase Sensitive Innovations, Inc. (United States)

13372-44 • 10:50 AM - 11:20 AM
Multicore fiber connectivity for submarine and data center applications *(Invited Paper)*
Author(s): **Douglas L. Butler,** Corning Incorporated (United States)

13372-45 • 11:20 AM - 11:40 AM
Using AI-driven wavefront-shaping for scalable optical circuit switching
Author(s): **Niyazi Ulas Dinc**, **Mustafa Yildirim**, **Ilker Oguz**, **Christophe Moser, Demetri Psaltis,** EPFL (Switzerland)

13372-46 • 11:40 AM - 12:00 PM
Power handling and polarization maintaining of photonic wire bonds
Author(s): **Peng Yao**, **Matthew Konkol,** Phase Sensitive Innovations, Inc. (United States); **Venkatesh Deenadayalan,** Rochester Institute of Technology (United States); **Chad Newkirk,** Phase Sensitive Innovations, Inc. (United States); **Yash Kabra**, **Md. Omar F. Rasel,** Univ. of Delaware (United States); **Mario Ciminelli**, **Stefan Preble,** Rochester Institute of Technology (United States); **Dennis W. Prather,** Phase Sensitive Innovations, Inc. (United States), Univ. of Delaware (United States)

13372-47 • 12:00 PM - 12:30 PM
Back-compatibility of hollow core fibers with SMF infrastructure *(Invited Paper)*
Author(s): **Radan Slavík,** Optoelectronics Research Ctr. (United Kingdom); **Matej Komanec,** Czech Technical Univ. in Prague (Czech Republic); **Francesco Poletti,** Optoelectronics Research Ctr. (United Kingdom)

Lunch/Exhibition Break 12:30 PM - 1:40 PM

SESSION 10: BUILDING BLOCKS FOR HETEROGENEOUS INTEGRATION

30 January 2025 • 1:40 PM - 3:20 PM | Moscone South, Room 204 (Level 2)
Session Chair(s): **Richard C. A. Pitwon**, Resolute Photonics Ltd. (Ireland)

13372-48 • 1:40 PM - 2:10 PM
Advancements in high-speed silicon photonic microring modulators *(Invited Paper)*
Author(s): **Xinru Wu**, **Ranjeet Kumar**, **Duanni Huang**, **Guan-Lin Su**, **Songtao Liu**, **Xiaoxi Wang**, **Junyi Gao, Haisheng Rong,** Intel Corp. (United States)

13372-49 • 2:10 PM - 2:30 PM
PCB-integrated flexo-printed optical networks structures
Author(s): **Andreas Evertz**, **Laura Fuetterer, Ludger Overmeyer,** Leibniz Univ. Hannover (Germany)

13372-51 • 2:30 PM - 2:50 PM
High efficiency PAM4 ring modulator using W-Shaped PN junction
Author(s): **Aser El-Dahshan**, **Mahmoud Hamouda**, **Carine Mankarious**, **Hussein Kotb**, **Alaa Fathy,** Ain Shams Univ. (Egypt); **Eslam El-Fiky,** Alexandria Univ. (Egypt); **Diaa Khalil,** Ain Shams Univ. (Egypt)

13372-52 • 2:50 PM - 3:20 PM
Silicon photonics: the road ahead *(Invited Paper)*
Author(s): **Sudip Shekhar,** The Univ. of British Columbia (Canada); **Wim Bogaerts,** Univ. Gent (Belgium); **Lukas Chrostowski,** The Univ. of British Columbia (Canada); **John E. Bowers,** Univ. of California, Santa Barbara (United States); **Michael Hochberg,** Luminous Computing, Inc. (United States); **Richard Soref,** Univ. of Massachusetts Boston (United States); **Bhavin J. Shastri,** Queen's Univ. (Canada)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13372-12

Inverse-co-designed passive and active layers for scalable optical switching

Author(s): **Mahdi Safari, Armaghan Eshaghi,** Huawei Technologies Canada Co., Ltd. (Canada)

13372-50

Extending the reach of IM/DD links: FIR filters for chromatic dispersion compensation

Author(s): **Mahdi Safari**, **Saket Kaushal, Armaghan Eshaghi,** Huawei Technologies Canada Co., Ltd. (Canada)

CONFERENCE 13373

Photonic Instrumentation Engineering XII

27 - 29 January 2025 | Moscone South, Room 313 (Level 3)

Conference Chair(s): **Lynda E. Busse,** U.S. Naval Research Lab. (United States); **Yakov Soskind,** Coherent Photonics (United States)

Program Committee: **Ishwar D. Aggarwal,** The Univ. of North Carolina at Charlotte (United States); **James T. A. Carriere,** Coherent Corp. (United States); **Wei Ting Chen,** SNOChip Inc. (United States); **Catalin Florea,** Lockheed Martin Space Systems Co. (United States); **Sanjay Gangadhara,** Ansys, Inc. (United States); **Groot Gregory,** Synopsys, Inc. (United States); **Kristen Hill,** Synrad, a Novanta Co. (United States); **Jacob B. Khurgin,** Johns Hopkins Univ. (United States); **Arka Majumdar,** Univ. of Washington (United States); **Patrick C. Mock,** Overview Energy, Inc. (United States); **Nada A. O'Brien,** Meta (United States); **S. Craig Olson,** L3Harris Technologies, Inc. (United States); **Lieven Penninck,** PlanOpSim (Belgium); **Ulrich Quaade,** NIL Technology ApS (Denmark); **Lucas Redlarski,** Mitutoyo Research Ctr. Europe B.V. (Netherlands)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: NANO-PHOTONICS MODULES AND SYSTEMS I

27 January 2025 • 10:45 AM - 12:15 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Yakov Soskind**, Coherent Photonics (United States)

13373-1 • 10:45 AM - 11:15 AM
Metalens-based eye tracking camera with unprecedented performance and compactness *(Invited Paper)*
Author(s): **Ulrich J. Quaade,** NIL Technology ApS (Denmark)

13373-2 • 11:15 AM - 11:45 AM
Full-color imaging using large-aperture meta-optics *(Invited Paper)*
Author(s): **Arka Majumdar,** Univ. of Washington (United States)

13373-3 • 11:45 AM - 12:15 PM
Addressing large scale photonic design for next-generation systems *(Invited Paper)*
Author(s): **Mayank Bahl**, **Evan Heller,** Synopsys, Inc. (United States); **Maryvonne Chalony,** Synopsys, Inc. (France); **Ming-Hsuan Lu,** Synopsys Taiwan Co., Ltd. (Taiwan); **Chenglin Xu**, **Ziwei Zhu**, **Daniel C. Herrmann**, **William J. Cassarly, Robert Scarmozzino,** Synopsys, Inc. (United States)

Lunch Break 12:15 PM - 1:45 PM

SESSION 2: APPLICATIONS OF PHOTONIC INSTRUMENTS I

27 January 2025 • 1:45 PM - 3:25 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Lynda E. Busse**, U.S. Naval Research Lab. (United States)

13373-4 • 1:45 PM - 2:05 PM
Moving quantum ghost imaging from demonstration to application
Author(s): **Duncan P. Ryan**, **James H. Werner**, **Kati A. Seitz**, **Dean P. Morales**, **Rebecca Holmes,** Los Alamos National Lab. (United States); **Edoardo Charbon**, **Claudio Bruschini**, **Paul Mos, Yang Lin,** EPFL (Switzerland)

13373-5 • 2:05 PM - 2:25 PM
High-resolution SD-OCT for surface and subsurface defect detection using broadband laser-driven light source (LDLS®)
Author(s): **Qingsong Wang**, **Shaival Buch**, **Huiling Zhu**, **William Grube**, **Jing Zhou**, **Vikram Singh,** Energetiq Technology, Inc. (United States); **Neal Foley, Craig Schiller,** Energetiq Technology (United States)

13373-6 • 2:25 PM - 2:45 PM
A case study on the integration of a snapshot hyperspectral field-portable imager solving fruit quality assessment
Author(s): **Alexander Spanellis**, **Eli Sheppard**, **Daniel Pearce**, **Steve Chappell, Elvira Castello,** Living Optics (United Kingdom)

13373-7 • 2:45 PM - 3:05 PM
Quadrature optical interferometry-based in-plane displacement measurement of a MEMS grating
Author(s): **Manuel J. L. F. Rodrigues,** INL - International Iberian Nanotechnology Lab. (Portugal); **Inês S. Garcia,** INL- International Iberian Nanotechnology Laboratory (Portugal); **Zeev Zalevsky,** Bar-Ilan Univ. (Israel); **Rosana A. Dias**, **Filipe S. Alves, Diogo E. Aguiam,** INL - International Iberian Nanotechnology Lab. (Portugal)

13373-8 • 3:05 PM - 3:25 PM
The measurement of object distance for projected virtual objects using a scanning pentaprism and digital alignment telescope
Author(s): **Kevin Sweeney, David A. Imrie,** Optikos Corp. (United States)

Coffee Break 3:25 PM - 3:55 PM

SESSION 3: APPLICATIONS OF PHOTONIC INSTRUMENTS II

27 January 2025 • 3:55 PM - 5:15 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Lynda E. Busse**, U.S. Naval Research Lab. (United States)

13373-9 • 3:55 PM - 4:15 PM
QCL-based photothermal spectroscopy of liquids: from a bench-top Mach Zehnder interferometer to using photonic integrated circuits
Author(s): **Alicja Dabrowska, Bernhard Lendl,** Technische Univ. Wien (Austria)

13373-10 • 4:15 PM - 4:35 PM
Characterizing optical and geometrical properties of semiconductor thin films with a split-step angular spectrum approach to inverse synthesis
Author(s): **John M. Bass,** Wyant College of Optical Sciences (United States); **Manuel Ballester,** Northwestern Univ. (United States); **Susana M. Fernández,** Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); **Aggelos K. Katsaggelos,** Northwestern Univ. (United States); **Emilio Márquez,** Univ. de Cádiz (Spain); **Florian Willomitzer,** Wyant College of Optical Sciences (United States)

13373-12 • 4:35 PM - 4:55 PM
Super-Spectral-Resolution Raman Spectroscopy using angle tuning of a Fabry-Pérot Interferometer with applications to diamond identification
Author(s): **Yaakov R. Tischler,** Bar-Ilan Univ. (Israel); **Hadass Tischler**, **Yishai Amiel,** Jerusalem College of Technology (Israel); **Romi Nedvedski,** Bar-Ilan Univ. (Israel); **Yaakov Mandelbaum,** Jerusalem College of Technology (Israel)

13373-54 • 4:55 PM - 5:15 PM
Wavefront sensing based on reference light modulation
Author(s): **Xie Li**, **Junkang Guo, Zhigang Liu,** Xi'an Jiaotong Univ. (China)

Tuesday 28 January 2025

SESSION 4: SENSORS AND RUGGEDIZED SYSTEMS

28 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Sanjay Gangadhara**, Ansys, Inc. (United States)

13373-14 • 8:30 AM - 8:50 AM
Phase-sensitive optical time domain reflectometry based on hybrid optical coupler I/Q demodulation
Author(s): **Nageswara Lalam**, **Hari Bhatta**, **Michael Buric, Ruishu Wright,** National Energy Technology Lab. (United States)

13373-15 • 8:50 AM - 9:10 AM
Tunable Vernier laser for stable multiple species detection at 2000nm
Author(s): **Vinayakrishna Joshi**, **Christian Assmann**, **Sebastian Schmidtmann**, **Martin Honsberg**, **Herve Tatenguem Fankem**, **Vahid Farsi, Joachim R. Sacher,** Sacher Lasertechnik GmbH (Germany)

13373-16 • 9:10 AM - 9:30 AM
Enabling simultaneous fiber optic distributed acoustic sensing and optical communications for mapping the underwater soundscape

Author(s): **Juan M. Marin**, **Wahyu Gunawan**, **Alaaeddine Rjeb**, **Islam Ashry**, **Tien Khee Ng**, **Shinkyu Park**, **Carlos M. Duarte, Boon S. Ooi,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13373-17 • 9:30 AM - 9:50 AM
Developing radiation-hard digital single-photon avalanche diode sensors for RICH particle detectors
Author(s): **Gregor Taylor,** EPFL (Switzerland); **Rok Dolenec,** Jožef Stefan Institute (Slovenia); **Won-Yong Ha,** EPFL (Switzerland); **Dania Consuegra Rodríguez,** Jožef Stefan Institute (Slovenia); **Utku Karaca**, **Ming-Lo Wu**, **Chufan Zhou,** EPFL (Switzerland); **Rok Pestotnik,** Jožef Stefan Institute (Slovenia); **Edoardo Charbon, Claudio Bruschini,** EPFL (Switzerland)

Coffee Break 9:50 AM - 10:20 AM

SESSION 5: DESIGN, DEVELOPMENT, AND CHARACTERIZATION OF PHOTONIC INSTRUMENTS I

28 January 2025 • 10:20 AM - 12:00 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Arka Majumdar**, Univ. of Washington (United States)

13373-18 • 10:20 AM - 10:40 AM
A novel laser frequency stabilization technique for FMCW systems
Author(s): **Adam J. Christiansen**, **David A. Naylor**, **Matthew A. Buchan, Brad G. Gom,** Blue Sky Spectroscopy Inc. (Canada), Univ. of Lethbridge (Canada)

13373-19 • 10:40 AM - 11:00 AM
Development of a SWIR UAV-based radiometer for validating Landsat 8/9 snow products
Author(s): **Shannon M. Hamp**, **Eric A. Sproles, Joseph A. Shaw,** Montana State Univ. (United States)

13373-20 • 11:00 AM - 11:20 AM
A compact hyperspectral camera in the thermal infrared
Author(s): **Cristian Manzoni,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Matteo Corti,** Politecnico di Milano (Italy); **Fabrizio Preda**, **Antonio Perri,** NIREOS s.r.l. (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy), NIREOS s.r.l. (Italy); **Gianluca Valentini,** Politecnico di Milano (Italy); **Ondřej Ballada**, **Čestmír Barta, Lukáš Chroust,** BBT-Materials Processing, s.r.o. Ltd. (Czech Republic)

13373-21 • 11:20 AM - 11:40 AM
Real-time phase-tracked dual-comb LiDAR with compact free-running dual-comb laser at 5kHz update rate
Author(s): **Lukas Lang**, **Sandro L. Camenzind**, **Benjamin Willenberg**, **Justinas Pupeikis**, **Hayk Soghomonyan**, **Robert Presl**, **Christopher R. Phillips, Ursula Keller,** ETH Zurich (Switzerland)

13373-22 • 11:40 AM - 12:00 PM
Performance improvement in white light interferometry
Author(s): **Neeraj Kumar**, **Harm Visscher**, **Adriaan Zuiderweg**, **Nitish Kumar,** Mitutoyo Research Ctr. Europe B.V. (Netherlands); **Ken Motohashi,** Mitutoyo Corp. (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: DESIGN, DEVELOPMENT, AND CHARACTERIZATION OF PHOTONIC INSTRUMENTS II

28 January 2025 • 1:30 PM - 2:50 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Sanjay Gangadhara**, Ansys, Inc. (United States)

13373-23 • 1:30 PM - 1:50 PM
Novel tunable diode laser spectroscopy with square wave injection current modulation and simple calibration
Author(s): **Michael Fried, Dag Roar Hjelme,** Norwegian Univ. of Science and Technology (Norway)

13373-24 • 1:50 PM - 2:10 PM
Sub-kHz miniaturized external cavity diode laser within a butterfly package
Author(s): **Christian Assmann**, **Sebastian Schmidtmann**, **Denis Erfle**, **Herve Tatenguem Fankem**, **Vahid Farsi, Joachim R. Sacher,** Sacher Lasertechnik GmbH (Germany)

13373-25 • 2:10 PM - 2:30 PM
High-speed AI image space wavefront sensing using embedded computing: achieving 1000 frames per second
Author(s): **Gaston Baudat,** Innovations Foresight LLC (United States); **David Lavanchy, Guillaume Müller,** Haute Ecole Spécialisée de Suisse Occidentale (Switzerland)

13373-26 • 2:30 PM - 2:50 PM
Broadband photonic lantern transfer matrix characterization for wavefront sensing
Author(s): **Miguel A. Romer**, **Ameer B. Batarseh**, **Tara Crowe**, **Robert Conwell**, **Caleb Dobias**, **Daniel Cruz-Delgado**, **Miguel A. Bandres**, **Rodrigo Amezcua-Correa, Stephen S. Eikenberry,** Univ. of Central Florida (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 7: DESIGN, DEVELOPMENT, AND CHARACTERIZATION OF PHOTONIC INSTRUMENTS III

28 January 2025 • 3:20 PM - 4:40 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Craig Olson**, L3Harris Technologies, Inc. (United States)

13373-27 • 3:20 PM - 3:40 PM
Design and characterization of a single photon counting module with high photon detection efficiency and low dark count rate
Author(s): **Arshey Patadia**, **Richard Kim,** Laser Components Detector Group, Inc. (United States); **Kirsten Schuh**, **Florian Gerg, Niklas Höpfl,** Laser Components Germany GmbH (Germany)

13373-28 • 3:40 PM - 4:00 PM
Laser soldering of large lenses for applications in space-born lidars and imaging systems
Author(s): **Erik Beckert**, **Thomas Peschel, Grucheska Rosario-Rodriguez,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13373-29 • 4:00 PM - 4:20 PM
HDR M700 next generation high dynamic range thermal infrared imaging system
Author(s): **Joseph A. Carrock,** Telops Inc. (Canada); **Benjamin Saute,** Telops, Inc. (Canada); **Veronique Zambon**, **Antoine Dumont**, **Jean-Philippe Gagnon**, **Fabien Dupont, Vince Morton,** Telops Inc. (Canada)

13373-30 • 4:20 PM - 4:40 PM
Comparative analysis of Hartmann screens for measuring the refraction of progressive ophthalmic lenses
Author(s): **Santiago Rodriguez Mendoza,** The Univ. of North Carolina at Charlotte (United States); **Yobani Mejia Barbosa,** Univ. Nacional de Colombia (Colombia)

Wednesday 29 January 2025

SESSION 8: APPLICATIONS OF PHOTONIC INSTRUMENTS III

29 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Groot Gregory**, Synopsys, Inc. (United States)

13373-31 • 8:40 AM - 9:00 AM
Enhanced multi-target detection in automotive FMCW LiDAR sensors affected by phase noise
Author(s): **Javier Perez Santacruz**, **Jac Romme**, **Xuebing Zhang**, **Esteban Venialgo Araujo,** imec (Netherlands); **Marcus Dahlem,** imec (Belgium); **Ruud M. Oldenbeuving,** imec (Netherlands)

13373-32 • 9:00 AM - 9:20 AM
Multi-depth HDR imaging system for improving accuracy in vein authentication
Author(s): **Yusuke Tanihata**, **Yu Feng,** Shizuoka Univ. (Japan); **Kamel Mars,** Shizuoka Institute of Science and Technology (Japan); **Keita Yasutomi**, **Shoji Kawahito,** Research Institute of Electronics, Shizuoka Univ. (Japan); **Keiichiro Kagawa,** Shizuoka Univ. (Japan); **Takashi Komuro,** Saitama Univ. (Japan); **Kazuya Nakano,** Seikei Univ. (Japan); **Hiroyuki Suzuki,** Gunma Univ. (Japan)

13373-33 • 9:20 AM - 9:40 AM
Enhanced phase measurement in optical coherence tomography using wavelength segmentation of stretched-pulse mode-locked laser
Author(s): **Jaeheung Kim**, **Minju Jeong**, **Seongjin Bak,** Pusan National Univ. (Korea, Republic of); **Gyeong Hun Kim,** Harvard Medical School (United States); **Hwidon Lee, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13373-35 • 9:40 AM - 10:00 AM
Towards a femtosecond laser written waveguide circuit in silica for hyperspectral imaging
Author(s): **Sébastien Bourdel**, **Olivier Gazzano,** ONERA (France); **Maxime Cavillon,** Institut de Chimie Moléculaire et des Matériaux d'Orsay (France); **Guillaume Druart,** ONERA (France); **Matthieu Lancry,** Institut de Chimie Moléculaire et des Matériaux d'Orsay (France)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: APPLICATIONS OF PHOTONIC INSTRUMENTS IV

29 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Groot Gregory**, Synopsys, Inc. (United States)

13373-36 • 10:30 AM - 10:50 AM
Miniaturization of a wide-angle 3D FMCW flash LIDAR
Author(s): **Laurent Frey**, **Anis Daami**, **Florence Rigal, Vincent Moulin,** CEA (France)

13373-37 • 10:50 AM - 11:10 AM
Flash LiDAR system using charge-domain time-compressive ToF CMOS image sensor and deep learning
Author(s): **Daisuke Hayashi,** Shizuoka Univ. (Japan); **Michitaka Yoshida,** Japan Society for the Promotion of Science (Japan); **De Xing Lioe**, **Keita Yasutomi**, **Shoji Kawahito,** Shizuoka Univ. (Japan); **Hajime Nagahara,** Osaka Univ. (Japan); **Keiichiro Kagawa,** Shizuoka Univ. (Japan)

13373-38 • 11:10 AM - 11:30 AM
Time-domain coherent LiDAR beyond coherence length using high-speed SPML laser
Author(s): **Dahun Jung,** Pusan National Univ. (Korea, Republic of); **Gyeong Hun Kim,** Harvard Medical School (United States), Massachusetts General Hospital (United States); **Seongjin Bak**, **Jaeheung Kim, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13373-39 • 11:30 AM - 11:50 AM **(CANCELLED)**
Fiber-based polarization sensitive FMCW LiDAR with two channel data acquisition
Author(s): **Jae Hwan Yang**, **Ji Won Bae**, **Yong-Jae Lee**, **Jaeheung Kim**, **Chang-Seok Kim, Tae Joong Eom,** Pusan National Univ. (Korea, Republic of)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 10: DESIGN, DEVELOPMENT, AND CHARACTERIZATION OF PHOTONIC INSTRUMENTS IV

29 January 2025 • 1:20 PM - 2:40 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Patrick C. Mock**, Overview Energy, Inc. (United States)

13373-40 • 1:20 PM - 1:40 PM
Full-range OCT imaging with 4×4 coupler and dual references for fourfold-extended depth range
Author(s): **Yeongbin Jeon**, **Jaeheung Kim**, **Hwidon Lee, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13373-41 • 1:40 PM - 2:00 PM
High Brightness Tunable Light Source Powered by LDLS® Facilitates Diamond Inspection
Author(s): **Xiaohua Ye**, **Nanu Brates**, **Renaud Richard**, **Megan Dube**, **Vikram Singh**, **Deborah Gustafson**, **Huiling Zhu**, **William Grube,** Energetiq Technology, Inc. (United States); **William Holber,** Plasmability, LLC (United States)

13373-42 • 2:00 PM - 2:20 PM
Advancements in TCSPC: overcoming pile-up limitations with high-speed photon detection versatile module
Author(s): **Piergiorgio Daniele**, **Gennaro Fratta**, **Francesco Malanga**, **Ivan Labanca**, **Giulia Acconcia, Ivan Rech,** Politecnico di Milano (Italy)

13373-43 • 2:20 PM - 2:40 PM
High-brightness broadband laser-driven pulsed source
Author(s): **Nanu Brates, Huiling Zhu,** Energetiq Technology, Inc. (United States)

Coffee Break 2:40 PM - 3:10 PM

SESSION 11: NANO-PHOTONICS MODULES AND SYSTEMS II

29 January 2025 • 3:10 PM - 4:40 PM | Moscone South, Room 313 (Level 3)
Session Chair(s): **Yakov Soskind**, Coherent Photonics (United States)

13373-44 • 3:10 PM - 3:40 PM
Novel workflow for metalens optical system design, simulation, and manufacture *(Invited Paper)*
Author(s): **Thibault Leportier,** Ansys Canada Ltd. (Canada); **Daniel Bacon-Brown,** MOXTEK, Inc. (United States); **Dylan McGuire,** Ansys Canada Ltd. (Canada); **Sanjay Gangadhara,** Ansys, Inc. (United States); **Brad Williams**, **Matthew George,** MOXTEK, Inc. (United States); **Adam Reid,** Ansys Canada Ltd. (Canada)

13373-45 • 3:40 PM - 4:00 PM
Fabrication and optical characterization of a silicon bilayer wire-grid polarizer for operation at a wavelength of 1550 nm
Author(s): **Jordan L. Baker**, **James Graham**, **Andrew Oliver**, **David L. Dickensheets, Wataru Nakagawa,** Montana State Univ. (United States)

13373-46 • 4:00 PM - 4:20 PM
Multifunctional spaceplates for aberration correction
Author(s): **Yixuan Shao**, **Tianxiang Dai,** Stanford Univ. (United States); **Robert Lupoiu,** Stanford University (United States); **Zichan Wang**, **Tom D. Milster,** The Univ. of Arizona (United States); **Jonathan A. Fan,** Stanford Univ. (United States)

13373-47 • 4:20 PM - 4:40 PM
A design study and advantages of meta-Alvarez lenses
Author(s): **Yijun Ding**, **Bryan D. Stone,** Synopsys, Inc. (United States); **Motoyuki Otake,** Synopsys, Inc. (Japan)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13373-11 • 6:00 PM - 8:00 PM
Cross-dispersion setup for an integrated near IR astrophotonic spectrograph
Author(s): **Harsha Pradeep,** Wyant College of Optical Sciences (United States); **Pradip Gatkine,** Univ. of California, Los Angeles (United States); **Sylvain Veilleux**, **Yang Zhang,** Univ. of Maryland, College Park (United States); **John Capone,** NASA Goddard Space Flight Ctr. (United States); **Jiahao Zhan, Mario Dagenais,** Univ. of Maryland, College Park (United States)

13373-34 • 6:00 PM - 8:00 PM
Enhanced defect detection in automotive wire harness using optical coherence tomography
Author(s): **Hayoung Kim**, **Euimin Lee**, **Juyeon Hong**, **Bosung Kim,** Kyungpook National Univ. (Korea, Republic of); **Ruchire Eranga H. Wijesinghe,** Sri Lanka Institute of Information Technology (Sri Lanka); **Mansik Jeon, Jeehyun Kim,** Kyungpook National Univ. (Korea, Republic of)

13373-50 • 6:00 PM - 8:00 PM
Classification method of 'root rot' using hyperspectral imaging technique
Author(s): **Hyo-suk Kim**, **Ji Hye Yoo**, **Jean Nepo Ndikumana**, **Hyoung Seok Kim, Jae Hun Kim,** Korea Institute of Science and Technology (Korea, Republic of)

13373-51 • 6:00 PM - 8:00 PM
Analyze the transparent internal structure of optical fiber with transmissive optical microscopy
Author(s): **Yoonseok Kim**, **Daewoon Seong**, **Hyungseo Jeon**, **Sangyeob Han,** Kyungpook National Univ. (Korea, Republic of); **Ruchire Eranga H. Wijesinghe,** Sri Lanka Institute of Information Technology (Sri Lanka); **Mansik Jeon, Jeehyun Kim,** Kyungpook National Univ. (Korea, Republic of)

13373-52 • 6:00 PM - 8:00 PM
Automotive curved display inspection system using optical coherence tomography
Author(s): **Bosung Kim**, **Sangyeob Han**, **Yoonseok Kim**, **Juyeon Hong,** Kyungpook National Univ. (Korea, Republic of); **Ruchire Eranga H. Wijesinghe,** Sri Lanka Institute of Information Technology (Sri Lanka); **Mansik Jeon, Jeehyun Kim,** Kyungpook National Univ. (Korea, Republic of)

13373-53 • 6:00 PM - 8:00 PM
Balanced detection for spectral-domain optical coherence tomography using dual line-scan camera structure
Author(s): **Hyungseo Jeon**, **Hayoung Kim**, **Daewoon Seong**, **Euimin Lee,** Kyungpook National Univ. (Korea, Republic of); **Ruchire Eranga H. Wijesinghe,** Sri Lanka Institute of Information Technology (Sri Lanka); **Mansik Jeon, Jeehyun Kim,** Kyungpook National Univ. (Korea, Republic of)

13373-55 • 6:00 PM - 8:00 PM
Laser-driven light source for FTIR applications in semiconductor manufacturing and metrology
Author(s): **Nanu Brates**, **Vikram Singh,** Energetiq Technology, Inc. (United States); **Renaud Richard,** Energetiq Technology (United States)

13373-56 • 6:00 PM - 8:00 PM
Spectral response and aging optimization of sub-miniaturized lamps for optical MEMS spectrometers
Author(s): **Ahmad Mahfouz**, **Shady Labib**, **Mohamed Ismail,** Si-Ware Systems (Egypt); **Islam Samir,** Si-Ware Systems (Egypt), Ain-Shams Univ. (Egypt); **Bassem Mortada,** Si-Ware Systems (Egypt); **Mazen Erfan,** Si-Ware Systems SAS (France), Ain-Shams Univ. (Egypt); **Yasser Sabry,** Si-Ware Systems (Egypt), Ain-Shams Univ. (Egypt)

13373-57 • 6:00 PM - 8:00 PM
Laser-driven light source enables improved trace-level gas measurements
Author(s): **Nanu Brates, William Grube,** Energetiq Technology, Inc. (United States)

13373-58 • 6:00 PM - 8:00 PM
Design and calibration of an all-sky polarization imager for smoke plume characterization
Author(s): **Matthew McClelland**, **Erica Venkatesulu, Joseph A. Shaw,** Montana State Univ. (United States)

13373-59 • 6:00 PM - 8:00 PM
Broadband phase retrieval for photonic lantern wavefront sensors
Author(s): **Ameer B. Batarseh**, **Miguel A. Romer**, **Miguel A. Bandres**, **Rodrigo Amezcua-Correa**, **Daniel Cruz-Delgado, Stephen S. Eikenberry,** Univ. of Central Florida (United States)

13373-60 • 6:00 PM - 8:00 PM
An open source software suite for automated electro optic characterization of photonic integrated circuits
Author(s): **Jonathan Barnes**, **Peter van den Doel**, **Mustafa Hammood**, **Madeline Mahanloo,** The Univ. of British Columbia (Canada); **Sean Lam,** University of British Columbia (Canada); **Lukas Chrostowski,** The Univ. of British Columbia (Canada)

13373-61 • 6:00 PM - 8:00 PM
Detection of *Escherichia coli* bacteria using surface plasmon resonance-wavelength interrogation setup
Author(s): **Sara Mohamed**, **Karim El-Seherawy**, **Mostafa Hassan,** The American Univ. in Cairo (Egypt); **Ahmed Kreta,** The American Univ. in Cairo (Egypt), May Univ. in Cairo (Egypt); **Baraah Hasanin**, **Yasmine Elbagoury**, **Heba Refaat**, **Shaimaa F. Ahmed**, **Mai Mostafa**, **Ahmed Moustafa, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13373-62 • 6:00 PM - 8:00 PM
Sum of integrated emissions identifying the best vapochromic coordination polymers for ammonia ppm detection using 405nm induced fluorescence
Author(s): **Glenn H. Chapman**, **Dawei Yin**, **Bonnie Gray**, **Lenna M Karen, Daniel Leznoff,** Simon Fraser Univ. (Canada)

13373-63 • 6:00 PM - 8:00 PM
Integration of MicroLED displays and quantum dot-based sensors in CMOS-driven smart functional pixels: a platform for multifunctional displays and sensing systems
Author(s): **Amir-Abbas Yousefi Amin,** Ludwig-Maximilians-Univ. München (Germany), SERINO Tech (Germany); **Maryam Ghassemi,** Ludwig-Maximilians-Univ. München (Germany)

13373-64 • 6:00 PM - 8:00 PM
Seismic tomography of dams using surface wave analysis and distributed acoustic sensing
Author(s): **Beatriz Brusamarello**, **João P. Bazzo**, **Uilian José Dreyer**, **Gustavo Macioski**, **Larissa W. Kulik,** Univ. Tecnológica Federal do Paraná (Brazil); **Sidnei H. C. Teixeira,** Univ. Federal do Paraná (Brazil); **Gilson A. Brunetto**, **Luis F. P. Melegari,** CPFL Geração de Energia S.A. (Brazil); **Daniel R. Pipa**, **Cicero Martelli, Jean Carlos Cardozo da Silva,** Univ. Tecnológica Federal do Paraná (Brazil)

13373-65 • 6:00 PM - 8:00 PM

Path to on-sky commissioning of the MROI fringe tracker

Author(s): **Jeffrey Mason,** New Mexico Institute of Mining and Technology (United States); **Michelle Creech-Eakman,** Magdalena Ridge Observatory (United States), New Mexico Institute of Mining and Technology (United States); **David F Buscher**, **Chris A Haniff,** Cavendish Laboratory, University of Cambridge (United Kingdom); **James J. D. Luis,** Magdalena Ridge Observatory (United States), New Mexico Institute of Mining and Technology (United States)

CONFERENCE 13374

Next-Generation Optical Communication: Components, Sub-Systems, and Systems XIV

28 - 29 January 2025 | Moscone South, Room 302 (Level 3)

Conference Chair(s): **Guifang Li,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Kazuhide Nakajima,** NTT - Tsukuba R&D Ctr. (Japan); **Atul K. Srivastava,** NTT Electronics America, Inc. (United States)

Program Committee: **Ezra Ip,** NEC Labs. America, Inc. (United States); **Hideki Isono,** Fujitsu Optical Components Ltd. (Japan); **Yongmin Jung,** Optoelectronics Research Ctr. (United Kingdom); **Ming-Jun Li,** Corning Incorporated (United States); **Akihiro Maruta,** Osaka Univ. (Japan); **Charles Park,** Juniper Networks, Inc. (United States); **Roland Ryf,** Nokia Bell Labs. (United States); **Takashi Sasaki,** Innovation Core SEI, Inc. (United States); **Leo Spiekman,** Aeon Corp. (United States); **Ryuichi Sugizaki,** Furukawa Electric Co., Ltd. (Japan); **Michela Svaluto Moreolo,** Ctr. Tecnològic de Telecomunicacions de Catalunya (Spain); **Chongjin Xie,** Alibaba (China) Co., Ltd. (China); **Yanjun Zhu,** Hisense Broadband, Inc. (United States)

Tuesday 28 January 2025

SESSION 1: EMERGING OPTICAL TRANSMISSION TECHNOLOGY

28 January 2025 • 8:10 AM - 10:00 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Guifang Li**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13374-1 • 8:10 AM - 8:40 AM
Whispering at the shot noise limit: communication using single photons through photon-starved channels *(Invited Paper)*
Author(s): **Sai Kanth Dacha,** Columbia Univ. (United States), Nokia Bell Labs. (United States); **René-Jean Essiambre**, **Alexei Ashikhmin**, **Andrea Blanco-Redondo,** Nokia Bell Labs. (United States); **Frank Kschischang,** Univ. of Toronto (Canada); **Konrad Banaszek,** Univ. of Warsaw (Poland); **Yuanhang Zhang,** Nokia Bell Labs. (United States)

13374-2 • 8:40 AM - 9:10 AM
Long-haul transmission of a 4096-ary optical eigenvalue-modulated signal *(Invited Paper)*
Author(s): **Ken Mishina,** Osaka Univ. (Japan)

13374-3 • 9:10 AM - 9:30 AM
Exploiting the acousto-optic effect for developing secure digital identifiers
Author(s): **David Martin-Sanchez,** Univ. College London (United Kingdom), Instituto de Microelectrónica de Sevilla, Ctr. Nacional de Microelectrónica, Univ. de Sevilla, Consejo Superior de Investigaciones Científicas (Spain); **Piedad Brox Jimenez,** Instituto de Microelectrónica de Sevilla (Spain)

13374-4 • 9:30 AM - 10:00 AM
The Quantum Age Begins: Now, 5 , 50 or 500 Years? An operator perspective on quantum (secure) communication evolution in the next years. *(Invited Paper)*
Author(s): **Zoe Davidson**, **Catherine White**, **Ali Sajjad**, **Emilio H Hugues-Salas, Andrew Lord,** British Telecommunications plc (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: SDM TRANSMISSION

28 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Yongmin Jung**, Optoelectronics Research Ctr. (United Kingdom)

13374-5 • 10:30 AM - 11:00 AM
Maximizing the transmission capacity in multimode SDM systems *(Invited Paper)*
Author(s): **Filipe Ferreira,** Univ. College London (United Kingdom)

13374-6 • 11:00 AM - 11:20 AM
Enabling multimode SDM at reduced equalization complexity via optimized elliptical core fibers
Author(s): **Rekha Yadav**, **Fabio Barbosa,** Univ. College London (United Kingdom); **Ming-Jun Li,** Corning Incorporated (United States); **Filipe M. Ferreira,** Univ. College London (United Kingdom)

13374-7 • 11:20 AM - 11:50 AM
Long-haul submarine transmission using coupled multicore fibers: recent research results and prospects for deployment *(Invited Paper)*
Author(s): **Emmanuel Le Taillandier de Gabory,** NEC Corp. (Japan)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 3: NETWORK SENSING AND WIDEBAND TRANSMISSION

28 January 2025 • 1:20 PM - 3:00 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Ken Mishina**, Osaka Univ. (Japan)

13374-8 • 1:20 PM - 1:50 PM
Diverse sensing applications with dual optical frequency combs *(Invited Paper)*
Author(s): **Aleksandra M. Kaszubowska-Anandarajah,** Trinity College Dublin (Ireland); **Prince Anandarajah, Minghao Wei,** Dublin City Univ. (Ireland)

13374-9 • 1:50 PM - 2:10 PM
Numerical Study of High-Speed Opto-Electronic Arbitrary Waveform Estimator Using Adaptive Filter Synthesis
Author(s): **Zheqing Sun, Takahide Sakamoto,** Tokyo Metropolitan Univ. (Japan)

13374-10 • 2:10 PM - 2:30 PM
Analytical and numerical hybrid capacity estimation method for multi-band elastic optical networks
Author(s): **Shunya Shimoi**, **Hayato Yuasa**, **Takuma Kuno,** Nagoya Univ. (Japan); **Yojiro Mori,** Toyota Technological Institute (Japan); **Shih-Chun Lin,** North Carolina State Univ. (United States); **Motoharu Matsuura,** The Univ. of Electro-Communications (Japan); **Suresh Subramaniam,** The George Washington Univ. (United States); **Hiroshi Hasegawa,** Nagoya Univ. (Japan)

13374-11 • 2:30 PM - 3:00 PM
Long-haul wideband WDM transmission beyond C+L bands using PPLN-based optical parametric amplifiers *(Invited Paper)*
Author(s): **Takayuki Kobayashi,** NTT Network Innovation Labs. (Japan)

Coffee Break 3:00 PM - 3:30 PM

SESSION 4: AI NATIVE NETWORK AND SILICON PHOTONICS

28 January 2025 • 3:30 PM - 5:30 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Atul K. Srivastava**, NTT Electronics America, Inc. (United States)

13374-12 • 3:30 PM - 4:00 PM
Ultrastable optical frequency transfer over deployed multicore fiber for optical clock comparison and synchronization *(Invited Paper)*
Author(s): **Nazanin Hoghooghi,** National Institute of Standards and Technology (United States)

13374-13 • 4:00 PM - 4:30 PM **(CANCELLED)**
AI native network for end-to-end assurance: an approach to IP-DWDM AIOPS with ZR/ZR+ coherent optic *(Invited Paper)*
Author(s): **Domenico Di Mola,** Juniper Networks, Inc. (United States)

13374-14 • 4:30 PM - 5:00 PM
Inverse-designed silicon photonic devices for data transmission *(Invited Paper)*
Author(s): **Kiyoul Yang,** Harvard Univ. (United States)

13374-15 • 5:00 PM - 5:30 PM
On-chip comb light source integration in silicon photonics *(Invited Paper)*
Author(s): **William He**, **Xiangpeng Ou**, **Xin Yao**, **Arterm Prokoshin**, **Ying Shi, Yating Wan,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

Wednesday 29 January 2025

SESSION 5: NOVEL OPTICAL TRANSCEIVERS TECHNOLOGIES

29 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Hideki Isono**, Fujitsu Optical Components Ltd. (Japan)

13374-16 • 8:00 AM - 8:30 AM
Optical DACs for energy efficient transmission *(Invited Paper)*
Author(s): **Ioannis Tomkos,** Athens Information Technology (Greece); **Christos Christofidis,** Univ. of Patras (Greece)

13374-17 • 8:30 AM - 8:50 AM
Reducing the power consumption of optical interconnects by employing oDAC based transmitters
Author(s): **Konstantinos Moschopoulos**, **Vassilis Tsourtis**, **Christos Christofidis,** Univ. of Patras (Greece); **Moshe Nazarathy,** Technion-Israel Institute of Technology (Israel); **Ioannis Tomkos,** Univ. of Patras (Greece)

13374-18 • 8:50 AM - 9:10 AM
EEPN mitigation by local oscillator phase isolation with dual pilot carriers
Author(s): **Taisei Sekizuka**, **Takuma Kuno**, **Reiji Higuchi,** Nagoya Univ. (Japan); **Ryuta Shiraki,** Kyoto Univ. (Japan); **Yojiro Mori,** Toyota Technological Institute (Japan); **Hiroshi Hasegawa,** Nagoya Univ. (Japan)

13374-19 • 9:10 AM - 9:30 AM
Beyond 100 GHz Operation of AlN/glass hybrid sub-mount for high-speed EML assembly
Author(s): **Mizuki Shirao**, **Shinya Okuda**, **Takuma Fujita, Nobuo Ohata,** Mitsubishi Electric Corp. (Japan)

13374-20 • 9:30 AM - 10:00 AM
Pluggable and embedded optics: capacity and rate support *(Invited Paper)*
Author(s): **Jeffery J. Maki,** Juniper Networks, Inc. (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 6: OPTICAL TECHNOLOGY FOR AI

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Takashi Sasaki**, Sumitomo Electric Industries, Ltd. (Japan)

13374-21 • 10:30 AM - 11:00 AM
Optical switching for AI computing systems *(Invited Paper)*
Author(s): **Paraskevas Bakopoulos**, **Giannis Patronas**, **Nikos Terzenidis,** NVIDIA Corp. (Greece); **Prethvi Kashinkunti,** NVIDIA Corp. (United States); **Eitan Zahavi,** NVIDIA Corp. (Israel); **Dimitris Syrivelis,** NVIDIA Corp. (Greece); **Louis Capps,** NVIDIA Corp. (United States); **Zsolt-Alon Wertheimer,** NVIDIA Corp. (Israel); **Nikos Argyris**, **Athanasios Fevgas,** NVIDIA Corp. (Greece); **Craig Thompson,** NVIDIA Corp. (United States); **Avraham Ganor,** NVIDIA Corp. (Israel); **Julie Bernauer,** NVIDIA Corp. (United States); **Elad Mentovich,** NVIDIA Corp. (Israel)

13374-22 • 11:00 AM - 11:30 AM
Ultra-high density I/O solutions for AI clusters *(Invited Paper)*
Author(s): **Peter J. Winzer,** Nubis Communications, Inc. (United States)

13374-23 • 11:30 AM - 12:00 PM
Energy efficient optical interconnects for the next generation of AI compute *(Invited Paper)*
Author(s): **Jeff O. Hutchins,** RANOVUS, Inc. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 7: NOVEL OPTICAL FIBERS AND SUBSYSTEMS

29 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Kazuhide Nakajima**, NTT - Tsukuba R&D Ctr. (Japan)

13374-24 • 1:30 PM - 2:00 PM
Advances in antiresonant hollow core fibers for communications, sensing, space, and beyond *(Invited Paper)*
Author(s): **Austin Taranta,** Univ. of Southampton (United Kingdom)

13374-25 • 2:00 PM - 2:20 PM
Infinitely scalable modular OXC node architecture with sparse and regular intra-node inter-connection
Author(s): **Atsuki Wada**, **Takuma Kuno,** Nagoya Univ. (Japan); **Yojiro Mori,** Toyota Technological Institute (Japan); **Wakako Maeda**, **Shigeyuki Yanagimachi,** NEC Corp. (Japan); **Hiroshi Hasegawa,** Nagoya Univ. (Japan)

13374-26 • 2:20 PM - 2:40 PM
50Gbit/s transmission at 850nm with a surface-normal electroabsorption modulator
Author(s): **Mathilde Gay,** Fonctions Optiques pour les Technologies de l'information, Univ. de Rennes 1, CNRS (France); **Laurent Bramerie**, **J. Potet,** Fonctions Optiques pour les Technologies de l'information (France); **Sébastien Lobo,** Institut Foton, CNRS, Univ. de Rennes (France); **M. Joindot,** Fonctions Optiques pour les Technologies de l'information (France); **Lucas Laplanche**, **Pierre Gadras**, **Christophe Viallon**, **Alexandre Arnoult**, **Alexandre Rumeau**, **Stéphane Calvez, Guilhem Almuneau,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France)

13374-27 • 2:40 PM - 3:10 PM
The latest fusion splicing technologies supporting innovation of fiber optics *(Invited Paper)*
Author(s): **Akio Tanabe,** Furukawa Electric Co., Ltd. (Japan); **Hideaki Hosoi**, **Toshiyuki Fujii**, **Masanori Takahashi**, **Ryuichi Sugizaki, Kazunori Mukasa,** Furukawa Electric Co.,Ltd. (Japan)

Coffee Break 3:10 PM - 3:40 PM

SESSION 8: NEXT GENERATION OPTICAL TRANSMISSION TECHNIQUES

29 January 2025 • 3:40 PM - 5:20 PM | Moscone South, Room 302 (Level 3)
Session Chair(s): **Guifang Li**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13374-28 • 3:40 PM - 4:10 PM
The future of communication networks *(Invited Paper)*
Author(s): **Dimitra E. Simeonidou,** Univ. of Bristol (United Kingdom)

13374-29 • 4:10 PM - 4:30 PM
Fiber fading-free dual-sideband direct detection OFDM transmission by optoelectronic phase-conjugation processing
Author(s): **Tomoya Suzuki**, **Shun Harada**, **Zheqing Sun**, **Manaki Iwatate**, **Gaku Karaki**, **Koshiro Hashihara,** Tokyo Metropolitan Univ. (Japan); **Ken Tanizawa**, **Fumio Futami,** Tamagawa Univ. (Japan); **Takahide Sakamoto,** Tokyo Metropolitan Univ. (Japan)

13374-30 • 4:30 PM - 4:50 PM
Laser phase-noise-free transmission scheme based on conjugated radio-on-fiber technology
Author(s):

13374-31 • 4:50 PM - 5:20 PM
Optical wireless convergence: development and challenges *(Invited Paper)*
Author(s): **Christina Lim**, **Yijie Tao,** The Univ. of Melbourne (Australia); **Chathurika Ranaweera,** Deakin Univ. (Australia); **Ampalavanapillai Nirmalathas,** The Univ. of Melbourne (Australia); **Lena Wosinska,** Chalmers University of Technology (Sweden)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13374-32 • 6:00 PM - 8:00 PM
Enhancing traffic flow with visible light communication: a deep reinforcement learning approach
Author(s): **Manuel Augusto Vieira,** ISEL-IPL /UNINOVA-CTS and LASI (Portugal); **Gonçalo Galvão,** ISEL (Portugal), NOVA School of Science and Technology (Portugal); **Manuela Vieira,** UNINOVA (Portugal), Instituto Superior de Engenharia de Lisboa, Instituto Politécnico de Lisboa (Portugal); **Mário Vestias,** Instituto Superior de Engenharia de Lisboa (Portugal); **Paula Louro,** ISEL-IPL /UNINOVA-CTS and LASI (Portugal); **Ricardo Jardim Gonçalves,** UNINOVA (Portugal), NOVA School of Science and Technology (Portugal)

13374-33 • 6:00 PM - 8:00 PM
RAMZI-coupled all optical digital to analog converter
Author(s): **Christos Christofidis**, **Dimitrios Vrahatis**, **Georgios Tsakalis**, **Kostantinos Moschopoulos,** Univ. of Patras (Greece); **Moshe Nazarathy,** Technion (Israel); **Ioannis Tomkos,** Univ. of Patras (Greece)

CONFERENCE 13375

AI and Optical Data Sciences VI

27 - 30 January 2025 | Moscone South, Room 202 (Level 2)

Conference Chair(s): **Masaya Notomi,** NTT Basic Research Labs. (Japan); **Tingyi Zhou,** SiLC Technologies, Inc. (United States)

Program Committee: **Christopher Barsi,** BRELYON, Inc. (United States); **Peter Bienstman,** UGent (Belgium); **Wim Bogaerts,** Univ. Gent (Belgium); **Kristofer Bouchard,** Lawrence Berkeley National Lab. (United States); **Daniel Brunner,** FEMTO-ST (France); **Marco Fiorentino,** Hewlett Packard Enterprise (United States); **Goëry Genty,** Tampere Univ. (Finland); **Ryoichi Horisaki,** The Univ. of Tokyo (Japan); **Bahram Jalali,** UCLA Samueli School of Engineering (United States); **Shota Kita,** NTT Basic Research Labs. (Japan); **Ken-ichi Kitayama,** National Institute of Information and Communications Technology (Japan), Hamamatsu Photonics (Japan); **Cejo K. Lonappan,** UCLA Samueli School Of Engineering (United States); **Arka Majumdar,** Univ. of Washington (United States); **Peter L. McMahon,** Cornell Univ. (United States); **Mitsumasa Nakajima,** NTT Device Technology Labs. (Japan); **Bert Jan Offrein,** IBM Research - Zürich (Switzerland); **Tatsuhiro Onodera,** NTT Research, Inc. (United States); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States); **Nikos Pleros,** Aristotle Univ. of Thessaloniki (Greece); **Bhavin J. Shastri,** Queen's Univ. (Canada); **Volker J. Sorger,** Univ. of Florida (United States); **Haruyoshi Toyoda,** Hamamatsu Photonics K.K. (Japan); **George C. Valley,** The Aerospace Corp. (United States); **Yiming Zhou,** Meta (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: COMPUTATIONAL IMAGING I

27 January 2025 • 10:45 AM - 12:35 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Christopher Barsi**, BRELYON, Inc. (United States)

13375-1 • 10:45 AM - 11:10 AM
Differentiable imaging *(Invited Paper)*
Author(s): **Ni Chen,** Wyant College of Optical Sciences (United States); **Yanmin Zhu,** Massachusetts Institute of Technology (United States)

13375-2 • 11:10 AM - 11:25 AM
Solid-immersion diffractive imaging
Author(s): **Jingtian Hu,** Harbin Institute of Technology Shenzhen Graduate School (China); **Kun Liao,** Peking Univ. (China); **Niyazi Ulas Dinc**, **Carlo Gigli,** EPFL (Switzerland); **Bijie Bai,** Univ. of California, Los Angeles (United States); **Xurong Li,** EPFL (Switzerland); **Hanlong Chen**, **Xilin Yang**, **Yuhang Li**, **Çağatay Işıl**, **Md Sadman Sakib Rahman**, **Jingxi Li,** Univ. of California, Los Angeles (United States); **Xiaoyong Hu,** Peking Univ. (China); **Mona Jarrahi,** Univ. of California, Los Angeles (United States); **Demetri Psaltis,** EPFL (Switzerland); **Aydogan Ozcan,** Univ. of

California, Los Angeles (United States)

13375-3 • 11:25 AM - 11:40 AM
Waveguide-integrated eye tracking system
Author(s): **Bonkon Koo**, **Jaeyeol Ryu,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Sanghyun Yi,** SAMSUNG Electronics Co. (Korea, Republic of); **Sunghwan Shin**, **Do Youn Kim,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Gavril Vostrikov**, **Andrey Malkin**, **Alexey Anikanov**, **Stanislav Shtykov,** Samsung R&D Institute Russia (Russian Federation); **JongChul Choi**, **Kyusub Kwak, Garam Young,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of)

13375-4 • 11:40 AM - 12:05 PM
Adjoint multiple scattering for differentiable 3D holographic imaging *(Invited Paper)*
Author(s): **Congli Wang,** Princeton Univ. (United States)

13375-5 • 12:05 PM - 12:20 PM
Event-driven LiDAR with dynamic neuromorphic processing
Author(s): **Matthias Aquilina,** Univ. of Glasgow (United Kingdom)

13375-6 • 12:20 PM - 12:35 PM
LiGO: LLM-Enhanced Iterative Graphic Optimization for Large Field-of-View Underwater 3D Reconstruction
Author(s): **Yuanzheng Ma,** Tsinghua Univ. (China); **Nikita Lukhanin,** Univ. of California (United States); **Erqi Wang,** The Chinese Univ. of Hong Kong (China); **Kwan Yi Shum**, **Yansong Du,** Tsinghua Univ. (China); **Liwei Lin,** Univ. of California, Berkeley (United States); **Xun Guan,** Tsinghua Univ. (China)

Lunch Break 12:35 PM - 1:55 PM

SESSION 2: COMPUTATIONAL IMAGING II

27 January 2025 • 1:55 PM - 3:30 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Congli Wang**, Princeton Univ. (United States)

13375-7 • 1:55 PM - 2:20 PM
Advancing computational microscopy by physics-simulator and deep learning *(Invited Paper)*
Author(s): **Lei Tian,** Boston Univ. (United States)

13375-8 • 2:20 PM - 2:35 PM
Miniaturized ultra-compact film spectrometer and the hyperspectral imaging application based on deep learning
Author(s): **Junren Wen**, **Chenying Yang,** Hangzhou Institute for Advanced Study, UCAS (China); **Weidong Shen,** Zhejiang Univ. (China); **Yuchuan Shao,** Hangzhou Institute for Advanced Study, UCAS (China)

13375-50 • 2:35 PM - 3:00 PM
Integration of programmable diffraction with digital neural networks *(Invited Paper)*
Author(s): **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13375-11 • 3:00 PM - 3:15 PM
Deep learning-enabled imaging of abdominal organs through multimode fibers
Author(s): **Jawaria Maqbool, M. Imran Cheema,** Lahore Univ. of Management Sciences (Pakistan)

13375-10 • 3:15 PM - 3:30 PM
Enhancing computer vision tasks with a hyperspectral video imager using coded aperture technology
Author(s): **Alexander Spanellis**, **Eli Sheppard**, **Daniel A. C. Pearce, Steve Chappell,** Living Optics (United Kingdom)

Coffee Break 3:30 PM - 4:00 PM

SESSION 3: PHOTONIC RESERVOIR COMPUTING

27 January 2025 • 4:00 PM - 6:00 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **George C. Valley**, The Aerospace Corp. (United States)

13375-13 • 4:00 PM - 4:25 PM
Optical next generation reservoir computing with complex media *(Invited Paper)*
Author(s): **Hao Wang,** Tsinghua Univ. (China), Lab. Kastler Brossel (France); **Jianqi Hu,** Lab. Kastler Brossel (France), EPFL (Switzerland); **YoonSeok Baek,** Lab. Kastler Brossel (France); **Kohei Tsuchiyama,** The Univ. of Tokyo (Japan), Lab. Kastler Brossel (France); **Malo Joly,** Lab. Kastler Brossel (France); **Qiang Liu,** Tsinghua Univ. (China); **Sylvain Gigan,** Lab. Kastler Brossel (France)

13375-14 • 4:25 PM - 4:40 PM
Comparison of digital, photonic, and memristor-based reservoir computing
Author(s): **Nataniel Holtzman**, **Patrick Edwards,** The Aerospace Corp. (United States); **Matthew Marinella,** Arizona State Univ. (United States); **George C. Valley,** The Aerospace Corp. (United States)

13375-15 • 4:40 PM - 5:05 PM
Photonic next-generation reservoir computing using optical fiber *(Invited Paper)*
Author(s): **Nicholas Cox**, **Joseph Murray,** U.S. Naval Research Lab. (United States); **Joseph Hart,** NASA (United States); **Raktim Sarma,** Sandia National Labs. (United States); **Sean Pang,** Univ. of Central Florida (United States); **Brandon Redding,** U.S. Naval Research Lab. (United States)

13375-16 • 5:05 PM - 5:20 PM
Reservoir computer using a photorefractive nonlinear medium
Author(s): **Sebastian Alveteg**, **Marc Sciamanna,** CentraleSupélec (France); **Alex Fuerbach,** Macquarie Univ. (Australia); **Delphine Wolfersberger,** CentraleSupélec (France)

13375-17 • 5:20 PM - 5:35 PM
Leveraging nonlinear dynamics in silicon microring resonator arrays for image classification via reservoir computing
Author(s): **Alessandro Foradori,** Univ. Gent (Belgium), Univ. degli Studi di Trento (Italy); **Alessio Lugnan**, **Lorenzo Pavesi,** Univ. degli Studi di Trento (Italy); **Peter Bienstman,** Univ. Gent (Belgium)

13375-97 • 5:35 PM - 6:00 PM
Mapping signals to a high-dimensional space using nonlinear photonics *(Invited Paper)*
Author(s): **Sergei K. Turitsyn,** Aston Univ. (United Kingdom)

Tuesday 28 January 2025

SESSION 4: NOVEL PIC AND DEVICE TECHNOLOGIES FOR OPTICAL NN I

28 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Volker J. Sorger**, Univ. of Florida (United States)

13375-18 • 8:00 AM - 8:15 AM
Non-volatile photonic hybrid optical switch with integrated phase change material assisted with nanographene-microheater for neuromorphic computing
Author(s): **Anna P. Ovvyan,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Niklas Vollmar,** Univ. Münster (Germany); **Zhongyu Tang**, **Seongmin Jo,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Martin Salinga,** Univ. Münster (Germany); **Wolfram H. P. Pernice,** Ruprecht-Karls-Univ. Heidelberg (Germany), Univ. Münster (Germany)

13375-19 • 8:15 AM - 8:40 AM
Meta-optical encoders for high-resolution, real-time computer vision *(Invited Paper)*
Author(s): **Arka Majumdar,** Univ. of Washington (United States)

13375-20 • 8:40 AM - 9:05 AM
Engineering photonics for efficient and scalable machine learning systems *(Invited Paper)*
Author(s): **Lingling Fan,** Stanford Univ. (United States)

13375-21 • 9:05 AM - 9:20 AM
Advanced packaging for enhancements to photonic machine learning accelerators
Author(s): **Russell L. T. Schwartz**, **Vishal Ayyappan**, **Hangbo Yang**, **Nicola Peserico, Volker J. Sorger,** Univ. of Florida (United States)

13375-22 • 9:20 AM - 9:45 AM
Heterogeneous integration of nonvolatile phase-change photonics *(Invited Paper)*
Author(s): **Cosmin-Constantin Popescu,** Massachusetts Institute of Technology (United States); **Hyun Jung Kim,** Korea Advanced Institute of Science and Technology (Korea, Republic of); **Khoi Dao**, **Brian Mills**, **Tian Gu,** Massachusetts Institute of Technology (United States); **Oleg Maksimov**, **Harish Bhandari,** Radiation Monitoring Devices Inc. (United States); **JueJun Hu,** Massachusetts Institute of Technology (United States)

13375-23 • 9:45 AM - 10:10 AM
Quantum tomography and intracavity dynamics with a biased optical parametric oscillator *(Invited Paper)*
Author(s): **Yannick Salamin,** Massachusetts Institute of Technology (United States), Univ. of Central Florida (United States); **Charles Roques-Carmes,** Massachusetts Institute of Technology (United States), Stanford Univ. (United States); **Seou Choi**, **Jamison Sloan**, **Michael Horodynski**, **Di Luo, Marin Soljačić,** Massachusetts Institute of Technology (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 5: NOVEL PIC AND DEVICE TECHNOLOGIES FOR OPTICAL NN II

28 January 2025 • 10:30 AM - 12:40 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Volker J. Sorger**, Univ. of Florida (United States)

13375-24 • 10:30 AM - 10:55 AM
Integration and scaling of high-speed silicon photonics joint transform correlator for convolution neural networks *(Invited Paper)*
Author(s): **Nicola Peserico**, **Hangbo Yang**, **Russell L. T. Schwartz**, **Salem Altaleb,** Univ. of Florida (United States); **Benyamin F. Motlagh**, **Jaskirat S. Virdi,** Univ. of California, Los Angeles (United States); **Belal Jahannia**, **Hamed Dalir,** Univ. of Florida (United States); **Aydin Babakhani**, **Puneet Gupta,** Univ. of California, Los Angeles (United States); **Volker J. Sorger,** Univ. of Florida (United States)

13375-25 • 10:55 AM - 11:20 AM
Advancing photonic crystal devices by non-Hermitian degeneracies *(Invited Paper)*
Author(s): **Kenta Takata,** NTT Basic Research Labs. (Japan); **Masaya Notomi,** NTT Basic Research Labs. (Japan), Tokyo Institute of Technology (Japan); **Adam Mock,** NTT Basic Research Labs. (Japan); **Takahiro Uemura,** Tokyo Institute of Technology (Japan)

13375-26 • 11:20 AM - 11:35 AM
Fabrication error-tolerant, wavelength insensitive silicon photonics interferometers for on-chip large-scale matrix-matrix multipliers

Author(s): **Shota Kita**, **Kohei Ikeda,** NTT Nanophotonics Ctr. (Japan), NTT Basic Research Labs. (Japan); **Bedilu Daniel,** NTT Basic Research Labs. (Japan); **Yuriko Maegami**, **Guangwei Cong**, **Noritsugu Yamamoto**, **Koji Yamada,** National Institute of Advanced Industrial Science and Technology (Japan); **Akihiko Shinya, Masaya Notomi,** NTT Nanophotonics Ctr. (Japan), NTT Basic Research Labs. (Japan)

13375-27 • 11:35 AM - 12:00 PM
Can metamaterials help achieve an "optical advantage" in computing? *(Invited Paper)*
Author(s): **Francesco Monticone, Yandong Li,** Cornell Univ. (United States)

13375-28 • 12:00 PM - 12:25 PM
Photonic computation mediated by sound waves *(Invited Paper)*
Author(s): **Birgit Stiller,** Max-Planck-Institut für die Physik des Lichts (Germany), Leibniz Univ. Hannover (Germany)

13375-29 • 12:25 PM - 12:40 PM
Comprehensive thermal crosstalk model of meshed MZI topologies for neuromorphic computing
Author(s): **Andrea Marchisio**, **Lorenzo Tunesi**, **Hasan Awad,** Politecnico di Torino (Italy); **Enrico Ghillino,** Synopsys, Inc. (United States); **Vittorio Curri**, **Andrea Carena, Paolo Bardella,** Politecnico di Torino (Italy)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 6: PHOTONIC HARDWARE ACCELERATOR I

28 January 2025 • 2:10 PM - 3:50 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Tingyi Zhou**, SiLC Technologies, Inc. (United States)

13375-30 • 2:10 PM - 2:45 PM
Accelerating computing with trainable nonlinear Schrödinger equation (Keynote Presentation)
Author(s): **Bahram Jalali**, **Yiming Zhou**, **Tingyi Zhou, Callen MacPhee,** Univ. of California, Los Angeles (United States)

13375-31 • 2:45 PM - 3:10 PM
Fully programmable multimode wave propagation for machine learning and quantum optics *(Invited Paper)*
Author(s): **Tatsuhiro Onodera,** Cornell Univ. (United States), NTT Research, Inc. (United States); **Martin Stein**, **Benjamin Ash,** Cornell Univ. (United States); **Ryotatsu Yanagimoto,** Cornell Univ. (United States), NTT Research, Inc. (United States); **Logan Wright,** Yale Univ. (United States); **Peter McMahon,** Cornell Univ. (United States)

13375-32 • 3:10 PM - 3:25 PM
Hyperspectral compute-in-memory architecture and key optical components
Author(s): **Myoung-Gyun Suh**, **Byoung Jun Park**, **Mostafa Honari-Latifpour, Yoshihisa Yamamoto,** NTT Research, Inc. (United States)

13375-33 • 3:25 PM - 3:50 PM
Photonic probabilistic computing *(Invited Paper)*
Author(s): **Wolfram H. P. Pernice,** Ruprecht-Karls-Univ. Heidelberg (Germany)

Coffee Break 3:50 PM - 4:10 PM

SESSION 7: PHOTONIC HARDWARE ACCELERATOR II

28 January 2025 • 4:10 PM - 5:55 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Tianyu Wang**, Boston Univ. (United States)

13375-34 • 4:10 PM - 4:35 PM
Programmable and scalable optical computing with fibers and complex media *(Invited Paper)*
Author(s): **Uğur Teğin,** Koç Univ. (Turkey)

13375-35 • 4:35 PM - 4:50 PM
Optical additive Kernel approximation using broadband scattering in complex media
Author(s): **Xue Dong**, **Fei Xia**, **Yoonseok Baek**, **Ziao Wang, Sylvain Gigan,** Lab. Kastler Brossel (France)

13375-36 • 4:50 PM - 5:15 PM
Fully nonlinear neuromorphic computing with linear wave scattering *(Invited Paper)*
Author(s): **Clara Wanjura, Florian Marquardt,** Max-Planck-Institut für die Physik des Lichts (Germany)

13375-37 • 5:15 PM - 5:30 PM
Spatiotemporal chaos-based photonic neural networks
Author(s): **Bahadır Utku Kesgin, Uğur Teğin,** Koç Univ. (Turkey)

13375-38 • 5:30 PM - 5:55 PM
Broadband light generation as a scalable computational resource in robust single-mode waveguides *(Invited Paper)*
Author(s): **Mario Chemnitz,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

Wednesday 29 January 2025

SESSION 8: PHOTONIC COMPUTING ON PIC I

29 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Nicola Peserico**, Avo Photonics, Inc. (United States)

13375-39 • 8:30 AM - 8:45 AM
High-fidelity photonic convolution neural network through on-chip lens-optimized joint transform correlator architectures
Author(s): **Hangbo Yang**, **Nicola Peserico**, **Belal Jahannia,** Univ. of Florida (United States); **Shurui Li,** Univ. of California, Los Angeles (United States); **Russell L. T. Schwartz,** Univ. of Florida (United States); **Puneet Gupta,** Univ. of California, Los Angeles (United States); **Hamed Dalir, Volker J. Sorger,** Univ. of Florida (United States)

13375-40 • 8:45 AM - 9:10 AM
Towards ultra-efficient photonic computer system: from a computer architecture perspective *(Invited Paper)*
Author(s): **Satoshi Kawakami,** Kyushu Univ. (Japan)

13375-41 • 9:10 AM - 9:25 AM
Mitigation of distortions in fiber-optic communication systems using optical neural network-based equalizer
Author(s): **Samarth Kumar**, **Mahmoud M. T. Maghrabi**, **Shiva Kumar, Mohamed H. Bakr,** McMaster Univ. (Canada)

13375-42 • 9:25 AM - 9:50 AM
Training large language models for analog photonic neural networks *(Invited Paper)*
Author(s): **Tianyu Wang,** Boston Univ. (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 9: PHOTONIC COMPUTING ON PIC II

29 January 2025 • 10:20 AM - 12:05 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Martin M. Stein**, Cornell Univ. (United States)

13375-43 • 10:20 AM - 10:45 AM
Storming the beach! Architectural impact of eliminating beachfront limitations for AI ASICs *(Invited Paper)*
Author(s): **David Lazovsky, Uday Poosarla,** Celestial AI (United States)

13375-44 • 10:45 AM - 11:00 AM
Enhancement of data reuploading for photonic neural computing without nonlinear optical components
Author(s): **Toshiaki Koike-Akino,** Mitsubishi Electric Research Labs. (United States); **Keisuke Kojima,** Boston Quantum Photonics LLC (United States); **Mari Taguchi,** Mitsubishi Electric Corp. (Japan)

13375-45 • 11:00 AM - 11:25 AM
Stochastic computing with biased optical parametric oscillators *(Invited Paper)*
Author(s): **Charles Roques-Carmes,** Stanford Univ. (United States); **Yannick Salamin**, **Seou Choi**, **Michael Horodynski**, **Jamison Sloan**, **Di Luo, Marin Soljacic,** Massachusetts Institute of Technology (United States)

13375-46 • 11:25 AM - 11:50 AM
Hypermultiplexed computing with photonic integrated circuits *(Invited Paper)*
Author(s): **Zaijun Chen,** The Univ. of Southern California (United States)

13375-47 • 11:50 AM - 12:05 PM
Reconfigurable time-wavelength integrated convolutional accelerator
Author(s): **Tigers Jonuzi**, **Irene Estebanez,** VLC Photonics S.L. (Spain); **Miguel C. Soriano,** Instituto de Física Interdisciplinar y Sistemas Complejos (Spain); **David Domenéch ,** VLC Photonics S.L. (Spain)

Lunch/Exhibition Break 12:05 PM - 1:35 PM

SESSION 10: DIFFRACTIVE OPTICAL NEURAL NETWORKS

29 January 2025 • 1:35 PM - 3:15 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Yuzhu Li**, Univ. of California, Los Angeles (United States)

13375-48 • 1:35 PM - 1:50 PM
Nonlinear modulation of broadband and spatially incoherent light using a transparent optoelectronic neuron array
Author(s): **Dehui Zhang**, **Dong Xu**, **Yuhang Li**, **Yi Luo**, **Jingtian Hu**, **Jingxuan Zhou**, **Yucheng Zhang**, **Boxuan Zhou**, **Peiqi Wang**, **Xurong Li**, **Bijie Bai**, **Huaying Ren**, **Laiyuan Wang**, **Ao Zhang**, **Mona Jarrahi**, **Yu Huang**, **Aydogan Ozcan, Xiangfeng Duan,** Univ. of California, Los Angeles (United States)

13375-49 • 1:50 PM - 2:05 PM
Diffractive optical processors with spatially incoherent illumination for complex-valued linear transformations and image encryption
Author(s): **Xilin Yang**, **Md Sadman Sakib Rahman**, **Bijie Bai**, **Jingxi Li, Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13375-54 • 2:05 PM - 2:30 PM
Analog optical computing for machine learning and optimization *(Invited Paper)*
Author(s): **Douglas Kelly,** Microsoft Research Cambridge (United Kingdom)

13375-51 • 2:30 PM - 2:45 PM
Multiplexed large-scale permutation operations using a reconfigurable diffractive optical network
Author(s): **Guangdong Ma**, **Xilin Yang**, **Bijie Bai**, **Jingxi Li**, **Tianyi Gan**, **Che-Yung Shen**, **Yijie Zhang**, **Yuzhu Li**, **Mona Jarrahi, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13375-52 • 2:45 PM - 3:00 PM
Diffractive optical processor conceals object information into ordinary images
Author(s): **Bijie Bai**, **Ryan Lee**, **Yuhang Li**, **Tianyi Gan**, **Yuntian Wang**, **Mona Jarrahi, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13375-53 • 3:00 PM - 3:15 PM
Optical phase conjugation using a diffractive processor
Author(s): **Che-Yung Shen**, **Jingxi Li**, **Yuhang Li**, **Tianyi Gan**, **Mona Jarrahi, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

Coffee Break 3:15 PM - 3:45 PM

SESSION 11: 2-DIMENTIONAL OPTICAL PROCESSOR

29 January 2025 • 3:45 PM - 5:50 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Yuzhu Li**, Univ. of California, Los Angeles (United States)

13375-55 • 3:45 PM - 4:00 PM
Diffractive processors for all-optical complex field imaging
Author(s): **Jingxi Li**, **Yuhang Li**, **Tianyi Gan**, **Che-Yung Shen**, **Mona Jarrahi, Aydogan Ozcan,** Univ. of California, Los Angeles (United States)

13375-56 • 4:00 PM - 4:15 PM
Pyramid-structured diffractive optical networks for unidirectional image magnification and demagnification
Author(s): **Xilin Yang**, **Bijie Bai**, **Tianyi Gan**, **Jingxi Li**, **Deniz Mengu**, **Mona Jarrahi, Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13375-57 • 4:15 PM - 4:40 PM
Spatiotemporal image encoder for capturing sub-nanosecond dynamic events *(Invited Paper)*
Author(s): **Satoshi Sunada,** Kanazawa Univ. (Japan), FEMTO-ST (France); **Tomoya Yamaguchi,** Kanazawa Univ. (Japan); **Anas Skalli, Daniel Brunner,** FEMTO-ST (France), Univ. Bourgogne Franche-Comté (France)

13375-58 • 4:40 PM - 4:55 PM
Generative diffusion models based on all-optical image denoising
Author(s): **Mustafa Yildirim**, **Ilker Oguz**, **Niyazi Ulas Dinc,** EPFL (Switzerland); **Junjie Ke**, **Innfarn Yoo**, **Qifei Wang**, **Feng Yang,** Google (United States); **Christophe Moser, Demetri Psaltis,** EPFL (Switzerland)

13375-59 • 4:55 PM - 5:20 PM
An optical computing framework utilizing multi-layer spatial light modulation for neural network implementation *(Invited Paper)*
Author(s): **Mustafa Yildirim**, **Niyazi Ulas Dinc**, **Ilker Oguz**, **Demetri Psaltis, Christophe Moser,** EPFL (Switzerland)

13375-60 • 5:20 PM - 5:35 PM
All-optical image denoising using diffractive networks
Author(s): **Çağatay Işıl**, **Hanlong Chen**, **Tianyi Gan**, **F. Onuralp Ardic**, **Koray Mentesoglu**, **Jagrit Digani**, **Huseyin Karaca**, **Jingxi Li**, **Deniz Mengu**, **Mona Jarrahi,** UCLA Samueli School of Engineering (United States); **Kaan Akşit,** Univ. College London (United Kingdom); **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13375-61 • 5:35 PM - 5:50 PM
Relief-surface-based on-chip hybrid diffraction neural network enabled by authentic all-optical fully-connected architecture
Author(s): **Shao Yu**, **Chenying Yang,** Hangzhou Institute for Advanced Study, UCAS (China); **Weidong Shen,** Zhejiang Univ. (China); **Yuchuan Shao,** Hangzhou Institute for Advanced Study, UCAS (China)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13375-12 • 6:00 PM - 8:00 PM
Deep learning via domain adaptation applied to fluorescence excitation emission maps: solving the challenge of small datasets
Author(s): **Francesca Venturini,** Zürcher Hochschule für Angewandte Wissenschaften (Switzerland); **Umberto Michelucci,** TOELT GmbH (Switzerland); **Miles Knöpfli,** Zürcher Hochschule für Angewandte Wissenschaften (Switzerland)

13375-83 • 6:00 PM - 8:00 PM
A large field of view singlet camera with curved image sensor and deblurring model
Author(s): **Yuki Fukashiro**, **Hiroki Sasaki**, **Koji Sato,** MIRISE Technologies Corp. (Japan); **Shinsaku Hiura,** Univ. of Hyogo (Japan)

13375-84 • 6:00 PM - 8:00 PM
Quantitative simulation of fringe projection profilometry techniques using blender
Author(s): **Daniel Weston**, **George Gordon, Samanta Piano,** The Univ. of Nottingham (United Kingdom)

13375-85 • 6:00 PM - 8:00 PM
Optical content-addressable memories for tree-based machine learning
Author(s): **Yanir London**, **Luca Buonanno**, **Lei Zhao**, **Giacomo Pedretti**, **Bassem Tossoun**, **Stanley Cheung**, **Yuan Yuan**, **Yiwei Peng**, **Matej Hejda**, **Marco Fiorentino**, **Thomas Van Vaerenbergh, Raymond G. Beausoleil,** Hewlett Packard Enterprise Co. (United States)

13375-86 • 6:00 PM - 8:00 PM
PCM-based silicon photonic neural networks under fabrication nonuniformity
Author(s): **Amin Shafiee**, **Zahra Ghanaatian,** Colorado State Univ. (United States); **Benoit Charbonnier,** Univ. Grenoble Alpes (France), CEA-LETI (France); **Carlos Rios,** Univ. of Maryland, College Park (United States); **Sudeep Pasricha, Mahdi Nikdast,** Colorado State Univ. (United States)

13375-87 • 6:00 PM - 8:00 PM
Multi-class object detection by an optical neural network implementation
Author(s): **Mamoru Otake**, **Shun Miura**, **Hiroyuki Kusaka**, **Nambara Takahiro**, **Yuichiro Kunai, Masahiro Kashiwagi,** Fujikura Ltd. (Japan)

13375-88 • 6:00 PM - 8:00 PM
Advancements in precision optics polishing through AI-driven predictive models
Author(s): **Nico Zettler, Rainer Börret,** Hochschule Aalen - Technik und Wirtschaft (Germany)

13375-89 • 6:00 PM - 8:00 PM
Time-space-wavelength division multiplexed (TSWDM) photonic AI accelerator for petamac-scale compute powers
Author(s): **Antonios Prapas**, **Christos Pappas**, **Theodoros Moschos**, **Manos Kirtas**, **Miltiadis Moralis-Pegios**, **Apostolos Tsakyridis**, **Odysseas Asimopoulos**, **Nikolaos Passalis**, **Anastasios Tefas, Nikos Pleros,** Aristotle Univ. of Thessaloniki (Greece)

13375-91 • 6:00 PM - 8:00 PM
Unpaired virtual histological staining of tissue from autofluorescence using regularized cycle-consistent adversarial networks
Author(s): **Zhesi Wen**, **Zhuo Yin, Min Xu,** The City Univ. of New York (United States)

13375-93 • 6:00 PM - 8:00 PM
Quantization-aware training of optical random neural networks
Author(s): **Bora Carpinlioglu, Uğur Teğin,** Koç Univ. (Turkey)

13375-94 • 6:00 PM - 8:00 PM
Single-pixel imaging with optical phase arrays: a machine-learning-assisted approach
Author(s): **Başak Ersoz**, **Paolo Bardella**, **Lorenzo Columbo**, **Marco Novarese,** Politecnico di Torino (Italy); **Maurizio Dabbicco,** Univ. degli Studi di Bari Aldo Moro (Italy); **Massimo Brambilla,** Politecnico di Bari (Italy)

13375-95 • 6:00 PM - 8:00 PM
Research on improving the teaching effectiveness of LED courses
Author(s): **Chun-Chin Tsai,** Southern Taiwan Univ. of Science & Technology (Taiwan); **Mei-Fang Chen**, **JIA-YUN TSAI,** National Tainan Junior College of Nursing (Taiwan); **YU-SHIANG TSAI,** National Taiwan University of Sport (Taiwan)

13375-96 • 6:00 PM - 8:00 PM
Physics-informed neural networks for etaloning correction in Raman spectra using inverse modeling
Author(s): **Ravi Teja Vulchi,** Friedrich-Schiller-Univ. Jena (Germany); **Thomas Bocklitz,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Volodymyr Morgunov,** Friedrich-Schiller-Univ. Jena (Germany)

Thursday 30 January 2025

SESSION 12: INVERSE DESIGN FOR PHOTONICS I

30 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Marco Fiorentino**, Hewlett Packard Enterprise Co. (United States)

13375-62 • 8:30 AM - 8:45 AM
Machine learning methods for designing and modeling photonic systems
Author(s): **Jonathan A. Fan,** Stanford Univ. (United States)

13375-63 • 8:45 AM - 9:00 AM
AI-based model for reducing the computational effort for optical meta-surfaces
Author(s): **Jürgen Jahns, Waldemar Spiller,** FernUniv. In Hagen (Germany)

13375-64 • 9:00 AM - 9:25 AM
Applications of machine learning to fiber laser optimization *(Invited Paper)*
Author(s): **Xinyang Liu, Regina V. Gumenyuk,** Tampere Univ. (Finland)

13375-65 • 9:25 AM - 9:40 AM
Digital twins for neuromorphic photonic edge devices
Author(s): **André Röhm**, **Rie Sai**, **Takatomo Mihana**, **Ryoichi Horisaki,** The Univ. of Tokyo (Japan); **Kazutaka Kanno, Atsushi Uchida,** Saitama Univ. (Japan)

13375-66 • 9:40 AM - 9:55 AM
Universally robust neural simulation of light physics
Author(s): **Charles Dove**, **Jatearoon Boondicharern, Laura Waller,** Univ. of California, Berkeley (United States)

13375-67 • 9:55 AM - 10:20 AM
Structural optimization of optical elements for photonic processing *(Invited Paper)*
Author(s): **Sean P. Rodrigues,** Toyota Research Institute, North America (United States); **Paul Schmalenberg**, **Ercan Dede**, **Yuqing Zhou,** Toyota Research Institute of North America (United States); **Jiahui Wang,** Stanford University (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 13: INVERSE DESIGN FOR PHOTONICS II

30 January 2025 • 10:50 AM - 12:25 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Tingyi Zhou**, SiLC Technologies, Inc. (United States)

13375-68 • 10:50 AM - 11:15 AM
Fiber-optic link tomography enabled by optics-informed machine learning *(Invited Paper)*
Author(s): **Takeo Sasai,** NTT Network Innovation Labs. (Japan)

13375-69 • 11:15 AM - 11:30 AM
Physics-driven multi-objective optimization of multi-angle resonant metasurface beamsplitter
Author(s): **Mulaine Shih,** Air Force Research Lab. (United States), Azumuth Corp. (United States); **Ray Secondo,** Air Force Research Lab. (United States), Azimuth Corp. (United States); **Maggie Lankford**, **Peter Stevenson**, **Jonathan Slagle, Eric S. Harper,** Air Force Research Lab. (United States)

13375-70 • 11:30 AM - 11:45 AM
Metamaterial inverse design using diffusion models
Author(s): **Chenkai Mao,** Stanford Univ. (United States); **Sandra S. Leuthold,** ETH Zurich (Switzerland); **Jonathan A. Fan,** Stanford Univ. (United States)

13375-71 • 11:45 AM - 12:10 PM
The application of automatic differentiation machine learning framework for design of photonic systems *(Invited Paper)*
Author(s): **Darko Zibar, Dimosthenis Stylios,** DTU Electro (Denmark)

13375-72 • 12:10 PM - 12:25 PM
Exploration of observation space extensions for reinforcement learning in automated optics design
Author(s): **Dominik Onyszkiewicz**, **Cailing Fu**, **Annika Bonhoff,** RWTH Aachen Univ. (Germany); **Carlo Holly,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany)

Lunch/Exhibition Break 12:25 PM - 1:55 PM

SESSION 14: NOVEL AI TECHNOLOGIES WITH PHOTONICS I

30 January 2025 • 1:55 PM - 3:55 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Masaya Notomi**, NTT Basic Research Labs. (Japan)

13375-73 • 1:55 PM - 2:10 PM
Scattering-inspired cryptosystem via deep learning
Author(s): **Huanhao Li,** Xidian Univ. (China)

13375-74 • 2:10 PM - 2:35 PM
AI for nonlinear control in fiber-optics *(Invited Paper)*
Author(s): **Goëry Genty,** Tampere Univ. (Finland)

13375-75 • 2:35 PM - 2:50 PM
Generalizable optical random projection
Author(s): **Bora Carpinlioglu, Uğur Teğin,** Koç Univ. (Turkey)

13375-76 • 2:50 PM - 3:15 PM
Interpretable AI for physics and photonics *(Invited Paper)*
Author(s): **Sachin Vaidya**, **Ali Ghorashi**, **Ziming Liu**, **Charlotte Loh**, **Max Tegmark, Marin Soljačić,** Massachusetts Institute of Technology (United States)

13375-77 • 3:15 PM - 3:30 PM
Improving predictive modelling performance via feature extraction from Raman spectroscopic line scans over samples with unevenly distributed substance
Author(s): **Oleg Ryabchykov,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Lisa B. Dreier**, **Anja Köhntopp**, **Frank Duschek,** Institute of Technical Physics, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Thomas Bocklitz,** Leibniz-Institut für Photonische Technologien e.V. (Germany), Institute of Physical Chemistry, Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics (Germany)

13375-78 • 3:30 PM - 3:55 PM
Machine learning for nonlinear optical processing in guided optics *(Invited Paper)*
Author(s): **Bruno P. Chaves**, **Yassin Boussafa**, **Jérémy Saucourt**, **Lynn Sader**, **Van-Thuy Hoang**, **Alexis Bougaud**, **Marc Fabert**, **Vincent Kermène**, **Alessandro Tonello**, **Vincent Couderc,** XLIM (France); **Brent E. Little,** QXP Technologies Inc. (China); **Sai T. Chu,** City Univ. of Hong Kong (Hong Kong, China); **David J. Moss,** Swinburne Univ. of Technology (Australia); **Roberto Morandotti,** Institut National de la Recherche Scientifique (Canada); **Michael Kues,** Leibniz Univ. Hannover (Germany); **Benjamin Wetzel,** XLIM (France)

Coffee Break 3:55 PM - 4:25 PM

SESSION 15: NOVEL AI TECHNOLOGIES WITH PHOTONICS II

30 January 2025 • 4:25 PM - 5:35 PM | Moscone South, Room 202 (Level 2)
Session Chair(s): **Tingyi Zhou**, SiLC Technologies, Inc. (United States)

13375-79 • 4:25 PM - 4:50 PM
Information processing with large-scale network of optical oscillators *(Invited Paper)*
Author(s): **Takahiro Inagaki**, **Kensuke Inaba**, **Yasuhiro Yamada**, **Toshimori Honjo**, **Takuya Ikuta**, **Yuya Yonezu,** NTT Basic Research Labs. (Japan); **Takushi Kazama**, **Koji Enbutsu**, **Takeshi Umeki**, **Ryoichi Kasahara,** NTT Device Technology Labs. (Japan); **Kazuyuki Aihara,** The Univ. of Tokyo (Japan); **Hiroki Takesue,** NTT Basic Research Labs. (Japan)

13375-80 • 4:50 PM - 5:05 PM
Innovative integration of visible light communication and artificial intelligence to enhance urban traffic management
Author(s): **Gonçalo Galvão,** Instituto Superior de Engenharia de Lisboa (Portugal); **Manuel Augusto Vieira**, **Manuela Vieira,** UNINOVA (Portugal); **Mário Véstias,** Instituto Superior de Engenharia de Lisboa (Portugal); **Paula Louro,** UNINOVA (Portugal); **Ricardo Jardim Gonçalves,** NOVA School of Science and Technology (Portugal), UNINOVA-CTS and LASI (Portugal)

13375-81 • 5:05 PM - 5:20 PM
Mol2Raman: a graph neural network approach for the prediction of Raman spectra from molecular structures
Author(s): **Salvatore Sorrentino,** Politecnico di Milano (Italy); **Alessandro Gussoni,** Satispay Europe SA (Italy); **Gioele Pasotti,** Politecnico di Milano (Italy); **Davide Avagliano,** Chimie ParisTech - PSL (France); **Ivan Rivalta**, **Francesco Calcagno,** Univ. degli Studi di Bologna (Italy); **Renzo Vanna,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Marco Garavelli,** Univ. degli Studi di Bologna (Italy); **Giulio Cerullo,** Politecnico di Milano (Italy); **Dario Polli,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13375-82 • 5:20 PM - 5:35 PM
AI-assisted control over spatiotemporal nonlinear fiber dynamics
Author(s): **Bora Carpinlioglu**, **Bahadır Utku Kesgin, Uğur Teğin,** Koç Univ. (Turkey)

CONFERENCE 13376

Quantum Sensing and Nano Electronics and Photonics XXI

26 - 30 January 2025 | Moscone South, Room 101 (Level 1 Lobby)

Conference Chair(s): **Manijeh Razeghi,** Northwestern Univ. (United States); **Giti A. Khodaparast,** Virginia Polytechnic Institute and State Univ. (United States); **Miriam S. Vitiello,** Istituto Nanoscienze (Italy)

Program Committee: **Jason M. Auxier,** U.S. Naval Research Lab. (United States); **David Burghoff,** The Univ. of Texas at Austin (United States); **Sumit Kumar Gupta,** St. Wilfreds PG College Jaipur (India); **Riad Haïdar,** ONERA (France); **Amr S. Helmy,** Univ. of Toronto (Canada); **Sven Höfling,** Julius-Maximilians-Univ. Würzburg (Germany); **Jean-Pierre Huignard,** Institut Langevin ESPCI-Uni PSL (France); **M. Saif Islam,** Univ. of California, Davis (United States); **Joachim Jonuscheit,** Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany); **Woo-Gwang Jung,** Kookmin Univ. (Korea, Republic of); **Pedram Khalili,** Northwestern Univ. (United States); **Kwok Keung Law,** Defense Advanced Research Projects Agency (DARPA)/Mach-20 (United States); **Giuseppe Leo,** Lab. Matériaux et Phénomènes Quantiques (France); **Dabing Li,** Changchun Institute of Optics, Fine Mechanics and Physics (China); **Amy W. K. Liu,** IQE Inc. (United States); **Quanyong Lu,** Beijing Academy of Quantum Information Sciences (United States); **Tariq Manzur,** Naval Undersea Warfare Ctr. (United States); **Jerry R. Meyer,** U.S. Naval Research Lab. (United States); **Zetian Mi,** Univ. of Michigan (United States); **Jean-Luc Pelouard,** Ctr. for Nanoscience and Nanotechnology (France); **Narasimha S. Prasad,** NASA Langley Research Ctr. (United States); **Edik U. Rafailov,** Aston Univ. (United Kingdom); **James P. Shaffer,** Quantum Valley Ideas Lab. (Canada); **Andrew M. Smith,** Univ. of Illinois (United States); **Vincenzo Spagnolo,** Politecnico di Bari (Italy); **Anna Szerling,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Joseph G. Tischler,** The Univ. of Oklahoma (United States); **Cunzhu Tong,** Changchun Institute of Optics, Fine Mechanics and Physics (China); **Hui Wang,** Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences (China); **Donghai Wu,** Institute of Semiconductors, Chinese Academy of Sciences (China); **Chao Zuo,** Nanjing Univ. of Science and Technology (China)

Sunday 26 January 2025

OPENING REMARKS

26 January 2025 • 8:00 AM - 8:20 AM | Moscone South, Room 101 (Level 1 Lobby)
Opening remarks by Conference Chair Manijeh Razeghi

13376-801 • 8:00 AM - 8:20 AM
Opening Remarks: Quantum Sensing and Nano Electronics and Photonics XXI
Author(s): **Manijeh Razeghi,** Northwestern Univ. (United States)

SESSION 1: ADVANCES IN QUANTUM SENSING

26 January 2025 • 8:20 AM - 10:05 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Manijeh Razeghi**, Northwestern Univ. (United States)

13376-1 • 8:20 AM - 8:55 AM
To be determined (Keynote Presentation)
Author(s): **Junhao Chu,** Shanghai Institute of Technical Physics (China)

13376-2 • 8:55 AM - 9:30 AM
Superconducting detectors for applications from astronomy to quantum science (Keynote Presentation)
Author(s): **Sheng-Cai Shi,** Purple Mountain Observatory, Chinese Academy of Sciences (China)

13376-3 • 9:30 AM - 10:05 AM
From matter waves to quantum sensors (Keynote Presentation)
Author(s): **Philippe Bouyer,** Univ. of Amsterdam (Netherlands), Technische Univ. Eindhoven (Netherlands)

Coffee Break 10:05 AM - 10:30 AM

SESSION 2: ADVANCES IN TERAHERTZ SCIENCE AND TECHNOLOGY I

26 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Miriam S. Vitiello**, Istituto Nanoscienze (Italy)

13376-4 • 10:30 AM - 11:05 AM
Raman spectroscopy of graphene for ultrasensitive protein detection (Keynote Presentation)
Author(s): **Matteo Piscitelli,** Univ. degli Studi di Bari Aldo Moro (Italy); **Cinzia Di Franco,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giuseppe Valerio Bianco**, **Giovanni Bruno,** Istituto di Nanotecnologia, Consiglio Nazionale delle Ricerche (Italy); **Eleonora Macchia**, **Luisa Torsi,** Univ. degli Studi di Bari Aldo Moro (Italy); **Gaetano Scamarcio,** Istituto Nanoscienze, Consiglio Nazionale delle Ricerche (Italy)

13376-5 • 11:05 AM - 11:30 AM
Free-space communication and remote sensing using mid-IR quantum cascade lasers down to few-photon light level *(Invited Paper)*
Author(s): **Simone Borri**, **Tecla Gabbrielli**, **Jacopo Pelini**, **Luigi Consolino**, **Davide Mazzotti,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Lorenzo Mischi,** ppqSense S.r.l. (Italy); **Nicola Corrias,** QTI S.R.L. (Italy); **Giovanni Bianchini**, **Paolo De Natale, Francesco Cappelli,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13376-6 • 11:30 AM - 11:55 AM
Layered controlled terahertz photonics and spintronics with 2D transition metal dichalcogenides *(Invited Paper)*
Author(s): **Sukhdeep S. Dhillon,** Lab. de Physique de l'Ecole Normale Supérieure (France); **Martin Micica,** VŠB-Technical Univ. of Ostrava (France)

13376-7 • 11:55 AM - 12:10 PM
Continuous-wave terahertz difference-frequency generation from intersubband polaritonic metasurfaces
Author(s): **Jonas Heiko Krakofsky**, **Markus Rieder**, **Simon Stich**, **Gerhard Böhm, Mikhail A. Belkin,** Technische Univ. München (Germany)

Lunch/Exhibition Break 12:10 PM - 1:30 PM

SESSION 3: SINGLE PHOTON SOURCES AND COLOR CENTERS

26 January 2025 • 1:30 PM - 3:05 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Saif M. Islam**, Univ. of California, Davis (United States)

13376-8 • 1:30 PM - 1:55 PM
Ultrafast plasmon-enhanced deterministically assembled single-photon sources based on nanodiamond color centers *(Invited Paper)*
Author(s): **Simeon Bogdanov**, **Swetapadma Sahoo,** Univ. of Illinois (United States); **Viatcheslav N. Agafonov,** Univ. de Tours (France); **Valery A. Davydov,** Institute for High Pressure Physics (Russian Federation)

13376-10 • 2:20 PM - 2:35 PM
Optimising heralding efficiency and brightness of a micro-ring resonator by tuning coupling regime
Author(s): **Nathan Moses**, **Siddarth Joshi**, **Alex Clark, Imad Faruque,** Univ. of Bristol (United Kingdom)

13376-11 • 2:35 PM - 2:50 PM
Mitigating the effects of space radiation on single-photon avalanche diodes (SPADs)
Author(s): **Alex Harwit**, **William Painter**, **Charlie Arutt**, **James Burst**, **Patrick Story**, **Owen Lincoln**, **Lynn Dick**, **Mark Allen**, **Steve Franka, Carl Weimer,** BAE Systems, Inc. (United States)

13376-12 • 2:50 PM - 3:05 PM
Femtosecond single photon time-bin detection via up-conversion
Author(s): **Maximilian Hornauer**, **Yuta Kochi,** Ctr. for Spintronics Research Network, Keio Univ. (Japan); **Tomoyuki Shoji,** Keio Univ. (Japan); **Sunao Kurimura,** National Institute for Materials Science (Japan); **Junko Ishi-Hayase,** Ctr. for Spintronics Research Network, Keio Univ. (Japan)

Coffee Break 3:05 PM - 3:30 PM

SESSION 4: NOVEL SENSING DEVICES AND LASERS

26 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Riad Haïdar**, ONERA (France)

13376-13 • 3:30 PM - 3:55 PM
Exploring the frontier of trace gas sensing, around the classical limit and beyond *(Invited Paper)*
Author(s): **Saverio Bartalini,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), ppqSense S.r.l. (Italy); **Simone Borri**, **Pablo Cancio Pastor**, **Francesco Cappelli**, **Maria Giulia Delli Santi,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Stefano Dello Russo,** Agenzia Spaziale Italiana (Italy); **Tecla Gabbrielli**, **Iacopo Galli,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Pasquale Maddaloni,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Davide Mazzotti,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Jacopo Pelini,** Univ. degli Studi di Napoli Federico II (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Mario Siciliani de Cumis,** Agenzia Spaziale Italiana (Italy); **Paolo De Natale,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13376-14 • 3:55 PM - 4:20 PM
Exotic quantum states of atoms for precision metrology: superluminal lasers and Schroedinger cats *(Invited Paper)*
Author(s): **Selim M. Shahriar,** Northwestern Univ. (United States)

13376-15 • 4:20 PM - 4:45 PM
Mid-infrared free-space communication: state of the art and future pathways using lithium niobate on sapphire *(Invited Paper)*
Author(s): **Pierre Didier**, **Prakhar Jain**, **Gaoyuan Li**, **Oliver Pitz,** ETH Zurich (Switzerland); **Olivier Spitz,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Angela Vasanelli**, **Carlo Sirtori,** Ecole Normale Supérieure (France); **Rachel Grange,** ETH Zurich (Switzerland)

13376-17 • 4:45 PM - 5:10 PM
The technology of different types of monolithic high contrast gratings for optoelectronic applications *(Invited Paper)*
Author(s): **Anna Szerling**, **Karolina Bogdanowicz**, **Magdalena Zadura**, **Weronika Głowadzka**, **Marek Ekielski**, **Piotr Polak**, **Laura Stanco**, **Joanna Jankowska-Sliwinska**, **Krzysztof Piskorski**, **Kamil Kosiel,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Magdalena Marciniak,** Lodz Univ. of Technology (Poland); **Michał Rybała**, **Tristan Smołka**, **Marcin Motyka,** Wroclaw Univ. of Science and Technology (Poland); **Tomasz Czyszanowski,** Lodz Univ. of Technology (Poland)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 5: NEW PHOTONICS MATERIALS

27 January 2025 • 10:45 AM - 12:00 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Gaetano Scamarcio**, Univ. degli Studi di Bari Aldo Moro (Italy); **Giuseppe Leo**, Lab. Matériaux et Phénomènes Quantiques (France)

13376-18 • 10:45 AM - 11:10 AM
Entanglement-enabled qualification of optical-material properties *(Invited Paper)*
Author(s): **Romain Dalidet**, **Anthony Martin**, **Gregory Sauder**, **Laurent Labonté,** Univ. Côte d'Azur, CNRS (France); **Sébastien Tanzilli,** Institut de Physique de Nice, Univ. Côte d'Azur, CNRS (France)

13376-19 • 11:10 AM - 11:35 AM
Development of large area hexagonal boron nitride quasi-bulk crystals *(Invited Paper)*
Author(s): **Jingyu Lin, Hongxing Jiang,** Texas Tech Univ. (United States)

13376-20 • 11:35 AM - 12:00 PM
Free-form lateral heterostructures in two-dimensional transition metal chalcogenides *(Invited Paper)*
Author(s): **Ali Adibi, Hossein Taghinejad,** Georgia Institute of Technology (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 6: QUANTUM MATERIALS AND DEVICES

27 January 2025 • 1:30 PM - 3:10 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Jerry R. Meyer**, U.S. Naval Research Lab. (United States)

13376-22 • 1:30 PM - 1:55 PM
Enabling quantum sensors with integrated photonics *(Invited Paper)*
Author(s): **Neal E. Solmeyer**, **Argyrios Dellis**, **Javad Dowran**, **Chad Fertig**, **Luke Horstman**, **Chad Hoyt**, **Wei Jiang**, **Karl Nelson**, **Matt Puckett**, **Jad Salman, Jianfeng Wu,** Honeywell International Inc. (United States)

13376-23 • 1:55 PM - 2:20 PM
Revising the figures of merit for optical sensors based on spectral transduction *(Invited Paper)*
Author(s): **Andrea Fiore**, **Felix L. McCluskey, Anne van Klinken,** Technische Univ. Eindhoven (Netherlands)

13376-24 • 2:20 PM - 2:45 PM
Engineering solid-state materials to control quantum optical information *(Invited Paper)*
Author(s): **Mahdi Hosseini**, **Zongfeng Li, Trevor Kling,** Northwestern Univ. (United States)

13376-25 • 2:45 PM - 3:10 PM
Active synthetic photonic lattices on a chip: controlling frequency combs with fast-gain *(Invited Paper)*
Author(s): **Alexander Dikopoltsev**, **Ina Heckelmann**, **Diego Piciocchi**, **Barbara Schneider**, **Mathieu Bertrand**, **Mattias Beck**, **Giacomo Scalari,** ETH Zurich (Switzerland); **Oded Zilberberg,** Univ. Konstanz (Germany); **Jérôme Faist,** ETH Zurich (Switzerland)

Coffee Break 3:10 PM - 3:30 PM

SESSION 7: INFRARED AND MIR TECHNOLOGY

27 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Joseph G. Tischler**, The Univ. of Oklahoma (United States)

13376-26 • 3:30 PM - 3:55 PM
Photonic functionalities and detection in the TERA-MIR range *(Invited Paper)*
Author(s): **Mauro F. Pereira,** Khalifa Univ. (United Arab Emirates); **Apostolos Apostolakis,** Institute of Physics of the CAS, v.v.i. (Czech Republic); **Humaira Zafar,** Khalifa Univ. (United Arab Emirates)

13376-27 • 3:55 PM - 4:20 PM
Metamaterial unipolar devices for free space optical communications at 4 μm and 10 μm *(Invited Paper)*
Author(s): **Carlo Sirtori**, **Hamza Dely**, **Thomas Bonazzi,** Ecole Normale Supérieure (France); **Pierre Didier,** Lab. Traitement et Communication de l'Information, Télécom Paris (France); **Djamal Gacemi,** Ecole Normale Supérieure (France); **Isabelle Sagnes**, **Konstantinos Pantzas,** Ctr. de Nanosciences et de Nanotechnologies (France); **Richard Schatz**, **Xiaodan Pang,** KTH Royal Institute of Technology (Sweden); **Frédéric Grillot,** Lab. Traitement et Communication de l'Information (France); **Angela Vasanelli,** Ecole Normale Supérieure (France)

13376-28 • 4:20 PM - 4:45 PM
Direct observation of infrared radiation in hBN-encapsulated graphene devices *(Invited Paper)*
Author(s): **Yannick De Wilde,** Institut Langevin (France); **Loubnan Abou-Hamdan,** Institut Langevin (France), ONERA (France); **Sylvio Rossetti,** Institut Langevin (France); **Aurelien Schmitt**, **Remi Bretel**, **Emmanuel Baudin,** Lab. de Physique de l'Ecole Normale Supérieure (France); **Jean-Jacques Greffet**, **Jean-Paul Hugonin,** Lab. Charles Fabry (France); **Patrick Bouchon,** ONERA (France)

13376-29 • 4:45 PM - 5:10 PM
Ultrafast (10 GHz) free-space mid-IR laser modulators operating at room temperature *(Invited Paper)*
Author(s): **Mario Malerba**, **Stefano Pirotta**, **Guy Aubin**, **Luca Lucia**, **Adel Bousseksou**, **M. Jeannin**, **Jean-Michel Manceau,** Ctr. de Nanosciences et de Nanotechnologies (France); **Q. Lin**, **J.F. Lampin**, **E. Peytavit**, **S. Barbieri,** Institut d'Electronique de Microélectronique et de Nanotechnologie (France); **L.H. Li**, **A.G. Davies**, **Edmund Linfield,** Univ. of Leeds (United Kingdom); **Raffaele Colombelli,** Ctr. de Nanosciences et de Nanotechnologies (France)

Tuesday 28 January 2025

SESSION 8: QUANTUM OPTICS

28 January 2025 • 9:00 AM - 10:00 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Mahdi Hosseini**, Northwestern Univ. (United States)

13376-30 • 9:00 AM - 9:35 AM
Practical non-classical sources of infrared light for quantum enhanced sensing (Keynote Presentation)
Author(s): **Amr S. Helmy,** Univ. of Toronto (Canada)

13376-31 • 9:35 AM - 10:00 AM
Arrays of single photon detectors for quantum optics *(Invited Paper)*
Author(s): **Valery Zwiller,** KTH Royal Institute of Technology (Sweden)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: ADVANCES IN OPTICAL IMAGING

28 January 2025 • 10:30 AM - 12:05 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Giti A. Khodaparast**, Virginia Polytechnic Institute and State Univ. (United States); **James P. Shaffer**, Quantum Valley Ideas Lab. (Canada)

13376-32 • 10:30 AM - 10:55 AM
Advancing quantum imaging and device testing with machine learning *(Invited Paper)*
Author(s): **Alexandra Boltasseva,** Purdue Univ. (United States)

13376-33 • 10:55 AM - 11:10 AM
Using a microwave kinetic inductance detector and computational ghost imaging for high-resolution, wavelength-resolved imaging
Author(s): **Jeremi Grabas**, **Kieran S. O'Brien, John M. Girkin,** Durham Univ. (United Kingdom)

13376-34 • 11:10 AM - 11:25 AM
Low-light upconversion imaging at 1950nm using a PPLN waveguide
Author(s): **Noelia Palomar Davidson**, **Paolo L. Mennea**, **Glenn Churchill**, **Peter Smith,** Univ. of Southampton (United Kingdom); **Lewis Wright**, **Greg Blanchard-Emmerson,** Covesion Ltd. (United Kingdom); **Corin Gawith,** Univ. of Southampton (United Kingdom), Covesion Ltd. (United Kingdom)

13376-35 • 11:25 AM - 11:40 AM
Performance metrics for neuromorphic imaging
Author(s): **Nimrod Kruger**, **Sami El Arja**, **Evie Andrew**, **Travis Monk, Andre van Schaik,** Western Sydney Univ. (Australia)

13376-36 • 11:40 AM - 12:05 PM
Quantum sensor with spin-squeezed matter-wave microring interferometer *(Invited Paper)*
Author(s): **Raymond Ooi,** Univ. of Malaya (Malaysia)

Lunch/Exhibition Break 12:05 PM - 1:30 PM

SESSION 10: NEW QUANTUM MATERIALS

28 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Andrew M. Smith**, Univ. of Illinois (United States)

13376-37 • 1:30 PM - 1:55 PM
Integrated photonic devices in thin-film lithium niobate *(Invited Paper)*
Author(s): **David Barton,** Northwestern Univ. (United States); **Matthew Yeh,** Harvard Univ. (United States); **Mengjie Yu,** The Univ. of Southern California (United States); **Evelyn Hu, Marko Loncar,** Harvard Univ. (United States)

13376-38 • 1:55 PM - 2:20 PM
Nonequilibrium dynamics of anomalous Hall effect in topological antiferromagnet Mn_3Sn studied by terahertz polarimetry *(Invited Paper)*
Author(s): **Takuya Matsuda,** Osaka Univ. (Japan); **Ryusuke Matsunaga,** The Univ. of Tokyo (Japan)

13376-39 • 2:20 PM - 2:45 PM
Probing quantum physics in quantum dots/graphene broadband photodetectors *(Invited Paper)*
Author(s): **Judy Z. Wu,** The Univ. of Kansas (United States)

13376-40 • 2:45 PM - 3:00 PM
Plasmon-enhanced apoferritin coupled neurophotonic electroluminescent devices
Author(s): **Arup Neogi**, **Chengjie Wang, Zhiming Wang,** Univ. of Electronic Science and Technology of China (China)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: PHOTONICS IN NATIONAL LABS, GOVERNMENT, AND INDUSTRY

28 January 2025 • 3:30 PM - 4:45 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Anna Szerling**, Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **David Barton**, Northwestern Univ. (United States)

13376-42 • 3:30 PM - 3:55 PM
On-chip detection of dimethylmethylphosphonate (DMMP) with a monolithic-designed photonic integrated circuit agent sensing sorbent (PICASSo) device *(Invited Paper)*
Author(s): **Chul Soo Kim**, **William W. Bewley**, **Viet K. Nguyen,** U.S. Naval Research Lab. (United States); **Mijin Kim,** Jacobs Technology Inc. (United States); **Chadwick L. Canedy**, **C. D. Merritt**, **Jerry R. Meyer**, **Christopher Kendziora**, **Robert A. McGill, Igor Vurgaftman,** U.S. Naval Research Lab. (United States)

13376-66 • 3:55 PM - 4:20 PM
Quantization of the electromagnetic field, entropy of an ideal monoatomic gas, and the birth of the Bose-Einstein statistics *(Invited Paper)*
Author(s): **Masud Mansuripur,** Wyant College of Optical Sciences (United States)

13376-44 • 4:20 PM - 4:45 PM
Quantum Devices based on Narrow Bandgap III-V Semiconductors *(Invited Paper)*
Author(s): **Binh-Minh Nguyen**, **David Saxum**, **Evan Guo**, **Amber Truong**, **Tong Wang**, **Brett Yurash, Andrew Pan,** HRL Labs., LLC (United States)

Wednesday 29 January 2025

SESSION 12: ATOMICS SYSTEMS AND NONLINEAR OPTICS

29 January 2025 • 8:30 AM - 9:45 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Sukhdeep S. Dhillon**, Lab. de Physique de l'Ecole Normale Supérieure (France); **Carlo Sirtori**, Lab. Matériaux et Phénomènes Quantiques (France)

13376-46 • 8:30 AM - 8:55 AM
Photon-photon interactions in atomic ensembles: from conditional phase to quantum vortices *(Invited Paper)*
Author(s): **Ofer Firstenberg,** Weizmann Institute of Science (Israel)

13376-47 • 8:55 AM - 9:20 AM
Ultrafast spectroscopy for coherent acoustic phonon and photoelasticity in topological Weyl antiferromagnet Mn_3Sn thin films *(Invited Paper)*
Author(s): **Yuchen Wang**, **Takuya Matsuda**, **Yuta Murotani**, **Hanyi Peng**, **Takumi Matsuo**, **Tomoya Higo**, **Satoru Nakatsuji, Ryusuke Matsunaga,** The Univ. of Tokyo (Japan)

13376-16 • 9:20 AM - 9:45 AM
Lasing from true bound states in the continuum cavity compatible with standard semiconductor technology *(Invited Paper)*
Author(s): **Tomasz G. Czyszanowski,** Lodz Univ. of Technology (Poland); **Karolina Bogdanowicz,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Tomasz Fąs,** Univ. of Warsaw (Poland); **Magdalena Zadura**, **Laura Stańco**, **Marek Ekielski**, **Jan Muszalski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Jan Suffczyński,** Univ. of Warsaw (Poland); **Anna Szerling,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

Coffee Break 9:45 AM - 10:30 AM

SESSION 13: BIO-PHOTONICS AND ADVANCES IN IMAGING

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Raffaele Colombelli**, Ctr. de Nanosciences et de Nanotechnologies (France)

13376-48 • 10:30 AM - 10:55 AM
New material and devices for light detection and imaging *(Invited Paper)*
Author(s): **Hooman Mohseni,** Northwestern Univ. (United States)

13376-49 • 10:55 AM - 11:20 AM
Advanced optical probes for ultrafast laser microscopy-spectroscopy to visualize photo-physics at nanoscale *(Invited Paper)*
Author(s): **Elham Ghadiri,** Wake Forest Univ. (United States)

13376-50 • 11:20 AM - 11:45 AM
Intracellular nanothermometers: from fluorescent proteins to quantum sensing probes *(Invited Paper)*
Author(s): **Filipe Camarneiro**, **Beatriz N. L. Costa, Jana B. Nieder,** INL - International Iberian Nanotechnology Lab. (Portugal)

13376-51 • 11:45 AM - 12:00 PM
A new type of hybrid platform for the rapid detection of medical biomarkers
Author(s): **Magdalena Zadura,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Weronika Głowadzka,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Institute of Physics, Lodz Univ. of Technology (Poland); **Piotr Polak**, **Joanna Jankowska-Sliwinska,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Karolina Bogdanowicz,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Institute of Physics, Lodz Univ. of Technology (Poland); **Magdalena Marciniak,** Institute of Physics, Lodz Univ. of Technology (Poland); **Krzysztof Piskorski**, **Kamil Kosiel**, **Marek Ekielski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Tomasz G. Czyszanowski,** Institute of Physics, Lodz Univ. of Technology (Poland); **Anna Szerling,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 14: ADVANCES IN TERAHERTZ SCIENCE AND TECHNOLOGY II

29 January 2025 • 1:30 PM - 2:55 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Philippe Bouyer**, Lab. Photonique, Numérique et Nanosciences (France)

13376-52 • 1:30 PM - 1:55 PM
Quantum and interband cascade lasers between classical and quantum operation regime *(Invited Paper)*
Author(s): **Tecla Gabbrielli**, **Jacopo Pelini**, **Luigi Consolino,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Davide Mazzotti,** Istituto Nazionale di Ottica (INO-CNR) (Italy); **Irene La Penna**, **Francesco Cappelli**, **Paolo De Natale, Simone Borri,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13376-53 • 1:55 PM - 2:10 PM
On-chip inverse-designed WDM integrated with surface emitting THz quantum cascade laser
Author(s): **Valerio Digiorgio**, **Urban Senica**, **Paolo Micheletti**, **Mattias Beck**, **Jérôme Faist, Giacomo Scalari,** ETH Zurich (Switzerland)

13376-54 • 2:10 PM - 2:25 PM
Recent advances on mid-infrared interband cascade lasers with external optical feedback
Author(s): **Thomas Poletti**, **Hyunah Kim**, **Heming Huang,** Télécom Paris, Institut Polytechnique de Paris (France); **Daniel Andrés Diaz Thomas**, **Maëva Fagot**, **Alexei N. Baranov**, **Laurent Cerutti,** Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France); **Frédéric Grillot,** Télécom Paris, Institut Polytechnique de Paris (France), The Univ. of New Mexico (United States)

13376-55 • 2:25 PM - 2:40 PM
Resolving the dynamics of a one-dimensional lattice driven by randomized forces
Author(s): **Diego Piciocchi**, **Ina Heckelmann**, **Alexander Dikopoltsev**, **Mathieu Bertrand**, **Mattias Beck, Jérôme Faist,** ETH Zurich (Switzerland)

13376-56 • 2:40 PM - 2:55 PM
High-speed room temperature ridge quantum cascade detectors for LWIR free-space optical communications established at 9μm
Author(s): **Nour Nawfal**, **Thomas Poletti,** III-V Lab. (France), Télécom Paris (France); **Claire Theveneau**, **Axel Evirgen**, **Virginie Trinité**, **Louiza Hamidouche**, **Quentin Levesque,** III-V Lab. (France); **Johan Abautret**, **Mathieu Carras**, **Gregory Maisons,** mirSense (France); **Djamal Gacemi,** Ecole Normale Supérieure (France); **Michel Garcia**, **Olivier Parillaud**, **Jean-Luc Reverchon,** III-V Lab. (France); **Carlo Sirtori,** Ecole Normale Supérieure (France); **Frédéric Grillot,** Télécom Paris (France), The Univ. of New Mexico (United States); **Salvatore Pes,** III-V Lab. (France)

Coffee Break 2:55 PM - 3:30 PM

SESSION 15: NEW PHOTONIC MATERIALS, DEVICES, AND CIRCUITS I

29 January 2025 • 3:30 PM - 5:35 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Mauro F. Pereira**, Khalifa Univ. (United Arab Emirates); **Jingyu Lin**, Texas Tech Univ. (United States)

13376-9 • 3:30 PM - 3:55 PM
Registered generation of single color centers within large-array hemispherical solid immersion lenses in silicon carbide *(Invited Paper)*
Author(s): **Alexander Jones,** Heriot-Watt Univ. (United Kingdom); **Xingrui Cheng**, **Jason Smith,** Univ. of Oxford (United Kingdom); **Cristian Bonato,** Heriot-Watt Univ. (United Kingdom); **Patrick Salter,** Univ. of Oxford (United Kingdom); **Christiaan Bekker,** Heriot-Watt Univ. (United Kingdom)

13376-57 • 3:55 PM - 4:20 PM
Evolutionary-based inverse design of 2D materials multilayer structures for next-generation IR smart sensing *(Invited Paper)*
Author(s): **Sarah S. Sharif,** The Univ. of Oklahoma (United States)

13376-58 • 4:20 PM - 4:45 PM
Epitaxial $LiNbO_3$ thin film with controlled stoichiometry for photonic applications *(Invited Paper)*
Author(s): **Ausrine Bartasyte,** FEMTO-ST, Univ. de Franche-Comté (France), Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France), Institut Univ. de France (France); **Gregoire Larger,** Univ. de Franche-Comté (France), Exail SAS (France); **Nelly Scheibel,** Univ. de Franche-Comté (France), Ctr. de Nanosciences et de Nanotechnologies (France); **Vincent Astié,** Annealsys (France); **Pascal Boulet,** Institut Jean Lamour (France); **Jean Manuel Decams,** Annealsys (France); **Samuel Margueron,** FEMTO-ST (France)

13376-59 • 4:45 PM - 5:10 PM
Combining cold atoms and nanoscale waveguides: status and prospects *(Invited Paper)*
Author(s): **Julien Laurat,** Lab. Kastler Brossel, Sorbonne Univ. (France)

13376-61 • 5:10 PM - 5:35 PM
Complex semiconductor lasers for large scale fully hardware implemented optical neural network *(Invited Paper)*
Author(s): **Anas Skalli,** FEMTO-ST (France); **Marcin Gębski**, **Tomasz G. Czyszanowski,** Lodz Univ. of Technology (Poland); **Daniel Brunner,** FEMTO-ST (France)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13376-78 • 6:00 PM - 8:00 PM
Probing the 2D to 3D growth transition dynamics in InAs/GaAs stacked submonolayer (SML) deposition by photoluminescence
Author(s): **Ronel Christian I. Roca, Itaru Kamiya,** Toyota Technological Institute (Japan)

13376-79 • 6:00 PM - 8:00 PM
Enhanced Photon Number Resolution (PNR): optimizing signal chain and software capabilities
Author(s): **Mireia Perera-Gonzalez,** Swabian Instruments USA Inc. (United States); **Matteo Moioli**, **Edoardo Mornacchi,** Swabian Instruments GmbH (Germany); **Tim Rambo**, **Jeremy Doredla**, **Aaron Miller,** Quantum Opus, LLC (United States); **Mirco Kolarczik,** Swabian Instruments GmbH (Germany)

13376-80 • 6:00 PM - 8:00 PM
Part-per-trillion level trace-gas photoacoustic detection with a new racket-shaped cantilever
Author(s): **Jacopo Pelini,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Stefano Dello Russo,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), Agenzia Spaziale Italiana (Italy); **Mario Siciliani de Cumis,** Agenzia Spaziale Italiana (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Zhen Wang,** The Chinese Univ. of Hong Kong (China); **Iacopo Galli**, **Pablo Cancio Pastor**, **Inaki Lopez Garcia,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Maria Concetta Canino**, **Alberto Roncaglia,** Istituto per la Microelettronica e Microsistemi, Consiglio Nazionale delle Ricerche (Italy); **Naota Akikusa,** Hamamatsu Photonics K.K. (Japan); **Wei Ren,** The Chinese Univ. of Hong Kong (China); **Paolo De Natale, Simone Borri,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13376-81 • 6:00 PM - 8:00 PM
Nano lasers for integrated photonics via direct epitaxy of III-V nano-heterostructures on silicon
Author(s): **Alisha Nanwani**, **Mathias Marchal**, **Pawel Holewa**, **Kresten Yvind, Elizaveta Semenova,** DTU Electro, Technical Univ. of Denmark (Denmark)

13376-82 • 6:00 PM - 8:00 PM
Effect of growth rate variations of 3ML SK quantum dot coverage in DWELL heterostructures on the strain and optical properties
Author(s): **Ajay Kumar,** Indian Institute of Technology Bombay (India); **Ravindra Kumar,** Government Engineering College, Sheohar (India); **Farheen Shamim Ahmed Sabiha**, **Rajib Saha, Subhananda Chakrabarti,** Indian Institute of Technology Bombay (India)

13376-83 • 6:00 PM - 8:00 PM
Room-temperature spin generation and nonlinear spin dynamics in Ga(N)As/GaAs opto-spintronic nanostructures
Author(s): **Y. Huang,** Linköping Univ. (Sweden); **V. Polojärvi**, **A. Aho**, **R. Isoaho**, **T. Hakkarainen**, **M. Guina,** Tampere Univ. (Finland); **I. A. Buyanova, Weimin M. Chen,** Linköping Univ. (Sweden)

13376-84 • 6:00 PM - 8:00 PM
Color SPAD sensor with resolution of 1024x1024 and 100,000 frame-rate
Author(s): **Augusto Carimatto**, **Cyril Saudan**, **Nadira Saly**, **Harald Homulle, Michel Antolovic,** Pi Imaging Technology SA (Switzerland)

13376-85 • 6:00 PM - 8:00 PM
External waveguide modulator operating at long wave infrared wavelength for free space optical communications
Author(s): **Thomas Poletti,** III-V Lab. (France), Lab. de Physique de l'Ecole Normale Supérieure (France); **Salvatore Pes**, **Nour Nawfal**, **Alexandre Delga**, **Virginie Trinité,** III-V Lab. (France); **Djamal Gacemi,** Lab. de Physique de l'Ecole Normale Supérieure (France); **Axel Evirgen**, **Claire Theveneau**, **Michel Garcia**, **Olivier Parillaud**, **Jean-Luc Reverchon,** III-V Lab. (France); **Carlo Sirtori,** Lab. de Physique de l'Ecole Normale Supérieure (France)

13376-86 • 6:00 PM - 8:00 PM
Remote fiber sensing by quantum spectroscopy using frequency entangled photons via a real-world fiber network
Author(s): **Masahiro Ishizeki**, **Tomoya Okita**, **Akifumi Asahara**, **Ryosuke Shimizu, Kaoru Minoshima,** The Univ. of Electro-Communications (Japan)

13376-87 • 6:00 PM - 8:00 PM **(CANCELLED)**
Investigation of structural, compositional and opto-electronic properties of CVD grown graphene on PLD deposited Ga_2O_3 thin films for heterojunction-based photodetector applications
Author(s): **Rajib Saha,** Indian Institute of Technology Bombay (India); **Robin Singla,** Thapar Institute of Engineering and Technology (India); **Madhuri Mishra, Subhananda Chakrabarti,** Indian Institute of Technology Bombay (India)

13376-88 • 6:00 PM - 8:00 PM
Impact of variation in monolayer coverage on the optical and structural properties of InAs/InGaAs Dot-in-a-well heterostructures
Author(s): **Ajay Kumar**, **Farheen Shamim Ahmed Ansari**, **Rajib Saha, Subhananda Chakrabarti,** Indian Institute of Technology Bombay (India)

13376-89 • 6:00 PM - 8:00 PM
Impact of nanoscale gap morphology on infrared plasmon transitions in nanoparticle dimers
Author(s): **Yina Wu,** ICFO - Institut de Ciències Fotòniques (Spain); **Andrea Konečná,** CEITEC Brno Univ. of Technology (Czech Republic); **Shin Hum Cho,** Keimyung Univ. (Korea, Republic of); **Delia J. Milliron,** The Univ. of Texas at Austin (United States); **Jordan A. Hachtel,** Oak Ridge National Lab. (United States); **F. Javier García de Abajo,** ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

13376-90 • 6:00 PM - 8:00 PM
Digital silicon photomultipliers for high-energy and nuclear physics applications
Author(s): **Claudio E. Bruschini, Edoardo Charbon,** EPFL (Switzerland)

13376-91 • 6:00 PM - 8:00 PM
Fabrication of monolithic high-contrast gratings as a top mirror for QCVCSEL
Author(s): **Marek Ekielski**, **Magdalena Zadura,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Karolina Bogdanowicz**, **Weronika Głowadzka,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Institute of Physics, Lodz Univ. of Technology (Poland); **Mikołaj Janczak,** Institute of Physics, Lodz Univ. of Technology (Poland); **Monika Mikulicz**, **Michał Rygała**, **Mikołaj Badura**, **Beata Ściana**, **Marcin Motyka,** Wroclaw Univ. of Science and Technology (Poland); **Tomasz G. Czyszanowski,** Institute of Physics, Lodz Univ. of Technology (Poland); **Anna Szerling,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

13376-92 • 6:00 PM - 8:00 PM
Delay-resolved gain measurements of intersubband devices
Author(s): **Zhenyang Xiao**, **Mithun Roy**, **Chao Dong,** The Univ. of Texas at Austin (United States); **Sadhvikas Addamane,** Sandia National Labs. (United States); **David Burghoff,** The Univ. of Texas at Austin (United States)

Thursday 30 January 2025

SESSION 16: SEMICONDUCTOR PHOTONICS

30 January 2025 • 9:00 AM - 10:05 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Sarah Safurah Sharif**, The Univ. of Oklahoma (United States)

13376-63 • 9:00 AM - 9:25 AM
Vortex beam generation via total angular momentum addition in flat optical elements *(Invited Paper)*
Author(s): **Evgenii Menshikov,** Univ. degli Studi di Brescia (Italy); **Paolo Franceschini,** Univ. degli Studi di Brescia (Italy), Istituto Nazionale di Ottica (Italy); **Kristina Frizyuk,** Univ. degli Studi di Brescia (Italy); **Ivan Fernandez-Corbaton,** Karlsruhe Institute of Technology (Germany); **Andrea Tognazzi,** Univ. degli Studi di Palermo (Italy), Istituto Nazionale di Ottica (Italy); **Alfonso C. Cino,** Univ. degli Studi di Palermo (Italy); **Denis Garoli,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Mihail Petrov,** Qingdao Innovation and Development Center, Harbin Engineering University (China); **Domenico de Ceglia, Costantino De Angelis,** Univ. degli Studi di Brescia (Italy), Istituto Nazionale di Ottica (Italy)

13376-64 • 9:25 AM - 9:40 AM
Optical thermodynamics for fusing incoherent pulse-trains
Author(s): **Abraham M. Berman Bradley**, **Mahmoud A. Selim**, **Hediyeh Mohammadi Dinani**, **Georgios G. Pyrialakos,** The Univ. of Southern California (United States); **Ulf Peschel,** Friedrich-Schiller-Univ. Jena (Germany); **Demetrios N. Christodoulides, Mercedeh Khajavikhan,** The Univ. of Southern California (United States)

13376-65 • 9:40 AM - 10:05 AM
Transparent conductive electrodes based on GaAs-metal deep sub-wavelength high contrast grating *(Invited Paper)*
Author(s): **Natan Monvoisin,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); **Weronika Głowadzka,** Lodz Univ. of Technology (Poland); **Stéphane Calvez**, **Olivier Gauthier-Lafaye**, **Antoine Monmayrant,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); **Marcin Gębski**, **Tomasz G. Czyszanowski,** Lodz Univ. of Technology (Poland); **Guilhem Almuneau,** Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France)

Coffee Break 10:05 AM - 10:30 AM

SESSION 17: MODELING OF PHOTONICS SYSTEMS

30 January 2025 • 10:30 AM - 11:30 AM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Yannick De Wilde**, Institut Langevin (France); **Paolo De Natale**, Istituto Nazionale di Ottica (Italy)

13376-67 • 10:30 AM - 10:45 AM
Localized thermodynamic expansion in time-synthetic photonic lattices
Author(s): **Hediyeh Mohammadi Dinani**, **Georgios G. Pyrialakos**, **Abraham M. Berman Bradley,** The Univ. of Southern California (United States); **Ulf Peschel,** Friedrich-Schiller-Univ. Jena (Germany); **Demetrios N. Christodoulides, Mercedeh Khajavikhan,** The Univ. of Southern California (United States)

13376-68 • 10:45 AM - 11:00 AM
A symbolic-numeric computation framework for bosonic operators: Modeling quantum features in QCL frequency combs
Author(s): **Michael Haider**, **Lukas Seitner**, **Johannes Stowasser**, **Michael A. Schreiber**, **Michael Rinderle**, **Yongjie Yuan, Christian Jirauschek,** Technische Univ. München (Germany)

13376-69 • 11:00 AM - 11:15 AM
Cavity engineering of THz QCLs: A Maxwell-Bloch based model to tailor the emission spectra
Author(s): **Lukas Seitner**, **Michael A. Schreiber**, **Michael Haider,** Technische Univ. München (Germany); **Miriam S. Vitiello,** Istituto Nanoscienze, Consiglio Nazionale delle Ricerche (Italy); **Christian Jirauschek,** Technische Univ. München (Germany)

13376-70 • 11:15 AM - 11:30 AM
A novel dual-tube spectrophone for sub-ppb cantilever-enhanced photoacoustic detection
Author(s): **Jacopo Pelini,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Stefano Dello Russo,** Agenzia Spaziale Italiana (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Inaki Lopez Garcia,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Maria Concetta Canino**, **Alberto Roncaglia,** Istituto per la Microelettronica e Microsistemi, Consiglio Nazionale delle Ricerche (Italy); **Iacopo Galli**, **Pablo Cancio Pastor**, **Paolo De Natale**, **Simone Borri,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Mario Siciliani de Cumis,** Agenzia Spaziale Italiana (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

Lunch/Exhibition Break 11:30 AM - 1:30 PM

SESSION 18: NEW PHOTONIC MATERIALS, DEVICES, AND CIRCUITS II

30 January 2025 • 1:30 PM - 3:25 PM | Moscone South, Room 101 (Level 1 Lobby)
Session Chair(s): **Elham Ghadiri**, Wake Forest Univ. (United States); **Sébastien Tanzilli**

13376-72 • 1:30 PM - 1:55 PM

Phase-engineered photonic-crystal cavities empowering high-brightness terahertz quantum cascade surface-emitting lasers *(Invited Paper)*

Author(s): **Quanyong Lu,** Beijing Academy of Quantum Information Sciences (China)

13376-93 • 1:55 PM - 2:10 PM

Fast time-gated superconducting nanowire single-photon detectors

Author(s): **Antonio Guardiani**, **Lieuwe Locht**, **Martin Caldarola**, **Andreas Fognini,** Single Quantum B.V. (Netherlands); **Sinda Meijri,** ESA/ESOC (Germany)

13376-73 • 2:10 PM - 2:25 PM

Drone-assisted multi-trace-gas sensing with mid-infrared quantum cascade laser frequency combs

Author(s): **Baichuan Huang**, **Nishant Goel**, **Jie Liu**, **Michael Soskind, Gerard Wysocki,** Princeton Univ. (United States)

13376-74 • 2:25 PM - 2:40 PM

Impact ionization in GaAs/GaAsBi multiple quantum well structures

Author(s): **Xiaofeng Tao**, **Xiao Jin**, **Shiyuan Gao,** The Univ. of Sheffield (United Kingdom); **Xin Yi,** The Univ. of Sheffield (United Kingdom), Heriot-Watt Univ. (United Kingdom); **Yuchen Liu**, **Thomas B. O. Rockett**, **Nicholas J. Bailey**, **Faezah Harun**, **Nada A. Adham**, **Chee Hing Tan**, **Robert D. Richards, John P. R. David,** The Univ. of Sheffield (United Kingdom)

13376-75 • 2:40 PM - 2:55 PM

Multistage photovoltaic HOT MIR detectors: various design comparison

Author(s): **Andrzej Janaszek,** VIGO Photonics S.A. (Poland), Univ. of Warsaw (Poland); **Karol Dąbrowski,** VIGO Photonics S.A. (Poland), Wojskowa Akademia Techniczna im. Jaroslawa Dabrowskiego (Poland); **Łukasz Kubiszyn**, **Bartłomiej Seredyński**, **Krystian Michalczewski**, **Krzesimir Nowakowski-Szkudlarek**, **Dariusz Smoczyński**, **Waldemar Gawron, Józef Piotrowski,** VIGO Photonics S.A. (Poland)

13376-76 • 2:55 PM - 3:10 PM

Ultra-fast CMOS-compatible plasmonic detectors for visible to mid-IR light

Author(s): **Mauro David**, **Alicja Dabrowska**, **Masiar Sistani**, **Zehao Song**, **Francesco Maraspini**, **Lukas Wind**, **Juraj Darmo**, **Gottfried Strasser**, **Bernhard Lendl, Alois Lugstein,** Technische Univ. Wien (Austria)

13376-77 • 3:10 PM - 3:25 PM

Ultrastrong coupling of SiGe parabolic quantum wells to terahertz patch antennas

Author(s): **Maria Gambelli**, **Sara Cibella,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giacomo Scalari,** ETH Zurich (Switzerland); **Fritz Berkmann,** Sapienza Univ. di Roma (Italy); **Monica De Seta**, **Luciana Di Gaspare**, **Elena Campagna**, **Enrico Talamas Simola,** Univ. degli Studi di Roma Tre (Italy); **Andrea Notargiacomo**, **Ennio Giovine,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Giovanni Capellini,** IHP GmbH (Germany); **Cedric Corley-Wiciak,** ESRF - The European Synchrotron (France); **Michele Virgilio,** Univ. di Pisa (Italy); **Tommaso Venanzi,** Istituto Italiano di Tecnologia (Italy); **Leonetta Baldassarre, Michele Ortolani,** Sapienza Univ. di Roma (Italy)

CONFERENCE 13377

Photonic and Phononic Properties of Engineered Nanostructures XV

27 - 30 January 2025 | Moscone South, Room 70 (Lower Mezz)

Conference Chair(s): **Ali Adibi,** Georgia Institute of Technology (United States); **Shawn-Yu Lin,** Rensselaer Polytechnic Institute (United States); **Axel Scherer,** Caltech (United States)

Program Committee: **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States); **Amir Arbabi,** Univ. of Massachusetts Amherst (United States); **Ali A. Eftekhar,** Intel Corp. (United States); **Mercedeh Khajavikhan,** The Univ. of Southern California (United States); **Reginald K. Lee,** Caltech (United States); **Marko Loncar,** Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Arka Majumdar,** Univ. of Washington (United States); **Susumu Noda,** Kyoto Univ. (Japan); **Masaya Notomi,** NTT Basic Research Labs. (Japan); **Ekmel Özbay,** Bilkent Univ. (Turkey); **Yong Xu,** Virginia Polytechnic Institute and State Univ. (United States); **Eli Yablonovitch,** Univ. of California, Berkeley (United States); **Rashid Zia,** Brown Univ. (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:30 AM

SESSION 1: RECENT ADVANCES IN ENGINEERED NANOSTRUCTURES

27 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Ali Adibi**, Georgia Institute of Technology (United States)

13377-24 • 10:30 AM - 11:00 AM
Quantum semiconductor photonic devices from deep UV to THZ, at CQD/NU history and future trends *(Invited Paper)*
Author(s): **Manijeh Razeghi,** Northwestern Univ. (United States)

13377-2 • 11:00 AM - 11:30 AM
Foundry enabled chip-scale photonics technology and applications *(Invited Paper)*
Author(s): **Yeshaiahu Fainman**, **Bill Lin, Tzu-Chien Hsueh,** Univ. of California, San Diego (United States)

13377-3 • 11:30 AM - 12:00 PM
Scalable classical and quantum photonics *(Invited Paper)*
Author(s): **Jelena Vuckovic,** Stanford Univ. (United States)

Lunch Break 12:00 PM - 1:30 PM

SESSION 2: NOVEL DEVICES AND PHENOMENA IN ENGINEERED NANOSTRUCTURES

27 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **JueJun Hu**, Massachusetts Institute of Technology (United States)

13377-4 • 1:30 PM - 2:00 PM
Dynamic photonic and thermal management with nano-architected materials *(Invited Paper)*
Author(s): **Yuebing Zheng,** The Univ. of Texas at Austin (United States)

13377-5 • 2:00 PM - 2:20 PM
Nonreciprocal scintillation using magneto-optical photonic crystals
Author(s): **Olivia Long,** Stanford Univ. (United States); **Simo Pajovic,** Massachusetts Institute of Technology (United States); **Charles Roques-Carmes**, **Yoichiro Tsurimaki,** Stanford Univ. (United States); **Nicholas Rivera,** Harvard Univ. (United States); **Marin Soljacic**, **Svetlana Boriskina,** Massachusetts Institute of Technology (United States); **Shanhui Fan,** Stanford Univ. (United States)

13377-6 • 2:20 PM - 2:40 PM
Utilizing statistical-spectral correlations of random metasurfaces for multi-wavelength cryptography
Author(s): **Romil Audhkhasi**, **Maksym Zhelyeznyakov**, **Steven L. Brunton, Arka Majumdar,** Univ. of Washington (United States)

13377-7 • 2:40 PM - 3:00 PM
Free-space outcoupling of OAM beams from Bloch surface waves
Author(s): **Emiliano Descrovi,** Politecnico di Torino (Italy); **Niccolò Marcucci,** Istituto di Fisica Applicata "Nello Carrara" (Italy); **Zongyuan Tang,** Southern Univ. of Science and Technology (China), Politecnico di Torino (Italy); **Tianlong Guo,** Univ. of Eastern Finland (Finland); **Yanjun Liu,** Southern Univ. of Science and Technology (China); **Matthieu Roussey,** Univ. of Eastern Finland (Finland)

13377-57 • 3:00 PM - 3:20 PM
Chiral biotemplates for the fabrication of optical metamaterials
Author(s): **Emre Aydemir, Ahu Gumrah Dumanli,** The Univ. of Manchester (United Kingdom)

Coffee Break 3:20 PM - 3:50 PM

SESSION 3: PHOTONIC NANOSTRUCTURES FOR IMAGING AND SENSING APPLICATIONS

27 January 2025 • 3:50 PM - 5:40 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Yuebing Zheng**, The Univ. of Texas at Austin (United States)

13377-8 • 3:50 PM - 4:20 PM
Wide-angle meta-optical projectors *(Invited Paper)*
Author(s): **Hung-I Lin,** Massachusetts Institute of Technology (United States), 2Pi Inc. (United States); **Luigi Ranno,** Massachusetts Institute of Technology (United States); **Padraic Burns**, **Fan Yang**, **Hanyu Zheng,** 2Pi Inc. (United States); **Tian Gu, JueJun Hu,** Massachusetts Institute of Technology (United States)

13377-9 • 4:20 PM - 4:40 PM
Unidirectional imaging in the mid-infrared using metasurfaces with engineered disorder
Author(s): **Romil Audhkhasi**, **Anna Wirth-Singh**, **Maksym Zhelyeznyakov**, **Rose Johnson**, **Vladimir Yarmolik, Arka Majumdar,** Univ. of Washington (United States)

13377-10 • 4:40 PM - 5:00 PM
Lensless imaging with active metasurfaces in detector-limited applications
Author(s): **Julie Belleville**, **Prachi Thureja, Harry A. Atwater,** Caltech (United States)

13377-11 • 5:00 PM - 5:20 PM
Polychromatic metalens in the NIR for CO_2 detection
Author(s): **Joeri Lenaerts,** Vrije Univ. Brussel (Belgium), Harvard Univ. (United States); **Davide Cassara**, **Paul Chevalier**, **Joon-Suh Park**, **Luca Sacchi**, **Soon Wei D. Lim,** Harvard Univ. (United States); **Raphaël Pestourie,** Georgia Tech Research Institute (United States); **Vincent Ginis,** Vrije Univ. Brussel (Belgium); **Maryna Leonidivna Meretska,** Karlsruher Institut für Technologie (Germany); **Federico Capasso,** Harvard Univ. (United States)

13377-12 • 5:20 PM - 5:40 PM
A metasurface-based microcavity for enhanced vibrational circular dichroism spectroscopy
Author(s): **Philip Scott**, **Markus Nyman**, **Benedikt Zerulla,** Karlsruher Institut für Technologie (Germany); **Ariel F. Perez Mellor**, **Thomas Bürgi,** Univ. de Genève (Switzerland); **Carsten Rockstuhl**, **Ivan Fernandez-Corbaton, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

Tuesday 28 January 2025

SESSION 4: PHOTONIC CRYSTAL STRUCTURES

28 January 2025 • 8:45 AM - 10:15 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Matthias Wuttig**, RWTH Aachen Univ. (Germany)

13377-13 • 8:45 AM - 9:15 AM
Emerging properties and applications of photonic metacrystal waveguides and cavities *(Invited Paper)*
Author(s): **Sharon M. Weiss,** Vanderbilt Univ. (United States)

13377-68 • 9:15 AM - 9:35 AM
Planar scale-invariant waveguides: a metamaterial approach for uniform field confinement in integrated photonics
Author(s): **Seyed Mohammadhossein Enjaviarsanjan**, **Amin Khavasi**, **Ashkan Zandi**, **Hamed Abiri**, **Reza Marzban**, **Saeed Javadizadeh, Ali Adibi,** Georgia Institute of Technology (United States)

13377-15 • 9:35 AM - 9:55 AM
Isolated moiré flat bands for augmented reality and beyond
Author(s): **Zhaowei Dai,** Yale Univ. (United States); **Suki Gu**, **Phillippe M. Pearson**, **Andrei Faraon,** Caltech (United States); **Owen D. Miller,** Yale Univ. (United States)

13377-16 • 9:55 AM - 10:15 AM
Optical energy localization at the termination of a topological photonic crystal waveguide
Author(s): **Daniel Muis,** Technische Univ. Delft (Netherlands); **Yandong Li,** Cornell Univ. (United States); **Rene Barczyk,** AMOLF (Netherlands); **Sonakshi Arora,** Technische Univ. Delft (Netherlands); **Ewold Verhagen,** AMOLF (Netherlands); **L. (Kobus) Kuipers,** Technische Univ. Delft (Netherlands); **Gennady Shvets,** Cornell Univ. (United States)

Coffee Break 10:15 AM - 10:30 AM

SESSION 5: RECONFIGURABLE NANOPHOTONICS USING PHASE-CHANGE MATERIALS

28 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Sharon M. Weiss**, Vanderbilt Univ. (United States)

13377-17 • 10:30 AM - 11:00 AM
Tailoring phase change materials for nanophotonic applications *(Invited Paper)*
Author(s): **Matthias Wuttig,** RWTH Aachen Univ. (Germany)

13377-18 • 11:00 AM - 11:20 AM
Superior asymmetric visibility using obscurants formed by reconfigurable metasurfaces
Author(s): **Reza Marzban,** Georgia Institute of Technology (United States); **Oliver Pierson,** Georgia Tech Research Institute (United States); **Amin Khavasi**, **Ashkan Zandi**, **Hamed Abiri**, **Mohammad Reza Tavakol Harandi,** Georgia Institute of Technology (United States); **Brent Wagner,** Georgia Tech Research Institute (United States); **Ali Adibi,** Georgia Institute of Technology (United States)

13377-1 • 11:20 AM - 11:50 AM
Metamaterial active matter *(Invited Paper)*
Author(s): **Nikolay I. Zheludev,** Optoelectronics Research Ctr. (United Kingdom)

SESSION 6: PLASMONIC STRUCTURES

28 January 2025 • 11:50 AM - 12:20 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Christoph Becher**, Univ. des Saarlandes (Germany)

13377-20 • 11:50 AM - 12:20 PM
Transdimensional materials: from tailorable plasmonics to new physics *(Invited Paper)*
Author(s): **Alexandra Boltasseva,** Purdue Univ. (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 7: NANOSTRUCTURES FOR QUANTUM SCIENCE AND ENGINEERING

28 January 2025 • 1:50 PM - 3:50 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Ali Adibi**, Georgia Institute of Technology (United States)

13377-41 • 1:50 PM - 2:20 PM
Ultrafast quantum and classical nonlinear nanophotonic circuits *(Invited Paper)*
Author(s): **Alireza Marandi,** Caltech (United States)

13377-25 • 2:20 PM - 2:50 PM
Integrated quantum photonics in silicon and silicon nitride *(Invited Paper)*
Author(s): **Vladimir M. Shalaev,** Purdue Univ. (United States)

13377-26 • 2:50 PM - 3:20 PM
Quantum nano-photonics with rare-earth ions *(Invited Paper)*
Author(s): **Andrei Faraon, Chun Ju Wu,** Caltech (United States)

13377-27 • 3:20 PM - 3:50 PM
Optical coherence of tin-vacancy qubits in diamond and diamond nanostructures *(Invited Paper)*
Author(s): **Christoph Becher,** Univ. des Saarlandes (Germany)

Wednesday 29 January 2025

SESSION 8: PHOTONIC METASURFACES I

29 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States)

13377-28 • 8:00 AM - 8:30 AM
Functional metasurfaces: atom trapping, wavelength-selective wavefront shaping, and nonlinear generation *(Invited Paper)*
Author(s): **Nanfang Yu,** Columbia Univ. (United States)

13377-29 • 8:30 AM - 9:00 AM
Metasurfaces with low-order nonlinearities *(Invited Paper)*
Author(s): **Shoufeng Lan,** Texas A&M Univ. (United States)

13377-30 • 9:00 AM - 9:20 AM
Extreme decoupling in dense high quality factor phase gradient metasurfaces
Author(s): **Samuel Ameyaw**, **Lin Lin**, **Bo Zhao,** Washington Univ. in St. Louis (United States); **Hamish Carr Delgado,** Stanford Univ. (United States); **Mark Lawrence,** Washington Univ. in St. Louis (United States)

13377-31 • 9:20 AM - 9:40 AM
Harnessing dielectric metasurfaces for light-matter interactions in the infrared region
Author(s): **Shovasis Kumar Biswas**, **Wihan Adi**, **Aidana Beisenova**, **Samir Rosas**, **Eduardo Romero Arvelo, Filiz Yesilkoy,** Univ. of Wisconsin-Madison (United States)

13377-32 • 9:40 AM - 10:00 AM
Can an angular engineered meta-lens break the conservation of etendue?
Author(s): **Bavo Robben**, **Lieven Penninck, Chris Beckerleg,** PlanOpSim (Belgium)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: PHOTONIC METASURFACES II

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Nanfang Yu**, Columbia Univ. (United States)

13377-33 • 10:30 AM - 11:00 AM
Engineered nonlocalities in metastructures *(Invited Paper)*
Author(s): **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States)

13377-34 • 11:00 AM - 11:20 AM
Group-IV asymmetric Kagome lattice optical metasurfaces
Author(s): **Anis Attiaoui,** Stanford Univ. (United States), Stanford Synchrotron Radiation Lightsource (SSRL), SLAC National Accelerator Lab. (United States); **Sudip Acharya,** Univ. of Arkansas (United States); **Lilian Maria Vogl**, **Andrew Minor,** National Ctr. for Electron Microscopy, Lawrence Berkeley National Lab. (United States), The Molecular Foundry (United States); **Paul McIntyre,** Stanford Univ. (United States), Stanford Synchrotron Radiation Lightsource (SSRL), SLAC National Accelerator Lab. (United States); **Shui-Qing (Fisher) Yu,** Univ. of Arkansas (United States)

13377-35 • 11:20 AM - 11:40 AM
A new phase-gradient-based paradigm for metaphotonics: enabling large feature size designs at small wavelengths
Author(s): **Amin Khavasi**, **Ashkan Zandi**, **Tyler Brown, Ali Adibi,** Georgia Institute of Technology (United States)

13377-36 • 11:40 AM - 12:00 PM
Study of a perfectly absorbing PbSe metasurface for mid-IR photodetection
Author(s): **Md Koushik Alam**, **Masoumeh Nazari, Binbin Weng,** The Univ. of Oklahoma (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 10: NOVEL INVERSE DESIGN TECHNIQUES FOR NANOPHOTONIC STRUCTURES

29 January 2025 • 1:30 PM - 3:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Amin Khavasi**, Georgia Institute of Technology (United States)

13377-37 • 1:30 PM - 2:00 PM
Freeform metasurface-enhanced optical systems for imaging and additive manufacturing *(Invited Paper)*
Author(s): **Jonathan A. Fan,** Stanford Univ. (United States)

13377-38 • 2:00 PM - 2:20 PM
Topology optimization of dispersive nanostructures for broadband absorption
Author(s): **Johannes Gedeon**, **Izzatjon Allayarov,** Leibniz Univ. Hannover (Germany); **Emadeldeen Hassan,** Umeå Univ. (Sweden); **Antonio Calà Lesina,** Leibniz Univ. Hannover (Germany)

13377-39 • 2:20 PM - 2:40 PM
Inverse design of optimal metaphotonic devices for dynamic structural colors using physics-informed neural networks
Author(s): **Reza Marzban**, **Nattakorn Kittisut**, **Ashkan Zandi**, **Hamed Abiri, Ali Adibi,** Georgia Institute of Technology (United States)

13377-40 • 2:40 PM - 3:00 PM
A flexible framework for large-scale FDTD simulations: open-source inverse design for 3D nanostructures
Author(s): **Yannik Mahlau**, **Frederik Schubert**, **Konrad Bethmann**, **Reinhard Caspary**, **Antonio Calà Lesina**, **Marco Munderloh**, **Jörn Ostermann, Bodo Rosenhahn,** Leibniz Univ. Hannover (Germany)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: NONLINEAR PHOTONIC NANOSTRUCTURES

29 January 2025 • 3:30 PM - 5:00 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Jonathan A. Fan**, Stanford Univ. (United States)

13377-42 • 3:30 PM - 4:00 PM
Experimental demonstration of self-injection locking and stimulated Brillouin scattering in photonic integrated 4H-SiC microresonators *(Invited Paper)*
Author(s): **Anatoliy Savchenkov,** Jet Propulsion Lab. (United States); **Jingwei Li**, **Ruixuan Wang,** Carnegie Mellon Univ. (United States); **Andrey B. Matsko,** Jet Propulsion Lab. (United States); **Qing Li,** Carnegie Mellon Univ. (United States); **Hossein Taheri,** Univ. of California, Riverside (United States)

13377-43 • 4:00 PM - 4:20 PM
Hybrid metasurface-photonic crystal-based platform for nonlinear optical applications
Author(s): **Yuruo Zheng**, **Hooman B. Sedeh,** Duke Univ. (United States); **Yaoyang Ji**, **Liang Feng,** Univ. of Pennsylvania (United States); **Maria A. Vincenti,** Univ. degli Studi di Brescia (Italy); **Michael Scalora,** U.S. Army Combat Capabilities Development Command (United States); **Natalia M. Litchinitser,** Duke Univ. (United States)

13377-44 • 4:20 PM - 4:40 PM
A chip-scale CMOS-compatible platform for generation of squeezed light with high squeezing ratio
Author(s): **Amin Khavasi**, **Mohammad Hossein Enjavi, Ali Adibi,** Georgia Institute of Technology (United States)

13377-45 • 4:40 PM - 5:00 PM
Second-order nonlinear interactions and wavefront manipulation using nonlocal silicon metasurfaces
Author(s): **Hooman Barati Sedeh**, **Yuruo Zheng,** Duke Univ. (United States); **Ivan Kravchenko,** Oak Ridge National Lab. (United States); **Natalia M. Litchinitser,** Duke Univ. (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13377-14 • 6:00 PM - 8:00 PM
A novel nanobeam photonic crystal structure for light confinement in air
Author(s): **Seyed Mohammadhossein Enjaviarsanjan**, **Ashkan Zandi**, **Amin Khavasi, Ali Adibi,** Georgia Institute of Technology (United States)

13377-61 • 6:00 PM - 8:00 PM
General approach to design special beams in anisotropic media
Author(s): **Yueqian Zhang,** Nanyang Technological Univ. (Singapore), A*STAR Agency for Science, Technology and Research (Singapore); **Haotian Wu,** Nanyang Technological University (Singapore); **Chongwu Wang,** Nanyang Technological Univ. (Singapore); **Guanghui Yuan,** Univ. of Science and Technology of China (China); **Linyang Zou,** Nanyang Technological Univ. (Singapore); **Qian Wang,** A*STAR Agency for Science, Technology and Research (Singapore); **Qi Jie Wang,** Nanyang Technological Univ. (Singapore); **Yu Luo,** Nanjing Univ. of Aeronautics and Astronautics (China)

13377-62 • 6:00 PM - 8:00 PM
Specific wavelength peak emulation with amorphous metastructures
Author(s): **Tae Young Kang, Kyujung Kim,** Pusan National Univ. (Korea, Republic of)

13377-63 • 6:00 PM - 8:00 PM
Deep Q reinforcement learning based multi-objective optimization of metasurfaces for sensing applications
Author(s): **Abdullah Bin Shams**, **Abdur Rahman Akib, J. Stewart Aitchison,** Univ. of Toronto (Canada)

13377-64 • 6:00 PM - 8:00 PM
Design of dielectric-metal-dielectric structures by artificial bee colony algorithm
Author(s): **Gilliard N. Malheiros-Silveira**, **Lucas B. de Oliveira,** UNICAMP (Brazil); **Eliane A. Namikuchi**, **Fernando G. Echeverrigaray, Fernando Ely,** Ctr. de Tecnologia da Informacao Renato Archer (Brazil)

13377-66 • 6:00 PM - 8:00 PM
Inverse design of robust out-of-plane coupling elements
Author(s): **Konrad Bethmann**, **Yannik Mahlau**, **Frederik Schubert**, **Marco Munderloh**, **Bodo Rosenhahn**, **Bernhard Roth, Jörn Ostermann,** Leibniz Univ. Hannover (Germany)

13377-67 • 6:00 PM - 8:00 PM
Focusing grating coupler-based metalens design for highly efficient metaphotonics
Author(s): **Amin Khavasi,** Georgia Institute of Technology (United States)

13377-69 • 6:00 PM - 8:00 PM
Reconfigurable transmissive metaphotonic devices for high-efficiency dynamic beam steering in the visible spectrum
Author(s): **Reza Marzban**, **Hamed Abiri, Ali Adibi,** Georgia Institute of Technology (United States)

13377-71 • 6:00 PM - 8:00 PM
3D superstructures based on polymer-metal hybrid solutions for metabolomics-based diagnostics
Author(s): **Tae-Young Jeong**, **Hyung Woo Lee, Jin-Woo Oh,** Pusan National Univ. (Korea, Republic of)

Thursday 30 January 2025

SESSION 12: PHONONIC CRYSTALS AND ACOUSTIC METAMATERIALS I

30 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Krzysztof Sacha**, Jagiellonian Univ. in Krakow (Poland)

13377-46 • 8:00 AM - 8:30 AM
Exploring high-Q ultrasound resonators in liquid-based metasurfaces through bound states in the continuum *(Invited Paper)*
Author(s): **Abdelkrim Khelif,** Hamad Bin Khalifa Univ. (Qatar); **Mohamed Farhat**, **Ying Wu,** King Abdullah Univ. of Science and Technology (Saudi Arabia); **Julio Iglesias Martínez,** Karlsruher Institut für Technologie (Germany)

13377-47 • 8:30 AM - 9:00 AM
Effect of waveguide interface on topological modes in phononic crystals *(Invited Paper)*
Author(s): **Yan Pennec**, **Monika Koijam,** Institut d'Electronique de Microélectronique et de Nanotechnologie (France); **Clivia Sotomayor-Torres,** INL - International Iberian Nanotechnology Lab. (Portugal); **Jouni Ahopelto,** VTT Technical Research Ctr. of Finland Ltd. (Finland); **Bahram Djafari-Rouhani,** Institut d'Electronique de Microélectronique et de Nanotechnologie (France)

13377-48 • 9:00 AM - 9:20 AM
Optophononic elliptical micropillars as ultrahigh frequency acoustic phonon transducers
Author(s): **Chushuang Xiang**, **Anne Rodriguez**, **Edson R. Cardozo de Oliveira**, **Elham Mehdi**, **Martin Esmann**, **Abdelmounaim Harouri**, **Luc Le Gratiet**, **Isabelle Sagnes**, **Martina Morassi**, **Aristide Lemaître,** Ctr. de Nanosciences et de Nanotechnologies (France); **Norberto Daniel Lanzillotti-Kimura,** Ctr. de Nanosciences et de Nanotechnologies (France), CNRS (France)

13377-49 • 9:20 AM - 9:40 AM
Observation of merging mechanical bound states in the continuum in phononic crystals
Author(s): **Shengyan Liu**, **Kejie Fang, Hao Tong,** Univ. of Illinois (United States)

13377-50 • 9:40 AM - 10:00 AM
Trapping light in air with membrane metasurfaces for vibrational strong coupling
Author(s): **Wihan Adi**, **Samir Rosas**, **Aidana Beisenova**, **Shovasis Kumar Biswas**, **Hongyan Mei,** Univ. of Wisconsin-Madison (United States); **David A. Czaplewski,** Argonne National Lab. (United States); **Filiz Yesilkoy,** Univ. of Wisconsin-Madison (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: PHONONIC CRYSTALS AND ACOUSTIC METAMATERIALS II

30 January 2025 • 10:30 AM - 11:40 AM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Abdelkrim Khelif**, Hamad Bin Khalifa Univ. (Qatar)

13377-51 • 10:30 AM - 11:00 AM
Time-resolved optical imaging of GHz surface acoustic waves in topological phononic crystals *(Invited Paper)*
Author(s): **Osamu Matsuda,** Hokkaido Univ. (Japan)

13377-52 • 11:00 AM - 11:20 AM
The role of pore size in the performance of mesoporous-based gigahertz nanoacoustic resonators
Author(s): **Edson R. Cardozo de Oliveira**, **Chushuang Xiang,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France); **Michael Zuarez Chamba**, **Gaston Grosman,** Instituto de Nanosistemas, Univ. Nacional De San Martín (Argentina); **Abdelmounaim Harouri,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France); **Galo J. A. A. Soler-Illia,** Instituto de Nanosistemas, Univ. Nacional De San Martín (Argentina); **Norberto Daniel Lanzillotti-Kimura,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France)

13377-53 • 11:20 AM - 11:40 AM
Time-resolved study of two-dimensional phononic crystals based on self-assembled nanospheres
Author(s): **Sandeep Sathyan**, **Edson R. Cardozo de Oliveira,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France); **Pedro Moronta Cambero**, **Rafael J. Jiménez-Riobóo**, **Ceferino Lopez**, **Pedro David Garcia Fernandez,** Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas (Spain); **Norberto Daniel Lanzillotti-Kimura,** Ctr. de Nanosciences et de Nanotechnologies, CNRS (France)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

SESSION 14: TIME CRYSTALS AND RESONANCE EFFECTS IN PHOTONIC NANOSTRUCTURES

30 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 70 (Lower Mezz)
Session Chair(s): **Ali Adibi**, Georgia Institute of Technology (United States)

13377-55 • 1:30 PM - 2:00 PM
Towards timetronics with photonic systems *(Invited Paper)*
Author(s): **Krzysztof Sacha,** Jagiellonian Univ. in Krakow (Poland)

13377-56 • 2:00 PM - 2:20 PM
Ultrathin absorber metasurfaces for photothermal conversion using split ring resonator arrays
Author(s): **Proficiency Munsaka**, **Maryna Leonidivna Meretska, Rose Mary Jose,** Karlsruher Institut für Technologie (Germany)

13377-58 • 2:20 PM - 2:40 PM
Anti-reflection coatings for highly anisotropic materials
Author(s): **Hongyan Mei**, **Jin-Woo Cho,** Univ. of Wisconsin-Madison (United States); **Jae Seon Yu,** Kyung Hee Univ. (Korea, Republic of); **Huandong Chen**, **Shantanu Singh**, **Boyang Zhao**, **Jayakanth Ravichandran,** The Univ. of Southern California (United States); **Sun-Kyung Kim,** Kyung Hee Univ. (Korea, Republic of); **Mikhail A. Kats,** Univ. of Wisconsin-Madison (United States)

13377-59 • 2:40 PM - 3:00 PM
Tailoring directional scattering in double Fano resonances based on coupled resonators metasurface
Author(s): **Norhan Ahmed Salama,** The American Univ. in Cairo (Egypt); **Salah S. A. Obayya,** Zewail City of Science and Technology (Egypt); **Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13377-60 • 3:00 PM - 3:20 PM
Design parameters of the silicon nanocavities for single photon sources emitting in telecom wavelength
Author(s): **Rezoana Bente Arif**, **Arez Nosratpour, Zahra Khatami,** Univ. of New Brunswick (Canada)

CONFERENCE 13378

High Contrast Metastructures XIV

27 - 30 January 2025 | Moscone South, Room 311 (Level 3)

Conference Chair(s): **Connie J. Chang-Hasnain,** Berxel Photonics Co., Ltd. (China); **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States); **Weimin Zhou,** DEVCOM Army Research Lab. (United States)

Program Committee: **Amir Arbabi,** Univ. of Massachusetts Amherst (United States); **Sang-Yeon Cho,** DEVCOM Army Research Lab. (United States); **Jonathan A. Fan,** Stanford Univ. (United States); **Andrei Faraon,** Caltech (United States); **Patrice Genevet,** Colorado School of Mines (United States); **Tingyi Gu,** Univ. of Delaware (United States); **Boubacar Kanté,** Univ. of California, Berkeley (United States); **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Arseniy I. Kuznetsov,** A*STAR Institute of Materials Research and Engineering (Singapore); **Philippe Lalanne,** Lab. Photonique, Numérique et Nanosciences (France); **John R. Lawall,** National Institute of Standards and Technology (United States); **Tien-Chang Lu,** National Yang Ming Chiao Tung Univ. (Taiwan); **Arka Majumdar,** Univ. of Washington (United States); **Adam Overvig,** The City Univ. of New York Advanced Science Research Ctr. (United States); **Bala Pesala,** Council of Scientific & Industrial Research (India); **Jon A. Schuller,** Univ. of California, Santa Barbara (United States); **Jason G. Valentine,** Vanderbilt Univ. (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

SESSION 1: HARNESSING LIGHT WITH HIGH-CONTRAST METASTRUCTURES

27 January 2025 • 1:35 PM - 3:30 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Weimin Zhou**, DEVCOM Army Research Lab. (United States)

13378-1 • 1:35 PM - 2:20 PM
3D sensors using high contrast metastructure VCSELs and optics (Keynote Presentation)
Author(s): **Connie J. Chang-Hasnain,** Berxel Photonics Co., Ltd. (China)

13378-2 • 2:20 PM - 2:50 PM
Topological scattering phenomena in metasurfaces *(Invited Paper)*
Author(s): **Cheng Guo, Shanhui Fan,** Stanford Univ. (United States)

13378-3 • 2:50 PM - 3:10 PM
Transmissive metasurface quarter-wave plates for few-femtosecond pulses at deep ultraviolet wavelengths
Author(s): **Shatha Kaassamani**, **Kyle Chapkin**, **Dhruv Fomra**, **Junyeob Song**, **Amit K. Agrawal**, **Henri J. Lezec, Wenqi Zhu,** National Institute of Standards and Technology (United States)

13378-4 • 3:10 PM - 3:30 PM **(CANCELLED)**
Near-field nanospectroscopy and mode mapping of high-index ultracompact meta-atoms

Author(s): **Tomer Lewi, Sukanta Nandi,** Bar-Ilan Univ. (Israel)

Coffee Break 3:30 PM - 4:00 PM

SESSION 2: MANIPULATING LIGHT WITH METASURFACES

27 January 2025 • 4:00 PM - 5:30 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Cheng Guo**, Stanford Univ. (United States)

13378-5 • 4:00 PM - 4:30 PM
Spatially encoded light-matter coupling with spectrally selective metasurfaces *(Invited Paper)*
Author(s): **Andreas Tittl,** Ludwig-Maximilians-Univ. München (Germany)

13378-6 • 4:30 PM - 4:50 PM
Steering non-diffracting wave packets with space-time media
Author(s): **Haiwen Wang**, **Cheng Guo, Shanhui Fan,** Stanford Univ. (United States)

13378-7 • 4:50 PM - 5:10 PM
From surface lattice resonance to quasi bound states in the continuum in dielectric metasurfaces via electric-magnetic dipole coupling
Author(s): **Izzatjon Allayarov,** Leibniz Univ. Hannover (Germany); **Vittorio Aita**, **Diane J. Roth,** King's College London (United Kingdom); **Andrey B. Evlyukhin,** Leibniz Univ. Hannover (Germany); **Anatoly V. Zayats,** King's College London (United Kingdom); **Antonio Calà Lesina,** Leibniz Univ. Hannover (Germany)

13378-8 • 5:10 PM - 5:30 PM **(CANCELLED)**
Capabilities and limits of grayscale volumetric metamaterials
Author(s): **Sara Azzouz, Jonathan A. Fan,** Stanford Univ. (United States)

Tuesday 28 January 2025

SESSION 3: METASURFACE APPLICATIONS: EMBITTERS (LASERS)

28 January 2025 • 8:45 AM - 10:25 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **You Zhou**, The Univ. of North Carolina at Charlotte (United States)

13378-9 • 8:45 AM - 9:15 AM
High power coherent PCSEL arrays *(Invited Paper)*
Author(s): **Weidong Zhou,** The Univ. of Texas at Arlington (United States); **Chhabindra Gautam,** Semergytech (United States); **Mingsen Pan,** The Univ. of Texas at Arlington (United States)

13378-10 • 9:15 AM - 9:35 AM **(CANCELLED)**
Directional and spectral tuning of lasing emission from guided mode assisted quasi-bound states in the continuum in all-dielectric metasurfaces
Author(s): **Ayesheh Bashiri,** Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics (Germany); **Aleksandr Vaskin,** Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); **Katsuya Tanaka,** Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics (Germany); **Michael Steinert**, **Daniel Repp**, **Bayarjargal N. Tugchin**, **Thomas Pertsch,** Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); **Isabelle Staude,** Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics (Germany)

13378-11 • 9:35 AM - 9:55 AM
Metalens integration in microdisk lasers
Author(s): **Aran Yu**, **Moohyuk Kim**, **Da In Song**, **Byoung Jun Park**, **Hae Rin Jeong, Myung-Ki Kim,** Korea Univ. (Korea, Republic of)

13378-45 • 9:55 AM - 10:25 AM
Scalable deterministic and probabilistic quantum light sources in silicon *(Invited Paper)*
Author(s): **Boubacar Kanté,** Univ. of California, Berkeley (United States)

Coffee Break 10:25 AM - 10:55 AM

SESSION 4: NO-LOCAL METASURFACES

28 January 2025 • 10:55 AM - 11:45 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Andreas Tittl**, Ludwig-Maximilians-Univ. München (Germany)

13378-13 • 10:55 AM - 11:25 AM
Freeform nonlocal netasurfaces enabled by near-field optical mode engineering *(Invited Paper)*
Author(s): **You Zhou,** The Univ. of North Carolina at Charlotte (United States); **Jonathan A. Fan,** Stanford Univ. (United States)

13378-14 • 11:25 AM - 11:45 AM
Nonlocal high-Q metasurface with enhanced color selectivity via topology optimization
Author(s): **Huan-Teng Su**, **Lu-Yun Wang**, **Chih-Yao Hsu, Yao-Wei Huang,** National Yang Ming Chiao Tung Univ. (Taiwan)

Lunch/Exhibition Break 11:45 AM - 1:55 PM

SESSION 5: METASURFACES FOR IMAGING, STRUCTURED LIGHT

28 January 2025 • 1:55 PM - 3:35 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Giulia Tagliabue**, EPFL (Switzerland)

13378-17 • 1:55 PM - 2:25 PM
Analog image processing with nonlinear flat optics *(Invited Paper)*
Author(s): **Costantino De Angelis, Domenico de Ceglia,** Univ. degli Studi di Brescia (Italy)

13378-18 • 2:25 PM - 2:55 PM
Nonlinear generation of structured light with metasurfaces and thin films *(Invited Paper)*
Author(s): **Giuseppe Leo,** Univ. Paris Cité (France)

13378-19 • 2:55 PM - 3:15 PM
On-chip cascadable all-optical polariton transistors
Author(s): **Pietro Tassan**, **Darius Urbonas,** IBM Research - Zürich (Switzerland); **Ullrich Scherf,** Bergische Univ. Wuppertal (Germany); **Rainer F. Mahrt, Thilo Stoeferle,** IBM Research - Zürich (Switzerland)

13378-20 • 3:15 PM - 3:35 PM
Large field of view and broadband metalens for optical beam steering
Author(s): **Jian Cao**, **Sarra Salhi**, **Jonathan Peltier**, **Jean-René Coudevylle**, **Etienne Herth**, **Cédric Villebasse**, **Laurent Vivien**, **Carlos Ramos, Daniele Melati,** Ctr. de Nanosciences et de Nanotechnologies (France)

Coffee Break 3:35 PM - 4:05 PM

SESSION 6: METASTRACTURES: THERMAL, ENZ EFFECTS

28 January 2025 • 4:05 PM - 5:15 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Costantino De Angelis**, Univ. degli Studi di Brescia (Italy)

13378-21 • 4:05 PM - 4:35 PM
Thermo-optical effects in nanoantennas and metasurfaces *(Invited Paper)*
Author(s): **Giulia Tagliabue,** EPFL (Switzerland)

13378-23 • 4:35 PM - 4:55 PM
Control of asymmetric thermal emission using a non-Hermitian meta-membrane
Author(s): **Stephen K. Sanders**, **Chris T. Kuhs**, **Henry O. Everitt**, **Sang-Yeon Cho, Charles Pelzman,** DEVCOM Army Research Lab. (United States)

13378-24 • 4:55 PM - 5:15 PM
Absorbing Metamaterials with Hyperbolic Dispersion in the Visible Spectrum
Author(s): **Rose Mary Jose**, **Maryna L. Meretska, Proficiency Munsaka,** Karlsruher Institut für Technologie (Germany)

Wednesday 29 January 2025

SESSION 7: ACTIVE METASURFACE DEVICES

29 January 2025 • 8:30 AM - 10:10 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Jason G. Valentine**, Vanderbilt Univ. (United States)

13378-25 • 8:30 AM - 9:00 AM
Ultrafast modulation in semiconductor metasurfaces for frequency conversion and optical switching *(Invited Paper)*
Author(s): **Dragomir N. Neshev,** The Australian National Univ. (Australia)

13378-26 • 9:00 AM - 9:30 AM
Passive and active optical properties of high contrast self-assembled metastructures in the visible and mid-infrared range *(Invited Paper)*
Author(s): **Marco Centini,** Sapienza Univ. di Roma (Italy)

13378-27 • 9:30 AM - 9:50 AM
MEMS-based twisted bilayer flat optics for multidimensional optical modulation and hyperimaging
Author(s): **Haoning Tang,** Harvard Univ. (United States); **Beicheng Lou,** Stanford University (United States); **Fan Du**, **Guangqi Gao**, **Mingjie Zhang**, **Xueqi Ni**, **Amir Yacoby,** Harvard Univ. (United States); **Yuan Cao,** UC Berkeley (United States); **Shanhui Fan,** Stanford University (United States); **Eric Mazur,** Harvard University (United States)

13378-28 • 9:50 AM - 10:10 AM
Electro-optically tunable active metasurfaces *(Invited Paper)*
Author(s): **Harry A. Atwater,** Caltech (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 8: META-OPTICS: APPLICATIONS

29 January 2025 • 10:40 AM - 12:20 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Dragomir N. Neshev**, The Australian National Univ. (Australia)

13378-29 • 10:40 AM - 11:10 AM
Meta-optics for edge computing *(Invited Paper)*
Author(s): **Jason G. Valentine,** Vanderbilt Univ. (United States)

13378-30 • 11:10 AM - 11:30 AM
Metasurfaces for infrared multimodal microscopy
Author(s): **Shaban B. Sulejman**, **Lukas Wesemann,** The Univ. of Melbourne (Australia); **Mikkaela McCormack,** Dorevitch Pathology (Australia); **Jiajun Meng**, **James A. Hutchison**, **Niken Priscilla**, **Gawain McColl,** The Univ. of Melbourne (Australia); **Katrina Read,** St. Vincent's Private Hospital (Australia); **Wilson Sim,** RMIT Univ. (Australia); **Andrey A. Sukhorukov,** The Australian National Univ. (Australia); **Kenneth B. Crozier, Ann Roberts,** The Univ. of Melbourne (Australia)

13378-32 • 11:30 AM - 11:50 AM
Meta lens metrology: challenges in objective assessment of image quality
Author(s): **Benjamin Stauss**, **Patrik Erichsen**, **Christian Domagalski**, **Paul Struszewski, Stefan Krey,** TRIOPTICS GmbH (Germany)

13378-47 • 11:50 AM - 12:20 PM
Revealing the true chirality of molecules with diffractive metasurfaces *(Invited Paper)*
Author(s): **Yang Zhao,** Univ. of Illinois (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 9: METASURFACES: APPLICATION FOR BIO

29 January 2025 • 1:50 PM - 3:20 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Rachel Grange**, ETH Zurich (Switzerland)

13378-33 • 1:50 PM - 2:20 PM
Si metasurface for DUV pseudo-plasmon-enhanced molecular spectroscopy *(Invited Paper)*
Author(s): **Bo Ray Lee**, **Mao-Feng Chiang**, **Pei Ying Ho**, **Jia-Hua Lee**, **Kuan-Heng Chen,** National Yang Ming Chiao Tung Univ. (Taiwan); **Po Hsiang Hsu,** National Yang-Ming Univ. (Taiwan); **Ray-Hua Horng,** National Yang Ming Chiao Tung Univ. (Taiwan); **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Bor-Ran Li**, **Yu-Chuan Lin**, **Tzu-En Lin**, **Der-Hsien Lien, Ming Lun Tseng,** National Yang Ming Chiao Tung Univ. (Taiwan)

13378-34 • 2:20 PM - 2:40 PM
A comparative analysis of bio-molecular sensing using photonic bound states in the continuum: metal vs dielectric metasurfaces
Author(s): **Angana Bhattacharya**, **Lina Rohrer**, **Tao Jiang**, **Andreas Aigner**, **Thomas Weber**, **Juan Wang,** Ludwig-Maximilians-Univ. München (Germany); **Stefan A. Maier,** Monash Univ. (Australia); **Andreas Tittl,** Ludwig-Maximilians-Univ. München (Germany)

13378-35 • 2:40 PM - 3:00 PM
Decoding antibody repertoires: high-throughput profiling enabled by multiplexed nanoresonators and digitized acoustic bioprinting
Author(s): **Sajjad Abdollahramezani**, **Darrell Omo-Lamai**, **Sahil Dagli**, **Varun Dolia**, **Jack Hu**, **Kai Chang**, **Hamish Carr Delgado**, **Butrus T. Khuri-Yakub**, **Fareeha Safir**, **Parivash Moradifar, Jennifer A. Dionne,** Stanford Univ. (United States)

13378-36 • 3:00 PM - 3:20 PM
Planar objective design for multiphoton brain imaging
Author(s): **Jacob Engelberg**, **Jonathan Weissfisch**, **Eliran Cohen, David Sinefeld,** Jerusalem College of Technology (Israel)

Coffee Break 3:20 PM - 3:50 PM

SESSION 10: METASURFACES: NEW FABRICATION METHODS

29 January 2025 • 3:50 PM - 5:20 PM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Ming Lun Tseng**, National Yang Ming Chiao Tung Univ. (Taiwan)

13378-37 • 3:50 PM - 4:20 PM
Scalable solution derived nanomaterials for nonlinear metasurfaces *(Invited Paper)*
Author(s): **Rachel Grange,** ETH Zurich (Switzerland)

13378-38 • 4:20 PM - 4:40 PM
Ferroelectric nanophotonics: electro-optic active metasurfaces
Author(s): **Martin Thomaschewski**, **Ruzan Sokhoyan**, **Morgan Foley, Harry A. Atwater,** Caltech (United States)

13378-39 • 4:40 PM - 5:00 PM
Deep glass etching technique and machine learning based design for glass-based metasurfaces
Author(s): **Akira Ueno,** AGC Inc. (Japan), Massachusetts Institute of Technology (United States); **Yoshitaka Ono**, **Kohei Sano,** AGC Inc. (Japan); **Juejun Hu,** Massachusetts Institute of Technology (United States); **Yasuo Hayashi,** AGC Inc. (Japan)

13378-40 • 5:00 PM - 5:20 PM
Free-standing membrane metasurfaces for enhanced biochemical sensing
Author(s): **Samir Rosas**, **Wihan Adi**, **Aidana Beisenova**, **Shovasis Kumar**, **Hongyan Mei**, **Mikhail A. Kats,** Univ. of Wisconsin-Madison (United States); **David A. Czaplewski,** Argonne National Lab. (United States); **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Filiz Yesilkoy,** Univ. of Wisconsin-Madison (United States)

Thursday 30 January 2025

SESSION 11: DESIGN/SIMULATION FOR METASTRUCTURE/METASURFACES

30 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 311 (Level 3)
Session Chair(s): **Giuseppe Leo**, Lab. Matériaux et Phénomènes Quantiques (France)

13378-41 • 8:30 AM - 9:00 AM
Tailored and broadband enhanced light chirality with dielectric metamaterials *(Invited Paper)*
Author(s): **Christos Argyropoulos,** The Pennsylvania State Univ. (United States); **Ufuk Kilic**, **Matthew Hilfiker**, **Shawn Wimer**, **Alexander Ruder**, **Eva Schubert, Mathias Schubert,** Univ. of Nebraska-Lincoln (United States)

13378-42 • 9:00 AM - 9:20 AM
Single layer metasurface fulfilling meta-reflector and metalens for polarized photodetection
Author(s): **Qian Sun**, **Borui Xu**, **Zixiao Yu**, **Cong Qi, Jingren Tan,** Alpha Cen (China)

13378-43 • 9:20 AM - 9:40 AM
Automated and high speed freeform metasurface design using an agentic large language model framework
Author(s): **Robert C. Lupoiu**, **Chenkai Mao**, **Yixuan Shao,** Stanford Univ. (United States); **Kofi Edée,** Univ. Clermont Auvergne (France); **Jonathan A. Fan,** Stanford Univ. (United States)

13378-44 • 9:40 AM - 10:00 AM
Ray-tracing compatible methods for large-scale metalenses in multiwavelength imaging system
Author(s): **Michael Cheng,** Ansys Japan K.K. (Japan); **Thibault Leportier,** Ansys Canada Ltd. (Canada); **Dan-Nha Huynh,** ANSYS Germany GmbH (Germany); **Jens Niegemann, Adam Reid,** Ansys Canada Ltd. (Canada)

13378-12 • 10:00 AM - 10:20 AM
Metasurface aberration correctors for improving broadband refractive lens system performance in the long-wave infrared
Author(s): **Owen Anderson**, **Cameron Vo**, **Zachary J. Coppens,** CFD Research Corp. (United States); **Arka Majumdar**, **Rose Johnson, Anna Wirth-Singh,** Univ. of Washington (United States)

CONFERENCE 13379

Photonic Heat Engines: Science and Applications VII

29 January 2025 | Moscone South, Room 105 (Level 1 Lobby)

Conference Chair(s): **Denis V. Seletskiy,** Polytechnique Montréal (Canada); **Masaru K. Kuno,** Univ. of Notre Dame (United States); **Peter J. Pauzauskie,** Univ. of Washington (United States)

Program Committee: **Alexander R. Albrecht,** The Univ. of New Mexico (United States); **Michel J. F. Digonnet,** Stanford Univ. (United States); **Peter D. Dragic,** Univ. of Illinois (United States); **Richard I. Epstein,** ThermoDynamic Films LLC (United States); **Fedor Jelezko,** Univ. Ulm (Germany); **Raman Kashyap,** Polytechnique Montréal (Canada); **Arash Mafi,** The Univ. of Kansas (United States); **Ali Sayir,** Air Force Office of Scientific Research (United States); **Mauro Tonelli,** Univ. di Pisa (Italy); **Eli Yablonovitch,** Univ. of California, Berkeley (United States)

Wednesday 29 January 2025

SESSION 1: OPTICAL REFRIGERATION IN RARE EARTH DOPED SOLIDS

29 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Masaru K. Kuno**, Univ. of Notre Dame (United States)

13379-1 • 8:00 AM - 8:30 AM
Optical refrigeration of ytterbium-doped fluoride crystals: from YLF to novel host materials *(Invited Paper)*
Author(s): **Hiroki Tanaka**, **Stefan Püschel**, **Zoe Liestmann, Christian Kränkel,** Leibniz-Institut für Kristallzüchtung (Germany)

13379-3 • 8:30 AM - 9:00 AM
Pro-silica, anti-stokes *(Invited Paper)*
Author(s): **Brian Topper,** Clemson Univ. (United States)

13379-4 • 9:00 AM - 9:30 AM
Advancing athermal silica fiber lasers to watt-level power and beyond *(Invited Paper)*
Author(s): **Michel J. F. Digonnet, Chun-Wei Chen,** Stanford Univ. (United States)

13379-5 • 9:30 AM - 9:50 AM
Solid-state laser cooling properties of a 7 mol% Yb3+-doped $LiLuF_4$ single crystal grown by the Bridgman technique
Author(s): **Cameron G. Richards**, **Azzurra Volpi,** Los Alamos National Lab. (United States), The Univ. of New Mexico (United States); **Jackson L. Kock,** The Univ. of New Mexico (United States); **Brenden W. Wiggins,** Los Alamos National Lab. (United States); **Alexander R. Albrecht,** The Univ. of New Mexico (United States); **Markus P. Hehlen,** Los Alamos National Lab. (United States)

13379-6 • 9:50 AM - 10:10 AM
Impact of foreign rare-earth impurities on optical refrigeration of Yb:YLF
Author(s): **Zoe Liestmann**, **Stefan Püschel**, **Sascha Kalusniak**, **Christian Kränkel, Hiroki Tanaka,** Leibniz-Institut für Kristallzüchtung (Germany)

Coffee Break 10:10 AM - 10:30 AM

SESSION 2: TOWARD OPTICAL REFRIGERATION IN SEMICONDUCTORS

29 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Denis V. Seletskiy**, Polytechnique Montréal (Canada)

13379-8 • 10:30 AM - 11:00 AM
Laser coupling in indirect bandgap Ge nanocrystals *(Invited Paper)*
Author(s): **Amr S. Helmy**, **Manuchehr Ebrahimi, Nazir Kherani,** Univ. of Toronto (Canada)

13379-7 • 11:00 AM - 11:30 AM
Photonic design for optical cooling with perovskite nanocrystals *(Invited Paper)*

Author(s): **Matthew T. Sheldon,** Univ. of California, Irvine (United States)

13379-9 • 11:30 AM - 11:50 AM
Accurate measuring photoluminescence quantum yield by photothermal absorption spectroscopy
Author(s): **Yang Ding**, **Shenghao Zhang, Masaru K. Kuno,** Univ. of Notre Dame (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 3: MEASUREMENT AND COOLING CHARACTERIZATION TECHNIQUES

29 January 2025 • 1:20 PM - 2:50 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Denis V. Seletskiy**, Polytechnique Montréal (Canada)

13379-10 • 1:20 PM - 1:40 PM
Experimental minimum of optical refrigeration
Author(s): **Masaru K. Kuno,** Univ. of Notre Dame (United States)

13379-11 • 1:40 PM - 2:00 PM
Improved fluorescence thermometry of Yb:YLF
Author(s): **Jackson L. Kock**, **Cameron G. Richards, Alexander R. Albrecht,** The Univ. of New Mexico (United States)

13379-12 • 2:00 PM - 2:30 PM
Precision measurements of optical absorption in III-V heterostructures from 680 nm to 10.6 μm *(Invited Paper)*
Author(s): **Garrett D. Cole,** Thorlabs Crystalline Solutions (United States)

13379-13 • 2:30 PM - 2:50 PM
Defect characterization and solid state laser refrigeration of Yb-doped CaF_2 microspheres
Author(s): **Sankhya Hirani**, **Peter Pauzauskie**, **Gerald Seidler, Anthony Gironda,** Univ. of Washington (United States)

Coffee Break 2:50 PM - 3:10 PM

SESSION 4: NOVEL CONCEPTS IN OPTICAL REFRIGERATION

29 January 2025 • 3:10 PM - 5:40 PM | Moscone South, Room 105 (Level 1 Lobby)
Session Chair(s): **Alexander R. Albrecht**, The Univ. of New Mexico (United States)

13379-14 • 3:10 PM - 3:40 PM
Recent developments in heat management of oxide nanocomposite silica optical fibers and glass rods through laser cooling *(Invited Paper)*
Author(s): **Raman Kashyap**, **Thomas Meyneng**, **Malek Aïssaoui,** Polytechnique Montréal (Canada); **Nicolas Grégoire,** Ctr. d'optique, photonique et laser (Canada), Univ. Laval (Canada); **Jean-Sebastien Boisvert**, **Vladimir Karpov,** Polytechnique Montréal (Canada); **Younes Messaddeq,** Ctr. d'optique, photonique et laser (Canada)

13379-15 • 3:40 PM - 4:10 PM
Photoluminescent cooling with incoherent light *(Invited Paper)*
Author(s): **Sushrut Ghonge,** Saint Mary's College (United States); **Masaru K. Kuno, Boldizsar Janko,** Univ. of Notre Dame (United States)

13379-16 • 4:10 PM - 4:40 PM
Overcoming temperature limitations in laser cooling using dressed states and diamond vacancies *(Invited Paper)*
Author(s): **Paul Eastham**, **Conor Murphy, Luisa Toledo Tude,** Trinity College Dublin (Ireland)

13379-18 • 4:40 PM - 5:10 PM
Cryogenic dielectric Mie resonators for quantum applications *(Invited Paper)*
Author(s): **Ingrid Torres,** Intelligence Community Postdoctoral Research Fellowship (United States), Florida International Univ. (United States); **Aleksandr Krasnok,** Florida International Univ. (United States)

CONFERENCE 13380

Optical Sensing and Precision Metrology

28 - 30 January 2025 | Moscone South, Room 54 (Lower Mezz)

Conference Chair(s): **Jacob Scheuer,** Tel Aviv Univ. (Israel)

Program Committee: **Tal Eliezer Carmon,** Tel Aviv Univ. (Israel); **Mercedeh Khajavikhan,** The Univ. of Southern California (United States); **Jacob B. Khurgin,** Johns Hopkins Univ. (United States); **Stefania Residori,** HOASYS SAS (France); **Selim M. Shahriar,** Northwestern Univ. (United States); **David D. Smith,** NASA Marshall Space Flight Ctr. (United States); **Misha Sumetsky,** Aston Univ. (United Kingdom); **Alan E. Willner,** The Univ. of Southern California (United States); **Avinoam Zadok,** Bar-Ilan Univ. (Israel)

Tuesday 28 January 2025

SESSION 1: SPECTROSCOPY AND COHERENT EFFECTS

28 January 2025 • 1:15 PM - 2:50 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Filippo Capolino**, Univ. of California, Irvine (United States)

13380-1 • 1:15 PM - 1:40 PM
Contrast enhancement of echo atom interferometers using optical channeling and optimization of near resonant Bragg scattering *(Invited Paper)*
Author(s): **Gehrig Carlse**, **Jaskaran Randhawa**, **Eduardo Ramos**, **Thomas Vacheresse**, **Alexander Pouliot, Anantharaman Kumarakrishnan,** York Univ. (Canada)

13380-2 • 1:40 PM - 1:55 PM
Pellicle membrane for spectroscopic ellipsometry of viscous samples
Author(s): **Cobey L. McGinnis**, **Jesse A. Frantz**, **Jason D. Myers, Jasbinder S. Sanghera,** U.S. Naval Research Lab. (United States)

13380-3 • 1:55 PM - 2:10 PM
Benzene and carbon monoxide sensing in urban fire environments via tunable interband cascade laser absorption spectroscopy
Author(s): **Nicolas S. Jaeger**, **Yi Yan, Mitchell Spearrin,** Univ. of California, Los Angeles (United States)

13380-4 • 2:10 PM - 2:25 PM
Extended measurable range with wavelength-segmented phase imaging in full-field optical coherence microscopy
Author(s): **Minju Jeong**, **Jaeheung Kim**, **Hwidon Lee, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13380-5 • 2:25 PM - 2:50 PM
Revealing long-range interactions by observing collective spin noise spectra in atomic vapors *(Invited Paper)*
Author(s): **Joseph Delpy**, **Nikos Fayard**, **Fabien Bretenaker, Fabienne Goldfarb,** LuMIn (France)

Coffee Break 2:50 PM - 3:20 PM

SESSION 2: ADVANCED TOPICS

28 January 2025 • 3:20 PM - 5:10 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Christopher Burgner**, Praevium Research, Inc. (United States)

13380-6 • 3:20 PM - 3:35 PM
High-temperature online monitoring of 3D printing of thermoplastic polymers using SS-OCT technology with an air-cooled piezoelectric scanner
Author(s): **Louis-Philippe Carignan**, **Guy Lamouche**, **Maxime Rivard**, **Christian Padioleau, Mihaela Mihai,** National Research Council Canada (Canada)

13380-7 • 3:35 PM - 3:50 PM
Online 6DOF metrology with MAPS utilizing a unique aperture pattern mask

Author(s): **Luis Garcia Barth,** Karlsruher Institut für Technologie (Germany), Hochschule Aalen - Technik und Wirtschaft (Germany); **Cornelius Neumann,** Karlsruher Institut für Technologie (Germany); **Rainer Börret,** Hochschule Aalen - Technik und Wirtschaft (Germany)

13380-8 • 3:50 PM - 4:05 PM
PV-based self-powered IoT nodes: using PVK/Si tandem solar cells for synergetic under-water energy harvesting and water depth sensing or VLC reception
Author(s): **Noah Tormena**, **Marco Migliorini**, **Francesco Rigo**, **Alessandro Brighente**, **Giacomo Peruzzi**, **Matteo Bertocco**, **Nicola Trivellin, Alessandro Pozzebon,** Univ. degli Studi di Padova (Italy)

13380-10 • 4:05 PM - 4:30 PM
Conservative funneling of light in time-synthetic mesh lattices *(Invited Paper)*
Author(s): **Georgios G. Pyrialakos,** The Univ. of Southern California (United States)

13380-11 • 4:30 PM - 4:45 PM
Dimensional metrology of optics and production datums for a three-mirror freeform telescope
Author(s): **Lucas Ochs,** The Univ. of North Carolina at Charlotte (United States); **Jordan Hall,** Opto-Alignment Technology, Inc. (United States); **Joshua R Wygal,** Opto-Alignment Technology (United States); **Matthew A Davies,** Moore Nanotechnology Systems (United States), The Univ. of North Carolina at Charlotte (United States); **Glenn D Boreman,** The Univ. of North Carolina at Charlotte (United States)

13380-13 • 4:45 PM - 5:10 PM
Nonlinear sensing and oscillators with exceptional points *(Invited Paper)*
Author(s): **Filippo Capolino,** Univ. of California, Irvine (United States)

Wednesday 29 January 2025

SESSION 3: INTEGRATED OPTICS AND RESONATORS

29 January 2025 • 8:00 AM - 9:20 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Philip R. Hemmer**, Texas A&M Univ. (United States)

13380-14 • 8:00 AM - 8:25 AM
Designing asymmetric fiber tapers for multimode-input-enhanced dissipative sensing in microresonators *(Invited Paper)*
Author(s): **Albert T. Rosenberger, Mohmad Junaid Ul Haq,** Oklahoma State Univ. (United States)

13380-15 • 8:25 AM - 8:40 AM
Multimode-input-enhanced absorption sensing of greenhouse gases in a hollow-bottle microresonator
Author(s): **Mohmad Junaid Ul Haq, Albert T. Rosenberger,** Oklahoma State Univ. (United States)

13380-17 • 8:40 AM - 8:55 AM **(CANCELLED)**
Low velocity noise MEMS-VCSELs for fiber-optic sensing using a michelson interferometer with 80 meter path delay
Author(s): **Christopher Burgner**, **Vijaysekhar Jayaraman**, **Wan Ying Ho, Savannah J. Siedschlag,** Praevium Research, Inc. (United States)

13380-18 • 8:55 AM - 9:20 AM
Spatiotemporal dynamics of semiconductor microcavity lasers *(Invited Paper)*
Author(s): **Hui Cao,** Yale Univ. (United States)

Coffee Break 9:20 AM - 9:45 AM

SESSION 4: QUANTUM TECHNIQUES AND FREQUENCY COMBS

29 January 2025 • 9:45 AM - 12:15 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Albert T. Rosenberger**, Oklahoma State Univ. (United States)

13380-19 • 9:45 AM - 10:10 AM
A new path to frequency comb sources: mode locked diode lasers with high pulse energy *(Invited Paper)*
Author(s): **Avi Pe'er,** Bar-Ilan Univ. (Israel)

13380-20 • 10:10 AM - 10:35 AM
Quantum sensing for precision navigation *(Invited Paper)*
Author(s): **Philippe Bouyer,** Lab. Charles Fabry (France)

13380-21 • 10:35 AM - 11:00 AM
High performance compact optical frequency references *(Invited Paper)*
Author(s): **Matthew T. Hummon,** National Institute of Standards and Technology (United States)

13380-22 • 11:00 AM - 11:25 AM
Quantum sensing with nanodiamonds *(Invited Paper)*
Author(s): **Philip R. Hemmer,** Texas A&M Univ. (United States)

13380-23 • 11:25 AM - 11:50 AM
Electro-optic dual frequency combs *(Invited Paper)*
Author(s): **Harald G. L. Schwefel,** Univ. of Otago (New Zealand)

13380-24 • 11:50 AM - 12:15 PM
Phase-insensitive quantum amplification for improving the shot-noise-limited sensitivity in interferometers via dispersion compensation *(Invited Paper)*
Author(s): **Artemiy Dmitriev,** Univ. of Birmingham (United Kingdom)

Lunch/Exhibition Break 12:15 PM - 1:45 PM

SESSION 5: LIDAR AND FREE SPACE

29 January 2025 • 1:45 PM - 3:40 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Uriel Levy**, The Hebrew Univ. of Jerusalem (Israel)

13380-25 • 1:45 PM - 2:10 PM
Recent progress in on-chip SLG FMCW LiDAR *(Invited Paper)*
Author(s): **Toshihiko Baba,** Yokohama National Univ. (Japan)

13380-26 • 2:10 PM - 2:25 PM
Characterization of fast steering mirrors for free space communication
Author(s): **Johannes Pfund**, **Christian Brock**, **Lucas Pfeifer,** OPTOCRAFT GmbH (Germany); **Thomas Reitberger**, **Daniel Neuwirth**, **Johannes Binder, Reinhold Hoenicka,** Micro-Epsilon Messtechnik GmbH&Co KG (Germany)

13380-27 • 2:25 PM - 2:40 PM
Dual-polarization FMCW LiDAR with high-quantum-efficiency coherent receiver
Author(s): **Sarah Cwalina**, **Christoph Kottke**, **Felix Ganzer**, **Trung Thanh Tran,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany); **Patrick Runge,** Fraunhofer-Institut für Nachrichtentechnik (Germany); **Volker Jungnickel, Ronald Freund,** Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, HHI (Germany)

13380-28 • 2:40 PM - 2:55 PM
High resolution terrain sensing lidar for precision navigation and safe landing of space and aerial vehicles
Author(s): **Farzin Amzajerdian,** NASA Langley Research Ctr. (United States); **Alexander Bulyshev,** Coherent Applications, Inc. (United States); **Paul F. Brewster**, **Aram Gragossian**, **Jacob M. Heppler**, **Frederick G. Wilson**, **Glenn D. Hines**, **Sean A. Laughter, Daniel K. Litton,** NASA Langley Research Ctr. (United States)

13380-29 • 2:55 PM - 3:10 PM
Solid-state fmcw lidar using wdm with wideband external cavity tunable laser
Author(s): **Huiyeon Kim**, **Sang Min Park**, **Hwidon Lee, Chang-Seok Kim,** Pusan National Univ. (Korea, Republic of)

13380-30 • 3:10 PM - 3:25 PM
Tunable lidar operating at the Christiansen wavelength for penetration through sand
Author(s): **Jesse A. Frantz**, **Cobey L. McGinnis**, **Jason D. Myers,** U.S. Naval Research Lab. (United States); **Anthony R. Clabeau,** Univ. Research Foundation (United States); **Jasbinder S. Sanghera,** U.S. Naval Research Lab. (United States)

13380-31 • 3:25 PM - 3:40 PM
First demonstration of simultaneous ranging and velocimetry with coherent lidar on the moon with NASA's Navigation Doppler Lidar
Author(s): **Aram Gragossian**, **Farzin Amzajerdian**, **Nathan A. Dostart**, **Glenn D. Hines, Frederick G. Wilson,** NASA Langley Research Ctr. (United States)

Coffee Break 3:40 PM - 4:00 PM

SESSION 6: PLASMONICS AND METAMATERIALS

29 January 2025 • 4:00 PM - 6:00 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Toshihiko Baba**, Yokohama National Univ. (Japan)

13380-32 • 4:00 PM - 4:25 PM
Enhanced nonlinear THz generation in dielectric metasurfaces *(Invited Paper)*
Author(s): **Davide Rocco**, **Luca Carletti**, **Paolo Franceschini**, **Olga Sergaeva,** Univ. degli Studi di Brescia (Italy); **Unai Arregui Leon**, **Giuseppe Della Valle,** Politecnico di Milano (Italy); **Costantino De Angelis,** Univ. degli Studi di Brescia (Italy)

13380-33 • 4:25 PM - 4:40 PM
Ultrafast polarization sensing with an ultrathin, metasurface-integrated pyroelectric photodetector
Author(s): **Eunso Shin**, **Rachel Bangle**, **Nathaniel Wilson,** Duke Univ. (United States); **Stefan Nikodemski**, **Jarrett Vella,** Air Force Research Lab. (United States); **Maiken Mikkelsen,** Duke Univ. (United States)

13380-34 • 4:40 PM - 4:55 PM
Optical hydrogen sensors based on plasmonics metamaterials
Author(s): **Anastasiia Zaleska**, **Wayne Dickson**, **David Richards, Anatoly V. Zayats,** King's College London (United Kingdom)

13380-35 • 4:55 PM - 5:10 PM
Design of ultrasensitive plasmonic multilayer structure in gas-sensing applications
Author(s): **Ahmad E. Alsayed**, **Abdelrahman Ghanim,** The American Univ. in Cairo (Egypt), Ain Shams Univ. (Egypt); **Ashraf Yahia,** Ain Shams Univ. (Egypt); **Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13380-36 • 5:10 PM - 5:35 PM
Metamaterial tweezers for trapping and distinguishing nanoparticles *(Invited Paper)*
Author(s): **Síle Nic Chormaic, Viet Giang Truong,** Okinawa Institute of Science and Technology Graduate Univ. (Japan)

13380-37 • 5:35 PM - 6:00 PM
Waveguides, metasurfaces with miniaturized vapor cells: from dense integration to quantum applications *(Invited Paper)*
Author(s): **Uriel Levy,** The Hebrew Univ. of Jerusalem (Israel)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13380-12 • 6:00 PM - 8:00 PM
The optical engineer companion, a wavefront sensing solution for LIDAR's beam qualification and focusing distance adjustment
Author(s): **Louis Ruel**, **Diego Ormaechea**, **Xavier Levecq, Rafael Porcar-Guezenec,** Imagine Optic SA (France)

13380-58 • 6:00 PM - 8:00 PM
Distributed UV sensing using azobenzene coated FBGs and tunable VCSEL in a time domain system
Author(s): **JongJu Moon**, **YoungMin Ko**, **HanMam Kang, TaeJung Ahn,** Chosun Univ. (Korea, Republic of)

13380-59 • 6:00 PM - 8:00 PM
White light scanning interferometry using structured illumination for high resolution
Author(s): **Min Seo Cho, Ki-Nam Joo,** Chosun Univ. (Korea, Republic of)

13380-60 • 6:00 PM - 8:00 PM
Physical optics modelling of eye displacement detection using self-mixing interferometry
Author(s): **Priya Jain,** ams-OSRAM International GmbH (Germany); **Jens F. Geiger,** ams AG (Switzerland); **Volker Zagolla**, **Antoine Boniface**, **Markus Rossi,** ams-OSRAM AG (Switzerland); **Mengkoung Veng**, **Julien Perchoux,** Institut National Polytechnique de Toulouse (France); **Frank Wyrowski,** LightTrans International GmbH (Germany), Friedrich-Schiller-Univ. Jena (Germany)

13380-61 • 6:00 PM - 8:00 PM
Fiber Bragg grating sensors for detecting localized metal loss in composite-sleeved pipelines
Author(s): **Alaaeddine Rjeb**, **Islam Ashry,** King Abdullah Univ. of Science and Technology (Saudi Arabia); **Abderrahim Fakiri,** Saudi Aramco (Saudi Arabia); **Juan M. Marin**, **Fares Banjar,** King Abdullah Univ. of Science and Technology (Saudi Arabia); **Shaj K. Manjalivalapil**, **Anwar Md. Parvez,** Saudi Aramco (Saudi Arabia); **Tien Khee Ng, Boon S. Ooi,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13380-62 • 6:00 PM - 8:00 PM
Mechanical quality factor and thermal noise analysis of NEXCERA for optical cavities
Author(s): **Nico Wagner,** Institut für Halbleitertechnik, Technische Univ. Braunschweig (Germany); **Mateusz Naroznik**, **Marcin Bober**, **Michal Zawada,** Nicolaus Copernicus Univ. (Poland); **Stefanie Kroker,** Institut für Halbleitertechnik, Technische Univ. Braunschweig (Germany)

13380-63 • 6:00 PM - 8:00 PM
Pulse contrast ratio measurement of diode laser-based light sources using SPADs
Author(s): **Kaito Nagasawa**, **Yutaro Tashiro, Kazuyoku Tei,** Tokai Univ. (Japan)

13380-64 • 6:00 PM - 8:00 PM
High throughput optical cavities for sensing
Author(s): **Cecilia Vollbrecht**, **Margaret Lekan, Justin Essing,** Kalamazoo College (United States)

13380-65 • 6:00 PM - 8:00 PM
Highly sensitive plasmonic grating sensor with zinc oxide layer
Author(s): **Mostafa Sayed**, **Ahmed Faramawy, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13380-66 • 6:00 PM - 8:00 PM
Phase extraction based on AI phase shifter and a single shot interferogram
Author(s): **Jurim Jeon, Yangjin Kim,** Pusan National Univ. (Korea, Republic of)

13380-67 • 6:00 PM - 8:00 PM
Hierarchical nanospheres for SERS-active substrates: design, fabrication, and performance assessment
Author(s): **Maria Alessandra Cutolo,** Univ. degli Studi del Sannio (Italy); **Francesco Galeotti,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Sara Spaziani,** CeRICT scrl (Italy); **Giuseppe Quero,** Univ. degli Studi del Molise (Italy); **Vincenzo Calcagno,** Univ. degli Studi del Sannio (Italy); **Alberto Micco,** CeRICT scrl (Italy); **Andrea Irace**, **Giovanni Breglio,** Univ. degli Studi di Napoli Federico II (Italy); **Marco Pisco, Andrea Cusano,** Univ. degli Studi del Sannio (Italy)

13380-68 • 6:00 PM - 8:00 PM
Salinity detection using liquid-core photonic crystal fiber: a simulation study
Author(s): **Ahmed Kreta**, **Mohamed A. Swillam,** The American Univ. in Cairo (Egypt); **Diaa A. M. Khalil,** Ain Shams Univ. (Egypt)

13380-50 • 6:00 PM - 8:00 PM
Multiplexed, space distributed chemo/biosensors by means of time resolved, in-fiber acousto-optic interaction
Author(s): **Jean Paul Marrou,** Univ. de València (Spain); **Jaime Cascante-Vindas,** Univ. de Costa Rica (Costa Rica); **Paula Rodrigo-Martínez**, **Martina Delgado-Pinar**, **Antonio Díez**, **Salvador Gil, Miguel V. Andrés,** Univ. de València (Spain)

Thursday 30 January 2025

SESSION 7: FIBER OPTICS I

30 January 2025 • 8:00 AM - 9:55 AM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Andrea Cusano**, Univ. degli Studi del Sannio (Italy)

13380-38 • 8:00 AM - 8:25 AM
Imaging with multimode fibers *(Invited Paper)*
Author(s): **Demetri Psaltis,** EPFL (Switzerland)

13380-39 • 8:25 AM - 8:50 AM
Time expansion in distributed optical fiber sensing *(Invited Paper)*
Author(s): **Sonia Martín-López**, **Miguel Soriano-Amat,** Univ. de Alcalá (Spain); **Jae Hyeong Youn,** Chung-Ang University (Korea, Republic of); **Miguel Gonzalez-Herraez,** Univ. de Alcalá (Spain); **Kwang Yong Song,** Chung-Ang University (Korea, Republic of); **Maria R Fernández-Ruiz,** Univ. de Alcalá (Spain)

13380-40 • 8:50 AM - 9:05 AM
Measuring optical fiber diameter variations with few nanometers resolution *(Invited Paper)*
Author(s): **Carlos Álvarez-Ocampo**, **Martina Delgado-Pinar**, **Antonio Díez**, **José Luis Cruz, Miguel V. Andrés,** Univ. de València (Spain)

13380-42 • 9:05 AM - 9:30 AM
Opto-mechanics of few-mode fibers *(Invited Paper)*
Author(s): **Avinoam Zadok,** Technion-Israel Institute of Technology (Israel)

13380-41 • 9:30 AM - 9:55 AM
New approach for localizing disturbances on optical fiber networks *(Invited Paper)*
Author(s): **Leo W. Hollberg, Jack Brandon,** Stanford Univ. (United States)

Coffee Break 9:55 AM - 10:25 AM

SESSION 8: FIBER OPTICS II

30 January 2025 • 10:25 AM - 12:20 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Sonia Martín-López**, Univ. de Alcalá (Spain)

13380-46 • 10:25 AM - 10:50 AM
Nanophotonic sensing meets fiber optics: membrane-on-fiber sensor technology *(Invited Paper)*
Author(s): **Andrea Fiore**, **Arthur Hendriks**, **Luca Picelli**, **Mildred S. Cano-Velázquez**, **Daan Rabelink**, **Paco Dreverman**, **Mathias Dolci**, **René van Veldhoven**, **Peter Zijlstra,** Technische Univ. Eindhoven (Netherlands); **Ewold Verhagen,** AMOLF (Netherlands)

13380-43 • 10:50 AM - 11:05 AM
A simple and cost-effective method for precise length measurements of optical fibers
Author(s): **Robin van Zutphen**, **Paul Bloemen**, **Ton van Leeuwen, Xavier Attendu,** Amsterdam UMC (Netherlands)

13380-45 • 11:05 AM - 11:30 AM
Lab on fiber as multifunctional platform for precision medicine *(Invited Paper)*
Author(s): **Andrea Cusano,** Univ. degli Studi del Sannio (Italy)

13380-47 • 11:30 AM - 11:55 AM
Fiber metrology and point sensing based on forward-stimulated Brillouin scattering *(Invited Paper)*
Author(s): **Miguel V. Andrés Bou**, **Antonio Díez Cremades**, **Luis A. Sánchez**, **Carlos Álvarez-Ocampo**, **Martina Delgado-Pinar, José Luis Cruz Muñoz,** Univ. de València (Spain)

13380-44 • 11:55 AM - 12:20 PM
Underwater optical ranging using multiple orbital-angular-momentum modes *(Invited Paper)*
Author(s): **Alan E. Willner,** The Univ. of Southern California (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 9: INERTIA AND ACOUSTIC SENSORS

30 January 2025 • 1:50 PM - 2:55 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Tal Eliezer Carmon**, Tel Aviv Univ. (Israel)

13380-49 • 1:50 PM - 2:15 PM
Enhanced sagnac sensitivity near exceptional points in ring laser gyroscopes *(Invited Paper)*
Author(s): **Mohammad Parvinnezhad Hokmabadi,** The Univ. of North Carolina at Charlotte (United States)

13380-51 • 2:15 PM - 2:30 PM
High accuracy localization of acoustic perturbation on a 60-km bidirectional coherent transmission system using a frequency-locked DFB laser
Author(s): **Yixiang Hu,** McGill Univ. (Canada); **Ramón Gutiérrez-Castrejón,** McGill Univ. (Canada), Univ. Nacional Autónoma de México (Mexico); **Kaibo Zhang,** McGill Univ. (Canada); **Daniel Robin**, **Simon Ayotte**, **Vincent Cardin,** TeraXion Inc. (Canada); **David V. Plant,** McGill Univ. (Canada)

13380-52 • 2:30 PM - 2:55 PM
Modeling an exceptional-point gyroscope utilizing a single ring resonator and a grating with nonreciprocal reflectivity *(Invited Paper)*
Author(s): **Michel J. F. Digonnet, Mohammed Azzouz,** Stanford Univ. (United States)

Coffee Break 2:55 PM - 3:25 PM

SESSION 10: FUNDAMENTAL AND NOVEL CONCEPTS

30 January 2025 • 3:25 PM - 5:05 PM | Moscone South, Room 54 (Lower Mezz)
Session Chair(s): **Mohammad Parvinnezhad Hokmabadi**, The Univ. of North Carolina at Charlotte (United States)

13380-53 • 3:25 PM - 3:50 PM
Deep subwavelength radio imaging *(Invited Paper)*
Author(s): **John C. Howell,** Chapman Univ. (United States)

13380-54 • 3:50 PM - 4:15 PM
Transformation and amplification of light modulated by a traveling wave with a relatively low frequency *(Invited Paper)*
Author(s): **Misha Sumetsky,** Aston Univ. (United Kingdom)

13380-55 • 4:15 PM - 4:40 PM
Photonic Origami *(Invited Paper)*
Author(s): **Tal E. Carmon,** Tel Aviv Univ. (Israel)

13380-56 • 4:40 PM - 5:05 PM
Fundamental and technical limitations of electro-optic e-field sensors *(Invited Paper)*
Author(s): **Andrey B. Matsko,** Jet Propulsion Lab. (United States)

CONFERENCE 13381

Advanced Fabrication Technologies for Micro/Nano Optics and Photonics XVIII

26 - 29 January 2025 | Moscone South, Room 155 (Upper Mezz)

CONFERENCE CO-SPONSORS

Conference Chair(s): **Christophe Moser,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Eva Blasco,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Debashis Chanda,** Univ. of Central Florida (United States)

Conference Co-Chair(s): **Georg von Freymann,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

Program Committee: **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States); **Ruth Houbertz,** ThinkMade Engineering & Consulting (Germany); **Saulius Juodkazis,** Swinburne Univ. of Technology (Australia); **Mangirdas Malinauskas,** Vilnius Univ. (Lithuania); **Virgilio Mattoli,** Istituto Italiano di Tecnologia (Italy); **Robert R. McLeod,** Univ. of Colorado Boulder (United States); **Junsuk Rho,** Pohang Univ. of Science and Technology (Korea, Republic of); **Daniela Serien,** National Institute of Advanced Industrial Science and Technology (Japan); **Michael Thiel,** Nanoscribe GmbH & Co. KG (Germany); **Augustine M. Urbas,** Air Force Research Lab. (United States); **Abraham Vázquez-Guardado,** North Carolina State Univ. (United States); **Daryl W. Yee,** EPFL (Switzerland)

Sunday 26 January 2025

SESSION 1: NANOPLASMONICS I

26 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Georg von Freymann**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13381-1 • 1:30 PM - 2:00 PM
Scalable manufacturing of optical metasurfaces in the visible using engineered optical materials *(Invited Paper)*
Author(s): **Junsuk Rho,** Pohang Univ. of Science and Technology (Korea, Republic of)

13381-2 • 2:00 PM - 2:20 PM
Integration of nanometer thin diamond membranes in plasmonic cavities: a roadmap to ultrafast emissions
Author(s): **Deniz Acil**, **Hengming Li**, **Andrew M. Boyce**, **Nathan Wilson,** Duke Univ. (United States); **Amirhassan Shams-Ansari,** Harvard Univ. (United States); **Srivatsa Chakravarthi**, **Christian Pederson,** Univ. of Washington (United States); **Qixin Shen,** Duke Univ. (United States); **Nicholas Yama**, **Kai-Mei C. Fu,** Univ. of Washington (United States); **Marko Loncar,** Harvard Univ. (United States); **Maiken H. Mikkelsen,** Duke Univ. (United States)

13381-3 • 2:20 PM - 2:40 PM
Large-area fabrication of SERS sensor chips for chemical and biological sensing
Author(s): **Umang Chaturvedi**, **Merbin John**, **Kamal Kumar**, **Vaibhav Chaturvedi**, **Mohd Asif, Anuj Dhawan,** Indian Institute of Technology Delhi (India)

13381-4 • 2:40 PM - 3:00 PM
Fully automated 3D assembly of nanoparticle building blocks using optical tweezers
Author(s): **Euan McLeod**, **Natalie Shultz, Kunal Sharma,** Wyant College of Optical Sciences (United States)

13381-5 • 3:00 PM - 3:20 PM
Modeling and simulation of custom microlenses from electrically deformed droplets
Author(s): **Mike Dohmen**, **Andreas Heinrich,** Hochschule Aalen - Technik und Wirtschaft (Germany); **Cornelius Neumann,** Karlsruher Institut für Technologie (Germany)

Coffee Break 3:20 PM - 3:50 PM

SESSION 2: NANOPLASMONICS II

26 January 2025 • 3:50 PM - 5:10 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Mahdi Soudi**, Univ. of Central Florida (United States)

13381-7 • 3:50 PM - 4:10 PM
Fabrication of micro lens array using low cost, one step electrochemical discharge processing
Author(s): **Julfekar Arab, Shih-chi Chen,** Ctr. for Perceptual and Interactive Intelligence (Hong Kong, China), The Chinese Univ. of Hong Kong (Hong Kong, China)

13381-8 • 4:10 PM - 4:30 PM
Large-area nanopatterning for plasmonics and optics via nanocoining and roll-to-roll lithography
Author(s): **Lauren Micklow**, **Robin McDonald**, **Nichole Scott, Stephen Furst,** Smart Material Solutions, Inc. (United States)

13381-9 • 4:30 PM - 4:50 PM
3D printing of micro-potentials for photonic Bose-Einstein-condensates
Author(s): **Georg von Freymann**, **Julian Schulz**, **Sven Enns,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany); **Kirankumar Karkihalli Umesh, Frank Vewinger,** Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany)

13381-10 • 4:50 PM - 5:10 PM
Scalable fabrication of non-coalescent liquid metal nanodroplet structure on an elastomeric substrate for gap-plasmon-based mechanoresponsive devices
Author(s): **Tapajyoti Dasgupta**, **Renu Raman Sahu,** Indian Institute of Science, Bengaluru (India); **Aravind Yelashetty,** Indian Institute of Science (India)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:35 AM

SESSION 3: PRINTED MICRO- AND NANOOPTICS

27 January 2025 • 10:35 AM - 12:15 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Georg von Freymann**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13381-11 • 10:35 AM - 11:05 AM
Fabrication and application of conducting polymer optics and metasurfaces *(Invited Paper)*
Author(s): **Magnus P. Jonsson,** Linköping Univ. (Sweden)

13381-12 • 11:05 AM - 11:25 AM
Scalable fabrication of aligned micro-optics enabled by two-photon grayscale lithography
Author(s): **Mareike D. Trappen**, **Tobias Hoose**, **Borhan T. Balkan**, **Stephan Dottermusch**, **Andrea Bertoncini**, **Benjamin Richter**, **Nicole Lindenmann**, **Matthias Blaicher, Michael Thiel,** Nanoscribe GmbH & Co. KG (Germany)

13381-13 • 11:25 AM - 11:45 AM
Advanced 3D printing techniques for multi-functional micro-optics
Author(s): **Zhihan Hong,** Wyant College of Optical Sciences (United States); **Piaoran Ye**, **Douglas A. Loy,** The Univ. of Arizona (United States); **Rongguang Liang,** Wyant College of Optical Sciences (United States)

13381-14 • 11:45 AM - 12:15 PM
3D printed liquid crystal-based materials for tunable photonics and information encryption *(Invited Paper)*
Author(s): **Sara Nocentini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ricerca Metrologica (Italy); **Simone Donato,** Istituto Nazionale di Ricerca Metrologica (Italy); **Federico Massarelli,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); **Daniele Martella,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Francesco Riboli,** Istituto Nazionale di Ottica (Italy); **Camilla Parmeggiani, Diederik S. Wiersma,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy)

Lunch Break 12:15 PM - 1:45 PM

SESSION 4: NANOPLASMONICS III

27 January 2025 • 1:45 PM - 3:35 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Nagendra Nagarajayya**, e-skin Displays Inc. (United States)

13381-15 • 1:45 PM - 2:15 PM
Dynamic plasmonic metasurfaces: molecular patterning, phase change materials, and design asymmetry to produce reconfigurable optical properties *(Invited Paper)*
Author(s): **Alasdair W. Clark**, **Justin R. Sperling, William J. Peveler,** Univ. of Glasgow (United Kingdom)

13381-16 • 2:15 PM - 2:45 PM
Scalable ultralight plasmonic paint: A lithography-free approach for sustainable structural coloration *(Invited Paper)*
Author(s): **Mahdi Soudi, Debashis Chanda,** Univ. of Central Florida (United States)

13381-17 • 2:45 PM - 3:15 PM
Extreme space-time optics and quantum meta-photonics *(Invited Paper)*
Author(s): **Vladimir M. Shalaev,** Purdue Univ. (United States)

13381-18 • 3:15 PM - 3:35 PM
Photo-driven micropatterning technique for three-dimensional surface engineering
Author(s): **Marcella Salvatore**, **I Komang Januariyasa**, **Francesco Reda**, **Fabio Borbone, Stefano Luigi Oscurato,** Univ. degli Studi di Napoli Federico II (Italy)

Coffee Break 3:35 PM - 3:55 PM

SESSION 5: NANOPLASMONICS IV

27 January 2025 • 3:55 PM - 6:15 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Mahdi Soudi**, Univ. of Central Florida (United States)

13381-19 • 3:55 PM - 4:25 PM
Large-area, topology-optimized metasurfaces with facile fabrication parameters *(Invited Paper)*
Author(s): **You Zhou,** The Univ. of North Carolina at Charlotte (United States); **Jonathan Fan,** Stanford Univ. (United States)

13381-20 • 4:25 PM - 4:55 PM
2D and 3D nanofabrication of optical metastructures *(Invited Paper)*
Author(s): **Andrea Alù,** The City Univ. of New York Advanced Science Research Ctr. (United States)

13381-21 • 4:55 PM - 5:25 PM
A single atom thick graphene LWIR infrared sensor with nanophotonic integration *(Invited Paper)*
Author(s): **Nagendra Nagarajayya,** e-skin Displays Inc. (United States); **Debashis Chanda,** Univ. of Central Florida (United States)

13381-22 • 5:25 PM - 5:55 PM
Direct laser writing of high refractive index contrast volumetric photonics *(Invited Paper)*
Author(s): **Paul V. Braun, Lynford L. Goddard,** Univ. of Illinois (United States)

13381-23 • 5:55 PM - 6:15 PM
Low resolution fabrication of highly precise diffractive optics by near index matching
Author(s): **Reut Kedem**, **Leonid Leites, Yoav Shechtman,** Technion-Israel Institute of Technology (Israel)

Tuesday 28 January 2025

SESSION 6: 3D PRINTING: JOINT SESSION WITH 13354 AND 13381

28 January 2025 • 8:30 AM - 12:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Bo Gu**, Bos Photonics (United States); **Georg von Freymann**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13354-1 • 8:30 AM - 8:55 AM
Flow dynamics of multi-material exchange in two-photon absorption 3D printing *(Invited Paper)*
Author(s): **Pratyaksh Yemulwar,** HETEROMERGE (Germany), TU Dresden (Germany); **Fatemeh Rajabasadi,** HETEROMERGE (Germany); **Tanya Saxena,** HETEROMERGE (Germany), TU Dresden (Germany); **Man Ho Wong**, **Josua Zscheile,** HETEROMERGE (Germany); **Robert Kirchner,** HETEROMERGE (Germany), TU Dresden (Germany)

13354-2 • 8:55 AM - 9:20 AM
In-situ optical tomographic reconstruction during 3D laser microprinting using deep learning *(Invited Paper)*
Author(s): **Tim Alletzhäusser**, **Roman Zvagelsky**, **Sebastian Kalt**, **Pascal Friederich, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

13354-3 • 9:20 AM - 9:35 AM
Bayesian optimization with Gaussian-process based active machine learning for projection multi-photon 3D printing
Author(s): **Jason E. Johnson**, **Ishat Raihan Jamil**, **Liang Pan**, **Guang Lin, Xianfan Xu,** Purdue Univ. (United States)

13354-4 • 9:35 AM - 9:50 AM
Compact diode laser-based system for multi-photon polymerization with conventional resins
Author(s): **Nils Surkamp**, **Felix Behlau**, **Cilly Plassmann,** Ruhr-Univ. Bochum (Germany); **Shulin Wohlfeil**, **Andrea Knigge,** Ferdinand-Braun-Institut gGmbH (Germany); **Cemal Esen**, **Andreas Ostendorf, Martin R. Hofmann,** Ruhr-Univ. Bochum (Germany)

13354-5 • 9:50 AM - 10:05 AM
Convolutional neural networks for projection multi-photon 3D printing
Author(s): **Ishat Raihan Jamil**, **Jason Johnson, Xianfan Xu,** Purdue Univ. (United States)

Coffee Break • 10:05 AM - 10:35 AM

13381-24 • 10:35 AM - 11:00 AM
Discussion on 3D holographic laser nanoprinting *(Invited Paper)*
Author(s): **Martin Wegener, Paul Somers,** Karlsruher Institut für Technologie (Germany)

13381-25 • 11:00 AM - 11:15 AM
Unraveling structure-process-property relationships of 3D/4D two-photon laser printed polymer microstructures
Author(s): **Eva Blasco**, **Clara Vazquez-Martel, Christoph A. Spiegel,** Ruprecht-Karls-Univ. Heidelberg (Germany)

13381-26 • 11:15 AM - 11:30 AM
Multiscale analysis on direct laser written structures to enhance calibration processes
Author(s): **Julian Hering-Stratemeier,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); **Matthias Eifler,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany), IU International Univ. of Applied Sciences (Germany); **Jörg Seewig,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany); **Georg von Freymann,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany), Opti-Cal GmbH (Germany), Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM (Germany)

13381-27 • 11:30 AM - 11:45 AM
Programmable liquid crystal microstructures made by 4D microprinting
Author(s): **Sébastien Dominici**, **Keynaz Kamranikia**, **Karine Mougin, Arnaud Spangenberg,** Institut de Sciences des Matériaux de Mulhouse (France)

13381-28 • 11:45 AM - 12:00 PM
3D laser printing below the diffraction limit using two-step absorption and depletion
Author(s): **Josephine Spiegelberg**, **Paul Somers, Martin Wegener,** Karlsruher Institut für Technologie (Germany)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 7: ADVANCED MANUFACTURING USING A DMD OR OTHER SLM: JOINT SESSION WITH 13381 AND 13383

28 January 2025 • 1:30 PM - 5:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Benjamin L. Lee**, Texas Instruments Inc. (United States)

13381-29 • 1:30 PM - 2:00 PM
Recent developments in computation, materials formulation, and hardware design for computed axial lithography *(Invited Paper)*
Author(s): **Hayden K. Taylor**, **Nour Akiki**, **Jennings Ye**, **Abrar A. Khan, Jacob Gottesman,** Univ. of California, Berkeley (United States)

13381-30 • 2:00 PM - 2:20 PM
Building with volumetric additive manufacturing
Author(s): **Antony Orth**, **Daniel Webber**, **Nicolas Milliken**, **Yujie Zhang**, **Hao Li**, **Katherine Houlahan**, **Thomas Lacelle**, **Derek Aranguren van Egmond, Chantal Paquet,** National Research Council Canada (Canada)

13381-32 • 2:20 PM - 2:40 PM
An inverse rendering framework for tomographic volumetric additive manufacturing
Author(s): **Baptiste Nicolet**, **Felix Wechsler**, **Jorge A. Madrid-Wolff**, **Christophe Moser, Wenzel Jakob,** EPFL (Switzerland)

13381-31 • 2:40 PM - 3:00 PM
Novel printing geometries for tomographic volumetric additive manufacturing
Author(s): **Felix Wechsler**, **Baptiste Nicolet**, **Jorge A. Madrid Wolff**, **Wenzel Jakob, Christophe Moser,** EPFL (Switzerland)

Coffee Break • 3:00 PM - 3:30 PM

13383-1 • 3:30 PM - 3:50 PM
3D printed GRIN lens using digital light projection additive manufacturing
Author(s): **Jamison D. Engelhardt**, **Robert V. Chimenti, Joseph F. Stanzione,** Rowan Univ. (United States)

13383-2 • 3:50 PM - 4:10 PM
High-resolution additive manufacturing for 3D multifunctional microelectronic devices
Author(s): **Jeroen Sol,** Holst Ctr. (Netherlands); **Marwan Aarab,** Eindhoven University of Technology (Netherlands); **Wilko van Grondelle**, **Darragh R. Walsh**, **Sophie C. E. Suijdendorp,** Holst Ctr. (Netherlands); **Joris J.C. Remmers,** Eindhoven University of Technology (Netherlands); **Hylke B. Akkerman,** Holst Ctr. (Netherlands)

13383-3 • 4:10 PM - 4:30 PM
Implementation of a micro electromechanical system (MEMS) phase-only light modulator (PLM) for holographic volumetric additive manufacturing
Author(s): **Maria Isabel Alvarez Castaño**, **Ye Pu**, **Felix Wechsler**, **Jorge Madrid-Wolff, Christophe Moser,** EPFL (Switzerland)

13381-6 • 4:30 PM - 5:00 PM
Understanding the nanophotonic chirality transfer with single molecule studies *(Invited Paper)*
Author(s): **Yang Zhao,** Univ. of Illinois (United States)

Wednesday 29 January 2025

SESSION 8: PRINTED OPTICS

29 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Georg von Freymann**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13381-33 • 8:00 AM - 8:30 AM
Advanced fabrication techniques for extremely large microoptics and complex optical fields *(Invited Paper)*
Author(s): **Harald Giessen,** Univ. Stuttgart (Germany)

13381-34 • 8:30 AM - 9:00 AM
Functional materials for additive manufacturing of optoelectronic components *(Invited Paper)*
Author(s): **Lyudmila Turyanska,** The Univ. of Nottingham (United Kingdom)

13381-35 • 9:00 AM - 9:20 AM
Dispensing of microlenses under adjustable gravity
Author(s): **Laura Fütterer**, **Andreas Evertz**, **Marco-Nicolas Galati**, **Ludger Overmeyer, Christoph Lotz,** Leibniz Univ. Hannover (Germany)

13381-36 • 9:20 AM - 9:40 AM
Laser-printed optical angular momentum converters
Author(s): **Vygantas Mizeikis,** Shizuoka Univ. (Japan); **Darius Gailevičius**, **Domas Paipulas,** Vilnius Univ. (Lithuania); **Saulius Juodkazis,** Swinburne Univ. of Technology (Australia)

13381-37 • 9:40 AM - 10:00 AM
A protocol using compact 3D printed micro-optical elements for protein identification from low-intensity amino-acid Raman signals

Author(s): **Jannis Weinacker,** Karlsruher Institut für Technologie (Germany); **Bikash Kumar Bhandari,** European Molecular Biology Lab. (United Kingdom); **Alba Viejo Rodriguez,** Univ. du Luxembourg (Luxembourg); **Charlotte West,** European Molecular Biology Lab. (United Kingdom); **Francesco De Angelis**, **Francesco Tantussi,** Istituto Italiano di Tecnologia (Italy); **Nicolò Maccaferri,** Umeå Univ. (Sweden), Univ. du Luxembourg (Luxembourg); **Nick Goldman,** European Molecular Biology Lab. (United Kingdom); **Martin Wegener,** Karlsruher Institut für Technologie (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: VOLUMETRIC PRINTING I

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Maxim Shusteff**, Lawrence Livermore National Lab. (United States)

13381-38 • 10:30 AM - 11:00 AM
Parallax manufacturing: a high dimensionality volumetric additive manufacturing framework *(Invited Paper)*
Author(s): **John E. Hergert,** Vitro3D, Inc. (United States); **Robert R. McLeod,** Univ. of Colorado Boulder (United States)

13381-39 • 11:00 AM - 11:20 AM
Tomography-Driven Registration of Embedded Objects for High-Precision Overprinting in Volumetric Additive Manufacturing
Author(s): **Gabriel T. Seymour, Robert R. McLeod,** Univ. of Colorado Boulder (United States)

13381-40 • 11:20 AM - 11:40 AM
Quantifying limits imposed by occlusions in volumetric additive manufacturing
Author(s): **Chi Chung Li,** Univ. of California, Berkeley (United States); **Robert R. McLeod,** Univ. of Colorado Boulder (United States)

13381-41 • 11:40 AM - 12:00 PM
Triangular cross-section multimode interference couplers in polymer enabled by 3D printing
Author(s): **Tigran Baghdasaryan**, **Koen Vanmol**, **Hugo Thienpont**, **Francis Berghmans, Jurgen Van Erps,** Vrije Univ. Brussel (Belgium)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 10: VOLUMETRIC PRINTING II

29 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Maxim Shusteff**, Lawrence Livermore National Lab. (United States)

13381-42 • 1:30 PM - 2:00 PM
Direct 3D printing of optical elements with xolography *(Invited Paper)*
Author(s): **Martin Herder**, **Yves Garmshausen**, **Marvin-Pascal C Tauber**, **Yousef Arzhangnia, Marcus Reuter,** xolo GmbH (Germany)

13381-43 • 2:00 PM - 2:30 PM
Light-based biofabrication and volumetric bioprinting technologies to engineer complex tissues and organoids *(Invited Paper)*
Author(s): **Riccardo Levato,** Univ. Medical Ctr. Utrecht (Netherlands)

13381-44 • 2:30 PM - 3:00 PM
High dimensionality volumetric additive manufacturing *(Invited Paper)*
Author(s): **Robert R. McLeod,** Univ. of Colorado Boulder (United States); **John E. Hergert,** Vitro3D, Inc. (United States)

13381-45 • 3:00 PM - 3:20 PM
Lithographically aligned 3D optical microsystems with high gradient index contrast
Author(s): **Amos Meeks**, **Natalie Nicolas**, **Soroush Shabahang**, **Zhenle Cao**, **Ryan Vincent**, **Shielan Sinjari, Daniel Oran,** Irradiant Technologies Inc. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 11: VOLUMETRIC PRINTING III

29 January 2025 • 3:50 PM - 5:20 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Robert R. McLeod**, Univ. of Colorado Boulder (United States)

13381-46 • 3:50 PM - 4:20 PM
New frontiers in volumetric 3D printing *(Invited Paper)*
Author(s): **Daniel Webber,** National Research Council Canada (Canada)

13381-47 • 4:20 PM - 4:50 PM
Advanced tomographic volumetric bioprinting: fast biofabrication with versatile, high-throughput, and cell-compatible technologies *(Invited Paper)*
Author(s): **Jorge A. Madrid-Wolff, Paul Delrot,** Readily3D SA (Switzerland)

13381-48 • 4:50 PM - 5:20 PM
Volumetric additive manufacturing: where do we go from here? *(Invited Paper)*
Author(s): **Maxim Shusteff,** Lawrence Livermore National Lab. (United States)

ADVANCED FABRICATION TECHNOLOGIES FOR MICRO/NANO OPTICS AND PHOTONICS BEST PAPER AWARDS CEREMONY

29 January 2025 • 5:20 PM - 5:40 PM | Moscone South, Room 155 (Upper Mezz)
A cash prize will be awarded to the best paper and best student paper in this conference. Qualifying papers will be evaluated by the awards committee. Manuscripts will be judged based on scientific merit, impact, and clarity.

Presented by:
Georg von Freymann, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

Sponsored by:
Opti-Cal GmbH (Germany)
Nanoscribe (Germany)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13381-49 • 6:00 PM - 8:00 PM
Polishing micro-optical components fabricated by femtosecond laser micromachining
Author(s): **Anna Pecorari,** Politecnico di Milano (Italy); **Behjat S. Kariman,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Andrea Ciceri,** Politecnico di Milano (Italy); **Michael Fokine,** KTH Royal Institute of Technology (Sweden); **Christoph Gerhard,** Univ. of Applied Sciences and Arts (Germany); **Alessia Candeo,** Politecnico di Milano (Italy); **Roberto Osellame**, **Francesca Bragheri,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Petra Paiè,** Politecnico di Milano (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13381-53 • 6:00 PM - 8:00 PM
Highly precise thermal imprinting of microstructures for optical sensing application
Author(s): **Yash Bhatia**, **Lei Zheng**, **Lukas Steinbach**, **Axel Günther**, **Andreas Schneider, Bernhard Roth,** Leibniz Univ. Hannover (Germany)

CONFERENCE 13382

MOEMS and Miniaturized Systems XXIV

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27 - 28 January 2025 | Moscone West, Room 2022 (Level 2)

Conference Chair(s): **Hans Zappe,** Univ. of Freiburg (Germany); **Wibool Piyawattanametha,** King Mongkut's Institute of Technology Ladkrabang (Thailand), Michigan State Univ. (United States); **Yong-Hwa Park,** KAIST (Korea, Republic of)

Program Committee: **David L. Dickensheets,** Montana State Univ. (United States); **Kristinn B. Gylfason,** KTH Royal Institute of Technology (Sweden); **Sangyoon Han,** Daegu Gyeongbuk Institute of Science & Technology (Korea, Republic of); **Alois M. Herkommer,** Institut für Technische Optik (Germany); **Ki-Hun Jeong,** KAIST (Korea, Republic of); **Diaa A.M. Khalil,** Ain Shams Univ. (Egypt), Si-Ware Systems (Egypt); **Jaeyoun Kim,** Iowa State Univ. of Science and Technology (United States); **Gil Ju Lee,** Pusan National Univ. (Korea, Republic of); **Hui Min Leung,** Indiana Univ. Bloomington (United States); **Yi-Hsin Lin,** National Yang Ming Chiao Tung Univ. (Taiwan); **David G. Lishan,** Consultant (United States); **Veljko Milanović,** Mirrorcle Technologies, Inc. (United States); **Jeroen Missinne,** Univ. Gent (Belgium), imec (Belgium); **Heidi Ottevaere,** Vrije Univ. Brussel (Belgium); **Yves-Alain Peter,** Polytechnique Montréal (Canada); **Zhen Qiu,** Michigan State Univ. (United States); **Niels Quack,** The Univ. of Sydney (Australia); **Thilo Sandner,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); **Young Min Song,** Gwangju Institute of Science and Technology (Korea, Republic of); **Hamdi Torun,** Northumbria Univ. (United Kingdom); **Youmin Wang,** Meta (United States); **Frédéric Zamkotsian,** Lab. d'Astrophysique de Marseille (France); **Guangya Zhou,** National Univ. of Singapore (Singapore)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: CHIP-BASED PHOTONICS

27 January 2025 • 10:45 AM - 11:55 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Hans Zappe**, Univ. of Freiburg (Germany)

13382-1 • 10:45 AM - 11:10 AM
Planar light valve: an 8192-channel MEMS-based spatial light modulator for high-speed amplitude and phase modulation *(Invited Paper)*
Author(s): **Alexander Payne**, **James Hunter**, **Michael Yeung**, **Greg Myatt**, **Tianbo Liu**, **Stephen Hamann**, **Gregory Jacob**, **Masamine Someha**, **Hong Wu**, **Hirofumi Mizuno**, **Yoshimi Hashimoto, Lars Eng,** Silicon Light Machines (United States)

13382-2 • 11:10 AM - 11:25 AM

A miniature photonic integrated pressure sensor based on a suspended waveguide Bragg grating
Author(s): **Harindra Kannojia**, **Viktor Geudens**, **Geert Van Steenberge,** Univ. Gent (Belgium), imec (Belgium); **Georgios Syriopoulos**, **Evrydiki Kyriazi**, **Giannis Poulopoulos**, **Thenia Prousalidi**, **Charalampos Zervos**, **Hercules Avramopoulos,** National Technical Univ. of Athens (Greece); **Jeroen Missinne,** Univ. Gent (Belgium), imec (Belgium)

13382-3 • 11:25 AM - 11:40 AM
A compact 2×2 optical gate using a silicon photonic MEMS dual-drive directional coupler
Author(s): **Pierre Edinger**, **August Djuphammar,** KTH Royal Institute of Technology (Sweden); **Alain Yuji Takabayashi,** EPFL (Switzerland); **Wim Bogaerts,** Univ. Gent (Belgium), imec (Belgium); **Niels Quack,** EPFL (Switzerland), The Univ. of Sydney (Australia); **Kristinn B. Gylfason,** KTH Royal Institute of Technology (Sweden)

13382-4 • 11:40 AM - 11:55 AM
Fabrication process of RF-photonic device with micro-transfer printing of III-V photodiode
Author(s): **Min Seong Kim,** Pusan National Univ. (Korea, Republic of)

Lunch Break 11:55 AM - 1:45 PM

SESSION 2: MICRO-IMAGING SYSTEMS

27 January 2025 • 1:45 PM - 3:05 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Young Min Song**, Gwangju Institute of Science and Technology (Korea, Republic of)

13382-5 • 1:45 PM - 2:10 PM
MEMS scanning indirect time-of-flight (iTOF) eye tracking *(Invited Paper)*
Author(s): **Youmin Wang,** Meta (United States); **Joonyoung Yu,** Univ. of Michigan (United States); **Evgeny Burmistrov**, **Alexander Khodarev**, **Bingwen Hu**, **Francesco LaRocca**, **Michael Tilleman**, **Anthony Nguyen, Robert Cavin,** Meta (United States)

13382-12 • 2:10 PM - 2:35 PM
Metasurfaces and metalenses for miniaturization of optical devices *(Invited Paper)*
Author(s): **Junsuk Rho,** Pohang Univ. of Science and Technology (Korea, Republic of)

13382-6 • 2:35 PM - 2:50 PM
Foveated imaging systems for target-centric imaging inspired by animal eyes
Author(s): **Young Min Song,** Gwangju Institute of Science and Technology (Korea, Republic of)

13382-9 • 2:50 PM - 3:05 PM
Self-written micro-lenses on fiber tips: investigation of the material parameters and optical behaviour
Author(s): **Axel Günther,** Technische Univ. Braunschweig (Germany); **Abhilash Pahari,** Hannoversches Zentrum für Optische Technologien (Germany); **Wolfgang Kowalsky,** Technische Univ. Braunschweig (Germany); **Bernhard Roth,** Hannoversches Zentrum für Optische Technologien (Germany)

Coffee Break 3:05 PM - 3:35 PM

SESSION 3: LIDAR AND 3D IMAGING

27 January 2025 • 3:35 PM - 4:35 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Yong-Hwa Park**, KAIST (Korea, Republic of)

13382-10 • 3:35 PM - 3:50 PM
MEMS scanners for integrating an optical cavity in a segmented ion trap for enhanced qubit readout
Author(s): **Paul Raschdorf,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); **Can Patric Leichtweiß**, **Jonas Vogel**, **Björn Lekitsch,** Johannes Gutenberg Univ. Mainz (Germany); **Erdem Yarar,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); **Janine Hilder,** Johannes Gutenberg Univ. Mainz (Germany); **Dirk Kähler**, **Hans-Joachim Quenzer**, **Fin Röhr**, **Gunnar Wille**, **Christian von Hofen,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); **Ferdinand Schmidt-Kaler,** Johannes Gutenberg Univ. Mainz (Germany); **Shanshan Gu-Stoppel,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany)

13382-11 • 3:50 PM - 4:05 PM
Piezoelectric MEMS mirror based SPAD LiDAR system enabling real-time monitoring across large covered areas for smart factory applications
Author(s): **Jeong-Yeon Hwang,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); **Andre Henschke,** Fraunhofer-Institut für Mikroelektronische Schaltungen und Systeme IMS (Germany); **Lena Wysocki**, **Paul Raschdorf,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany); **Manuel Ligges**, **Maren Kasischke,** Fraunhofer-Institut für Mikroelektronische Schaltungen und Systeme IMS (Germany); **Michael Mensing**, **Holger Kapels, Shanshan Gu-Stoppel,** Fraunhofer-Institut für Siliziumtechnologie ISIT (Germany)

13382-7 • 4:05 PM - 4:20 PM
Fast structured light engine for 3D image capture based on high-frequency MEMS scanning mirror
Author(s): **Yong Yang**, **Ruiqi Jiang**, **Malcolm C. Gower, Andrew S. Holmes,** Imperial College London (United Kingdom)

13382-13 • 4:20 PM - 4:35 PM
Towards the modeling and control of a quasi-static 2D-MEMS vector scanner with a hybrid-integrated moving magnet drive
Author(s): **Klemens Birnbaum,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany), TU Dresden (Germany); **Benjamin Mustin**, **Julius Schneider, Thilo Sandner,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

Break 4:35 PM - 4:40 PM

SESSION 4: SPECTROMETERS

27 January 2025 • 4:40 PM - 5:50 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **David L. Dickensheets**, Montana State Univ. (United States)

13382-14 • 4:40 PM - 5:05 PM
Integrated, waveguide-based spectrometer for high-performance applications *(Invited Paper)*
Author(s): **Zoe Weber-Porter**, **Nafiz Amin,** Univ. of California, Santa Cruz (United States); **Porter Dixon**, **Tyler Adams,** Brigham Young Univ. (United States); **Thomas D. Yuzvinsky**, **Helio Ramollari**, **Matthew DeMartino**, **Kevin Bundy,** Univ. of California, Santa Cruz (United States); **Aaron R. Hawkins,** Brigham Young Univ. (United States); **Holger Schmidt,** Univ. of California, Santa Cruz (United States)

13382-15 • 5:05 PM - 5:20 PM
Grism microspectrometer for Raman spectroscopic application
Author(s): **Geonhui Han**, **Gibeom Kim**, **JungWoo Park**, **Jaehun Jeon, Kihun Jeong,** KAIST (Korea, Republic of)

13382-16 • 5:20 PM - 5:35 PM
Modeling and compensation of backreflection signal in diffuse reflection optical MEMS spectrometers
Author(s): **Samir Abozyd,** Si-Ware Systems (Egypt); **Mazen Erfan,** Si-Ware Systems (Egypt), Ain Shams Univ. (Egypt); **Bassem Mortada,** Si-Ware Systems (Egypt); **Yasser M. Sabry,** Si-Ware Systems (Egypt), Ain Shams Univ. (Egypt)

13382-17 • 5:35 PM - 5:50 PM
Miniaturized tuneable light source based on a digital micromirror device
Author(s): **Astghik Chalyan,** Vrije Univ. Brussel (Belgium); **Willem Hoving,** Anteryon B.V. (Netherlands); **Wendy Meulebroeck, Heidi Ottevaere,** Vrije Univ. Brussel (Belgium)

Tuesday 28 January 2025

SESSION 5: NOVEL MICRO-OPTICAL COMPONENTS

28 January 2025 • 9:15 AM - 10:25 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Veljko Milanović**, Mirrorcle Technologies, Inc. (United States)

13382-18 • 9:15 AM - 9:40 AM
Integrated 512×320 micro mirror array with novel lever-type piston-tip-tilt actuator *(Invited Paper)*
Author(s): **Andreas Gehner**, **Dirk Rudloff**, **Sebastian Döring**, **Andreas Neudert**, **Alexander Mai**, **Mario Nitzsche, Peter Dürr,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

13382-19 • 9:40 AM - 9:55 AM
Wide-scanning-angle/diffraction-free quasistatic MEMS mirrors with back-side double-circular ribs
Author(s): **Natsumi Furuichi**, **Jun Takigawa**, **Masaya Nakazumi**, **Masaharu Fukakusa**, **Kensuke Mihara**, **Shinichiro Nozaki, Toshihiro Koga,** Panasonic Industry Co., Ltd. (Japan)

13382-20 • 9:55 AM - 10:10 AM
Waveguide-coupled, broadband thermal emission enabled by a bulk-micromachined trench undercut
Author(s): **Marcel W. Pruessner**, **Nathan F. Tyndall**, **Jacob N. Bouchard,** U.S. Naval Research Lab. (United States); **Scott A. Holmstrom,** U.S. Naval Research Lab. (United States), The Univ. of Tulsa (United States); **Steven T. Lipkowitz, Todd H. Stievater,** U.S. Naval Research Lab. (United States)

13382-21 • 10:10 AM - 10:25 AM
An electromagnetic indirect-driving scanning mirror for wide-field coaxial LiDAR applications
Author(s): **Shuangliang Li**, **Di Wang**, **Dezhen Song, Jun Zou,** Texas A&M Univ. (United States)

Coffee break 10:25 AM - 10:55 AM

SESSION 6: TUNABLE MICRO-OPTICS

28 January 2025 • 10:55 AM - 11:25 AM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Youmin Wang**, Meta (United States)

13382-23 • 10:55 AM - 11:10 AM
Miniaturized electro-optical modulator based on substrate-free thin films
Author(s): **Anna Karoline Rüsseler,** Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany); **Michael McKinlay,** Univ. of Glasgow (United Kingdom); **Jonas N. Matthes,** Laser Zentrum Hannover e.V. (Germany); **Carlos Garcia Nuñez,** Univ. of Glasgow (United Kingdom); **Philipp Gehrke,** Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany); **Marco Jupé,** Laser Zentrum Hannover e.V. (Germany); **Gerd-Albert Hoffmann**, **Andreas Wienke, Detlev Ristau,** Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany)

13382-26 • 11:10 AM - 11:25 AM
Holographic photo-morphing of polymer surfaces for reprogrammable diffractive optics
Author(s): **Francesco Reda**, **Marcella Salvatore**, **I Komang Januariyasa**, **Fabio Borbone, Stefano Luigi Oscurato,** Univ. degli Studi di Napoli Federico II (Italy)

Lunch/Exhibition Break 11:25 AM - 1:25 PM

SESSION 7: NOVEL MATERIALS AND PROCESSES

28 January 2025 • 1:25 PM - 2:25 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Jeroen Missinne**, Univ. Gent (Belgium)

13382-27 • 1:25 PM - 1:40 PM
Light-orchestrated microdroplet reactors for enhanced solid-phase synthesis
Author(s): **Mo Wu**, **Mohammad Asif Zaman**, **Michael A. Jensen**, **Wei Ren,** Stanford Univ. (United States); **Ronald W. Davis,** Stanford Univ. School of Medicine (United States); **Lambertus Hesselink,** Stanford Univ. (United States)

13382-28 • 1:40 PM - 1:55 PM
Structural coloring with low-index polymer meta-pixels by multipole-based design
Author(s): **Jaeyoun Kim, Rabiul Sikder,** Iowa State Univ. of Science and Technology (United States)

13382-29 • 1:55 PM - 2:10 PM
Low-frequency spring-like MEMS for photoacoustic trace gas detection
Author(s): **Stefano Dello Russo,** Agenzia Spaziale Italiana (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Jacopo Pelini,** Istituto Nazionale di Ottica CNR (Italy); **Inaki Lopez Garcia**, **Iacopo Galli,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Pablo Cancio Pastor,** Istituto Nazionale di Ottica (Italy); **Marica Concetta Canino**, **Alberto Roncaglia,** Istituto per la Microelettronica e Microsistemi (Italy); **Paolo De Natale,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Simone Borri,** Istituto Nazionale di Ottica (Italy); **Mario Siciliani de Cumis,** Agenzia Spaziale Italiana (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13382-30 • 2:10 PM - 2:25 PM
Glass-based micro-opto electromechanical systems manufactured by laser induced deep etching
Author(s): **Maik Bertke**, **Jannis Heinz, Svenja Schudak,** LPKF Laser & Electronics SE (Germany)

Coffee Break 2:25 PM - 2:55 PM

SESSION 8: MEDICAL APPLICATIONS

28 January 2025 • 2:55 PM - 4:10 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Wibool Piyawattanametha**, King Mongkut's Institute of Technology Ladkrabang (Thailand)

13382-31 • 2:55 PM - 3:10 PM
Micromechanically bending membrane for curved SERS
Author(s): **Mehdi Feizpour**, **Sara Abbasi, Heidi Ottevaere,** Vrije Univ. Brussel (Belgium)

13382-32 • 3:10 PM - 3:25 PM
Light-sheet fluorescence microscopy and beating pattern detection for human heart organoid analysis
Author(s): **Aniwat Juhong**, **Yifan Liu**, **Bo Li**, **Cheng-You Yao**, **Brett Volmert**, **Yonatan Lewis-Israeli**, **Wen Li**, **Aitor Aguirre,** Michigan State Univ. (United States); **Wibool Piyawattanametha,** King Mongkut's Institute of Technology Ladkrabang (Thailand); **Zhen Qiu,** Michigan State Univ. (United States)

13382-33 • 3:25 PM - 3:40 PM
Investigations and optimization of positioning dynamics of a vectorial MEMS scanning mirror
Author(s): **Thilo Sandner**, **Thomas Graßhoff**, **Markus Schwarzenberg**, **Klemens Birnbaum, Tino Pügner,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

13382-34 • 3:40 PM - 3:55 PM
Compact hyperspectral photodermography module for skin quality assessment
Author(s): **Jaehyeok Park**, **Jaehun Jeon**, **JungWoo Park, Ki-Hun Jeong,** KAIST (Korea, Republic of)

13382-35 • 3:55 PM - 4:10 PM
Nonlinear vibration-enhanced fiber-optic MEMS scanner and shape memory polymer catheter for potential microscopy application
Author(s): **Wei-Chih Wang,** Univ. of Washington (United States); **Po-Chen Lin**, **Yu Chang**, **Aditya Sharma,** National Tsing Hua Univ. (Taiwan); **Chi-Leung Tsui,** Univ. of Washington (United States)

MOEMS AND MINIATURIZED SYSTEMS BEST PAPER AWARDS CEREMONY

28 January 2025 • 4:10 PM - 4:25 PM | Moscone West, Room 2022 (Level 2)
Session Chair(s): **Veljko Milanović**, Mirrorcle Technologies, Inc. (United States)
Sponsored by Mirrorcle Technologies, Inc. (United States)

Wednesday 29 January 2025

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13382-38 • 6:00 PM - 8:00 PM
MOEMS-enabled miniaturized SERS Raman detection system for imaging-guided surgery
Author(s): **Yifan Liu**, **Aniwat Juhong**, **Cheng-You Yao**, **Bo Li**, **Chia-Wei Yang**, **A. K. M. Atique Ullah**, **Kunli Liu**, **Xuefei Huang**, **Wen Li,** Michigan State Univ. (United States); **Wibool Piyawattanametha,** King Mongkut's Institute of Technology Ladkrabang (Thailand); **Zhen Qiu,** Michigan State Univ. (United States)

13382-39 • 6:00 PM - 8:00 PM
10 mm-diameter single-crystal-silicon MEMS micro mirror for optical applications
Author(s): **Jianing Zhao**, **Trent Huang**, **Jia Li**, **Tracy Liu**, **Mohamed Serry, Curtis Ray,** Omnitron Sensors Inc. (United States)

13382-40 • 6:00 PM - 8:00 PM
High-sensitivity colorimetric humidity sensor using nanostructured Fano resonator with ultra-wide color gamut
Author(s): **HeeJun Nam, Gil Ju Lee,** Pusan National Univ. (Korea, Republic of)

13382-41 • 6:00 PM - 8:00 PM
Design and development of a novel miniaturized 2D electro-optic scanner based on liquid crystal for potential micro display and head-mounted display applications
Author(s): **Wei-Chih Wang,** Univ. of Washington (United States); **Vinayak Ghorapade**, **Po-Chen Lin,** National Tsing Hua Univ. (Taiwan); **benjamin estroff,** Univ. of Washington (United States)

ON-DEMAND POSTERS

The posters listed below are available exclusively for online viewing during the week of SPIE Photonics West 2025.

13382-24
A miniature dual-mode optomechanical device for integrated scanning and focusing
Author(s): **Shahab Haidarian, Ulrike Wallrabe,** Univ. of Freiburg (Germany)

CONFERENCE CO-SPONSORS

CONFERENCE 13383

Emerging Digital Micromirror Device Based Systems and Applications XVII

28 - 29 January 2025 | Moscone South, Room 206 (Session 1 in Room 155)

Conference Chair(s): **Benjamin L. Lee, Alex Lyubarsky,** Texas Instruments Inc. (United States)

Program Committee: **Arturo A. Bianchetti,** IN-VISION Digital Imaging Optics GmbH (Austria); **Shih-Chi Chen,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Jeremy Gribben,** Ajile Light Industries Inc. (Canada); **Alfred Jacobsen,** Visitech Engineering GmbH (Germany); **Yuval Kapellner Rabinovitz,** EKB Technologies Ltd. (Israel); **Badia Koudsi,** Optecks, LLC (United States); **Daniel L. Lau,** Univ. of Kentucky (United States); **Beiwen Li,** The Univ. of Georgia (United States); **Jinyang Liang,** Institut National de la Recherche Scientifique (Canada); **Eric Pruett,** Texas Instruments Inc. (United States); **Hakki H. Refai,** Optecks, LLC (United States); **Oliver Seifert,** ViALUX GmbH (Germany); **Youmin Wang,** Meta (United States); **Song Zhang,** Purdue Univ. (United States); **Renjie Zhou,** The Chinese Univ. of Hong Kong (Hong Kong, China); **Karel J. Zuzak,** Kent Imaging (United States), The Lab. of Biomedical Imaging and Engineering, LBI-51, LLC (United States)

Tuesday 28 January 2025

SESSION 1: ADVANCED MANUFACTURING USING A DMD OR OTHER SLM: JOINT SESSION WITH 13381 AND 13383

28 January 2025 • 1:30 PM - 5:00 PM | Moscone South, Room 155 (Upper Mezz)
Session Chair(s): **Benjamin L. Lee**, Texas Instruments Inc. (United States)

13381-29 • 1:30 PM - 2:00 PM
Recent developments in computation, materials formulation, and hardware design for computed axial lithography *(Invited Paper)*
Author(s): **Hayden K. Taylor**, **Nour Akiki**, **Jennings Ye**, **Abrar A. Khan, Jacob Gottesman,** Univ. of California, Berkeley (United States)

13381-30 • 2:00 PM - 2:20 PM
Building with volumetric additive manufacturing
Author(s): **Antony Orth**, **Daniel Webber**, **Nicolas Milliken**, **Yujie Zhang**, **Hao Li**, **Katherine Houlahan**, **Thomas Lacelle**, **Derek Aranguren van Egmond, Chantal Paquet,** National Research Council Canada (Canada)

13381-32 • 2:20 PM - 2:40 PM
An inverse rendering framework for tomographic volumetric additive manufacturing
Author(s): **Baptiste Nicolet**, **Felix Wechsler**, **Jorge A. Madrid-Wolff**, **Christophe Moser, Wenzel Jakob,** EPFL (Switzerland)

13381-31 • 2:40 PM - 3:00 PM
Novel printing geometries for tomographic volumetric additive manufacturing
Author(s): **Felix Wechsler**, **Baptiste Nicolet**, **Jorge A. Madrid Wolff**, **Wenzel Jakob, Christophe Moser,** EPFL (Switzerland)

Coffee Break • 3:00 PM - 3:30 PM

13383-1 • 3:30 PM - 3:50 PM
3D printed GRIN lens using digital light projection additive manufacturing
Author(s): **Jamison D. Engelhardt**, **Robert V. Chimenti, Joseph F. Stanzione,** Rowan Univ. (United States)

13383-2 • 3:50 PM - 4:10 PM
High-resolution additive manufacturing for 3D multifunctional microelectronic devices
Author(s): **Jeroen Sol,** Holst Ctr. (Netherlands); **Marwan Aarab,** Eindhoven University of Technology (Netherlands); **Wilko van Grondelle**, **Darragh R. Walsh**, **Sophie C. E. Suijdendorp,** Holst Ctr. (Netherlands); **Joris J.C. Remmers,** Eindhoven University of Technology (Netherlands); **Hylke B. Akkerman,** Holst Ctr. (Netherlands)

13383-3 • 4:10 PM - 4:30 PM
Implementation of a micro electromechanical system (MEMS) phase-only light modulator (PLM) for holographic volumetric additive manufacturing
Author(s): **Maria Isabel Alvarez Castaño**, **Ye Pu**, **Felix Wechsler**, **Jorge Madrid-Wolff, Christophe Moser,** EPFL (Switzerland)

13381-6 • 4:30 PM - 5:00 PM
Understanding the nanophotonic chirality transfer with single molecule studies *(Invited Paper)*
Author(s): **Yang Zhao,** Univ. of Illinois (United States)

Wednesday 29 January 2025

SESSION 2: PHASE LIGHT MODULATOR

29 January 2025 • 9:00 AM - 10:20 AM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Benjamin L. Lee**, Texas Instruments Inc. (United States)

13383-4 • 9:00 AM - 9:20 AM
High-volume production test methodology and parametrics of the Texas Instruments Phase Light Modulator (PLM)
Author(s): **Griffin Orr**, **Taylor Byrum**, **Marshall Worrall**, **Zachary Walker**, **William McDonald**, **Kristofer Oberascher**, **Dennis Doane**, **Nathan Gilly**, **Sean O'Brien**, **Patrick Oden, James Hall,** Texas Instruments Inc. (United States)

13383-5 • 9:20 AM - 9:40 AM
Adaptive optics using Texas Instruments Phase Light Modulator
Author(s): **Jeffrey Chen**, **John Bass**, **Gregory M. Nero,** The Univ. of Arizona (United States); **Thomas Koch,** Wyant College of Optical Sciences (United States); **Ivan Djordjevic**, **Florian Willomitzer, Yuzuru Takashima,** The Univ. of Arizona (United States)

13383-6 • 9:40 AM - 10:00 AM
Simulating the beam steering accuracy and efficiency of a pixelated micromirror phase light modulator
Author(s): **Gregory Nero**, **Muralidhar Madabhushi Balaji**, **John Bass**, **Jeff Chen**, **Xianyue Deng**, **Thomas Koch**, **Yushi Kaneda**, **Florian Willomitzer, Yuzuru Takashima,** Wyant College of Optical Sciences (United States)

13383-7 • 10:00 AM - 10:20 AM
High-dimensional adaptive optics using MEMS-based phase light modulation
Author(s): **Jose Carlos D. do Amaral Rocha,** Univ. of Exeter (United Kingdom), The Univ. of Queensland (Australia); **Terry Wright,** The Univ. of Nottingham (United Kingdom); **Unė G. Būtaitė,** Univ. of Exeter (United Kingdom); **Joel Carpenter,** The Univ. of Queensland (Australia); **George S. D. Gordon,** The Univ. of Nottingham (United Kingdom); **David B. Phillips,** Univ. of Exeter (United Kingdom)

Coffee Break 10:20 AM - 10:50 AM

SESSION 3: BEAM SHAPING

29 January 2025 • 10:50 AM - 12:00 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Alex Lyubarsky**, Texas Instruments Inc. (United States)

13383-8 • 10:50 AM - 11:20 AM
Accelerating complex wavefront shaping with line-scanning holography using digital micromirror devices *(Invited Paper)*
Author(s): **Moosoek Jang,** KAIST (Korea, Republic of); **Atsushi Shibukawa,** Hokkaido Univ. (Japan)

13383-9 • 11:20 AM - 11:40 AM
Optimizing DMD-based vector beam generation for increased utility
Author(s): **Bertus S. Jordaan**, **Cathy Maako,** Button Optics (South Africa), Univ. of the Witwatersrand, Johannesburg (South Africa); **Nicholas Webster**, **Angela Dudley, Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa), Button Optics (South Africa)

13383-10 • 11:40 AM - 12:00 PM
Dispersion compensation for digital micromirror device with a low energy loss
Author(s): **Yuan Qu,** Shanghai Jiao Tong Univ. (China)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 4: COMPUTATIONAL IMAGING AND SPECTROSCOPY

29 January 2025 • 1:30 PM - 2:30 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Benjamin L. Lee**, Texas Instruments Inc. (United States)

13383-11 • 1:30 PM - 1:50 PM
Advanced non-quantum ghost imaging for detecting and quantifying surface fluorescence in light-polluted environments
Author(s): **Sophie Gruner**, **Alexander Kabardiadi-Virkovski**, **Elena Kabardiadi-Virkovski**, **Leander Kläber, Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13383-12 • 1:50 PM - 2:10 PM
Performance analysis of a Hadamard transform spectral imaging system
Author(s): **John Nijim**, **Zoran Ninkov,** Rochester Institute of Technology (United States); **Kevin J. Kearney,** Rochester Institute of Technology (United States), Optimax Systems, Inc. (United States)

13383-14 • 2:10 PM - 2:30 PM
Novel calibration method with arbitrary patterns for digital fringe projection system
Author(s): **Seung Jae Son,** Yonsei Univ. (Korea, Republic of); **Yatong An**, **Alexander Fix,** Meta (United States); **Jae-Sang Hyun,** Yonsei Univ. (Korea, Republic of)

Coffee Break 2:30 PM - 3:00 PM

SESSION 5: BIOMEDICAL IMAGING AND OTHER ADVANCED APPLICATIONS

29 January 2025 • 3:00 PM - 4:10 PM | Moscone South, Room 206 (Level 2)
Session Chair(s): **Alex Lyubarsky**, Texas Instruments Inc. (United States)

13383-15 • 3:00 PM - 3:30 PM
Free-space coupling to ultra-high-Q microtoroid resonators *(Invited Paper)*
Author(s): **Sartanee Suebka**, **Euan McLeod,** The Univ. of Arizona (United States); **Tsu-Te Judith Su,** Wyant College of Optical Sciences, The Univ. of Arizona (United States)

13383-17 • 3:30 PM - 3:50 PM
Sustainable, next generation data storage solution leveraging DMD for laser ablation
Author(s): **Markus Maurerlehner**, **Lukas Kreuziger,** Cerabyte GmbH (Austria); **Steven Campbell,**

13383-19 • 3:50 PM - 4:10 PM
Reflection-mode optical diffraction tomography at 1.3 µm for deep tissue imaging
Author(s): **Chaodu Shi**, **Hongfei Zhu**, **Nansen Zhou**, **Jiayu Cheng, Renjie Zhou,** The Chinese Univ. of Hong Kong (Hong Kong, China)

CONFERENCE 13384

Vertical-Cavity Surface-Emitting Lasers XXIX

29 - 30 January 2025 | Moscone South, Room 102 (Level 1 Lobby)

Conference Chair(s): **Kent D. Choquette,** Univ. of Illinois (United States); **Luke A. Graham,** Dallas Quantum Devices, Inc. (United States)

Program Committee: **Hamed Dalir,** Univ. of Florida (United States); **Aaron J. Danner,** National Univ. of Singapore (Singapore); **Deepa Gazula,** Coherent Corp. (United States); **Martin Grabherr,** Priolas GmbH (Germany); **James Guenter,** Dallas Quantum Devices, Inc. (United States); **Chun Lei,** Lumentum (United States); **James A. Lott,** Technische Univ. Berlin (Germany); **M. V. Ramana Murty,** Broadcom Inc. (United States); **Darwin K. Serkland,** Sandia National Labs. (United States); **Noriyuki Yokouchi,** Furukawa Electric Co., Ltd. (Japan)

Wednesday 29 January 2025

SESSION 1: VCSELS IN DATA COMMUNICATIONS

29 January 2025 • 8:10 AM - 9:40 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Luke A. Graham**, Dallas Quantum Devices, Inc. (United States)

13384-1 • 8:10 AM - 8:35 AM
Single mesa multiaperture VCSELs for high data rate transmission over multimode fiber *(Invited Paper)*
Author(s): **Nikolay N. Ledentsov**, **Vitaly A. Shchukin**, **Nikolay Ledentsov**, **Vladimir Kalosha**, **Oleg Y. Makarov**, **Ilya Titkov**, **Alexander Ledentsov**, **Łukasz Chorchos,** VI Systems GmbH (Germany); **Jaroslaw Turkiewicz,** Warsaw Univ. of Technology (Poland); **Xin Chen**, **Jason E Hurley, Ming-Jun Li,** Corning Incorporated (United States)

13384-2 • 8:35 AM - 9:00 AM
200Gb/s PAM4 oxide VCSEL development progress at Broadcom *(Invited Paper)*
Author(s): **Jingyi Wang**, **M. V. Ramana Murty**, **Sizhu Jiang**, **David W. Dolfi**, **T. K. K. Wang,** Broadcom Inc. (United States); **Zheng-Wen Feng**, **Sumtro-Joyo Taslim**, **Aadi Sridhara**, **Xinle Cai**, **Yu Rong Nelvin Leong**, **Gim-Hong Koh**, **Jason Chu,** Broadcom Inc. (Singapore); **Laura M. Giovane,** Broadcom Inc. (United States)

13384-3 • 9:00 AM - 9:20 AM
53.125 Gbps PAM-4 transmission up to 75°C using 940-nm VCSELs on 330 µm Ge substrates for datacom applications
Author(s): **Yun-Cheng Yang,** National Taiwan Univ. (Taiwan); **Zeyu Wan,** The Univ. of British Columbia (Canada); **Chih-Chuan Chiu**, **I-Chi Liu,** National Taiwan Univ. (Taiwan); **Guangrui Xia,** The Univ. of British Columbia (Canada); **Chao-Hsin Wu,** National Taiwan Univ. (Taiwan)

13384-4 • 9:20 AM - 9:40 AM
850 nm VCSEL array for decoy state quantum key distribution
Author(s): **Michael Zimmer**, **Katharina Dahler**, **Michael Jetter, Peter Michler,** Univ. Stuttgart (Germany)

Coffee Break 9:40 AM - 10:30 AM

SESSION 2: VCSEL RELIABILITY

29 January 2025 • 10:30 AM - 12:15 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **James Guenter**, Dallas Quantum Devices, Inc. (United States)

13384-6 • 10:30 AM - 10:55 AM
High performance and reliability of 940nm multijunction VCSEL arrays for 3D sensing and LiDAR applications *(Invited Paper)*
Author(s): **Bing Cheng Lin**, **Ming Chen**, **Szi Yan Chuah,** HLJ Technology Co., Ltd. (Taiwan); **Wan Chun Huang,** HLJ Technology Co. (Taiwan)

13384-7 • 10:55 AM - 11:15 AM
Picometer-scale wavelength drift analysis of 760 nm single-frequency VCSELs
Author(s): **Martin Grabherr, Lin R. Borowski,** Priolas GmbH (Germany)

13384-8 • 11:15 AM - 11:35 AM
Impact of stress current on reverse-bias electroluminescence images of 850 nm oxide-confined VCSELs
Author(s): **Arndt Jaeger,** Hochschule Esslingen (Germany); **Nikolay Ledentsov,** VI Systems GmbH (Germany); **Sebastian Haberkern**, **Helmut Meinert**, **Alexander Moll,** Hochschule Esslingen (Germany); **Ilya Titkov**, **Oleg Y. Makarov, Nikolay N. Ledentsov,** VI Systems GmbH (Germany)

13384-9 • 11:35 AM - 11:55 AM
Addressing the oxide-aperture dependency of the degradation of 845 nm VCSELs for silicon photonics
Author(s): **Matteo Buffolo**, **Michele Zenari**, **Carlo De Santi,** Univ. degli Studi di Padova (Italy); **Francesca Rossi**, **Laura Lazzarini,** Consiglio Nazionale delle Ricerche (Italy); **Günther Roelkens,** Univ. Gent (Belgium); **Anders Larsson**, **Alexander Grabowski**, **Johan Gustavsson,** Chalmers Univ. of Technology (Sweden); **Gaudenzio Meneghesso**, **Enrico Zanoni, Matteo Meneghini,** Univ. degli Studi di Padova (Italy)

13384-10 • 11:55 AM - 12:15 PM
Reliability and non-destructive failure investigation of 850-nm multi-mode and 795-nm single-mode VCSELs for space applications
Author(s): **Yongkun Sin**, **Jesse Theiss**, **Michael Huang**, **Emily Tang**, **Adam Bushmaker,** The Aerospace Corp. (United States); **Jian Li**, **Robert Bedford, Adam T. Neal,** Air Force Research Lab. (United States)

Lunch/Exhibition Break 12:15 PM - 2:05 PM

SESSION 3: ADVANCED VCSEL EPITAXY

29 January 2025 • 2:05 PM - 3:10 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Kent D. Choquette**, Univ. of Illinois (United States)

13384-11 • 2:05 PM - 2:30 PM
Mass production of 6" multi-junction VCSEL epitaxial wafers by MOVPE for high performance sensing applications *(Invited Paper)*
Author(s): **Ben Stevens**, **Timothy Lewis Roberts**, **Matthew Geen**, **Rodney Pelzel**, **Mark J. Furlong,** IQE (United Kingdom); **Andrew Clark,** IQE plc (United Kingdom)

13384-13 • 2:30 PM - 2:50 PM
Effect of substrate type on 200-mm diameter VCSEL performance for volume manufacturing
Author(s): **Sara-Jayne Gillgrass**, **Craig P. Allford**, **Jack Baker,** Cardiff Univ. (United Kingdom); **J. Iwan Davies,** IQE plc (United Kingdom); **Sam Shutts, Peter M. Smowton,** Cardiff Univ. (United Kingdom)

13384-14 • 2:50 PM - 3:10 PM
1390nm dilute nitride VCSELs on 150mm GaAs
Author(s): **Ijeoma Franco Obuseli**, **Craig P. Allford**, **Sara-Jayne Gillgrass,** Cardiff Univ. (United Kingdom); **Andrew Clark,** IQE (United Kingdom); **Kalyan Nunna,** IQE (United States); **J. Iwan Davies,** IQE plc (United Kingdom); **Peter M. Smowton,** Cardiff Univ. (United Kingdom)

Coffee Break 3:10 PM - 3:40 PM

SESSION 4: NOVEL DEVICE STRUCTURES

29 January 2025 • 3:40 PM - 5:30 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Chun Lei**, Lumentum (United States)

13384-15 • 3:40 PM - 4:05 PM
Compact VCSEL chips for diverse applications (795 nm to 850 nm) *(Invited Paper)*
Author(s): **Roman Alexander Koerner**, **Stephan Gronenborn**, **Markus Herper**, **Alexander Van Der Lee**, **Julian Lindner**, **Cynthia Klett**, **Holger Moench**, **Tobias Pusch**, **Jochen Reichel**, **Ulrich Weichmann, Susanne Weidenfeld,** TRUMPF Photonic Components GmbH (Germany)

13384-16 • 4:05 PM - 4:30 PM
Coherent ring VCSELs for high power, narrow linewidth applications *(Invited Paper)*
Author(s): **Luke A. Graham**, **James Guenter**, **Pritha Khurana**, **Jim A. Tatum,** Dallas Quantum Devices, Inc. (United States); **Arjun Khurana,** Georgia Institute of Technology (United States); **Freddie Castillo,** Dallas Quantum Devices, Inc. (United States)

13384-17 • 4:30 PM - 4:50 PM
InP SWIR VCSELs enabled by nanoporous DBRs
Author(s): **Jin-Ho Kang,** Yale Univ. (United States), Inphred Inc. (United States); **Chenziyi Mi**, **Bingjun Li,** Yale Univ. (United States); **Supratik Dasgupta,** Bühler Inc. (United States); **Jung Han,** Yale Univ. (United States)

13384-18 • 4:50 PM - 5:10 PM
1130 nm wavelength vertical-cavity surface-emitting laser with single mode characteristics
Author(s): **Jheng-Jie Liu**, **C. Y. Lu**, **Po Chou Pan**, **C. H. Chou**, **Y. C. Lee**, **L. H. Laih**, **L. W. Laih, Ying-Lun Ho,** HLJ Technology Co., Ltd. (Taiwan)

13384-19 • 5:10 PM - 5:30 PM
Physics-based computer-aided modelling of transverse coupled cavity VCSELs
Author(s): **Martino D'Alessandro,** Politecnico di Torino (Italy); **Nikolay Ledentsov**, **Vitaly A. Shchukin**, **Nikolai N. Ledentsov,** VI Systems GmbH (Germany); **Markus Lindemann,** Ruhr-Univ. Bochum (Germany); **Alberto Tibaldi,** Politecnico di Torino (Italy)

Thursday 30 January 2025

SESSION 5: COMMERCIAL HIGH POWER DEVICES AND APPLICATIONS

30 January 2025 • 9:00 AM - 10:55 AM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Deepa Gazula**, Coherent Corp. (United States)

13384-20 • 9:00 AM - 9:25 AM
High efficiency GaAs-based 1130-nm polarized VCSELs for 3D sensing *(Invited Paper)*
Author(s): **Qianhuan Yu**, **Benjamin Kesler**, **Jun Yang**, **Guowei Zhao**, **Richa Dubey**, **Matthew G. Peters**, **Shib Dastider**, **Mahdad Mansouree**, **Claire Lin, Marina Huang,** Lumentum (United States)

13384-21 • 9:25 AM - 9:50 AM
High performance multijunction VCSELs *(Invited Paper)*
Author(s): **Pei Miao,** Suzhou Everbright Photonics Co., Ltd. (China), Sichuan Univ. (China); **Yao Xiao,** Sichuan Univ. (China); **Heng Liu,** Suzhou Everbright Photonics Co., Ltd. (China); **Zhicheng Zhang**, **Yudan Gou,** Sichuan Univ. (China); **Jun Wang,** Suzhou Everbright Photonics Co., Ltd. (China), Sichuan Univ. (China)

13384-22 • 9:50 AM - 10:15 AM
High-power compact VCSEL subsystem as game changer for photoacoustic medical imaging and sensing *(Invited Paper)*
Author(s): **Josef Konradl,** iThera Medical GmbH (Germany); **Stephan Gronenborn**, **Alexander Weigl**, **Cynthia Klett,** TRUMPF Photonic Components GmbH (Germany); **Dominik Dörich**, **Uwe Malzahn,** iC-Haus GmbH (Germany); **Antonia Longo**, **Guillaume Zahnd, Patrick Leisching,** iThera Medical GmbH (Germany)

13384-23 • 10:15 AM - 10:35 AM
Design and simulation of AlGaAs curved mirror vertical cavity surface emitting laser
Author(s): **Ahmed I. Nashed**, **Michel Lestrade**, **Z Q Leo Li, Zhanming Simon Li,** Crosslight Software Inc. (Canada)

13384-24 • 10:35 AM - 10:55 AM
Critical aspects of VCSELs fabrication
Author(s): **Karolina Olucha**, **Marek Ekielski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Marcin Gębski,** Lodz Univ. of Technology (Poland), Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Magdalena Zadura,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Karolina Bogdanowicz,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Lodz Univ. of Technology (Poland); **Wioleta Słaba,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland); **Oskar Sadowski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Warsaw Univ. of Technology (Poland); **Tomasz Czyszanowski,** Lodz Univ. of Technology (Poland); **Anna Szerling,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

Coffee Break 10:55 AM - 11:25 AM

SESSION 6: POLARIZATION CONTROL IN VCSELS

30 January 2025 • 11:25 AM - 12:45 PM | Moscone South, Room 102 (Level 1 Lobby)
Session Chair(s): **Hamed Dalir**, Univ. of Florida (United States)

13384-26 • 11:25 AM - 11:45 AM
Polarization-locked 1130nm VCSELs
Author(s): **Po Chou Pan**, **C. Y. Lu**, **Jheng-Jie Liu**, **W. W. Jheng**, **Y. C. Lee**, **L. H. Laih, L. W. Laih,** HLJ Technology Co., Ltd. (Taiwan)

13384-27 • 11:45 AM - 12:05 PM
Mastering VCSEL polarization from linear to circular using subwavelength gratings
Author(s): **Valerio Torrelli**, **Martino D'Alessandro**, **Lorenzo Miri,** Politecnico di Torino (Italy); **Alberto Gullino,** Consiglio Nazionale delle Ricerche (Italy); **Wolfgang Elsässer,** Technische Univ. Darmstadt (Germany); **Alberto Tibaldi,** Politecnico di Torino (Italy); **Pierluigi Debernardi,** Consiglio Nazionale delle Ricerche (Italy)

13384-28 • 12:05 PM - 12:25 PM

Assessing noise performance in multimode VCSELs with elliptical oxide apertures through spatially resolved near-field measurements

Author(s): **Cristina Rimoldi**, **Marco Novarese**, **Lorenzo L. Columbo,** Politecnico di Torino (Italy); **Sebastian Romero García**, **Christian Raabe,** Cisco Optical GmbH (Germany); **Mariangela Gioannini,** Politecnico di Torino (Italy)

13384-29 • 12:25 PM - 12:45 PM

Demonstration of 3-in full-wafer monolithic fabrication and wafer-level testing of MEMS-tunable single-mode ~1060nm VCSELs

Author(s): **Wan Ying Ho**, **Calisto Ruiz**, **Colin Iversen**, **Alexander Yang**, **Vijaysekhar Jayaraman, Christopher Burgner,** Praevium Research, Inc. (United States)

CONFERENCE 13385

Novel In-Plane Semiconductor Lasers XXIV

27 - 30 January 2025 | Moscone South, Room 103 (Level 1 Lobby)

Conference Chair(s): **Alexey A. Belyanin,** Texas A&M Univ. (United States); **Peter M. Smowton,** Cardiff Univ. (United Kingdom)

Program Committee: **Yasuhiko Arakawa,** Institute of Industrial Science, The Univ. of Tokyo (Japan); **Mikhail A. Belkin,** Walter Schottky Institut (Germany); **Dan Botez,** Univ. of Wisconsin-Madison (United States); **Federico Capasso,** Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Gary A. Evans,** Southern Methodist Univ. (United States); **Mariangela Gioannini,** Politecnico di Torino (Italy); **Michael Kneissl,** Technische Univ. Berlin (Germany); **Kei-May Lau,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Shinji Matsuo,** NTT Device Technology Labs. (Japan); **Luke J. Mawst,** Univ. of Wisconsin-Madison (United States); **Jerry R. Meyer,** U.S. Naval Research Lab. (United States); **Roberto Paiella,** Boston Univ. (United States); **Katrin Paschke,** Ferdinand-Braun-Institut (Germany); **Richard V. Penty,** Univ. of Cambridge (United Kingdom); **Johann Peter Reithmaier,** Univ. Kassel (Germany); **Haisheng Rong,** Intel Corp. (United States); **Gary M. Smith,** MIT Lincoln Lab. (United States); **Nelson Tansu,** The Univ. of Adelaide (Australia); **Miriam S. Vitiello,** Istituto Nanoscienze (Italy); **Qijie Wang,** Nanyang Technological Univ. (Singapore)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: NITRIDES

27 January 2025 • 10:45 AM - 12:05 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Marcel Schilling**, Technische Univ. Berlin (Germany)

13385-1 • 10:45 AM - 11:15 AM
High-efficiency UV-A lasers using GaN waveguides on native GaN substrates *(Invited Paper)*
Author(s): **Shubhra S. Pasayat**, **Qinchen Lin**, **Cheng Liu**, **Guangying Wang**, **Surjava Sanyal,** Univ. of Wisconsin-Madison (United States); **Matthew Dwyer,** DRS Daylight Solutions (United States); **Matthew Seitz,** Rochester Institute of Technology (United States); **Tom Earles,** DRS Daylight Solutions (United States); **Nelson Tansu,** University of Adelaide (Australia); **Jing Zhang,** Rochester Institute of Technology (United States); **Luke Mawst, Chirag Gupta,** Univ. of Wisconsin-Madison (United States)

13385-2 • 11:15 AM - 11:35 AM
Fabrication and linewidth characterization of III-nitride distributed feedback laser diodes with embedded surface gratings

Author(s): **Emily S. Trageser**, **Jiaao Zhang,** Univ. of California, Santa Barbara (United States); **Ryan Anderson,** BluGlass, Ltd. (Australia); **Daniel Cohen**, **Haojun Zhang**, **Theodore Morin**, **Shuji Nakamura**, **John Bowers, Steven DenBaars,** Univ. of California, Santa Barbara (United States)

13385-3 • 11:35 AM - 12:05 PM
Critical discussion of loss mechanisms in UV-C PCSEL *(Invited Paper)*
Author(s): **Ulrich T. Schwarz,** Technische Univ. Chemnitz (Germany); **Doğukan Apaydın**, **Lars Persson,** Chalmers Univ. of Technology (Sweden); **Lukas Uhlig,** Technische Univ. Chemnitz (Germany); **Åsa Haglund,** Chalmers Univ. of Technology (Sweden)

Lunch Break 12:05 PM - 1:35 PM

SESSION 2: MODE-LOCKING AND FREQUENCY COMBS

27 January 2025 • 1:35 PM - 3:25 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Johann Peter M. Reithmaier**, Univ. Kassel (Germany)

13385-4 • 1:35 PM - 2:05 PM
Flexible mode locking in photonic band-gap semiconductor laser *(Invited Paper)*
Author(s): **Emmanuel Bourgon,** III-V Lab. (France); **Sylvain Combrié,** Thales Research and Technologies (France); **Nicolas Vaissiere**, **Delphine Néel,** III-V Lab. (France); **Stephane Malhouitre,** CEA-Leti (France); **Alexandre Shen,** III-V Lab. (France); **Alfredo de Rossi,** Thales Research and Technologies (France)

13385-5 • 2:05 PM - 2:25 PM
Addressing experimental self-generation of frequency combs in III-V/SiN hybrid integrated tunable lasers
Author(s): **Stefania Cucco,** Politecnico di Torino (Italy); **Anzal Memon,** Univ. Twente (Netherlands); **Cristina Rimoldi**, **Marco Novarese**, **Lorenzo L. Columbo,** Politecnico di Torino (Italy); **Klaus-Jochen Boller,** Univ. Twente (Netherlands); **Mariangela Gioannini,** Politecnico di Torino (Italy)

13385-6 • 2:25 PM - 2:45 PM
Experimental validation of two-section ridge and tapered lasers for the design of a monolithically mode-locked 200pJ source at 900 nm for two-photon excitation fluorescence lifetime imaging microscopy
Author(s): **Michel Krakowski**, **Sylvain Boust**, **Maxime Meghnagi**, **Guillaume Daccord,** III-V Lab. (France); **Severin Oeschger,** CSEM SA (Switzerland); **François Duport**, **Eva Izquierdo**, **Jean-Pierre Legoec**, **Thomas Cossuet**, **Michel Garcia**, **Olivier Parillaud,** III-V Lab. (France); **Dmitri Boiko,** CSEM SA (Switzerland)

13385-7 • 2:45 PM - 3:05 PM
Changing longitudinal mode spacing of quantum dot mode-locked laser diode depending on saturable absorber position
Author(s): **Satoshi Yanase,** Aoyama Gakuin Univ. (Japan), National Institute of Information and Communications Technology (Japan); **Kouichi Akahane**, **Atsushi Matsumoto**, **Toshimasa Umezawa**, **Naokatsu Yamamoto,** National Institute of Information and Communications Technology (Japan); **Tomohiro Maeda,** Aoyama Gakuin Univ. (Japan), National Institute of Information and Communications Technology (Japan); **Hideyuki Sotobayashi,** Aoyama Gakuin Univ. (Japan)

13385-8 • 3:05 PM - 3:25 PM
On-chip InAs-QD mode-locked laser for integrated photonics
Author(s): **Fwoziah T. Albeladi,** Cardiff Univ. (United Kingdom), Univ. of Jeddah (Saudi Arabia); **Craig P. Allford**, **Sara-Jayne Gillgrass**, **Susanna Power**, **Noor Albittar**, **Samuel Shutts, Peter M. Smowton,** Cardiff Univ. (United Kingdom)

Coffee Break 3:25 PM - 3:55 PM

SESSION 3: NANOWIRES

27 January 2025 • 3:55 PM - 5:25 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Kei-May Lau**, Hong Kong Univ. of Science and Technology (Hong Kong, China)

13385-9 • 3:55 PM - 4:25 PM
GaAsSb nanowire lasers emitting at silicon transparent wavelengths *(Invited Paper)*
Author(s): **Paul Schmiedeke**, **Cem Doganlar**, **Hyowon W. Jeong,** Walter Schottky Institut (Germany); **Markus Döblinger,** Ludwig-Maximilians-Univ. München (Germany); **Jonathan J. Finley, Gregor Koblmüller,** Walter Schottky Institut (Germany)

13385-10 • 4:25 PM - 4:45 PM
Room temperature lasing from InGaAs quantum well nanowires on silicon-on-insulator substrates
Author(s): **Balthazar Temu**, **Zhao Yan**, **Bogdan Petrin Ratiu**, **Sang Soon Oh, Qiang Li,** Cardiff Univ. (United Kingdom)

13385-11 • 4:45 PM - 5:05 PM
Switchable directionality in the emission of a coupled nanolaser array
Author(s): **Guilhem Madiot,** Institut de Physique de Nice, Univ. Côte d'Azur, CNRS (France); **Patricia Loren,** Univ. Côte d'Azur (France); **Quentin Chateiller**, **Alexandre Bazin**, **Isabelle Sagnes**, **Grégoire Beaudoin**, **Konstantinos Pantzas,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay (France); **Fabrice Raineri,** Univ. Côte d'Azur (France)

13385-12 • 5:05 PM - 5:25 PM
Integration of hex-SiGe into a nanowire-induced photonic crystal cavity
Author(s): **Jona Zöllner**, **Steffen Meder,** Technische Univ. München (Germany); **Wouter Peeters**, **Erik P. A. M. Bakkers,** Technische Univ. Eindhoven (Netherlands); **Gregor Koblmüller, Jonathan J. Finley,** Technische Univ. München (Germany)

Tuesday 28 January 2025

SESSION 4: LASERS ON SILICON

28 January 2025 • 8:20 AM - 10:10 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Haisheng Rong**, Intel Corp. (United States)

13385-13 • 8:20 AM - 8:50 AM
Lateral epitaxy of III-V membranes for integrated lasers on silicon-on-insulator *(Invited Paper)*
Author(s): **Qiang Li,** Cardiff Univ. (United Kingdom)

13385-14 • 8:50 AM - 9:20 AM
Direct growth of O-band quantum dot lasers on silicon *(Invited Paper)*
Author(s): **Alec Skipper**, **Kaiyin Feng**, **Rosalyn Koscica**, **Chen Shang, John Bowers,** Univ. of California, Santa Barbara (United States)

13385-15 • 9:20 AM - 9:50 AM
Membrane lasers on silicon integrated with polymer waveguides *(Invited Paper)*
Author(s): **Yoshiho Maeda**, **Takuma Aihara**, **Tatsurou Hiraki**, **Takuro Fujii**, **Koji Takeda**, **Hiroki Sugiyama**, **Tomonari Sato,** Nippon Telegraph and Telephone Corp. (Japan); **Yasutomo Ota,** Keio Univ. (Japan); **Satoshi Iwamoto**, **Yasuhiko Arakawa,** The Univ. of Tokyo (Japan); **Shinji Matsuo,** Nippon Telegraph and Telephone Corp. (Japan)

13385-16 • 9:50 AM - 10:10 AM
Quantum dot lasers at 300 mm for silicon photonics and datacenter optical interconnect applications
Author(s): **Andrew Clark**, **Katie Sautter,** IQE, Inc. (United States); **Nasser Babazadeh**, **Mark Furlong, Rodney Pelzel,** IQE plc (United Kingdom)

Coffee Break 10:10 AM - 10:40 AM

SESSION 5: SCALING LASER WAFER SIZE

28 January 2025 • 10:40 AM - 12:30 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Shinji Matsuo**, NTT Device Technology Labs. (Japan)

13385-17 • 10:40 AM - 11:10 AM
Heterogeneously integrated quantum dot lasers for 300mm silicon photonics *(Invited Paper)*
Author(s): **Duanni Huang,** Intel Corp. (United States)

13385-18 • 11:10 AM - 11:30 AM
Evaluation of 1300nm emitting InAs quantum dot performance grown on 150-mm substrates
Author(s): **Craig P. Allford**, **Sara-Jayne Gillgrass**, **Andrew Smith,** Cardiff Univ. (United Kingdom); **Andrew Clark,** IQE plc (United States); **J. Iwan Davies,** IQE plc (United Kingdom); **Peter M. Smowton,** Cardiff Univ. (United Kingdom)

13385-19 • 11:30 AM - 12:00 PM
Electrically injected InGaAs/GaAs nano-ridge laser fully processed in a 300 mm CMOS pilot line *(Invited Paper)*
Author(s): **Didit Yudistira**, **Joris Van Campenhout, Bernardette Kunert,** imec (Belgium)

13385-20 • 12:00 PM - 12:30 PM
Heterogeneously integrated tunable III-V/Si lasers *(Invited Paper)*
Author(s): **Ranjeet Kumar**, **Guan-Lin Su**, **Duanni Huang**, **Hari Mahalingam**, **Mahtab Hakami**, **Chenyang Wu**, **Adam Bowles**, **David Gold**, **Richard Jones, Haisheng Rong,** Intel Corp. (United States)

Lunch/Exhibition Break 12:30 PM - 1:50 PM

SESSION 6: QCL FREQUENCY COMBS

28 January 2025 • 1:50 PM - 3:30 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Alexey Belyanin**, Texas A&M Univ. (United States); **Kevin Oresick**, Alpes Lasers SA (Switzerland)

13385-21 • 1:50 PM - 2:20 PM
Quantum walk combs: from the terahertz to the near-infrared *(Invited Paper)*
Author(s): **Jérôme Faist,** ETH Zurich (Switzerland)

13385-22 • 2:20 PM - 2:50 PM
Integrated soliton photonics in the mid-infrared *(Invited Paper)*
Author(s): **Theodore P. Letsou,** Harvard Univ. (United States), Massachusetts Institute of Technology (United States); **Dmitry Kazakov,** Harvard Univ. (United States); **Marco Piccardo,** Harvard Univ. (United States), Univ. de Lisboa (Portugal), INESC MN (Portugal); **Pawan Ratra,** Harvard Univ. (United States), Imperial College London (United Kingdom); **Lorenzo L. Columbo,** Politecnico di Torino (Italy); **Massimo Brambilla,** Politecnico di Bari (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Franco Prati,** Univ. degli Studi dell'Insubria (Italy); **Cristina Rimoldi,** Politecnico di Torino (Italy); **Sandro Dal Cin**, **Maximilian Beiser**, **Johannes Fuchsberger**, **Nikola Opačak,** Technische Univ. Wien (Austria); **Michael Pushkarsky**, **David Caffey**, **Timothy Day,** DRS Daylight Solutions (United States); **Henry O. Everitt,** DEVCOM Army Research Lab. (United States), Duke Univ. (United States); **Benedikt Schwarz,** Technische Univ. Wien (Austria), Harvard Univ. (United States); **Federico Capasso,** Harvard Univ. (United States)

13385-24 • 2:50 PM - 3:10 PM
Effective Rabi frequency in quantum cascade lasers and its role in the origin of harmonic frequency combs
Author(s): **Carlo Silvestri,** The Univ. of Queensland (Australia), The Univ. of Sydney (Australia); **Massimo Brambilla,** Politecnico di Bari (Italy); **Franco Prati,** Univ. degli Studi dell'Insubria (Italy); **Mariangela Gioannini, Lorenzo L. Columbo,** Politecnico di Torino (Italy)

13385-23 • 3:10 PM - 3:30 PM
Spectral control by engineering of a synthetic dimension in a fast gain laser
Author(s): **Diego Piciocchi**, **Alexander Dikopoltsev**, **Ina Heckelmann**, **Mathieu Bertrand**, **Mattias Beck, Jérôme Faist,** ETH Zurich (Switzerland)

Coffee Break 3:30 PM - 4:00 PM

SESSION 7: MID-IR LASERS

28 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Christian J. Pfluegl**, Pendar Technologies (United States)

13385-25 • 4:00 PM - 4:30 PM
Mid-IR GaSb -based lasers grown on Si platforms *(Invited Paper)*
Author(s): **Eric Tournié,** Univ. de Montpellier (France), Institut Univ. de France (France); **Michele Paparella**, **Andres Remis**, **Daniel A. Diaz-Thomas**, **Maeva Fagot**, **Audrey Gilbert,** Univ. de Montpellier (France); **Milan Silvestre,** Univ. de Montpellier (France), RIBER S.A. (France); **Laurent Cerutti, Jean-Baptiste Rodriguez,** Univ. de Montpellier (France)

13385-26 • 4:30 PM - 5:00 PM
Recent progress in interband cascade lasers with hybrid cladding layers covering a wide range of emission wavelengths *(Invited Paper)*
Author(s): **Rui Q. Yang**, **Yixuan Shen**, **Tetsuya Mishima**, **Michael Santos,** The Univ. of Oklahoma (United States); **Samuel Hawkins**, **Aaron Muhowski,** Sandia National Labs. (United States); **Xiaojun Wang,** AdTech Photonics, Inc. (United States)

13385-27 • 5:00 PM - 5:20 PM
Room-temperature, continuous-wave, single transverse-mode operation of distributed-feedback and Fabry-Perot interband cascade lasers
Author(s): **Kevin Oresick**, **Richard Maulini**, **Kaspar Suter**, **Tobias Gresch, Antoine Müller,** Alpes Lasers SA (Switzerland)

Wednesday 29 January 2025

SESSION 8: DFB AND DBR

29 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Gary A. Evans**, Southern Methodist Univ. (United States)

13385-28 • 8:00 AM - 8:20 AM
830 nm multimode interference coupler-based dual-wavelength master oscillator power amplifier for spectroscopic applications
Author(s): **André Müller**, **Renée Busch**, **Kay Sowoidnich**, **Lara Sophie Theurer**, **Jan-Philipp Koester**, **Martin Maiwald**, **Andrea Knigge, Bernd Sumpf,** Ferdinand-Braun-Institut gGmbH (Germany)

13385-29 • 8:20 AM - 8:40 AM
Carbon monoxide absorption line detection using 2.3-micrometer distributed Bragg reflector laser embedded on control driver with graphical user interface
Author(s): **Makoto Shimokozono**, **Yuta Ueda**, **Takahiko Shindo**, **Wataru Kobayashi,** NTT Device Technology Labs. (Japan); **Shigeru Kanazawa**, **Mingchen Chen,** NTT Device Innovation Ctr. (Japan); **Fumito Nakajima,** NTT Device Technology Labs. (Japan)

13385-30 • 8:40 AM - 9:00 AM
Highly reliable semiconductor DBR laser platform
Author(s): **Mika Mähönen**, **Luukas Kuusela**, **Riina Ulkuniemi**, **Andreas Schramm**, **Soile Talmila**, **Jarkko Liimatainen**, **Pekko Sipilä, Petteri Uusimaa,** Modulight Corp. (Finland)

13385-31 • 9:00 AM - 9:20 AM
Quantification of losses in bent waveguide distributed Bragg reflector diode lasers at 785 nm
Author(s): **Lara Sophie Theurer**, **Jan-Philipp Koester**, **André Müller**, **Martin Maiwald**, **Andrea Knigge**, **Bernd Sumpf, Günther Tränkle,** Ferdinand-Braun-Institut gGmbH (Germany)

13385-32 • 9:20 AM - 9:40 AM
Widely tunable 2.3-µm-wavelength superstructure grating (SSG) DBR laser with InAs/InGaAs multiple quantum wells grown on InP substrate
Author(s): **Takahiko Shindo**, **Yuta Ueda**, **Makoto Shimokozono**, **Wataru Kobayashi**, **Shigeru Kanazawa**, **Mingchen Chen, Fumito Nakajima,** Nippon Telegraph and Telephone Corp. (Japan)

13385-33 • 9:40 AM - 10:00 AM
MOCVD-grown c-band InAs/InAlGaAs quantum dot laterally-coupled distributed feedback lasers
Author(s): **Ben Salmond**, **Tom Simpson,** Cardiff Univ. (United Kingdom); **Tomas Peach,** Institute for Compound Semiconductors, Cardiff Univ. (United Kingdom); **Shangfeng Liu,** Cardiff Univ. (United Kingdom); **Michael Wale,** Univ. College London (United Kingdom); **Wyn Meredith,** Compound Semiconductor Ctr. Ltd. (United Kingdom); **Qiang Li,** Cardiff Univ. (United Kingdom); **Peter M. Smowton, Samuel Shutts,** Institute for Compound Semiconductors, Cardiff Univ. (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: MID-IR QCLS AND APPLICATIONS

29 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Eric Tournié**, Univ. de Montpellier (France)

13385-34 • 10:30 AM - 11:00 AM
Free-space optics at 10 μm wavelength *(Invited Paper)*
Author(s): **Carlo Sirtori,** Ecole Normale Supérieure (France)

13385-35 • 11:00 AM - 11:30 AM
Innovative QCL arrays for high-power and broadband applications *(Invited Paper)*
Author(s): **Laurent Diehl**, **Fielding Confer**, **John Roethle**, **Ryan Dill**, **Daryoosh Vakhshoori,** Pendar Technologies (United States); **Tushar Sanjay Karnik**, **Juejun Hu,** Massachusetts Institute of Technology (United States); **Christian J. Pfluegl,** Pendar Technologies (United States)

13385-36 • 11:30 AM - 11:50 AM
Monolithic beam combined DFB quantum cascade laser arrays with integrated arrayed waveguide gratings
Author(s): **Tushar Sanjay Karnik,** Massachusetts Institute of Technology (United States); **Laurent Diehl,** Pendar Technologies (United States); **Qingyang Du,** Massachusetts Institute of Technology (United States); **Christian J. Pfluegl**, **Daryoosh Vakhshoori,** Pendar Technologies (United States); **Juejun Hu,** Massachusetts Institute of Technology (United States)

13385-37 • 11:50 AM - 12:10 PM
Ultra-broadband external-cavity quantum cascade laser synchronization for mode-hop free tuning
Author(s): **Nicholas Kosan,** Princeton Univ. (United States); **Zane Meyer**, **Keith Nowicki,** Southwest Research Institute (United States); **Joel Silver**, **Kristen Peterson**, **Adriana Reyes-Newell,** Southwest Sciences, Inc. (United States); **Jeff Applegate,** BAE Systems, Inc. (United States); **Scot Rafkin,** Southwest Research Institute (United States); **Gerard Wysocki,** Princeton Univ. (United States)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 10: THZ QCLS

29 January 2025 • 1:40 PM - 3:00 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Miriam S. Vitiello**, Istituto Nanoscienze (Italy)

13385-38 • 1:40 PM - 2:10 PM
Widely repetition-rate-tunable pulse emission in THz quantum cascade lasers *(Invited Paper)*
Author(s): **Giacomo Scalari**, **Urban Senica,** ETH Zurich (Switzerland); **Christian Jirauschek**, **Michael Schreiber,** Technische Univ. München (Germany); **Mattias Beck**, **Alexander Dikopoltsev, Jerome Faist,** ETH Zurich (Switzerland)

13385-39 • 2:10 PM - 2:40 PM
Terahertz semiconductor bound states in the continuum lasers *(Invited Paper)*
Author(s): **Qi Jie Wang,** Nanyang Technological Univ. (Singapore)

13385-40 • 2:40 PM - 3:00 PM
Two-well InGaAs/AlInAs THz quantum cascade lasers lasing up to 165K
Author(s): **Sebastian Gloor**, **David Stark**, **Mattias Beck**, **Jérôme Faist, Giacomo Scalari,** ETH Zurich (Switzerland)

Coffee Break 3:00 PM - 3:30 PM

SESSION 11: QCL MODELING, NEW MATERIALS, AND DESIGNS

29 January 2025 • 3:30 PM - 5:10 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Qi Jie Wang**, Nanyang Technological Univ. (Singapore)

13385-41 • 3:30 PM - 4:00 PM
Dynamic modeling of quantum cascade lasers based on Maxwell-density matrix approaches *(Invited Paper)*
Author(s): **Christian Jirauschek,** Technische Univ. München (Germany)

13385-42 • 4:00 PM - 4:30 PM
Holographic nanoimaging of Dirac plasmon polaritons enabled by multifrequency THz quantum cascade lasers *(Invited Paper)*
Author(s): **Miriam S. Vitiello,** Istituto Nanoscienze (Italy)

13385-43 • 4:30 PM - 4:50 PM
Tunable Quantum Cascade VECSELs above 5 THz
Author(s): **Mohammad Shahili**, **Anthony D. Kim,** Univ. of California, Los Angeles (United States); **Sadhvikas J. Addamane,** Sandia National Labs. (United States); **Christopher A. Curwen**, **Jonathan H. Kawamura,** Jet Propulsion Lab. (United States); **Benjamin S. Williams,** Univ. of California, Los Angeles (United States)

13385-44 • 4:50 PM - 5:10 PM
Output couplers for dispersion compensation of terahertz QC-VECSEL frequency combs
Author(s): **Jordane A. Bloomfield**, **Yu Wu,** Univ. of California, Los Angeles (United States); **Sadhvikas J. Addamane,** Sandia National Labs. (United States); **Benjamin S. Williams,** Univ. of California, Los Angeles (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13385-56 • 6:00 PM - 8:00 PM
High-power DBR lasers at elevated operation temperature
Author(s): **Luukas Kuusela**, **Timo Aho**, **Riina Ulkuniemi**, **Mika Mähönen**, **Jussi Hämelahti**, **Andreas Schramm**, **Soile Talmila**, **Jarkko Liimatainen**, **Pekko Sipilä, Petteri Uusimaa,** Modulight Corp. (Finland)

13385-57 • 6:00 PM - 8:00 PM
Heterogeneous integration of high power III-V laser on Si for LiDAR applications
Author(s): **Guillaume Bruel,** STMicroelectronics (France), CEA-LETI (France), Univ. Grenoble Alpes (France); **Frédéric Boeuf,** STMicroelectronics (France); **Sylvain Guerber**, **Léopold Virot, Johan Rothman,** CEA-LETI (France)

13385-58 • 6:00 PM - 8:00 PM
Enhanced high Q-factor single mode for photonic Majorana quantum cascade laser
Author(s): **Hanyu Liu**, **Yun Da Chua,** Nanyang Technological Univ. (Singapore); **Qian Wang,** A*STAR Agency for Science, Technology and Research (Singapore); **Qi Jie Wang,** Nanyang Technological Univ. (Singapore)

Thursday 30 January 2025

SESSION 12: HIGH POWER AND HIGH BRIGHTNESS

30 January 2025 • 8:40 AM - 10:00 AM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Peter M. Smowton**, Cardiff Univ. (United Kingdom)

13385-45 • 8:40 AM - 9:10 AM
Wavelength tunable tapered diode lasers at 1180 nm with high spectral radiance *(Invited Paper)*
Author(s): **Katrin Paschke**, **David Feise**, **Pietro Della Casa**, **Ralph-Stephan Unger, Gunnar Blume,** Ferdinand-Braun-Institut gGmbH (Germany)

13385-46 • 9:10 AM - 9:40 AM
Recent advances in visible AlGaInP laser diodes *(Invited Paper)*
Author(s): **Riina Ulkuniemi**, **Andreas Schramm**, **Soile Talmila**, **Mika Mähönen**, **Luukas Kuusela**, **Timo Aho**, **Jussi Hämelahti**, **Pekko Sipilä**, **Ville Vilokkinen, Petteri Uusimaa,** Modulight Corp. (Finland)

13385-47 • 9:40 AM - 10:00 AM
Experimental studies of GaAs-based broad area diode lasers using highly asymmetric epitaxial structures with high modal gain: finding a path to exceeding 80% conversion efficiency at 25°C
Author(s): **Paul A. Crump,** Ferdinand-Braun-Institut gGmbH (Germany); **Anisuzzaman Boni,** Lumics GmbH (Germany), Ferdinand-Braun-Institut gGmbH (Germany); **Mohamed Elattar,** Ferdinand-Braun-Institut gGmbH (Germany); **Shailesh Khamari,** Raja Ramanna Ctr. for Advanced Technology (India); **Igor P. Marko,** Univ. of Glasgow (United Kingdom); **Stephen J. Sweeney,** Univ. of Glasgow (United Kingdom), Ferdinand-Braun-Institut gGmbH (Germany); **Seval Arslan**, **Ben King,** Ferdinand-Braun-Institut gGmbH (Germany); **M. Jarez Miah,** Bangladesh Univ. of Engineering and Technology (Bangladesh), Ferdinand-Braun-Institut gGmbH (Germany); **Dominic Martin**, **Andrea Knigge**, **Pietro Della Casa, Guenther Traenkle,** Ferdinand-Braun-Institut gGmbH (Germany)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: PCSELS

30 January 2025 • 10:30 AM - 12:10 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Richard A. Hogg**, Aston Univ. (United Kingdom)

13385-48 • 10:30 AM - 11:00 AM
Scaling towards high-speed and efficient hybrid on-chip and regrown PCSELs *(Invited Paper)*
Author(s): **Weidong Zhou,** The Univ. of Texas at Arlington (United States); **Mingsen Pan,** The Univ. of Texas at Arlington (United States), Semergytech, Inc. (United States); **Chhabindra Gautam,** Semergytech, Inc. (United States)

13385-49 • 11:00 AM - 11:20 AM
Photonic crystal surface emitting lasers (PCSELs) based on InAs quantum dots-in-a-well
Author(s): **Thomas J. Rotter**, **Subhashree Seth**, **Kevin J. Reilly**, **Fatih F. Ince,** The Univ. of New Mexico (United States); **Akhil Kalapala**, **Chhabindra Gautam**, **Zhonghe Liu,** The Univ. of Texas at Arlington (United States); **Sadhvikas Addamane,** Sandia National Labs. (United States); **Weidong Zhou,** The Univ. of Texas at Arlington (United States); **Ganesh Balakrishnan,** The Univ. of New Mexico (United States)

13385-50 • 11:20 AM - 11:50 AM
High-power high-beam-quality 1550-nm-wavelength InP-based photonic-crystal surface-emitting laser *(Invited Paper)*
Author(s): **Takeshi Aoki**, **Yuhki Itoh**, **Kosuke Fujii**, **Makoto Ogasawara**, **Yusuke Sawada**, **Hiroyuki Yoshinaga**, **Naoki Fujiwara**, **Rei Tanaka**, **Hideki Yagi**, **Masaki Yanagisawa,** Sumitomo Electric Industries, Ltd. (Japan); **Masahiro Yoshida**, **Takuya Inoue**, **Menaka De Zoysa**, **Kenji Ishizaki, Susumu Noda,** Kyoto Univ. (Japan)

13385-51 • 11:50 AM - 12:10 PM
Design study on large-area all-semiconductor PCSELs
Author(s): **Ben King**, **Hans Wenzel,** Ferdinand-Braun-Institut gGmbH (Germany); **Eduard Kuhn**, **Mindaugas Radziunas,** Weierstrass-Institut für Angewandte Analysis und Stochastik (Germany); **Paul A. Crump,** Ferdinand-Braun-Institut gGmbH (Germany)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 14: MID-IR LASERS AND APPLICATIONS

30 January 2025 • 1:40 PM - 3:00 PM | Moscone South, Room 103 (Level 1 Lobby)
Session Chair(s): **Theodore P. Letsou**, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

13385-52 • 1:40 PM - 2:00 PM
Characterization of degradation and failure in long-wave quantum cascade lasers
Author(s): **Alejandro M. Villalobos-Meza,** Univ. of Central Florida (United States); **Hong Shu,** Irglare, LLC (United States); **Arkadiy Lyakh,** Univ. of Central Florida (United States)

13385-53 • 2:00 PM - 2:20 PM
Low threshold supercontinuum generation on the GaAs0.51Sb0.49/InP platform
Author(s): **Edoardo De Toma,** Walter Schottky Institut (Germany); **Victor Turpaud,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay (France); **Kevin Zhang,** Walter Schottky Institut (Germany); **Yijun Yang,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay (France); **Gerhard Böhm**, **Anna Köninger,** Walter Schottky Institut (Germany); **Laurent Vivien**, **Delphine Marris-Morini,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay (France); **Mikhail Belkin,** Walter Schottky Institut (Germany)

13385-54 • 2:20 PM - 2:40 PM
QCLs emitting in 3.8 micrometer range for applications in FSO system
Author(s): **Kamil Pierscinski**, **Dorota Pierscinska**, **Dominika Niewczas**, **Agata Krząstek**, **Michał Nagowski, Krzysztof Chmielewski,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

13385-55 • 2:40 PM - 3:00 PM
Quantum cascade lasers optical power enhancement through the optimization of high-reflection coatings
Author(s): **Dominika Niewczas,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland), Univ. of Warsaw (Poland); **Dorota Pierścińska**, **Agata Krząstek**, **Paweł Kozłowski, Kamil Pierściński,** Lukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

CONFERENCE 13386

Light-Emitting Devices, Materials, and Applications XXIX

27 - 29 January 2025 | Moscone West, Room 2016 (Level 2)

Conference Chair(s): **Jong Kyu Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Michael R. Krames,** Arkesso, LLC (United States); **Martin Strassburg,** ams-OSRAM International GmbH (Germany)

Program Committee: **Jim R. Bonar,** Meta (United States); **Yong-Hoon Cho,** KAIST (Korea, Republic of); **Aurelien David,** Google (United States); **Amélie Dussaigne,** CEA-LETI (France); **Kolja Haberland,** LayTec AG (Germany); **Jana Hartmann,** Technische Univ. Braunschweig (Germany); **Michael Heuken,** AIXTRON SE (Germany); **Christoph G. A. Hoelen,** Signify N.V. (Netherlands); **Hee Jin Kim,** Lumileds, LLC (United States); **Juanita N. Kurtin,** OSRAM Opto Semiconductors Inc. (United States); **Soo Min Lee,** Veeco Instruments Inc. (United States); **Yun-Li Li,** PlayNitride Inc. (Taiwan); **Tien-Chang Lu,** National Yang Ming Chiao Tung Univ. (Taiwan); **Benjamin D. Mangum,** OSRAM Opto Semiconductors Inc. (United States); **Koh Matsumoto,** Nagoya Univ. (Japan); **Matteo Meneghini,** Univ. degli Studi di Padova (Italy); **Tetsuya Takeuchi,** Meijo Univ. (Japan); **Marie Anne van de Haar,** Seaborough Research B.V. (Netherlands); **Dong-Sing Wuu,** National Chi Nan Univ. (Taiwan); **Erin C. Young,** Apple Inc. (United States)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: LEDS FOR AR/VR/XR I

27 January 2025 • 10:45 AM - 11:50 AM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Michael R. Krames**, Arkesso, LLC (United States)

13386-1 • 10:45 AM - 11:10 AM
Structured micro illumination light engines: from chip processing to neuromorphic computing *(Invited Paper)*
Author(s): **Andreas Waag**, **Georg Schöttler**, **Maximilian Vergin**, **Steffen Higfgins-Wood**, **Stefan Wolter**, **Florian Meierhofer**, **Rany Miranti-Augustin**, **Jana Hartmann**, **Robert Kraneis**, **Maximilian Müller,** Technische Univ. Braunschweig (Germany); **Noah Kaelin,** OST – Ostschweizer Fachhochschule (Switzerland); **Norwin von Malm,** ams-OSRAM International GmbH (Germany); **Christian Werner,** OST – Ostschweizer Fachhochschule (Switzerland)

13386-3 • 11:10 AM - 11:25 AM
Techno-economics of axial nanowire light-emitting diodes for augmented reality displays and data communication applications
Author(s): **Khaled Ahmed,** Intel Corp. (United States)

13386-4 • 11:25 AM - 11:50 AM
Developments toward monolithic III-N microLEDs: red InGaN active region and tunnel junctions grown by MOCVD *(Invited Paper)*
Author(s): **Matthew S. Wong**, **Vincent Rienzi**, **Panpan Li**, **Jacob J. Ewing**, **Jordan M. Smith**, **Alejandro Quevedo**, **Tanay Tak**, **Shuji Nakamura**, **James S. Speck, Steven P. DenBaars,** Univ. of California, Santa Barbara (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: LEDS FOR AR/VR/XR II

27 January 2025 • 1:20 PM - 3:00 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Martin Strassburg**, ams-OSRAM International GmbH (Germany)

13386-5 • 1:20 PM - 1:45 PM
MicroLED micro-display technology with μ-PixeLED solution *(Invited Paper)*
Author(s): **Chih-Ling Wu**, **Yu-Jui Tseng**, **Kuo-Wei Chen**, **Sheng Yuan Sun**, **Po-Wei Chiu**, **Hio-Kun Si**, **Ying-Tsang Liu, Yun-Li Li,** PlayNitride Inc. (Taiwan)

13386-6 • 1:45 PM - 2:10 PM
Monolithic 3D integration of full color microLEDs towards > 5000 PPI *(Invited Paper)*
Author(s): **Jeehwan Kim, Jung-El Ryu,** Massachusetts Institute of Technology (United States)

13386-7 • 2:10 PM - 2:35 PM
InGaN-based red LEDs on Sapphire and ScAlMgO4 substrates *(Invited Paper)*
Author(s): **Kazuhiro Ohkawa**, **Daisuke Iida**, **Mohammed Najmi, Cesur Altinkaya,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13386-8 • 2:35 PM - 3:00 PM
Strategies for improving light extraction in thin film-based InGaN micro-LED arrays for AR displays *(Invited Paper)*
Author(s): **Florian Vögl,** ams-OSRAM International GmbH (Germany), Technische Univ. Braunschweig (Germany); **Adrian Avramescu,** ams-OSRAM International GmbH (Germany); **Andreas Lex,** ams-OSRAM International GmbH (Germany), Technische Univ. Braunschweig (Germany); **Andreas Waag,** Technische Univ. Braunschweig (Germany); **Martin Hetzl, Norwin von Malm,** ams-OSRAM International GmbH (Germany)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: LEDS FOR AR/VR/XR III

27 January 2025 • 3:30 PM - 5:05 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Jong Kyu Kim**, Pohang Univ. of Science and Technology (Korea, Republic of)

13386-9 • 3:30 PM - 3:55 PM
Micro-light emitting diodes: effects of size, contact schemes, V pits, and dislocations *(Invited Paper)*
Author(s): **Tae-Yeon Seong,** Korea Univ. (Korea, Republic of); **Jeong-Hwan Park,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Markus Pristovsek, Hiroshi Amano,** Nagoya Univ. (Japan)

13386-10 • 3:55 PM - 4:10 PM
Active-matrix micro-LED display driven by IGZO/IZO TFT-integrated ReRAM unit
Author(s): **Seok Hee Hong**, **Ho Jin Lee**, **Nahyun Kim**, **Sim Hun Yuk**, **Sung Keun Choi, Tae Geun Kim,** Korea Univ. (Korea, Republic of)

13386-11 • 4:10 PM - 4:25 PM
Improving the light extraction efficiency of InGaN-based red micro-LEDs via indium tin oxide transparent p-electrodes
Author(s): **Cesur Altinkaya**, **Daisuke Iida**, **Mohammed Najmi, Kazuhiro Ohkawa,** King Abdullah Univ. of Science and Technology (Saudi Arabia)

13386-12 • 4:25 PM - 4:50 PM
Eu-doped GaN and InGaN monolithically stacked RGB LEDs for ultrahigh-resolution micro-LED displays *(Invited Paper)*
Author(s): **Yasufumi Fujiwara,** Ritsumeikan Univ. (Japan); **Shuhei Ichikawa, Jun Tatebayashi,** Osaka Univ. (Japan)

13386-59 • 4:50 PM - 5:05 PM
Pyramidal microLEDs delivering RGB in single materials system
Author(s): **Lisa Rullik**, **Ivan Martinovic**, **Son P. Le**, **Andrei Vorobiev**, **Chih-Wei Hsu, Per Olof Holtz,** Polar Light Technologies (Sweden)

Tuesday 28 January 2025

SESSION 4: UVC EMITTERS AND APPLICATIONS

28 January 2025 • 8:30 AM - 10:15 AM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Jong Kyu Kim**, Pohang Univ. of Science and Technology (Korea, Republic of)

13386-13 • 8:30 AM - 8:55 AM
Multi-quantum well design and carrier transport of AlGaN-based far-UVC LEDs with emission wavelengths between 225 nm and 233 nm *(Invited Paper)*
Author(s): **Marcel Schilling**, **Franz Biebler,** Technische Univ. Berlin (Germany); **Jan Ruschel**, **Jens Rass**, **Hyun Kyong Cho**, **Sylvia Hagedorn,** Ferdinand-Braun-Institut gGmbH (Germany); **Tim Wernicke,** Technische Univ. Berlin (Germany); **Sven Einfeldt**, **Markus Weyers,** Ferdinand-Braun-Institut gGmbH (Germany); **Michael Kneissl,** Technische Univ. Berlin (Germany), Ferdinand-Braun-Institut gGmbH (Germany)

13386-14 • 8:55 AM - 9:20 AM
Far-UVC LEDs fabricated on face-to-face annealed sputter-deposited AlN templates *(Invited Paper)*
Author(s): **Ryota Akaike**, **Kenjiro Uesugi**, **Hiroki Yasunaga,** Mie Univ. (Japan); **Shuhei Ichikawa,** Osaka Univ. (Japan); **Takao Nakamura,** Mie Univ. (Japan); **Kazunobu Kojima,** Osaka Univ. (Japan); **Masahiko Tsuchiya,** Stanley Electric Co., Ltd. (Japan); **Hideto Miyake,** Mie Univ. (Japan)

13386-15 • 9:20 AM - 9:35 AM
Study of UV-C LED technology on in-door air disinfection: an effective mercury-free and ozone-free method to irradicate airborne microorganisms
Author(s): **Muhammad Shafa,** MassPhoton (United States); **Muhammad Furqan,** Chase Farm Hospital (United Kingdom); **Eason Liao,** MassPhoton (Hong Kong, China)

13386-16 • 9:35 AM - 9:50 AM
Spectral components, initial improvement, and degradation of 265 nm UV-C LEDs
Author(s): **Carlo De Santi**, **Francesco Piva**, **Matteo Buffolo**, **Nicola Roccato**, **Marco Pilati**, **Simone Longato,** Univ. degli Studi di Padova (Italy); **Norman Susilo**, **Daniel Hauer Vidal**, **Anton Muhin**, **Luca Sulmoni**, **Tim Wernicke,** Technische Univ. Berlin (Germany); **Michael Kneissl,** Technische Univ. Berlin (Germany), Ferdinand-Braun-Institut gGmbH (Germany); **Nicola Trivellin**, **Gaudenzio Meneghesso**, **Enrico Zanoni, Matteo Meneghini,** Univ. degli Studi di Padova (Italy)

13386-17 • 9:50 AM - 10:15 AM
Optical sensing of ammonia performed using a 229 nm LED as a far UV-C light source *(Invited Paper)*
Author(s): **Kosuke Sato, Yoshihisa Kunimi,** Asahi Kasei Corp. (Japan)

Coffee Break 10:15 AM - 10:45 AM

SESSION 5: III-N EFFICIENCY CHALLENGES

28 January 2025 • 10:45 AM - 12:25 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Michael R. Krames**, Arkesso, LLC (United States)

13386-18 • 10:45 AM - 11:10 AM
Revisiting the physics of InGaN LEDs: Myths and facts *(Invited Paper)*
Author(s): **Aurelien David,** Google (United States)

13386-19 • 11:10 AM - 11:35 AM
Defects in InGaN QW structures: microscopic properties and modeling *(Invited Paper)*
Author(s): **Matteo Meneghini**, **Marco Nicoletto**, **Francesco Piva**, **Nicola Roccato**, **Alessandro Caria**, **Fabiana Rampazzo**, **Carlo De Santi**, **Matteo Buffolo,** Univ. degli Studi di Padova (Italy); **Francesca Rossi,** Consiglio Nazionale delle Ricerche (Italy); **Giovanna Mura,** Univ. degli Studi di Cagliari (Italy); **Andrea Gasparotto,** Univ. degli Studi di Padova (Italy); **Conny Becht,** Technische Univ. Chemnitz (Germany); **Gunnar Kusch**, **Yihong Ji,** Univ. of Cambridge (United Kingdom); **Xuanqi Huang**, **Houqiang Fu**, **Hong Chen,** Arizona State Univ. (United States); **Yuji Zhao,** Rice Univ. (United States); **Nicola Trivellin**, **Gaudenzio Meneghesso**, **Enrico Zanoni,** Univ. degli Studi di Padova (Italy); **Rachel Oliver,** Univ. of Cambridge (United Kingdom); **Nicolas Grandjean,** EPFL (Switzerland); **Ulrich T. Schwarz,** Technische Univ. Chemnitz (Germany)

13386-20 • 11:35 AM - 12:00 PM
Growth-induced point defect and their impact on InGaN-based light-emitting diodes *(Invited Paper)*
Author(s): **Yao Chen**, **Anna Toschi**, **Jean-François Carlin, Nicolas Grandjean,** EPFL (Switzerland)

13386-21 • 12:00 PM - 12:25 PM
Modeling of III-N heterostructures for GaN light-emitting diodes based on effective bond-orbital model *(Invited Paper)*
Author(s): **Fu-Chen Hsiao,** North Carolina State Univ. (United States); **Yia-Chung Chang,** Academia Sinica (Taiwan); **Jonathan Wierer, Fred Kish,** North Carolina State Univ. (United States)

Lunch/Exhibition Break 12:25 PM - 1:55 PM

SESSION 6: APPLICATIONS AND MANUFACTURING I

28 January 2025 • 1:55 PM - 3:35 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Hee Jin Kim**, Lumileds, LLC (United States)

13386-22 • 1:55 PM - 2:20 PM
Micro-LED technology for high definition automotive lighting applications *(Invited Paper)*
Author(s): **Ted Schriefer,** Nichia America Corp. (United States)

13386-23 • 2:20 PM - 2:45 PM
MOVPE technology for leading edge III-N based devices *(Invited Paper)*
Author(s): **Michael Heuken,** AIXTRON SE (Germany)

13386-24 • 2:45 PM - 3:10 PM
Latest improvements on in-situ and ex-situ metrology for epitaxy and etching of light emitting devices *(Invited Paper)*
Author(s): **Kolja Haberland,** LayTec AG (Germany)

13386-25 • 3:10 PM - 3:35 PM
Advances in MOCVD high volume manufacturing for light-emitting diodes *(Invited Paper)*
Author(s): **Eric A. Armour**, **Wei Y. Chan**, **Bojan Mitrovic**, **Scott Burfeind**, **Sandeep Krishnan**, **Mark McKee**, **Martin A. Diaz**, **Aaron Frazier, Brian Cheng,** Veeco Instruments Inc. (United States)

Coffee Break 3:35 PM - 4:05 PM

SESSION 7: APPLICATIONS AND MANUFACTURING II

28 January 2025 • 4:05 PM - 5:25 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Michael Heuken**, AIXTRON SE (Germany)

13386-26 • 4:05 PM - 4:30 PM
Options for cost and performance improvements and integrated emitter design in GaN based electro-optical devices *(Invited Paper)*
Author(s): **Lars Nähle**, **Sven Gerhard**, **André Somers**, **Mariel Grace Jama**, **Robert Lawrowski**, **Damir Borovac**, **Christoph Eichler**, **Georg Bruederl**, **Sönke Tautz**, **Matthias Heidemann**, **Elisabeth Reiger**, **Saransh Gosain**, **Bruno Jentzsch**, **Maria Haimerl**, **Urs Heine**, **Teresa Wurm**, **Norwin von Malm**, **Martin Behringer,** ams-OSRAM International GmbH (Germany); **Xin Mu, Wesley Sacher,** Max Planck Institute of Microstructure Physics (Germany)

13386-27 • 4:30 PM - 4:55 PM
InGaN-based micro-LEDs for display and chip-to-chip optical interconnections *(Invited Paper)*
Author(s): **Anda Chen**, **Xinran Zhang**, **Zhibiao Hao**, **Changzheng Sun**, **Bing Xiong**, **Yanjun Han**, **Jian Wang**, **Hongtao Li**, **Lin Gan**, **Yi Luo, Lai Wang,** Tsinghua Univ. (China)

13386-28 • 4:55 PM - 5:10 PM
Enhancing airport traffic management: innovative integration of visible light communication and artificial intelligence
Author(s): **Manuela Vieira**, **Manuel A. Vieira,** UNINOVA (Portugal); **Gonçalo Galvão,** Instituto Superior de Engenharia de Lisboa (Portugal); **Paula A. Louro,** UNINOVA (Portugal); **Alessandro Fantoni**, **Pedro Vieira, Mário Véstias,** Instituto Superior de Engenharia de Lisboa (Portugal)

13386-29 • 5:10 PM - 5:25 PM
Progress in hybrid integration of light sources and detectors in ceramic packages for ultra-compact sensors
Author(s): **Nikolay Ledentsov**, **Oleg Yu. Marakov**, **Mikhail Koniaev**, **Michael Hoppe**, **Matthias Edling**, **Russell Dahl, Peter Rotsch,** EPIGAP OSA Photonics GmbH (Germany)

Wednesday 29 January 2025

SESSION 8: EMERGING MATERIALS AND DEVICES

29 January 2025 • 8:30 AM - 10:15 AM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Martin Strassburg**, ams-OSRAM International GmbH (Germany)

13386-30 • 8:30 AM - 8:55 AM
Growth of hexagonal boron nitride by MOCVD for electronic and photonic applications *(Invited Paper)*
Author(s): **Jong Kyu Kim,** Pohang Univ. of Science and Technology (Korea, Republic of)

13386-31 • 8:55 AM - 9:20 AM
MOVPE growth of hexagonal boron nitride and its heterostructures *(Invited Paper)*
Author(s): **Suresh Sundaram**, **Phuong Vuong,** Georgia Tech-Lorraine (France), Georgia Tech - CNRS (France); **Mohamed Bourras**, **Vishnu Ottapilakkal**, **May Tran Thi**, **Rajat Gujrati,** Georgia Tech - CNRS (France); **Ashutosh Srivastava,** Georgia Tech-Lorraine (France), Georgia Tech - CNRS (France); **Tarik Moudakir**, **Simon Gautier,** Institut Lafayette (France); **Paul L. Voss,** Georgia Tech - CNRS (France), Georgia Tech-Lorraine (France); **Jean-Paul Salvestrini,** Georgia Tech-Lorraine (France), Georgia Tech - CNRS (France); **Abdallah Ougazzaden,** Georgia Tech - CNRS (France), Georgia Tech-Lorraine (France)

13386-32 • 9:20 AM - 9:35 AM
Tailoring surface chemistry and electronic properties of NiMgO nanocrystals for efficient all-inorganic quantum dot light emitting diodes
Author(s): **Woon Ho Jung,** Sungkyunkwan Univ. (Korea, Republic of); **Tae Hwan Park,** Korea Institute of Science and Technology (Korea, Republic of); **Hyeonjun Lee,** KAIST (Korea, Republic of); **Gyu Weon Hwang,** Korea Institute of Science and Technology (Korea, Republic of); **Jaehoon Lim,** Sungkyunkwan Univ. (Korea, Republic of)

13386-33 • 9:35 AM - 9:50 AM
Impact of defects on the spectral characteristics of PureB avalanche-mode light emitting diodes
Author(s): **Eva Jelavic,** Ruder Boškovic Institute (Croatia); **Lis K. Nanver,** Univ. Twente (Netherlands); **Tihomir Kneževic,** Ruder Boškovic Institute (Croatia)

13386-35 • 9:50 AM - 10:15 AM
Light emission and lasing in organic semiconductor-incorporated perovskite (OSiP) *(Invited Paper)*
Author(s): **Letian Dou,** Purdue Univ. (United States)

Coffee Break 10:15 AM - 10:45 AM

SESSION 9: WAVELENGTH CONVERSION

29 January 2025 • 10:45 AM - 12:20 PM | Moscone West, Room 2016 (Level 2)
Session Chair(s): **Benjamin D. Mangum**, OSRAM Opto Semiconductors Inc. (United States)

13386-36 • 10:45 AM - 11:10 AM
Nano-engineered narrow-band phosphors for LED applications *(Invited Paper)*
Author(s): **Marie Anne van de Haar**, **Vasilii Khanin**, **Atul D. Sontakke**, **Federico Montanarella**, **Daniel Lenting**, **Mohamed Tachikirt,** Seaborough Research B.V. (Netherlands); **Mike R. Krames,** Seaborough Research B.V. (Netherlands), Arkesso, LLC (United States)

13386-37 • 11:10 AM - 11:25 AM
Integration of molecular quantum emitters onto GaN-based LEDs
Author(s): **Gunilla W. Harm**, **Peer Kasten**, **Uta Schlickum, Tobias Voss,** Technische Univ. Braunschweig (Germany)

13386-38 • 11:25 AM - 11:40 AM
Utilizing novel hybrid color conversion thin film for ultra-high resolution and thin micro-LED arrays
Author(s): **Ching-Fuh Lin**, **Hao-Sung Chiu**, **Chih-Yuan Tsai**, **Chen Hsun Wu**, **Shan-Yu Chen**, **Tzu-Yi Yang**, **Yu-Han Kung**, **Ting-Chun Lee, Guan-Wen Wang,** National Taiwan Univ. (Taiwan)

13386-39 • 11:40 AM - 11:55 AM
Far-red to near-infrared bulk ceramic phosphors pumped by blue lasers for high radiant exitance
Author(s): **Albrecht Seidl, Jens Vietor,** SCHOTT AG (Germany)

13386-40 • 11:55 AM - 12:20 PM
Emission dynamics and quenching of phosphors at high excitation powers *(Invited Paper)*
Author(s): **Freddy Rabouw,** Utrecht Univ. (Netherlands); **Marie Anne van de Haar,** Seaborough Research B.V. (Netherlands); **Jur de Wit**, **Thomas van Swieten,** Utrecht Univ. (Netherlands); **Anne Berends,** Seaborough Research B.V. (Netherlands); **Sander Vonk**, **Ayla Dekker,** Utrecht Univ. (Netherlands); **Mohamed Tachikirt,** Seaborough Research B.V. (Netherlands); **Ario Cocina**, **Erik Maris,** ETH Zurich (Switzerland); **Michael R. Krames,** Arkesso, LLC (United States); **Andries Meijerink,** Utrecht Univ. (Netherlands)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13386-41 • 6:00 PM - 8:00 PM
Multi-wavelength GaNAs-based nanowire lasers
Author(s): **M. Jansson,** Linköping Univ. (Sweden); **Y. Torigoe,** Ehime Univ. (Japan); **K. Nakama,** Hokkaido Univ. (Japan); **M. Yukimine,** Ehime Univ. (Japan); **F. Ishikawa,** Hokkaido Univ. (Japan); **Weimin M. Chen, Irina Buyanova,** Linköping Univ. (Sweden)

13386-42 • 6:00 PM - 8:00 PM
Fabrication of highly efficient quantum dot light-emitting diodes with surface-modified tin oxide electron transport layer
Author(s): **YongIl Kim,** Sungkyunkwan Univ. (Korea, Republic of), SAMSUNG Display Co., Ltd. (Korea, Republic of); **Woon Ho Jung**, **Hyeonjun Lee**, **Yong Woo Kwon, Jaehoon Lim,** Sungkyunkwan Univ. (Korea, Republic of)

13386-43 • 6:00 PM - 8:00 PM
Removal of etch damage in GaN mesas for µLED applications
Author(s): **Andrew Newton**, **Sean Cho**, **Zhengfei Wei,** Oxford Instruments Plasma Technology Ltd. (United Kingdom); **Stuart Robertson,** Loughborough Univ. (United Kingdom); **Toon Coenen, Marcin Zielinski,** Delmic B.V. (Netherlands)

13386-44 • 6:00 PM - 8:00 PM
Time-resolved cathodoluminescence spectroscopy of oxygen-related defects in AlN layers
Author(s): **Barbara Szafranski**, **Lukas Peters**, **Christoph Margenfeld**, **Andreas Waag, Tobias Voss,** Technische Univ. Braunschweig (Germany)

13386-45 • 6:00 PM - 8:00 PM
Development of a water-resistant geopolymer adhesive utilized for packaging DUV LEDs
Author(s): **Qinglei Sun,** China Univ. of Geosciences (China)

13386-46 • 6:00 PM - 8:00 PM
Characterization of optical response from variant InGaN nanowires emitting within the green spectral gap
Author(s): **Mohsen Esmaeilzadeh**, **Pablo Tieben,** Physikalisch-Technische Bundesanstalt (Germany), Leibniz Univ. Hannover (Germany); **Soumyadip Chatterjee**, **Apurba Laha,** Indian Institute of Technology Bombay (India); **Andreas W. Schell,** Johannes Kepler Univ. Linz (Austria), Leibniz Univ. Hannover (Germany)

13386-49 • 6:00 PM - 8:00 PM
Demonstration of a novel full structure electrically driven AlGaN-delta-GaN QW DUV LED
Author(s): **Jacob Boisvere**, **Bryan Melanson**, **Matthew Seitz, Jing Zhang,** Rochester Institute of Technology (United States)

13386-50 • 6:00 PM - 8:00 PM
Direct diffused LED of sedimentation-enhanced diffuser in encapsulation layer for high brightness and homogeneity in automotive rear signal lamps
Author(s): **Eun Bi Kwon, Seok Ho Jeong,** Hyundai Mobis Co., Ltd. (Korea, Republic of)

13386-51 • 6:00 PM - 8:00 PM
Graphene as a current spreading layer in top-emitting AlGaN-based UVC-LEDs
Author(s): **Jannik Korte**, **Johanna Meier**, **Hehe Zhang**, **Umut Kaya**, **Wolfgang Mertin, Gerd Bacher,** Univ. Duisburg-Essen (Germany)

13386-52 • 6:00 PM - 8:00 PM
Analysis of extrinsic failure mechanisms of high-power blue, red, and white LEDs for horticulture and street lighting
Author(s): **Alessandro Caria**, **Riccardo Fraccaroli**, **Giulia Pierobon**, **Thomas Castellaro**, **Ambrogio Huang,** Univ. degli Studi di Padova (Italy); **Julien Magnien**, **Joerdis Rosc,** Materials Ctr. Leoben Forschung GmbH (Austria); **Giovanna Mura,** Univ. degli Studi di Cagliari (Italy); **Carlo De Santi**, **Matteo Buffolo**, **Nicola Trivellin**, **Enrico Zanoni**, **Gaudenzio Meneghesso, Matteo Meneghini,** Univ. degli Studi di Padova (Italy)

13386-53 • 6:00 PM - 8:00 PM
System design considerations for high-density UV LED arrays for disinfection applications
Author(s): **Pratibha Sharma,** Violumas (Canada); **Pao Chen, Saya Han,** Violumas (United States)

13386-54 • 6:00 PM - 8:00 PM
Numerical optical optimization of a micro-LED package for fluorescence microscopy
Author(s): **Anna-Lena Fritze**, **Andreas Evertz**, **Sebastian Leineweber, Ludger Overmeyer,** Leibniz Univ. Hannover (Germany)

13386-55 • 6:00 PM - 8:00 PM
Theory of pulsed optical power transients in GaN MicroLEDs
Author(s): **Khaled Ahmed,** Intel Corp. (United States)

13386-56 • 6:00 PM - 8:00 PM
Meta analysis of MicroLED and OLED drive current
Author(s):

13386-57 • 6:00 PM - 8:00 PM
Laser-driven phosphor-converted green photonic technology based solid state lighting device for high-brightness illumination
Author(s): **Dheeraj Kumar**, **R. K. Varshney, Dalip Singh Mehta,** Indian Institute of Technology Delhi (India)

13386-58 • 6:00 PM - 8:00 PM
Interface Engineering in Mixed Halide Perovskite for Flexible Light Emitting devices
Author(s): **Somnath Mahato,** Lukasiewicz Research Network (Poland)

CONFERENCE 13387

Emerging Liquid Crystal Technologies XX

27 - 28 January 2025 | Moscone West, Room 2004 (Level 2)

Conference Chair(s): **Liang-Chy Chien,** Kent State Univ. (United States); **Nelson V. Tabiryan,** BEAM Engineering for Advanced Measurements Co. (United States); **Jun Yamamoto,** Kyoto Univ. (Japan)

Program Committee: **Etienne Brasselet,** Univ. de Bordeaux (France); **Vladimir G. Chigrinov,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Su Seok Choi,** Pohang Univ. of Science and Technology (Korea, Republic of); **Antônio M. Figueiredo Neto,** Univ. de São Paulo (Brazil); **Tigran Galstian,** Univ. Laval (Canada); **Helen F. Gleeson,** Univ. of Leeds (United Kingdom); **Hirotsugu Kikuchi,** Kyushu Univ. (Japan); **Heinz S. Kitzerow,** Univ. Paderborn (Germany); **Jan P. F. Lagerwall,** Univ. du Luxembourg (Luxembourg); **Chia-Rong Lee,** National Cheng Kung Univ. (Taiwan); **Ji-Hoon Lee**, **Seung Hee Lee,** Jeonbuk National Univ. (Korea, Republic of); **Quan Li,** Southeast Univ. (China); **Yi-Hsin Lin,** National Yang Ming Chiao Tung Univ. (Taiwan); **Danqing Liu,** Technische Univ. Eindhoven (Netherlands); **Lu Lu,** Meta (United States); **Akihiro Mochizuki,** i-CORE Technology, LLC (United States); **Stephen M. Morris,** Univ. of Oxford (United Kingdom); **Igor Muševič,** Jožef Stefan Institute (Slovenia); **Kristiaan Neyts,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Toshiaki Nose,** Akita Prefectural Univ. (Japan); **Masanori Ozaki,** Osaka Univ. (Japan); **Miha Ravnik,** Univ. of Ljubljana (Slovenia); **Ivan I. Smalyukh,** Univ. of Colorado Boulder (United States); **Qi-Huo Wei,** Southern Univ. of Science and Technology (China); **Timothy J. White,** Univ. of Colorado Boulder (United States); **Michael Wittek,** Merck KGaA (Germany); **Tomasz R. Wolinski ,** Warsaw Univ. of Technology (Poland); **Shin-Tson Wu,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Dong Ki Yoon,** KAIST (Korea, Republic of)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: LASING/WAVEGUIDE I

27 January 2025 • 10:45 AM - 12:10 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Nelson V. Tabiryan**, BEAM Engineering for Advanced Measurements Co. (United States)

13387-1 • 10:45 AM - 11:20 AM
Light steering and waveguide coupling with liquid crystals (Keynote Presentation)
Author(s): **Tigran Galstian, William Boissonneault,** Univ. Laval (Canada)

13387-2 • 11:20 AM - 11:55 AM
Liquid crystal-integrated dynamic metasurface holographic displays (Keynote Presentation)
Author(s): **Junsuk Rho,** Pohang Univ. of Science and Technology (Korea, Republic of)

13387-3 • 11:55 AM - 12:10 PM
Laser induced damage threshold test for dual-domain polymer stabilized liquid crystals with different twist angles
Author(s): **Dengcheng Chen,** Kent State Univ. (United States); **Zoey S. Davidson**, **Brian P. Radka**, **Selim Elhadj,** Seurat Technologies (United States); **Liang-Chy Chien,** Kent State Univ. (United States)

Lunch Break 12:10 PM - 1:40 PM

SESSION 2: FLAT OPTICS/BEAM STEERING/TWEEZING

27 January 2025 • 1:40 PM - 3:10 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Jun Yamamoto**, Kyoto Univ. (Japan)

13387-4 • 1:40 PM - 2:05 PM
Dual mode multifocus liquid crystal microlens arrays: fabrication methods and applications in laser light sources *(Invited Paper)*
Author(s): **Che Ju Hsu**, **Chi-Yen Huang, Mareena Antony,** National Changhua Univ. of Education (Taiwan)

13387-5 • 2:05 PM - 2:30 PM
Improved liquid crystal laser with fluidic gain medium *(Invited Paper)*
Author(s): **Jia-De Lin**, **Yu-Hua Chou**, **Yu-Hsien Wu, Shang-Rui Wu,** National Dong Hwa Univ. (Taiwan)

13387-6 • 2:30 PM - 2:55 PM
Optoelectronically tunable geometric phase flat optics using molecular-motor-based heliconical cholesteric liquid crystals *(Invited Paper)*
Author(s): **Ching-Han Yang**, **Ya-Han Zheng**, **Chi-Min Liang, Chia-Rong Lee,** National Cheng Kung Univ. (Taiwan)

13387-7 • 2:55 PM - 3:10 PM
Spatial-temporal coherence modulating liquid crystal devices
Author(s): **Nathan Spiller**, **Tianxin Wang**, **Camron Nourshargh**, **Waqas Kamal**, **Martin J. Booth**, **Steve Elston, Stephen M. Morris,** Univ. of Oxford (United Kingdom)

Coffee Break 3:10 PM - 3:40 PM

SESSION 3: AR/VR/LENS

27 January 2025 • 3:40 PM - 4:25 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Kristiaan Neyts**, Hong Kong Univ. of Science and Technology (Hong Kong, China)

13387-8 • 3:40 PM - 3:55 PM
FLCoS: a promising path towards small form-factor, high performance color-sequential micro-displays
Author(s): **Thomas Charisoulis**, **Ziqian He**, **Fenglin Peng**, **John DeFranco**, **Yun Wang**, **Barry Silverstein,** Meta (United States); **Yuta Kanamori**, **Tomohiro Ando, Rikoku Nakamura,** Citizen Finedevice Co., Ltd. (Japan)

13387-9 • 3:55 PM - 4:10 PM
Enhanced off-axis performance of single-layer tunable LC lenses for near-eye devices
Author(s): **Daniel Jimmerskog, James Harding,** FlexEnable Technology Ltd. (United Kingdom)

13387-10 • 4:10 PM - 4:25 PM
Mapping liquid crystal-alignment layers interaction in LCoS-type and thin cells
Author(s): **Denitsa Bankova**, **Benjamin Stedman**, **Vasilis Apostolopoulos**, **Nicolas Brouckaert**, **Giampaolo D'Alessandro, Malgosia Kaczmarek,** Univ. of Southampton (United Kingdom)

SESSION 4: E-SIGNAGES/SMART WINDOWS

27 January 2025 • 4:25 PM - 5:30 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Quan Li**, Southeast Univ. (China)

13387-11 • 4:25 PM - 4:50 PM
Color cholesteric LCD: innovations driving ESG goals in display technology *(Invited Paper)*
Author(s): **Chih Wei Chen,** IRIS Optronics Co., Ltd. (Taiwan)

13387-12 • 4:50 PM - 5:15 PM
Dual-cell liquid crystal window with three substrates and three electrodes *(Invited Paper)*
Author(s): **Xiang-Dong Mi,** Corning Incorporated (United States); **Chien-Tsung Hou,** Kent State Univ. (United States); **Mingqian He,** Corning Incorporated (United States); **Liang-Chy Chien,** Kent State Univ. (United States)

13387-13 • 5:15 PM - 5:30 PM
Liquid crystal smart window based on dynamic light scattering without ionic additives
Author(s): **Timothy Ogolla,** Kent State Univ. (United States), Advanced Materials and Liquid Crystal Institute (United States); **Xiang-Dong Mi**, **Mingqian He**, **Katerina Rousseva,** Corning Incorporated (United States); **Liang-Chy Chien,** Kent State Univ. (United States), Advanced Materials and Liquid Crystal Institute (United States)

Tuesday 28 January 2025

SESSION 5: NEW MATERIALS, DEVICES, AND APPLICATIONS

28 January 2025 • 8:30 AM - 10:20 AM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Akihiro Mochizuki**, i-CORE Technology, LLC (United States)

13387-14 • 8:30 AM - 9:05 AM
Light-driven liquid crystalline materials: from 1D photonics to 3D photonics and beyond (Keynote Presentation)
Author(s): **Quan Li,** Southeast Univ. (China)

13387-15 • 9:05 AM - 9:30 AM
Reversible morphological transformation of liquid crystal droplet induced by UV light irradiation *(Invited Paper)*
Author(s): **Yoshiko Takenaka**, **Takahiro Yamamoto,** National Institute of Advanced Industrial Science and Technology (Japan); **Miho Aizawa,** Tokyo Institute of Technology (Japan); **Uros Jagodic,** Jožef Stefan Institute (Slovenia); **Amiko Aizawa,** Keio Univ. (Japan); **Igor Musevic,** Jožef Stefan Institute (Slovenia)

13387-16 • 9:30 AM - 9:55 AM
Method for rapid foodborne pathogen detection with liquid crystal materials *(Invited Paper)*
Author(s): **Gregory Lundeen,** Crystal Diagnostics (United States)

13387-17 • 9:55 AM - 10:20 AM
Highly polar nematics: from nematic to ferroelectric nematic, and in between *(Invited Paper)*
Author(s): **Satoshi Aya**, **Mingjun Huang, Xinxin Zhang,** South China Univ. of Technology (China)

Coffee Break 10:20 AM - 10:50 AM

SESSION 6: CHIRAL PHOTONICS

28 January 2025 • 10:50 AM - 12:30 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Liang-Chy Chien**, Kent State Univ. (United States)

13387-18 • 10:50 AM - 11:25 AM
Photoaligned 3D liquid crystal arrangements for photonic components (Keynote Presentation)
Author(s): **Kristiaan Neyts,** Hong Kong Univ. of Science and Technology (Hong Kong, China), Ghent Univ. (Belgium); **Migle Stebryte**, **Rohan Sharma**, **Sunqian Liu,** Univ. Gent (Belgium); **Jeroen Beeckman,** Ghent Univ. (Belgium); **Peter Ropac**, **Matevs Marincic**, **Miha Ravnik,** University of Ljubljana (Slovenia); **Ke Xu**, **Pouya Nosratkhah**, **Le Zhou,** Hong Kong Univ. of Science and Technology (Hong Kong, China); **Inge Nys,** Univ. Gent (Belgium)

13387-19 • 11:25 AM - 11:50 AM
Helielectric polar fluid and its application *(Invited Paper)*
Author(s): **Hiroya Nishikawa, Fumito Araoka,** RIKEN (Japan)

13387-20 • 11:50 AM - 12:15 PM
Propagation of periodic director and flow patterns in a cholesteric liquid crystal under electroconvection *(Invited Paper)*
Author(s): **Jun Yoshioka**, **Hiroki Nobori**, **Koji Fukao,** Ritsumeikan Univ. (Japan); **Fumito Araoka,** RIKEN (Japan)

13387-21 • 12:15 PM - 12:30 PM
Phase behavior of blue phase liquid crystals stabilized with amorphous crosslinkers and nanoparticles
Author(s): **Kyung Min Lee**, **Urice N. Tohgha**, **Nicholas P. Godman**, **Peter R. Stevenson**, **Timothy J. Bunning, Michael E. McConney,** Air Force Research Lab. (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 7: LASING/WAVEGUIDE II

28 January 2025 • 2:00 PM - 3:25 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Chia-Rong Lee**, National Cheng Kung Univ. (Taiwan)

13387-22 • 2:00 PM - 2:35 PM
Ultralight planar optics and photonics systems for space applications (Keynote Presentation)
Author(s): **Nelson V. Tabiryan**, **David Roberts,** BEAM Engineering for Advanced Measurements Co. (United States); **Grover Swartzlander,** Rochester Institute of Technology (United States); **Eugene Serabyn,** Jet Propulsion Lab. (United States); **Jonathan Slagle**, **Michael E. McConney, Timothy J. Bunning,** Air Force Research Lab. (United States)

13387-23 • 2:35 PM - 3:00 PM
Photopatterning molecular orientations with ultra-high spatial resolutions *(Invited Paper)*
Author(s): **Hai Yun**, **Songxu Jiang**, **Hao Chen**, **Youyang Zhu,** Southern Univ. of Science and Technology (China); **Xinzhu Xu,** Peking Univ. (China); **Bingxiang Li,** Nanjing Univ. of Posts and Telecommunications (China); **Peng Xi,** Peking Univ. (China); **Miao Jiang, Qi-Huo Wei,** Southern Univ. of Science and Technology (China)

13387-24 • 3:00 PM - 3:25 PM
Liquid crystal quantum light sources and lasers *(Invited Paper)*
Author(s): **Matjaž Humar,** Ctr. of Excellence on Nanoscience and Nanotechnology - Nanocenter (Slovenia)

Coffee Break 3:25 PM - 3:55 PM

SESSION 8: SLM/BEAM STEERERS/GRATINGS

28 January 2025 • 3:55 PM - 5:35 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Liang-Chy Chien**, Kent State Univ. (United States)

13387-25 • 3:55 PM - 4:20 PM
Liquid crystal cells with nanowall electrodes *(Invited Paper)*
Author(s): **Chia-Yi Huang**, **Harry Miyosi Silalahi, Risti Suryantari,** Tunghai Univ. (Taiwan)

13387-26 • 4:20 PM - 4:45 PM
Large continuous steering angle with millisecond response liquid crystal-based beam steering *(Invited Paper)*
Author(s): **Akihiro Mochizuki,** i-CORE Technology, LLC (United States)

13387-27 • 4:45 PM - 5:20 PM
Dynamic heterogeneity in various homogeneous and transparent soft matter (Keynote Presentation)
Author(s): **Jun Yamamoto,** Kyoto Univ. (Japan)

13387-28 • 5:20 PM - 5:35 PM
Directional deformation in light-responsive amorphous polymers
Author(s): **Emiliano Descrovi,** Politecnico di Torino (Italy); **David Urban, Dag Roar Hjelme,** Norwegian Univ. of Science and Technology (Norway)

Wednesday 29 January 2025

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13387-29 • 6:00 PM - 8:00 PM
Electrically switchable continuous liquid crystal Fresnel zone plates
Author(s): **Zhiyu Xu**, **Camron Nourshargh**, **Alec Xu**, **Steve Elston**, **Tessar Wang**, **Nathan Spiller**, **Martin J. Booth**, **Patrick Salter, Stephen M. Morris,** Univ. of Oxford (United Kingdom)

13387-30 • 6:00 PM - 8:00 PM
Tunable diffractor using liquid crystals and carbon black nanoparticles
Author(s): **ChaeLim Han**, **Yeon Jin Han**, **GyuRi Choi**, **Young Jin Lim**, **Seung Hee Lee, MinSu Kim,** Jeonbuk National Univ. (Korea, Republic of)

13387-31 • 6:00 PM - 8:00 PM
Demonstrating terahertz induced optical non-linearity in liquid crystal using z-scan method
Author(s): **Ben Beddoes**, **Nicholas Klokkou**, **Malgosia Kaczmarek,** Univ. of Southampton (United Kingdom); **Vassili A. Fedotov,** Optoelectronics Research Ctr. (United Kingdom); **Vasilis Apostolopoulos,** Univ. of Southampton (United Kingdom), Univ. of Crete (Greece)

13387-32 • 6:00 PM - 8:00 PM
Localized states with Rashba-Dresselhaus spin-orbit coupling
Author(s): **Rafał Mirek,** IBM Research - Zürich (Switzerland); **Pavel Kokhanchik,** Univ. Clermont Auvergne (France); **Darius Urbonas**, **Ioannis Georgakilas,** IBM Research - Zürich (Switzerland); **Marcin Muszyński**, **Piotr Kapuściński**, **Przemysław Oliwa**, **Barbara Piętka**, **Jacek Szczytko,** Univ. of Warsaw (Poland); **Michael Forster**, **Ulrich Scherf,** Bergische Univ. Wuppertal (Germany); **Przemysław Morawiak**, **Wiktor Piecek**, **Przemysław Kula,** Wojskowa Akademia Techniczna im. Jaroslawa Dabrowskiego (Poland); **Dmitry Solnyshkov**, **Guillaume Malpuech,** Univ. Clermont Auvergne (France); **Rainer F. Marht, Thilo Stöferle,** IBM Research - Zürich (Switzerland)

13387-33 • 6:00 PM - 8:00 PM
Dynamic deep-ultraviolet beam pattern structuring in nonlinear third harmonic generation by spatial wavefront modulation of near-infrared driving laser
Author(s): **Seungjai Won**, **Jungyoon Kim**, **Taewon Kim**, **Seungman Choi,** KAIST (Korea, Republic of); **Byunggi Kim,** Tokyo Institute of Technology (Japan); **Joohyung Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of); **Seung-Woo Kim, Young-Jin Kim,** KAIST (Korea, Republic of)

13387-34 • 6:00 PM - 8:00 PM
When liquid crystals encounter structured light
Author(s): **Le Zhou,** Colorado School of Mines (United States); **Yuanfeng Liu,** Tsinghua University (China); **Kristiaan Neyts,** The Hong Kong University of Science and Technology (Hong Kong, China); **Yang Shen**, **Jingbo Sun, Ji Zhou,** Tsinghua University (China)

CONFERENCE 13388

Advances in Display Technologies XV

27 - 28 January 2025 | Moscone West, Room 2002 (Level 2)

Conference Chair(s): **Jiun-Haw Lee,** National Taiwan Univ. (Taiwan); **Qiong-Hua Wang,** Beihang Univ. (China)

Conference Co-Chair(s): **Liang-Chy Chien,** Kent State Univ. (United States)

Program Committee: **Liangcai Cao,** Tsinghua Univ. (China); **Li Yin Chen,** National Yang Ming Chiao Tung Univ. (Taiwan); **Yu-Chieh Cheng,** National Taipei Univ. of Technology (Taiwan); **Tien-Lung Chiu,** Yuan Ze Univ. (Taiwan); **Nobuyuki Hashimoto,** Citizen Watch Co., Ltd. (Japan); **Yan Li,** Shanghai Jiao Tong Univ. (China); **Shun-Wei Liu,** Ming Chi Univ. of Technology (Taiwan); **Akihiro Mochizuki,** i-CORE Technology, LLC (United States); **Fenglin Peng,** Meta (United States); **Zong Qin,** Sun Yat-Sen Univ. (China)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:45 AM

SESSION 1: MICRO-LED

27 January 2025 • 10:45 AM - 12:05 PM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Uwe Vogel**, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

13388-1 • 10:45 AM - 11:15 AM
MicroLED display development roadmap *(Invited Paper)*
Author(s): **Ying-Tsang Liu**, **Ching-Liang Lin**, **Tzu-Yang Lin, Yun-Li Li,** PlayNitride Display Co., Ltd. (Taiwan)

13388-2 • 11:15 AM - 11:45 AM
Commercializing nanowire LEDs for AR/VR/MR headset displays *(Invited Paper)*
Author(s): **Seth Coe-Sullivan,** NS Nanotech, Inc. (United States)

13388-3 • 11:45 AM - 12:05 PM
Directional emission from full color hybrid GaN LEDs for AR glasses
Author(s): **Jaesang Lee,** Seoul National Univ. (Korea, Republic of)

Lunch Break 12:05 PM - 1:15 PM

SESSION 2: AR/VR

27 January 2025 • 1:15 PM - 3:15 PM | Moscone West, Room 2002 (Level 2)

Session Chair(s): **Jaesang Lee**, Seoul National Univ. (Korea, Republic of)

13388-4 • 1:15 PM - 1:45 PM
Augmented reality waveguide display based on liquid crystal polarization volume gratings *(Invited Paper)*
Author(s): **Yu-Chieh Cheng**, **Yu-Wei Cheng**, **Nien-Jung Chiang,** National Taipei Univ. of Technology (Taiwan); **Ting-Wei Huang**, **Bo-Kai Zhang**, **Ji-Ping Sheng, Wen-Chang Hung,** ASUSTeK Computer Inc. (Taiwan)

13388-5 • 1:45 PM - 2:15 PM
Breaking in-coupling efficiency and uniformity tradeoff in waveguide-based AR displays with polarization volume gratings *(Invited Paper)*
Author(s): **Yuqiang Ding**, **Qian Yang**, **Zhiyong Yang,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Yuge Huang,** Meta Reality Labs Research (United States); **Shin-Tson Wu,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13388-6 • 2:15 PM - 2:35 PM
Optical and photonic simulation of exit pupil expander of AR/VR
Author(s): **Majid Heidari**, **Jeffery Huang, Metin Ozen,** Ozen Engineering, Inc. (United States)

13388-7 • 2:35 PM - 2:55 PM
Innovative fabrication of high-refractive-index components for AR using UV-curable metal oxide precursors
Author(s): **Omid Sadeghi**, **Cory Perkins, Douglas Keszler,** Phosio Corp. (United States)

13388-8 • 2:55 PM - 3:15 PM
A deep learning and linear filtering hybrid pre-emphasis image enhancement technique to increase visual quality of liquid crystal linear interpolation of UHD 11,800 PPI liquid crystal on silicon XR microdisplay
Author(s): **Minsu Jeong,** RAONTECH (Korea, Republic of); **Young-Min Jeong,** Korea Univ. (Korea, Republic of); **Saejin Park,** RAONTECH (Korea, Republic of); **Jiwoo Jeong,** Michigan State Univ. (United States); **Jong-Ok Kim,** Korea Univ. (Korea, Republic of)

Coffee Break 3:15 PM - 3:45 PM

SESSION 3: NTE

27 January 2025 • 3:45 PM - 6:15 PM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Yu-Chieh Cheng**, National Taipei Univ. of Technology (Taiwan)

13388-9 • 3:45 PM - 4:15 PM
Towards highest pixel density, lowest power consumption, and semi-transparent microdisplays: approaches and achievements *(Invited Paper)*
Author(s): **Uwe Vogel**, **Philipp Wartenberg**, **Bernd Richter**, **Stephan Brenner**, **Judith Baumgarten**, **Simone Lenk**, **Karsten Fehse**, **Dirk Schlebusch**, **Michael Toerker**, **Andreas Fritscher**, **Johannes Zeltner**, **Christian Schmidt**, **Martin Rolle**, **Steffen Damnik**, **Josephine Muetze, Florian Schuster,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

13388-10 • 4:15 PM - 4:45 PM
Wearable adaptive optics for the human eye *(Invited Paper)*
Author(s): **Pablo Artal, Alba Maria Paniagua-Diaz,** Univ. de Murcia (Spain)

13388-11 • 4:45 PM - 5:15 PM
Light field AR display for close-range applications: advantages, use cases, and challenges *(Invited Paper)*
Author(s): **Bing-Cheng Chiang**, **Chih-Sheng Chang**, **Wen Perng**, **Ting-Hsun Chi**, **Yu-Hsiang Huang,** National Taiwan Univ. (Taiwan); **Ting-Yu Wei,** PetaRay Inc. (Taiwan); **Kuang-Chen Yen,** Department of Medical Imaging, National Taiwan Univ. Hospital (Taiwan); **Ming-Lun Han**, **Wei-Chih Liao,** Department of Internal Medicine, National Taiwan Univ. Hospital (Taiwan); **Shyh-Jye Chen,** Department of Medical Imaging, National Taiwan Univ. Hospital (Taiwan); **Homer H. Chen,** National Taiwan Univ. (Taiwan)

13388-12 • 5:15 PM - 5:35 PM
Visible light red, green, and blue multiplexer by sputter-deposited thin-film lithium niobate
Author(s): **Atsushi Shimura**, **Jiro Yoshinari**, **Hiroki Hara**, **Hiroshi Take**, **Tetsuya Mino**, **Shigeru Mieda**, **Takashi Kikukawa**, **Katsumi Kawasaki**, **Yasuhiro Takagi, Hideaki Fukuzawa,** TDK Corp. (Japan)

13388-13 • 5:35 PM - 5:55 PM
Fabrication and analysis of directional microholograms for a new generation of displays
Author(s): **Salaheddine Toubi,** Univ. Grenoble Alpes (France), CEA-LETI (France); **Elise Ghibaudo,** Univ. Grenoble Alpes (France), Univ. Savoie Mont Blanc (France), CROMA (France); **Christophe Martinez,** CEA-LETI (France)

13388-34 • 5:55 PM - 6:15 PM
UV stable high-index nanocomposite formulations for advanced display applications
Author(s): **Brian Szychowski**, **Aaron Krieg**, **Peter Guschl,** Pixelligent Technologies LLC (United States); **Neil Pschirer,** Pixelligent Technologies (United States); **Serpil Gonen Williams,** Pixelligent Technologies LLC (United States)

Tuesday 28 January 2025

SESSION 4: HOLOGRAPHIC DISPLAYS, HOE, AND MEASUREMENT

28 January 2025 • 8:00 AM - 10:10 AM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Zong Qin**, Sun Yat-Sen Univ. (China)

13388-14 • 8:00 AM - 8:30 AM
Role of perceptually guided image quality metrics in computer-generated holography *(Invited Paper)*
Author(s): **Doğa Yilmaz,** Özyeğin Univ. (Turkey); **Rafal Mantiuk,** Univ. of Cambridge (United Kingdom); **Kaan Akşit,** Univ. College London (United Kingdom)

13388-15 • 8:30 AM - 9:00 AM
High-speed and high-quality computer-generated holography with deep learning assistance *(Invited Paper)*
Author(s): **Kexuan Liu**, **Jiachen Wu**, **Liangcai Cao, Yunhui Gao,** Tsinghua Univ. (China)

13388-16 • 9:00 AM - 9:20 AM
Bragg compensated non-normal incidence HOE fabrication for occlusion capable near eye display
Author(s): **Chun Wei Ooi,** The Univ. of Tokyo (Japan); **Dipanjan Chakraborty**, **Owen Kearney**, **Izabela Naydenova,** Technological Univ. Dublin (Ireland); **John Dingliana,** Trinity College Dublin (Ireland); **Suzanne Martin,** Technological Univ. Dublin (Ireland)

13388-17 • 9:20 AM - 9:40 AM
Photophoretic optical particle trapping improvements using beam reflection
Author(s): **Ian Garcia**, **Kun Hua, Xiaomin Jin,** California Polytechnic State Univ., San Luis Obispo (United States)

13388-18 • 9:40 AM - 10:10 AM
A novel critical dimension metrology by conducting soft x-ray technique for advanced semiconductor manufacturing *(Invited Paper)*
Author(s): **Chia-Hsun Chen**, **Jin-Yu Liu**, **Chiu-Hun Su**, **Fang-Hsun Lin**, **Wei-En Fu,** Industrial Technology Research Institute (Taiwan); **Chun-Ting Liu**, **Bo-Ching He**, **Kai-Hao Chang**, **Kuo-Feng Lin**, **Yu Yan Au Yong, Thung-Hsien Han,** NanoSeeX Inc. (Taiwan)

Coffee Break 10:10 AM - 10:30 AM

SESSION 5: 3D DISPLAY

28 January 2025 • 10:30 AM - 12:00 PM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Liangcai Cao**, Tsinghua Univ. (China)

13388-19 • 10:30 AM - 11:00 AM
Real-time rendering super Multiview display through a universal rendering engine *(Invited Paper)*
Author(s): **Zong Qin**, **Jiaqi Dong**, **Yunfan Cheng**, **Yifan Ding**, **Qimeng Wang,** Sun Yat-Sen Univ. (China); **Yaodong Wu**, **Wei Wu**, **Hao Wu, Feng Lu,** Shanghai Tianma Microelectronics Co., Ltd. (China)

13388-20 • 11:00 AM - 11:30 AM
Thin virtual reality display presenting Maxwellian and super-multiview three-dimensional images *(Invited Paper)*
Author(s): **Jae-Hyeung Park**, **Minseong Kim**, **Woongseob Han,** Seoul National Univ. (Korea, Republic of); **Xu Yunhan,** Inha Univ. (Korea, Republic of)

13388-21 • 11:30 AM - 12:00 PM
High-performance integral imaging based light field 3D display *(Invited Paper)*
Author(s): **Yuang Chen**, **Chongji Zhao**, **Yucheng Bai, Huan Deng,** Sichuan Univ. (China)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 6: LIGHT MANIPULATION

28 January 2025 • 1:30 PM - 3:00 PM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Jae-Hyeung Park**, Seoul National Univ. (Korea, Republic of)

13388-22 • 1:30 PM - 2:00 PM
Image steering by MEMS SLMs for display and lidar applications *(Invited Paper)*
Author(s): **Yuzuru Takashima**, **Xianyue Deng**, **Gregory Nero**, **Tianyao Zhang**, **Yexin Pei**, **Chuan Luo**, **Emil Varghese**, **Rajesh Shrestha**, **Yefu Zhang**, **Yu-Kai Shen, Yushi Kaneda,** Wyant College of Optical Sciences (United States)

13388-23 • 2:00 PM - 2:30 PM
Advancements in liquid crystal-based lenses for XR near eye displays: technologies and applications *(Invited Paper)*
Author(s): **Kun Gao,** Goertek Electronics, Inc. (United States)

13388-24 • 2:30 PM - 3:00 PM
50 μs optical response in-plane only retardation switching liquid crystal technology for display uses *(Invited Paper)*
Author(s): **Akihiro Mochizuki,** i-CORE Technology, LLC (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 7: OLED

28 January 2025 • 3:30 PM - 6:00 PM | Moscone West, Room 2002 (Level 2)
Session Chair(s): **Chia-Hsun Chen**, Industrial Technology Research Institute (Taiwan)

13388-25 • 3:30 PM - 4:00 PM
Triplet harvesting organic emitters for OLED and sensing applications *(Invited Paper)*
Author(s): **Juozas Vidas Grazulevicius,** Kaunas Univ. of Technology (Lithuania)

13388-26 • 4:00 PM - 4:30 PM
Understanding the key roles of defects in determining OLED efficiency and lifetimes *(Invited Paper)*
Author(s): **Jaesang Lee,** Seoul National Univ. (Korea, Republic of)

13388-27 • 4:30 PM - 5:00 PM
Degradation of organic LEDs characterized with algebraic decay relaxation function *(Invited Paper)*
Author(s): **Can Aygen**, **Michael Richards**, **Ramin Yazdaanpanah**, **Sachin P. Kulkarni**, **Ibrahim Tanriover**, **Claire C. Onsager,** Northwestern Univ. (United States); **Bo-Yen Lin,** National Dong Hwa Univ. (Taiwan); **Jiun-Haw Lee,** National Taiwan Univ. (Taiwan); **Koray Aydin, Matthew A. Grayson,** Northwestern Univ. (United States)

13388-28 • 5:00 PM - 5:30 PM
Naphthyridine-based luminophores for highly efficient thermally activated delayed fluorescence organic light-emitting diodes *(Invited Paper)*
Author(s): **Rasa Keruckiene,** Kaunas Univ. of Technology (Lithuania); **Chia-Hsun Chen**, **Chun-Chieh Chu,** National Taiwan Univ. (Taiwan); **Dmytro Volyniuk,** Kaunas Univ. of Technology (Lithuania); **Tien-Lung Chiu**, **Jiun-Haw Lee,** National Taiwan Univ. (Taiwan); **Juozas Vidas Grazulevicius,** Kaunas Univ. of Technology (Lithuania)

13388-29 • 5:30 PM - 6:00 PM
Triplet-triplet fusion in organic light-emitting diodes *(Invited Paper)*
Author(s): **Jiun-Haw Lee,** National Taiwan Univ. (Taiwan); **Tien-Lung Chiu,** Yuan Ze Univ. (Taiwan); **Yi-Ting Lee,** Soochow Univ. (Taiwan); **Man-Kit Leung,** National Taiwan Univ. (Taiwan); **Bo-Yen Lin,** National Dong Hwa Univ. (Taiwan); **Chia-Hsun Chen,** National Taiwan Univ. (Taiwan)

Wednesday 29 January 2025

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13388-30 • 6:00 PM - 8:00 PM
Innovative HLED technology: advancing automotive rear lamp design with slim, high-performance light sources
Author(s): **Seokho Jeong, Eunbi Kwon,** Hyundai Mobis Co., Ltd. (Korea, Republic of)

13388-31 • 6:00 PM - 8:00 PM
Non-doped blue fluorescent organic light emitting diode based on pyrene derivative
Author(s): **Kuan-Wei Chen**, **Zheng-Yu Wei,** National Taiwan Univ. (Taiwan); **Chiao-En Li**, **Yi-Ting Lee,** Soochow Univ. (Taiwan); **Tien-Lung Chiu,** Yuan Ze Univ. (Taiwan); **Jiun-Haw Lee,** National Taiwan Univ. (Taiwan)

13388-32 • 6:00 PM - 8:00 PM
Bipolar phenoxathiine derivatives exhibiting thermally activated delayed fluorescence or room temperature phosphorescence
Author(s): **Asta Dabuliene**, **Oleksandr Bezvikonnyi**, **Rasa Keruckiene**, **Jurate Simokaitiene, Juozas Vidas Grazulevicius,** Kaunas Univ. of Technology (Lithuania)

13388-33 • 6:00 PM - 8:00 PM
Red and near-infrared absorbing organic semiconductors for advanced technologies
Author(s): **Viktorija Andruleviciene**, **Juozas Vidas Grazulevicius, Rita Butkute,** Kaunas Univ. of Technology (Lithuania)

13388-35 • 6:00 PM - 8:00 PM
Accurate calibration for measurement of displays
Author(s): **Matthew Falanga**, **Christopher Wandersee, Samarpita Chowdhury,** Novanta (United States)

13388-36 • 6:00 PM - 8:00 PM
Spectroradiometer accessories for near eye displays
Author(s): **Matthew Falanga,** Novanta (United States)

13388-37 • 6:00 PM - 8:00 PM
Laser-driven colour converter with Al_2O_3-ZnO composite phosphor-in-glass for high-brightness white light illumination
Author(s): **Dheeraj Kumar**, **R. K. Varshney, Dalip Singh Mehta,** Indian Institute of Technology Delhi (India)

CONFERENCE 13389

Ultra-High-Definition Imaging Systems VIII

29 January 2025 | Moscone West, Room 2004 (Level 2)

Conference Chair(s): **Seizo Miyata,** Tokyo Univ. of Agriculture and Technology (Japan); **Toyohiko Yatagai,** Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Yasuhiro Koike,** Keio Univ. (Japan)

Program Committee: **Partha P. Banerjee,** Univ. of Dayton (United States); **Liangcai Cao,** Tsinghua Univ. (China); **Janglin Chen,** Industrial Technology Research Institute (Taiwan); **Ray T. Chen,** The Univ. of Texas at Austin (United States); **Toshio Chiba,** Medical Innovation Consortium (Japan); **Namho Hur,** Electronics and Telecommunications Research Institute (Korea, Republic of); **Norihiko Ishii,** NHK Japan Broadcasting Corp. (Japan); **Toru Iwane,** Nikon Corp. (Japan); **Bahram Javidi,** Univ. of Connecticut (United States); **Kyuheon Kim,** Kyung Hee Univ. (Korea, Republic of); **Gauthier Lafruit,** Univ. Libre de Bruxelles (Belgium); **Byoungho Lee,** Seoul National Univ. (Korea, Republic of); **Shiuan-Huei Lin,** National Yang Ming Chiao Tung Univ. (Taiwan); **Kenta Muramoto,** Keio Univ. (Japan); **Wolfgang Osten,** Institut für Technische Optik (Germany); **No-Cheol Park,** Yonsei Univ. (Korea, Republic of); **Ifor D. W. Samuel,** Univ. of St. Andrews (United Kingdom); **Mark Schubin,** Hollywood Post Alliance (United States); **Atsushi Shishido,** Institute of Integrated Research, Institute of Science Tokyo (Japan); **Okihiro Sugihara,** Utsunomiya Univ. (Japan); **Xiaodi Tan,** Fujian Normal Univ. (China); **Kenkichi Tanioka,** Medical Innovation Consortium (Japan); **Din Ping Tsai,** City Univ. of Hong Kong (Hong Kong, China); **Whitney R. White,** Chromis Fiberoptics Inc. (United States); **Hirotsugu Yamamoto,** Utsunomiya Univ. (Japan); **Kenji Yamamoto,** National Institute of Information and Communications Technology (Japan); **Hiromasa Yamashita,** Air Water Inc. (Japan)

Wednesday 29 January 2025

SESSION 1: DATA STORAGE

29 January 2025 • 9:00 AM - 11:40 AM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Hirotsugu Yamamoto**, Utsunomiya Univ. (Japan); **Yasuhiro Koike**, Keio Univ. (Japan)

13389-1 • 9:00 AM - 9:20 AM
Multi-channel polarization holograms recording based on optical polarized orthogonal matrix *(Invited Paper)*
Author(s): **Shujun Zheng,** Fujian Normal Univ. (China); **Jiaren Tan,** Univ. of Toronto (Canada); **Xianmiao Xu**, **Hongjie Liu**, **Ruying Xiong**, **Xu Zheng**, **Peng Lin**, **Xueyan Chen**, **Junchao Jin**, **Jinyu Wang**, **Yi Yang, Xiaodi Tan,** Fujian Normal Univ. (China)

13389-2 • 9:20 AM - 9:35 AM
Design of the vertical axis ACT for holographic data storage system
Author(s): **Rupeng Yang**, **Yiping Liu**, **Jingjun Huang**, **Yilong Zhuang,** Fujian Normal Univ. (China); **Jianshe Ma**, **Jiayong Lin**, **Xianwen Yang,** Tsinghua Univ. Shenzhen International Graduate School (China); **Mingyuan Liu,** Duke Univ. (United States); **Xiao Lin, Xiaodi Tan,** Fujian Normal Univ. (China)

13389-3 • 9:35 AM - 9:55 AM
Multilayer optical data storage systems for active archives *(Invited Paper)*
Author(s): **Kenneth D. Singer,** Case Western Reserve Univ. (United States), Folio Photonics LLC (United States)

13389-4 • 9:55 AM - 10:15 AM
Advanced holographic data storage modulated by amplitude, phase, and polarization *(Invited Paper)*
Author(s): **Xiaodi Tan**, **Xiao Lin**, **Jianying Hao**, **Haiyang Song**, **Yongkun Lin**, **Shenghui Ke**, **Shujun Zheng**, **Hongjie Liu**, **Xianmiao Xu**, **Rupeng Yang**, **Junchao Jin**, **Junhui Wu**, **Dakui Lin, Yuhong Ren,** Fujian Normal Univ. (China)

13389-5 • 10:15 AM - 10:30 AM
High-capacity sparse modulation code for holographic data storage
Author(s): **Hongjie Liu**, **Shujun Zheng**, **Haiyang Song**, **Yongkun Lin**, **Junchao Jin**, **Xu Zheng**, **Ruying Xiong**, **Dakui Lin**, **Xiao Lin, Xiaodi Tan,** Fujian Normal Univ. (China)

Coffee Break • 10:30 AM - 11:00 AM

13389-6 • 11:00 AM - 11:20 AM
Polarization-sensitive materials for holographic data storage *(Invited Paper)*
Author(s): **Daisuke Barada,** Utsunomiya Univ. (Japan)

13389-18 • 11:20 AM - 11:40 AM
Flexible all-solid self-written waveguides for fiber-to-fiber self-coupling *(Invited Paper)*
Author(s): **Okihiro Sugihara**, **Hayato Kakurai**, **Hidetaka Terasawa, Keisuke Kondo,** Utsunomiya Univ. (Japan)

SESSION 2: DISPLAY I

29 January 2025 • 11:40 AM - 12:15 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Xiaodi Tan**, Fujian Normal Univ. (China)

13389-7 • 11:40 AM - 12:00 PM
Holographic gratings based on liquid-crystalline polymer coatings *(Invited Paper)*
Author(s): **Atsushi Shishido,** Institute of Science Tokyo (Japan)

13389-8 • 12:00 PM - 12:15 PM
The reconstruction, testing and improvement of a historical giant astronomical telescope
Author(s): **Wolfgang Osten**, **Christof Pruss**, **Alois Herkommer**, **Christian Schober**, **Kevin Treptow**, **Michael Wischert,** Institut für Technische Optik (Germany); **Hans-Joachim Leue,** Astronomicum (Germany)

Lunch/Exhibition Break 12:15 PM - 1:45 PM

SESSION 3: DISPLAY II

29 January 2025 • 1:45 PM - 2:35 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Xiaodi Tan**, Fujian Normal Univ. (China)

13389-9 • 1:45 PM - 2:00 PM
Compensation for color mura on displays by reducing degree of polarization
Author(s): **Shizuki Sasaki, Yasuhiro Koike,** Keio Univ. (Japan)

13389-10 • 2:00 PM - 2:20 PM
Polarization grating using photoalignable liquid crystalline polymer and control of its birefringence *(Invited Paper)*
Author(s): **Nobuhiro Kawatsuki**, **Mizuho Kondo,** Univ. of Hyogo (Japan); **Moritsugu Sakamoto, Hiroshi Ono,** Nagaoka Univ. of Technology (Japan)

13389-11 • 2:20 PM - 2:35 PM
Color change with structural deformation of resin-formed metal semi-shell structure
Author(s): **Narumi Asato,** Utsunomiya Univ. (Japan); **Ryushi Fujimura,** Utsunomiya Univ. (Japan), Univ. of Tokyo (Japan)

SESSION 4: IMAGING SYSTEMS

29 January 2025 • 2:35 PM - 4:55 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Atsushi Shishido**, Institute of Science Tokyo (Japan); **Daisuke Barada**, Utsunomiya Univ. (Japan)

13389-12 • 2:35 PM - 2:55 PM
Numerical investigation of volume holographic waveguides for application to AR/MR glasses *(Invited Paper)*
Author(s): **Ryushi Fujimura**, **Toshiteru Nakamura**, **Kenta Kikuchi, Daiki Kataoka,** Utsunomiya Univ. (Japan)

13389-13 • 2:55 PM - 3:15 PM
Design and fabrication of metasurface towards high-definition complex amplitude measurement *(Invited Paper)*
Author(s): **Teruyoshi Nobukawa**, **Ryo Higashida, Kei Hagiwara,** NHK Japan Broadcasting Corp. (Japan)

13389-14 • 3:15 PM - 3:30 PM
High-precision tracking using gradient marker with LiDAR
Author(s): **Shota Hasui, Daisuke Barada,** Utsunomiya Univ. (Japan)

Coffee Break • 3:30 PM - 4:00 PM

13389-15 • 4:00 PM - 4:15 PM
5-inch high-resolution aerial display by use of retro-reflector and a Fresnel lens
Author(s): **Kazuaki Takiyama,** Utsunomiya Univ. (Japan), JSPS Research Fellowship (Japan); **Toru Iwane**, **Shiro Suyama,** Utsunomiya Univ. (Japan); **Kenichiro Masaoka,** NHK Japan Broadcasting Corp. (Japan); **Hirotsugu Yamamoto,** Utsunomiya Univ. (Japan)

13389-16 • 4:15 PM - 4:35 PM
Optical design and applications of aquatic display based on AIRR *(Invited Paper)*
Author(s): **Hirotsugu Yamamoto**, **Ryosuke Ichikawa**, **Hiroki Takatsuka**, **Toru Iwane, Shiro Suyama,** Utsunomiya Univ. (Japan)

13389-17 • 4:35 PM - 4:55 PM
Image processing using volume holography *(Invited Paper)*
Author(s): **Austin Scott, Partha P. Banerjee,** Univ. of Dayton (United States)

SESSION 5: TRANSMISSION

29 January 2025 • 4:55 PM - 5:50 PM | Moscone West, Room 2004 (Level 2)
Session Chair(s): **Ryushi Fujimura**, Utsunomiya Univ. (Japan)

13389-19 • 4:55 PM - 5:15 PM
Graded-index plastic optical fiber for needle-sized lens and rigid endoscope *(Invited Paper)*
Author(s): **Hiromasa Yamashita,** Air Water Inc. (Japan); **Ikko Koike**, **Masaya Nakamura, Yasuhiro Koike,** Keio Univ. (Japan)

13389-20 • 5:15 PM - 5:35 PM **(CANCELLED)**
Gi-POF, decreasing core size for improving performance of data communications *(Invited Paper)*
Author(s): **Dexi Weng,** Dexyan Global, LLC (United States)

13389-21 • 5:35 PM - 5:50 PM
Error-free graded-index plastic optical fiber for 53.125 Gb/s PAM4 transmission with DSP-free transceivers
Author(s): **Kenta Muramoto, Yasuhiro Koike,** Keio Univ. (Japan)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13389-22 • 6:00 PM - 8:00 PM
Effect of the increased resolution to the usability in interaction between curved aerial 3D images and planar operations by use of 2D sensors and 3D space
Author(s): **Ryota Yamada**, **Takumi Watanabe**, **Mayu Adachi**, **Shiro Suyama, Hirotsugu Yamamoto,** Utsunomiya Univ. (Japan)

13389-23 • 6:00 PM - 8:00 PM
Alignment-free diffuser film composed of dielectric multilayers and an optical path conversion layer for mini-LED backlights
Author(s): **Marii Nishikawa,** Dai Nippon Printing Co., Ltd. (Japan), Utsunomiya Univ. (Japan); **Yukio Taniguchi**, **Masahiro Goto**, **Yasuyuki Ohyagi**, **Yoshihiro Kanai**, **Masayuki Sekido,** Dai Nippon Printing Co., Ltd. (Japan); **Hirotsugu Yamamoto,** Utsunomiya Univ. (Japan)

CONFERENCE 13390

Practical Holography XXXIX: Displays, Materials, and Applications

28 - 29 January 2025 | Moscone West, Room 2006 (Level 2)

Conference Chair(s): **Pierre-Alexandre J. Blanche,** Formerly with Wyant College of Optical Sciences (United States); **Hiroshi Yoshikawa,** Nihon Univ. (Japan)

Program Committee: **Maria Isabel Azevedo,** Univ. de Aveiro (Portugal); **Partha P. Banerjee,** Univ. of Dayton (United States); **Hans I. Bjelkhagen,** Hansholo Consulting Ltd. (United Kingdom); **David Blinder,** Vrije Univ. Brussel (Belgium); **Ivan B. Divliansky,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Philippe Gentet,** Kwangwoon Univ. (Korea, Republic of), Ultimate Holography (France); **Nam Kim,** Chungbuk National Univ. (Korea, Republic of); **Hong-Seok Lee,** Pukyong National Univ. (Korea, Republic of); **Juan Liu,** Beijing Institute of Technology (China); **Robert R. McLeod,** Univ. of Colorado Boulder (United States); **Deanna McMillen,** Garmin International, Inc. (United States); **Pascal Picart,** Lab. d'Acoustique de l'Univ. du Mans (France); **Daniel E. Smalley,** Brigham Young Univ. (United States); **Yaping Zhang,** Kunming Univ. of Science and Technology (China)

Tuesday 28 January 2025

SESSION 1: TECHNIQUES AND CONCEPTS IN DISPLAY HOLOGRAPHY I

28 January 2025 • 8:30 AM - 10:00 AM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)

13390-1 • 8:30 AM - 9:00 AM
Holographic displays for augmented reality *(Invited Paper)*
Author(s): **Edward Buckley,** Swave Photonics (Belgium); **Andrzej Kaczorowski,** Swave Photonics (United Kingdom); **Aaron Demolder,**

13390-2 • 9:00 AM - 9:20 AM
Towards zero-th order free, full field of view, computer generated holography
Author(s): **Alessandro Cerioni**, **Marco Astarita ,** Politecnico di Milano (Italy); **Tommaso Ongarello**, **Anna Cesaratto,** EssilorLuxottica Smart Eyewear Lab (Italy); **Giulio N. F. Cerullo**, **Andrea Bassi**, **Gianluca Valentini, Paolo Pozzi,** Politecnico di Milano (Italy)

13390-3 • 9:20 AM - 9:40 AM
See through three-dimensional aerial display by HOE, dihedral hederal reflector array, and depth fused 3D display
Author(s): **Isamu Nakao**, **Keishi Nagatomo,** Nagasaki Univ. (Japan); **Masahiro Yamaguchi,** Tokyo Institute of Technology (Japan); **Hideaki Takada,** Nagasaki Univ. (Japan)

13390-4 • 9:40 AM - 10:00 AM
Compressing phase-only holograms via deep phase unwrapping
Author(s): **Yoshiki Watanabe**, **Chihiro Tsutake**, **Keita Takahashi, Toshiaki Fujii,** Nagoya Univ. Graduate School of Engineering (Japan)

Coffee Break 10:00 AM - 10:30 AM

SESSION 2: TECHNIQUES AND CONCEPTS IN DISPLAY HOLOGRAPHY II

28 January 2025 • 10:30 AM - 12:00 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Hiroshi Yoshikawa**, Nihon Univ. (Japan)

13390-5 • 10:30 AM - 11:00 AM
Learning plane-to-multiplane light propagation improves hologram optimization *(Invited Paper)*
Author(s): **Chuanjun Zheng**, **Yicheng Zhan, Kaan Akşit,** Univ. College London (United Kingdom)

13390-7 • 11:00 AM - 11:20 AM
3D holography using communication mode optics

Author(s): **Ahmed H. Dorrah,** Technische Univ. Eindhoven (Netherlands), Harvard Univ. (United States); **Vinicius S. de Angelis,** Harvard Univ. (United States), Univ. de São Paulo (Brazil); **Leonardo A. Ambrosio,** Univ. de São Paulo (Brazil); **David A. B. Miller,** Stanford Univ. (United States); **Federico Capasso,** Harvard Univ. (United States)

13390-8 • 11:20 AM - 11:40 AM
See-through characteristics of direct-view augmented reality holographic near-eye display
Author(s): **Youngsub Kim, Hwi Kim,** Korea Univ. (Korea, Republic of)

13390-9 • 11:40 AM - 12:00 PM
Wireframe holography: a new method for computer-generated holography
Author(s): **Marco Astarita** , **Alessandro Cerioni**, **Andrea Bassi,** Politecnico di Milano (Italy); **Anna Cesaratto**, **Tommaso Ongarello,** Luxottica S.r.l. (Italy); **Giulio N. F. Cerullo**, **Gianluca Valentini, Paolo Pozzi,** Politecnico di Milano (Italy)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 3: TECHNIQUES AND CONCEPTS IN DISPLAY HOLOGRAPHY III

28 January 2025 • 1:30 PM - 3:40 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Hiroshi Yoshikawa**, Nihon Univ. (Japan)

13390-10 • 1:30 PM - 1:50 PM
Isolated measurement of the effect of spherical aberration on photophoretic trap rate with Revibro tunable focus mirror
Author(s): **Logan M. Cropper,** Brigham Young Univ. (United States); **Chase H. Grochett,** Texas A&M Univ. (United States); **Daniel E. Smalley,** Brigham Young Univ. (United States)

13390-11 • 1:50 PM - 2:10 PM
A next-generation holographic spatial display implementation method for mobility
Author(s): **Leehwan Hwang, Seunghyun Lee,** Kwangwoon Univ. (Korea, Republic of)

13390-12 • 2:10 PM - 2:30 PM
Enhanced image upsampling with time-multiplexed phase holography using batch gradient descent
Author(s): **Antoni Wojcik**, **Jinze Sha**, **Ayan Rakshit**, **Dilawer Singh**, **Hannah J Joyce, Timothy D. Wilkinson,** Univ. of Cambridge (United Kingdom)

Coffee Break • 2:30 PM - 3:00 PM

13390-13 • 3:00 PM - 3:20 PM
INTERFERE: a high throughput, view-selective codec for holography
Author(s): **Raees Kizhakkumkara Muhamad,** Vrije Univ. Brussel (Belgium), imec (Belgium); **David Blinder,** Vrije Univ. Brussel (Belgium), imec (Belgium), Chiba Univ. (Japan); **Peter Schelkens,** Vrije Univ. Brussel (Belgium), imec (Belgium)

13390-14 • 3:20 PM - 3:40 PM
Camera-in-the-loop optimization for étendue-expanded waveguide holography
Author(s): **Jee Hyun Lee, Hwi Kim,** Korea Univ. (Korea, Republic of)

SESSION 4: MATERIALS FOR HOLOGRAPHY AND DIFFRACTIVE OPTICS

28 January 2025 • 3:40 PM - 4:20 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)

13390-15 • 3:40 PM - 4:00 PM
Design of achromatic diffractive waveguide for compact full-color near-eye display
Author(s): **Myoneggyu Choi, Hwi Kim,** Korea Univ. (Korea, Republic of)

13390-16 • 4:00 PM - 4:20 PM
Accelerating optical metasurface design: AI-driven surrogate models for efficient multi-scale inverse design of metasurface holograms
Author(s): **Ighodalo Idehenre,** Air Force Research Lab. (United States), Azimuth Corp. (United States); **Eric S. Harper,** Air Force Research Lab. (United States)

SESSION 5: ARTISTIC APPLICATIONS OF HOLOGRAPHY

28 January 2025 • 4:20 PM - 4:40 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)

13390-17 • 4:20 PM - 4:40 PM
Holography: art and science through exhibitions
Author(s): **Pedro M. Pombo**, **Maria Isabel Azevedo, Emanuel Santos,** Univ. de Aveiro (Portugal)

HOLOGRAPHY TECHNICAL EVENT

28 January 2025 • 7:30 PM - 9:00 PM | InterContinental Hotel, InterContinental Ballroom B (5th Floor)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)
Join the Holography Technical Group for a discussion on recent developments and directions in holography. The Holography Technical Group is involved with the whole record of research, engineering, recording materials, and applications of holography. The main fields of interest are display holograms, commercial and artistic, holographic optical elements (HOEs), holographic interferometry and holographic non-destructive testing (HNDT), computer-generated holography (CGH), electro and digital holography, holographic microscopy, and holographic data storage (HDS).

Confirmed presentations include:
- **Edward Buckley** from Swave Photonics on the NanoPixel Holographic light engine

Wednesday 29 January 2025

SESSION 6: ELECTRO-HOLOGRAPHY: ELECTRONIC GENERATION/DISPLAY OF HOLOGRAPHIC IMAGE INFORMATION

29 January 2025 • 8:30 AM - 10:10 AM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Hiroshi Yoshikawa**, Nihon Univ. (Japan)

13390-19 • 8:30 AM - 8:50 AM
Target image phase optimization hologram generation method for phase-only spatial light modulators
Author(s): **Jinze Sha**, **Antoni Wojcik, Timothy D. Wilkinson,** Univ. of Cambridge (United Kingdom)

13390-20 • 8:50 AM - 9:10 AM
Pupiled complex-valued holographic image synthesis using a phase-only spatial light modulator
Author(s): **Sehwan Na,** Korea Univ. (Korea, Republic of); **Hwi Kim,** Korea Univ (Korea, Republic of)

13390-21 • 9:10 AM - 9:30 AM
Real time generation of full color 32K rainbow hologram with line source approximation
Author(s): **Hiroshi Yoshikawa**, **Weizhong Zeng, Takeshi Yamaguchi,** Nihon Univ. (Japan)

13390-22 • 9:30 AM - 9:50 AM
Horizontal-only computer-generated hologram for AR waveguide holographic glasses
Author(s): **Sehyeon Jeong, Hwi Kim,** Korea Univ. (Korea, Republic of)

13390-23 • 9:50 AM - 10:10 AM
Reproducing light sheets for continuous-depth holography
Author(s): **Daniel E. Smalley**, **Jay C. Dearden**, **Jacob R. Gunnell**, **Spencer Duke**, **Stephen Griffith, Logan M. Cropper,** Brigham Young Univ. (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 7: HOES AND DOES UTILIZING MATERIALS PROPERTIES FOR ENHANCED PERFORMANCE

29 January 2025 • 10:40 AM - 12:00 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)

13390-24 • 10:40 AM - 11:00 AM
Wavelength multiplexed volume holographic optical couplers to couple red, green, and blue light for solar collection
Author(s): **Dipanjan Chakraborty**, **Rosen Georgiev**, **Vincent Toal**, **Izabela Naydenova**, **Dervil Cody, Suzanne Martin,** FOCAS Research Institute, TU Dublin (Ireland)

13390-25 • 11:00 AM - 11:20 AM
Efficient volume holograms by (3+1)D printing
Author(s): **Niyazi Ulas Dinc**, **Christophe Moser, Demetri Psaltis,** EPFL (Switzerland)

13390-26 • 11:20 AM - 11:40 AM
A new application example for NIR sensitized Bayfol HX film
Author(s): **Friedrich-Karl Bruder**, **Jose Diaz**, **Johannes Frank**, **Mira Holzheimer**, **Alexander Lorenz**, **Christel Manecke,** Covestro AG (Germany); **Jack Mills,** Covestro LLC (United States); **Lena Nault**, **Igor Pochorovski, Thomas Roelle,** Covestro AG (Germany)

13390-27 • 11:40 AM - 12:00 PM
Optimizing multilayered diffractive optical elements for compressive sensing in imaging systems
Author(s): **Tomoya Nakamura, Mohamad Ammar Alsherfawi Aljazaerly,** SANKEN, Osaka Univ. (Japan)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 8: HOE APPLIED IN LASER SYSTEMS

29 January 2025 • 1:30 PM - 2:30 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Pierre-Alexandre J. Blanche**, Wyant College of Optical Sciences (United States)

13390-28 • 1:30 PM - 1:50 PM
Training techniques for robust laser beam shaping with diffractive neural networks
Author(s): **Paul Buske**, **Louis Michels**, **Oskar Hofmann**, **Annika Bonhoff,** RWTH Aachen Univ. (Germany); **Carlo Holly,** RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany)

13390-29 • 1:50 PM - 2:10 PM
Properties of phase-shifted, chirped volume Bragg gratings
Author(s): **Daniel Lumpkin**, **Oussama Mhibik**, **Ivan Divliansky,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Vadim Smirnov,** OptiGrate – IPG Photonics (United States)

13390-30 • 2:10 PM - 2:30 PM
Volume Bragg gratings for locking and beam combining of blue diode lasers
Author(s): **David Guacaneme**, **Oussama Mhibik, Ivan Divliansky,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

Coffee Break 2:30 PM - 3:00 PM

SESSION 9: 3D IMAGING FOR APPLICATION IN INDUSTRY, MEDICINE, EDUCATION, ADVERTISING, AND OTHERS

29 January 2025 • 3:00 PM - 4:30 PM | Moscone West, Room 2006 (Level 2)
Session Chair(s): **Hiroshi Yoshikawa**, Nihon Univ. (Japan)

13390-31 • 3:00 PM - 3:30 PM
Digital holography and physics-informed neural networks for mode decomposition of multimode fibers towards classical and quantum communication *(Invited Paper)*
Author(s): **Juergen W. Czarske, Qian Zhang,** TU Dresden (Germany)

13390-32 • 3:30 PM - 3:50 PM
Enhancing 3D displays through student-led research: an update on the Hunt for the Hologram Program
Author(s): **Maija J. Pearson**, **Daniel E. Smalley**, **Max Hartman, Landon S. Reynolds,** Brigham Young Univ. (United States)

13390-33 • 3:50 PM - 4:10 PM
Fábrica HoloLab: holography for all in a science center
Author(s): **Pedro M. Pombo, Emanuel Santos,** Univ. de Aveiro (Portugal)

13390-34 • 4:10 PM - 4:30 PM
Quantitative holography for the characterisation of semiconductor amplifieres and lasers
Author(s): **Leon Zens,** Ruhr-Univ. Bochum (Germany); **Vira Besaga,** bFriedrich Schiller University Jena/ Institute of Applied Physics, Abbe Center of Photonics (Germany); **Jens Möller**, **Nils C. Gerhardt, Martin R. Hofmann,** Ruhr-Univ. Bochum (Germany)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

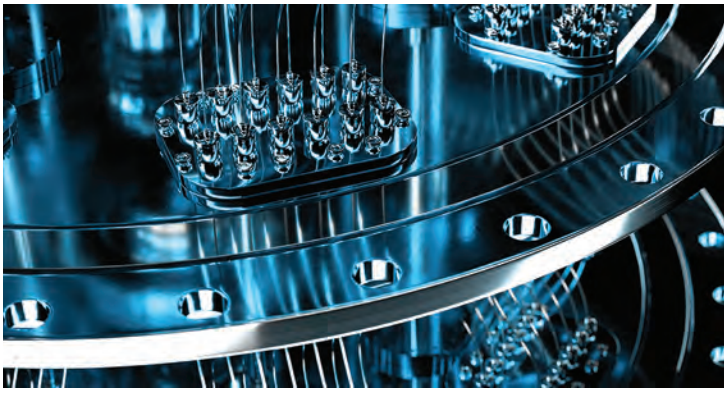
13390-35 • 6:00 PM - 8:00 PM
Optimizing top-hat beam arrays: relative angular adjustment between beam shapes and unit cells in square lattice
Author(s): **Hiroto Sakai, Tsubasa Watanabe,** Hamamatsu Photonics K.K. (Japan)

13390-36 • 6:00 PM - 8:00 PM
Fast calculation method for curved surface mirror reflections using subdivision in computer-generated hologram
Author(s): **Kodai Ono**, **Seok Kang, Yuji Sakamoto,** Hokkaido Univ. (Japan)

13390-37 • 6:00 PM - 8:00 PM
Display method of real-world data captured by an RGBD camera on a holographic head-mounted display reacting to viewpoint movement
Author(s): **Sota Nishita**, **Taichi Sakakihara,** Hokkaido Univ. (Japan); **Ryosuke Watanabe,** KDDI Research, Inc. (Japan); **Seok Kang, Yuji Sakamoto,** Hokkaido Univ. (Japan)

13390-40 • 6:00 PM - 8:00 PM
Denisyuk-type wavefront printer and its computational correction of aberration in optical system
Author(s): **Yuki Takemura**, **Hirohito Nishi, Kyoji Matsushima,** Kansai Univ. (Japan)

13390-41 • 6:00 PM - 8:00 PM
Experimental investigations on the performance of dynamic binary hologram based trapped bead movement
Author(s): **Shilpa Singh, Bosanta R. Boruah,** Indian Institute of Technology Guwahati (India)



QUANTUM WEST

Quantum West showcases the exciting Possibilities of Quantum 2.0 and the future of applied quantum technologies to solve entirely new challenges and provide unique capabilities in large-scale systems.

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Quantum Effects and Measurement Techniques in Biology and Biophotonics II
Chairs: Clarice Aiello; Sergey V. Polyakov; Paige Derr

CONFERENCE 13391 681
Quantum Computing, Communication, and Simulation V
Chairs: Philip R. Hemmer; Alan L. Migdall

CONFERENCE 13392 693
Quantum Sensing, Imaging, and Precision Metrology III
Chairs: Selim M. Shahriar

CONFERENCE 13393 713
Complex Light and Optical Forces XIX
Chairs: David L. Andrews; Enrique J. Galvez; Halina Rubinsztein-Dunlop

CONFERENCE 13391

Quantum Computing, Communication, and Simulation V

25 - 30 January 2025 | Moscone South, Room 158 (Upper Mezz)

Conference Chair(s): **Philip R. Hemmer,** Texas A&M Univ. (United States); **Alan L. Migdall,** National Institute of Standards and Technology (United States)

Program Committee: **Michael Brodsky,** CCDC Army Research Lab. (United States); **Tina Brower-Thomas,** Howard Univ. (United States); **Ivan A. Burenkov,** National Institute of Standards and Technology (United States), Joint Quantum Institute, University of Maryland (United States); **Tatjana Curcic,** Consultant for Quantum Information Science & Technology (United States); **Angela Hodge,** NASA Space Communications and Navigation (United States); **Yuping Huang,** Stevens Institute of Technology (United States); **Usman A. Javid,** Univ. of Maryland, College Park (United States); **Evan J. Katz,** NASA Glenn Research Ctr. (United States); **Paulina S. Kuo,** National Institute of Standards and Technology (United States); **Marko Loncar,** Harvard John A. Paulson School of Engineering and Applied Sciences (United States); **Joseph M. Lukens,** Oak Ridge National Lab. (United States); **Prineha Narang,** Univ. of California, Los Angeles (United States); **Avi Pe'er,** Bar-Ilan Univ. (Israel); **Mirko Pittaluga,** Toshiba Europe Ltd. (United Kingdom); **Matthew J. Sellars,** The Australian National Univ. (Australia); **Selim M. Shahriar,** Northwestern Univ. (United States); **Devin H. Smith,** QuiX Quantum BV (Netherlands); **Robert E. Tench,** Cybel, LLC (United States); **Varun B. Verma,** National Institute of Standards and Technology (United States); **Jörg Wrachtrup,** Univ. Stuttgart (Germany); **Zheshen Zhang,** Univ. of Michigan (United States)

Saturday 25 January 2025

SESSION 1: QUANTUM COMMUNICATION (SPACE-, FREE-, AND FIBER-BASED)

25 January 2025 • 8:20 AM - 11:40 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Muneer Alshowkan**, Oak Ridge National Lab. (United States)

13391-1 • 8:20 AM - 8:50 AM
Space quantum communication networks *(Invited Paper)*
Author(s): **Duncan McArthur**, **Jasminder S. Sidhu,** Univ. of Strathclyde (United Kingdom); **Colin Aitken,** Craft Prospect Ltd. (United Kingdom); **Owain Pryce-Jones,** Archangel Lightworks (United Kingdom); **Mark D. J. Bowyer,** Airbus Defence and Space (United Kingdom); **Markus Krutzik**, **Mustafa Gündoğan,** Humboldt-Univ. zu Berlin (Germany); **Daniel K. L. Oi,** Univ. of Strathclyde (United Kingdom), South East Technological Univ. (Ireland)

13391-2 • 8:50 AM - 9:10 AM
Arbitrary unitary transformation over time-binned optical modes and the demonstration of superadditive communication
Author(s): **Chaohan Cui**, **Jasvith Raj Basani**, **Jack Postlewaite,** Univ. of Maryland (United States); **Babak N Saif,** NASA Goddard Space Flight Center (United States); **Linran Fan,** Univ. of Texas at Austin (United States); **Edo Waks, Saikat Guha,** Univ. of Maryland (United States)

13391-3 • 9:10 AM - 9:30 AM
Phase stabilization of high-bandwidth squeezed and entangled states over 1km distributed optical fiber
Author(s): **Sophie Verclas**, **Benedict Tohermes, Roman Schnabel,** Univ. Hamburg (Germany)

13391-4 • 9:30 AM - 9:50 AM
Enhancements to quantum communication performance utilizing prototype photonic lanterns and multiplexed single-photon detection
Author(s): **Harikumar K. Chandrasekharan**, **Peter Barrow**, **David MacLachlan**, **Robert Thomson, Ross Donaldson,** Heriot-Watt Univ. (United Kingdom)

13391-5 • 9:50 AM - 10:10 AM
Temperature-insensitive source of polarization-entangled photon pairs through noncritical phasematching in single-domain KTiPO4

Author(s): **Jia Boon Chin**, **Diane Prato, Euk Jin Alexander Ling,** Ctr. for Quantum Technologies, National Univ. of Singapore (Singapore)

Coffee Break • 10:10 AM - 10:40 AM

13391-7 • 10:40 AM - 11:10 AM
Steps towards integrating isolated parts and developing a joint time and frequency distribution fiber infrastructure in Europe *(Invited Paper)*
Author(s): **Josef Vojtech,** CESNET z.s.p.o. (Czech Republic); **Guy Roberts,** GÉANT Association (United Kingdom); **Vladimir Smotlacha,** CESNET z.s.p.o. (Czech Republic); **Tomas Novak**, **Michal Spacek**, **Elisabeth Andriantsarazo,** Czech Technical Univ. in Prague (Czech Republic); **Ondrej Havlis**, **Martin Slapak,** CESNET z.s.p.o. (Czech Republic); **Richard Lui,** GÉANT Association (United Kingdom); **Jaroslav Roztocil,** Czech Technical Univ. in Prague (Czech Republic); **Susanne Naegele-Jackson,** Friedrich-Alexander Universität Erlangen-Nürnberg (Germany); **Jochen Kronjaeger,** Physikalisch-Technische Bundesanstalt (Germany); **Jacques-Olivier Gaudron,** National Physical Lab. (United Kingdom); **Krzysztof Turza,** Poznan Supercomputing and Networking Ctr. (Poland)

13391-8 • 11:10 AM - 11:40 AM
Picosecond clock synchronization across a 7-node metropolitan scale quantum network *(Invited Paper)*
Author(s): **Wayne McKenzie**, **Anne Marie Richards,** Lab. for Telecommunications Sciences (United States); **Ya-Shian Li-Baboud**, **Ivan A. Burenkov**, **Anouar Rahmouni**, **Thomas Gerrits,** National Institute of Standards and Technology (United States); **Adam T. Black,** Naval Research Laboratory (NRL) (United States); **Daniel E. Jones,** DEVCOM Army Research Laboratory (ARL) (United States); **Alejandro R. Perez,** Goddard Space Flight Center, National Aeronautics and Space Administration (NASA) (United States); **Thomas G. Akin,** Clock Development Division, United States Naval Observatory (United States)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

SESSION 2: QUANTUM COMMUNICATION AND QUANTUM INTERNET I

25 January 2025 • 1:30 PM - 4:50 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Daniel K. L. Oi**, Univ. of Strathclyde (United Kingdom)

13391-9 • 1:30 PM - 1:50 PM
High-power 1762 nm single-frequency fiber laser system for trapped barium ion qubits
Author(s): **Andrei Fedotov,** Modulight Corp. (Finland); **Iuliia Zalesskaia,** Modulight Corp. (Finland), Tampere Univ. (Finland); **Petteri Uusimaa,** Modulight Corp. (Finland)

13391-10 • 1:50 PM - 2:10 PM
Spin-bath dynamics in magnetic-field gradients for selective addressing of spin qubits
Author(s): **Walter Hahn**, **Philip Schätzle**, **Riccardo Bellese**, **Rebekka Eberle**, **Annarita Ricci, Daniel Hähnel,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

13391-11 • 2:10 PM - 2:30 PM
State transfer in latent-symmetric networks
Author(s): **Jonas Himmel**, **Max Ehrhardt**, **Matthias Heinrich**, **Tom A. W. Wolterink**, **Sebastian Weidemann,** Institut für Physik, Univ. Rostock (Germany); **Malte Röntgen,** Zentrum für Optische Quantentechnologien (Germany); **Peter Schmelcher,** Univ. Hamburg (Germany); **Alexander Szameit,** Institut für Physik, Univ. Rostock (Germany)

13391-13 • 2:30 PM - 2:50 PM
Quantum measurement of a solid-state spin qubit in diamond
Author(s): **Souvik Biswas**, **Eric I. Rosenthal**, **Giovanni Scuri**, **Hope Lee**, **Abigail J. Stein**, **Hannah C. Kleidermacher**, **Jakob Grzesik**, **Alison E. Rugar**, **Shahriar Aghaeimeibodi**, **Daniel Riedel,** Stanford Univ. (United States); **Michael Titze**, **Edward S. Bielejec,** Sandia National Labs. (United States); **Joonhee Choi,** Stanford Univ. (United States); **Christopher P. Anderson,** Stanford Univ. (United States), Univ. of Illinois (United States); **Jelena Vuckovic,** Stanford Univ. (United States)

Coffee Break • 2:50 PM - 3:20 PM

13391-15 • 3:20 PM - 3:40 PM
Entanglement-based quantum key distribution using frequency-bin encoding in a flexible frequency-multiplexed network
Author(s): **Anahita Khodadad Kashi, Michael Kues,** Leibniz Univ. Hannover (Germany)

13391-16 • 3:40 PM - 4:10 PM
Multihop entanglement distribution in a software-defined quantum network *(Invited Paper)*
Author(s): **Muneer Alshowkan,** Oak Ridge National Lab. (United States); **Joseph M. Lukens,** Oak Ridge National Lab. (United States), Arizona State Univ. (United States); **Hsuan-Hao Lu, Nicholas A. Peters,** Oak Ridge National Lab. (United States)

13391-17 • 4:10 PM - 4:30 PM
Efficient multiparty entanglement distribution with DODAG-X protocol
Author(s): **Roberto Negrin**, **Nicolas Dirnegger**, **William Munizzi**, **Jugal Talukdar, Prineha Narang,** Univ. of California, Los Angeles (United States)

13391-18 • 4:30 PM - 4:50 PM
Enabling cross-network synchronization of independent sources of indistinguishable photons
Author(s): **Cory M. Nunn**, **Nijil Lal Cheriya Koyyottummal,** National Institute of Standards and Technology (United States); **Ivan A. Burenkov,** Joint Quantum Institute, Univ. of Maryland, College Park (United States), National Institute of Standards and Technology (United States); **Ya-Shian Li-Baboud**, **Paulina S. Kuo**, **Thomas Gerrits,** National Institute of Standards and Technology (United States); **Sergey V. Polyakov,** National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States)

Sunday 26 January 2025

SESSION 3: QUANTUM COMMUNICATION AND QUANTUM INTERNET II

26 January 2025 • 8:00 AM - 12:20 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Raju Valivarthi**, Caltech (United States)

13391-19 • 8:00 AM - 8:20 AM
Frequency-comb-assisted, broadband optical phase stabilization for quantum communications
Author(s): **Daehyun Ahn,** National Institute of Standards and Technology (United States), Joint Quantum Institute, Univ. of Maryland, College Park (United States); **Jabir Marakkarakath Vadakkepurayil,** National Institute of Standards and Technology (United States); **Ivan A. Burenkov,** National Institute of Standards and Technology (United States), Joint Quantum Institute, Univ. of Maryland, College Park (United States); **Sergey V. Polyakov,** National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States)

13391-20 • 8:20 AM - 8:40 AM
Towards a quantum-classical augmented network
Author(s): **Nitin Jha**, **Abhishek Parakh,** Kennesaw State Univ. (United States); **Mahadevan Subramaniam,** Univ. of Nebraska at Omaha (United States)

13391-21 • 8:40 AM - 9:00 AM
Metropolitan-scale quantum network using multimode fiber
Author(s): **Adam Brzosko,** Univ. of Cambridge (United Kingdom), Toshiba Europe Ltd. (United Kingdom); **Robert I. Woodward**, **Yuen San Lo**, **Mirko Pittaluga**, **Peter R. Smith**, **James F. Dynes, Andrew J. Shields,** Toshiba Europe Ltd. (United Kingdom)

13391-22 • 9:00 AM - 9:20 AM
Serrodyne transceiver for entangled quantum and coherent co-transmission on a single frequency channel
Author(s): **Jan Heine**, **Philip Rübeling**, **Robert Johanning, Michael Kues,** Leibniz Univ. Hannover (Germany)

13391-23 • 9:20 AM - 9:50 AM
Wafer-scale quantum photonics in silicon carbide *(Invited Paper)*
Author(s): **Marina Radulaski,** Univ. of California, Davis (United States)

13391-24 • 9:50 AM - 10:20 AM
Quantum network loss estimation with quantum enhanced precision metrology *(Invited Paper)*
Author(s): **Jabir Marakkarakath Vadakkepurayil,** National Institute of Standards and Technology (United States); **Riley B. Dawkins,** Louisiana State Univ. (United States); **Javier Sabines-Chesterking,** Xanadu Quantum Technologies Inc. (Canada); **Dileep V. Reddy**, **Adriana Lita**, **Abdella Battou, Thomas Gerrits,** National Institute of Standards and Technology (United States)

Coffee Break • 10:20 AM - 10:50 AM

13391-25 • 10:50 AM - 11:10 AM
Ultralow-error encoder for time-bin and decoy states for quantum key distribution
Author(s): **Davide Scalcon**, **Elisa Bazzani**, **Giuseppe Vallone**, **Paolo Villoresi, Marco Avesani,** Univ. degli Studi di Padova (Italy)

13391-26 • 11:10 AM - 11:30 AM
Compact and efficient optical parametric sources for quantum networking
Author(s): **Tiphaine Kouadou,** Univ. of Illinois (United States); **Josh Aller,** AdvR, Inc. (United States); **Tony Roberts,** AdvR (United States); **Philip Battle,** AdvR, Inc. (United States); **Paul Kwiat,** Univ. of Illinois (United States)

13391-27 • 11:30 AM - 11:50 AM
Progress toward intermodal photon pair generation and characterization in few-mode fibers
Author(s): **Seyedehnajmeh Montazeri, Mina Esmaeelpour,** Missouri Univ. of Science and Technology (United States)

13391-28 • 11:50 AM - 12:20 PM
Multiphoton interference and quantum teleportation coexisting with classical communications in optical fiber *(Invited Paper)*
Author(s): **Jordan M. Thomas,** Northwestern Univ. (United States); **Gregory S. Kanter,** Northwestern Univ. (United States), NuCrypt, LLC (United States); **Prem Kumar,** Northwestern Univ. (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 4: QUANTUM COMMUNICATION AND QUANTUM INTERNET III

26 January 2025 • 1:50 PM - 5:30 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Jan Heine**, Leibniz Univ. Hannover (Germany)

13391-29 • 1:50 PM - 2:10 PM
Ultracompact, VCSEL-based photon source for prepare-and-measure QKD
Author(s): **Erik Beckert,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Matthias Hein**, **Jens Mueller,** Technische Univ. Ilmenau (Germany); **Michael Jetter,** Univ. Stuttgart (Germany); **Marcus Babin**, **Shadia Chowdhury,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Uwe Stehr**, **Cathleen Kleinholz,** Technische Univ. Ilmenau (Germany); **Michael Zimmer**, **Lena Engel,** Univ. Stuttgart (Germany); **Johannes Kripfgans,** Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM (Germany); **Christopher Spiess,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13391-30 • 2:10 PM - 2:30 PM
Ultra-compact payload for a LEO-orbit based entanglement QKD mission using cubesats
Author(s): **Erik Beckert**, **Daniel Heinig**, **Fabian Steinlechner,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Kevin Fuechsel,** Quantum Optics Jena GmbH (Germany); **Matthias Beier,** SPACEOPTIX GmbH (Germany); **Klaus Schilling,** Zentrum für Telematik e.V. (Germany); **Andre Kloth,** DiGOS Potsdam GmbH (Germany)

13391-31 • 2:30 PM - 3:00 PM
Quantum networks at INQNET *(Invited Paper)*
Author(s): **Raju Valivarthi,** Caltech (United States)

13391-32 • 3:00 PM - 3:30 PM
Wafer-scale fabrication of III-V integrated photonics for quantum networking and sensing *(Invited Paper)*
Author(s): **Galan Moody**, **Lillian Thiel**, **Joshua E. Castro,** Univ. of California, Santa Barbara (United States); **Paolo Pintus,** Univ. of California, Santa Barbara (United States), Univ. degli Studi di Cagliari (Italy); **Trevor Steiner**, **Nick Lewis**, **Yiming Pang**, **Liao Duan,** Univ. of California, Santa Barbara (United States); **Catherine L. Nguyen**, **Garrett D. Cole,** Thorlabs Crystalline Solutions (United States); **John E. Bowers,** Univ. of California, Santa Barbara (United States)

Coffee Break • 3:30 PM - 4:00 PM

13391-33 • 4:00 PM - 4:20 PM
A fiber-based, alignment-free, hyper-entangled photon pair source
Author(s): **Jackson Russett, Li Qian,** Univ. of Toronto (Canada)

13391-34 • 4:20 PM - 4:40 PM
Frequency-bin entanglement-based quantum key distribution
Author(s): **Noemi Tagliavacche**, **Massimo Borghi,** Univ. degli Studi di Pavia (Italy); **Giulia Guarda,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Domenico Ribezzo,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi dell'Aquila (Italy); **Marco Liscidini,** Univ. degli Studi di Pavia (Italy); **Davide Bacco,** QTI S.R.L. (Italy), Univ. degli Studi di Firenze (Italy); **Matteo Galli, Daniele Bajoni,** Univ. degli Studi di Pavia (Italy)

13391-35 • 4:40 PM - 5:00 PM
Simple quantum state tomography of single-photon entanglement
Author(s): **Joe Yoshimoto**, **Hikaru Shimizu**, **Kazufumi Tanji,** Keio Univ. (Japan); **Aruto Hosaka,** Mitsubishi Electric Corporation (Japan); **Junko Ishi-Hayase,** Keio Univ. (Japan); **Tomoyuki Horikiri,** Yokohama National University (Japan); **Rikizo Ikuta,** Osaka Univ. (Japan); **Masahiro Takeoka,** Keio Univ. (Japan)

13391-36 • 5:00 PM - 5:30 PM
Extracting the complete CHSH parameter from each entangled photon pair *(Invited Paper)*
Author(s): **Ivo Pietro Degiovanni**, **S. Virzì**, **Enrico Rebufello**, **Francesco Atzori**, **Alessio Avella**, **Fabrizio Piacentini**, **R. Lussana,** Istituto Nazionale di Ricerca Metrologica (Italy); **Iris Cusini**, **Francesca Madonini**, **Federica Villa,** Politecnico di Milano (Italy); **Marco Gramegna,** Istituto Nazionale di Ricerca Metrologica (Italy); **Eliahu Cohen,** Bar-Ilan Univ. (Israel); **Marco Genovese,** Istituto Nazionale di Ricerca Metrologica (Italy)

Monday 27 January 2025

OPTO PLENARY

27 January 2025 • 8:00 AM - 10:15 AM | Moscone South, Room 207/215 (Level 2)
Session Chairs: **Karin Hinzer**, Univ. of Ottawa (Canada) and **Ulrich T. Schwarz**, Technische Univ. Chemnitz (Germany)

8:00 AM - 8:15 AM: **Welcome and Opening Remarks**

13364-501 • 8:15 AM - 8:55 AM
A plasma perspective on attosecond and THz science (Plenary Presentation)
Author(s): **Paul B. Corkum,** Univ. of Ottawa (Canada)

13381-501 • 8:55 AM - 9:35 AM
Topology in space, time, and space-time (Plenary Presentation)
Author(s): **Alexander Szameit,** Univ. Rostock (Germany)

13369-501 • 9:35 AM - 10:15 AM
Photonic quantum technologies: from integrated quantum devices to designing scalable complex systems (Plenary Presentation)
Author(s): **Christine Silberhorn,** Univ. Paderborn (Germany)

Coffee Break 10:15 AM - 10:30 AM

SESSION 5: QUANTUM ENABLED SECURITY

27 January 2025 • 10:30 AM - 11:40 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Erik Beckert**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13391-37 • 10:30 AM - 10:50 AM
Twin-field QKD over a deployed optical network enabled by long-range phase locking and semiconductor detectors
Author(s): **Mirko Pittaluga**, **Yuen San Lo**, **Adam Brzosko**, **Robert I. Woodward**, **Davide Scalcon**, **Matthew Winnel**, **Thomas Roger**, **James F. Dynes**, **Kim Owen**, **Sergio Juárez,** Toshiba Europe Ltd. (United Kingdom); **Piotr Rydlichowski,** Poznan Supercomputing and Networking Ctr. (Poland); **Domenico Vicinanza,** GÉANT Association (Netherlands), Anglia Ruskin Univ. (United Kingdom); **Guy Roberts,** GÉANT Association (Netherlands); **Andrew Shields,** Toshiba Europe Ltd. (United Kingdom)

13391-38 • 10:50 AM - 11:10 AM
Scalable, self-monitoring quantum random number generator with minimal performance overhead
Author(s): **Joakim Argillander**, **Martin Clason,** Linköping Univ. (Sweden); **Sérgio Tahim de Oliveira,** Univ. Federal do Ceará (Brazil); **Guilherme B. Xavier,** Linköping Univ. (Sweden)

13391-40 • 11:10 AM - 11:40 AM
Towards experimental demonstration of quantum position verification using single photons *(Invited Paper)*
Author(s): **Wolfgang Löffler**, **Kirsten Kanneworff**, **Petr Steindl**, **Mio Poortvliet,** Leiden Univ. (Netherlands); **Rene Allerstorfer**, **Philip Verduyn Lunel,** QuSoft, Ctr. Wiskunde & Informatica (Netherlands); **Florian Speelman, Harry Buhrman,** QuSoft, Univ. of Amsterdam (Netherlands)

Lunch Break 11:40 AM - 1:00 PM

QUANTUM WEST PLENARY SESSION

27 January 2025 • 1:00 PM - 3:05 PM | Moscone South, Room 207/215 (Level 2)
Session Chair: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks
Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

13393-501 • 1:05 PM - 1:45 PM
Quantum structured light takes shape (Plenary Presentation)
Author(s): **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13392-501 • 1:45 PM - 2:25 PM
Optical clocks: time and the future of metrology (Plenary Presentation)
Author(s): **Tara M. Fortier,** National Institute of Standards and Technology (United States)

13392-502 • 2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory (Plenary Presentation)
Author(s): **Eric A. Cornell,** National Institute of Standards and Technology (United States)

Coffee Break 3:05 PM - 3:30 PM

SESSION 6: QUANTUM IMAGING FOR BIOLOGY AND BEYOND: JOINT SESSION WITH 13340 AND 13391

27 January 2025 • 3:30 PM - 6:00 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Davide Giacomo Marangon**, Univ. degli Studi di Padova (Italy)

13340-22 • 3:30 PM - 4:00 PM
Nonlinear quantum bioimaging with bright squeezed light *(Invited Paper)*
Author(s): **Alex Terrasson**, **Lars Madsen**, **Joel Grim, Warwick Bowen,** The Univ. of Queensland (Australia)

13340-23 • 4:00 PM - 4:20 PM
Passive super-resolution imaging via photon enumeration
Author(s): **Ivan A. Burenkov,** National Institute of Standards and Technology (United States), Joint Quantum Institute (United States); **Seungjin Yoon, Sergey Polyakov,** National Institute of Standards and Technology (United States)

13340-24 • 4:20 PM - 4:40 PM
Dynamic imaging of magnetic bioeffects in cells using multiphoton autofluorescence intensity and lifetime microscopy
Author(s): **Kevin K. Tan**, **Carlos A. Renteria**, **Rishyashring R. Iyer**, **Jindou Shi**, **Alexander Ho**, **Janet E. Sorrells,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States); **Edita Aksamitiene,** Beckman Institute for Advanced Science and Technology (United States); **Maria Ingaramo,** Calico Life Sciences, LLC (United States); **Robert J. Usselman,** Florida Institute of Technology (United States); **Stephen A. Boppart,** Beckman Institute for Advanced Science and Technology (United States), Univ. of Illinois (United States)

13340-25 • 4:40 PM - 5:10 PM
Metasurface-based super-resolution image scanning microscopy *(Invited Paper)*
Author(s): **Yongjae Jo**, **Hyemi Park**, **Seho Lee**, **Hyeyoung Yoon**, **Taehoon Lee**, **Gyu Soo Bak**, **Jong-Chan Park, Inki Kim,** Sungkyunkwan Univ. (Korea, Republic of)

13391-41 • 5:10 PM - 5:40 PM
Fusing classical and quantum information for super resolution spatial frequency modulation imaging *(Invited Paper)*
Author(s): **Daniel Scarbrough,** Colorado School of Mines (United States); **Randy Bartels,** Morgridge Institute for Research (United States); **Jeff Squier,** Colorado School of Mines (United States)

13391-42 • 5:40 PM - 6:00 PM
A high-performance 64-pixel SNSPD camera for high data rate and picosecond time-resolved imaging applications
Author(s): **Fiona Fleming**, **Will McCutcheon,** Heriot-Watt Univ. (United Kingdom); **Emma E. Wollman**, **Boris A. Korzh,** Jet Propulsion Lab. (United States); **Gerald S. Buller**, **Mehul Malik,** Heriot-Watt Univ. (United Kingdom); **Matthew D. Shaw,** Jet Propulsion Lab. (United States)

Tuesday 28 January 2025

SESSION 7: QUANTUM COMPUTATION I

28 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Sergei Slussarenko**, Griffith Univ. (Australia)

13391-46 • 8:00 AM - 8:20 AM
Connection between reservoir computing and gate-based quantum computers for quantum machine learning
Author(s): **Nils-Erik Schütte,** Institut für Satellitengeodäsie und Inertialsensorik, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany), Institut für Theoretische Physik, Univ. Bremen (Germany); **Niclas Götting,** Institut für Theoretische Physik, Univ. Bremen (Germany); **Hauke Müntinga,** Institut für Satellitengeodäsie und Inertialsensorik, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Christopher Gies,** Institut für Theoretische Physik, Univ. Bremen (Germany); **Meike List,** Institut für Satellitengeodäsie und Inertialsensorik, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany), Univ. Bremen (Germany)

13391-44 • 8:20 AM - 8:40 AM
Architectures for quantum data center networks
Author(s): **Hassan Shapourian**, **Eneet Kaur**, **Jiapeng Zhao**, **Michael Kilzer**, **Ramana Kompella, Reza Nejabati,** Cisco Systems, Inc. (United States)

13391-45 • 8:40 AM - 9:10 AM
Boson sampling powered image recognition *(Invited Paper)*
Author(s): **William J. Munro**, **Akitada Sakurai**, **Aoi Hayashi, Kae Nemoto,** Okinawa Institute of Science and Technology Graduate Univ. (Japan)

13391-43 • 9:10 AM - 9:30 AM
Quantum reservoir computing with linear photonic networks
Author(s): **Oliver D. Neill**, **Sam Nerenberg**, **Giulia Marcucci, Daniele Faccio,** Univ. of Glasgow (United Kingdom)

13391-47 • 9:30 AM - 10:00 AM
Key technologies toward ultra-fast optical quantum computers *(Invited Paper)*
Author(s): **Mamoru Endo, Akira Furusawa,** The Univ. of Tokyo (Japan), RIKEN Ctr. for Quantum Computing (Japan)

Coffee Break 10:00 AM - 10:30 AM

SESSION 8: QUANTUM COMPUTATION II

28 January 2025 • 10:30 AM - 11:50 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **William J. Munro**, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

13391-48 • 10:30 AM - 10:50 AM
Optimized quantum circuit partitioning across multiple quantum processors
Author(s): **Eneet Kaur**, **Hassan Shapourian**, **Jiapeng Zhao**, **Michael Kilzer,** Cisco Systems, Inc. (United States); **Ramana Kompella,** Cisco Systems (United States); **Reza Nejabati,** Cisco Systems, Inc. (United States)

13391-49 • 10:50 AM - 11:10 AM
Heralded arbitrary graph states with inefficient quantum emitters
Author(s): **Jianlong Lin**, **Maxwell Gold**, **Eric Chitambar, Elizabeth A. Goldschmidt,** Univ. of Illinois (United States)

13391-50 • 11:10 AM - 11:30 AM
Deterministic creation of a thin nuclear spin layer near an NV center for quantum computation and simulation
Author(s): **Johannes Lang**, **Christian Osterkamp**, **Christoph Findler, Philipp Vetter,** Diatope GmbH (Germany)

13391-97 • 11:30 AM - 11:50 AM
Trapped ion and neutral atom quantum computers illuminating the path for innovation: past, present, and future of qubit state detection
Author(s): **Klea Dhimitri,** Hamamatsu Corp. (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 9: QUANTUM COMPUTATION III

28 January 2025 • 1:20 PM - 3:00 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Mamoru Endo**, The Univ. of Tokyo (Japan)

13391-52 • 1:20 PM - 1:50 PM
Entropy computing: efficient optimization in an open quantum photonic system *(Invited Paper)*
Author(s): **Mohammad-Ali Miri,** Queens College, The City Univ. of New York (United States), Quantum Computing Inc. (United States); **Joey Rupert**, **Lac Nguyen**, **Wesley Dyk**, **Sam Wu**, **Nick Vrahoretis**, **Irwin Huang**, **Milan Begliarbekov**, **Nicholas Chancellor**, **Uchenna Chukwu**, **Pranav Mahamuni**, **Cesar Martinez-Delgado**, **David Haycraft**, **Carrie Spear**, **Mark Campanelli**, **Russell Huffman**, **Yong Meng Sua, Yuping Huang,** Quantum Computing Inc. (United States)

13391-54 • 1:50 PM - 2:10 PM
Single-frequency VECSEL core
Author(s): **Kostiantyn Nechay**, **Luukas Kuusela**, **Andreas Schramm**, **Mika Mahonen**, **Soile Talmila**, **Pekko Sipilä**, **Kalle Palomäki, Petteri Uusimaa,** Modulight Corp. (Finland)

13391-55 • 2:10 PM - 2:30 PM
Independent optical control of co-located ^{85}Rb and ^{87}Rb ensembles for quantum information processing
Author(s): **Gregory Smail**, **Mark Bashkansky, Adam T. Black,** U.S. Naval Research Lab. (United States)

13391-56 • 2:30 PM - 3:00 PM
Building a robust trapped-ion quantum computer with integrated photonic chip technology *(Invited Paper)*
Author(s): **May Eun Yeon Kim,** MIT Lincoln Lab. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 10: QUANTUM INTERFACES AND TECHNOLOGY I

28 January 2025 • 3:30 PM - 5:40 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Mahdi Hosseini**, Northwestern Univ. (United States)

13391-57 • 3:30 PM - 4:00 PM
Programming coherent-wave mixing for broadband quantum optical engineering with arbitrary poling *(Invited Paper)*
Author(s): **Ryotatsu Yanagimoto**, **Benjamin A. Ash**, **Mandar M. Sohoni**, **Martin M. Stein,** Cornell Univ. (United States); **Marc Jankowski,** NTT Research, Inc. (United States); **Logan G. Wright,** Yale Univ. (United States); **Tatsuhiro Onodera, Peter L. McMahon,** Cornell Univ. (United States)

13391-58 • 4:00 PM - 4:30 PM
Generation of quantum entanglement between light and microwaves with a chip-scale transducer *(Invited Paper)*
Author(s): **Srujan Meesala,** Rice Univ. (United States)

13391-59 • 4:30 PM - 4:50 PM
Superconducting 2.5D interposer for quantum processors
Author(s): **Hongyu Li,** A*STAR Institute of Microelectronics (Singapore); **Adrian Utama,** A*STAR Institute of Materials Research and Engineering (Singapore); **Naga Manikanta Kommanaboina,** NQFF Institute of Material Research and Engineering, Agency for Science Technology and Research (Singapore); **Norhanani Jaafar,** ASTAR Institute of Microelectronics (Singapore); **Ding Huang**, **Yiyu Zhang,** ASTAR Institute of Materials Research and Engineering (Singapore); **Yong Chyn Ng,** ASTAR Institute of Microelectronics (Singapore); **Kuan Eng Johnson GOH, Manas Mukherjee,** ASTAR Institute of Materials Research and Engineering (Singapore), NQFF Institute of Material Research and Engineering (Singapore)

13391-60 • 4:50 PM - 5:20 PM
Thin film lithium niobate: the ideal material for quantum technologies *(Invited Paper)*
Author(s): **Milan Begliarbekov**, **Yong Meng Sua**, **Yichen Ma**, **Dustin Hess**, **Pouya Dianat**, **Yunong Tang**, **Lac Nguyen**, **He Zhang**, **Ting Bu**, **Malvika Garikapati, Jeevanandha Ramanathan,** Quantum Computing Inc. (United States)

13391-51 • 5:20 PM - 5:40 PM
Exploring quantum advantage in classification: single-qubit vs. entangled systems
Author(s): **Sara Aminpour**, **Yaser M. Banad, Sarah S. Sharif,** The Univ. of Oklahoma (United States)

Wednesday 29 January 2025

SESSION 11: QUANTUM INTERFACES AND TECHNOLOGY II

29 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Srujan Meesala**, Rice Univ. (United States)

13391-83 • 8:00 AM - 8:40 AM
Spin qubits in diamond (Keynote Presentation)
Author(s): **Fedor Jelezko,** Univ. Ulm (Germany)

13391-61 • 8:40 AM - 9:10 AM
Observation of topological frequency combs *(Invited Paper)*
Author(s): **Christopher J. Flower**, **Mahmoud Jalali-Mehrabad**, **Lida Xu,** Univ. of Maryland, College Park (United States); **Gregory Moille,** National Institute of Standards and Technology (United States); **Daniel G. Suarez-Forero,** Univ. of Maryland, College Park (United States); **Ogulcan Orsel**, **Gaurav Bahl,** Univ. of Illinois (United States); **Yanne Chembo,** Univ. of Maryland, College Park (United States); **Kartik Srinivasan,** National Institute of Standards and Technology (United States); **Sunil Mittal,** Northeastern Univ. (United States); **Mohammad Hafezi,** Univ. of Maryland, College Park (United States)

13391-62 • 9:10 AM - 9:30 AM
Crystalline waveguides for highly efficient integrated quantum memories
Author(s): **Mickael Chan,** Thales SIX GTS France S.A.S. (France); **Alban Ferrier,** Ecole Nationale Supérieure de Chimie de Paris, Univ. PSL (France), Institut de Recherche de Chimie Paris, CNRS (France); **Anne Talneau,** Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay (France); **Perrine Berger**, **Loic Morvan, Sacha Welinski,** Thales Research & Technology (France)

13391-63 • 9:30 AM - 9:50 AM
Efficient quantum optical storage in rare earth crystals
Author(s): **Mahdi Hosseini**, **Yisheng Lei**, **Zongfeng Li, Trevor Kling,** Northwestern Univ. (United States)

13391-64 • 9:50 AM - 10:10 AM
Coherent manipulation of optical transitions in 167Er:Y2SiO5 with multiple hyperfine sublevels
Author(s): **Shoichiro Yasui,** Hokkaido Univ. (Japan); **Tomohiro Inaba,** NTT Basic Research Labs. (Japan); **Atsushi Ishizawa,** Nihon Univ. (Japan); **Kenichi Hitachi,** NTT Basic Research Labs. (Japan); **Hiroo Omi,** Yamato Univ. (Japan); **Kyuma Matsuura**, **Reina Kaji,** Hokkaido Univ. (Japan); **Takehiko Tawara,** Nihon Univ. (Japan); **Satoru Adachi,** Hokkaido Univ. (Japan); **Xuejun Xu, Haruki Sanada,** NTT Basic Research Labs. (Japan)

Coffee Break 10:10 AM - 10:30 AM

QUANTUM WEST BUSINESS SUMMIT PANEL

29 January 2025 • 10:30 AM - 12:00 PM | Moscone South, Room 153 (Upper Mezz)
This panel is a part of the Quantum West Business Summit. Note the different room location.

View Full Details: spie.org/pw/burning-the-ghost-light

Burning the Ghost Light--Economic Opportunities to Scale the Photonics Supply Chain

At the inflection point between R&D and commercial scale, there is a growing need to improve costs and lead times, particularly of components critical to the advancement of quantum technologies. With so many quantum computing modalities still under development, the proliferation of new and diverse designs has highlighted challenges in connecting customers to the appropriate suppliers, what economists call a matching problem. Photonics suppliers are interested in how customers apply their products as solutions, yet specific photonics standards in quantum technologies are only now beginning to be established. This panel will discuss current supply chain pain points faced today in quantum technologies, what specific challenges are being faced by the photonics industry, and the role of standards in mitigating sourcing risks.

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 12: QUANTUM SIMULATION

29 January 2025 • 1:30 PM - 3:20 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Christopher J. Flower**, Univ. of Maryland, College Park (United States)

13391-65 • 1:30 PM - 1:50 PM
Large-scale 2D mode couplers via liquid-crystal metasurfaces
Author(s): **Maria Gorizia Ammendola**, **Francesco Di Colandrea**, **Lorenzo Marrucci, Filippo Cardano,** Univ. degli Studi di Napoli Federico II (Italy)

13391-66 • 1:50 PM - 2:10 PM
Simple measurements and efficient optimization of linear optical networks
Author(s): **Shannon Ray,** Griffiss Institute (United States); **A. Matthew Smith**, **Daniel Koch,** Air Force Research Lab. (United States); **Sam Ellis,** Rochester Institute of Technology (United States); **Christopher C. Tison,** Air Force Research Lab. (United States); **Paul M. Alsing,** Griffiss Institute (United States)

13391-67 • 2:10 PM - 2:30 PM
Photon culling: a new photon subtraction approach with application to non-classical light generation
Author(s): **Abdolreza Pasharavesh, Michal Bajcsy,** Univ. of Waterloo (Canada)

13391-68 • 2:30 PM - 2:50 PM
Quantum algorithm for modeling confinement in nanostructures
Author(s): **Mustafa M. El-Boghdady, Mohamed A. Swillam,** The American Univ. in Cairo (Egypt)

13391-69 • 2:50 PM - 3:20 PM
Relaxation of an out-of-equilibrium closed quantum systems: experimental observations of decay of turbulence and the stages to reach equilibrium *(Invited Paper)*
Author(s): **Vanderlei Salvador Bagnato,** Texas A&M Univ. (United States)

Coffee Break 3:20 PM - 3:50 PM

SESSION 13: QUANTUM REPEATERS AND QUANTUM CRYPTO

29 January 2025 • 3:50 PM - 6:00 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Ivo Pietro Degiovanni**, Istituto Nazionale di Ricerca Metrologica (Italy)

13391-72 • 3:50 PM - 4:10 PM
Single-photon Raman interaction for realizing the photon-number splitting attack
Author(s): **Ariel Ashkenazy**, **Yuval Idan,** Bar-Ilan Univ. (Israel); **Dor Korn,** Weizmann Institute of Science (Israel); **Dror Fixler,** Bar-Ilan Univ. (Israel); **Barak Dayan,** Weizmann Institute of Science (Israel), Quantum Source Labs. Ltd. (Israel); **Eliahu Cohen,** Bar-Ilan Univ. (Israel)

13391-70 • 4:10 PM - 4:30 PM
Colloidal quantum dots grown from singly-doped seed clusters: a spin-photon interface for quantum memories and quantum repeaters
Author(s): **Julian Schneider**, **Robert Page**, **James Harris**, **Nigel Pickett**, **Nathalie Gresty**, **Christopher Waby**, **Charles Biddlecombe,** Nanoco Technologies Ltd (United Kingdom); **Rachel Barrett**, **Adam Brookfield**, **Patrick Parkinson**, **Floriana Tuna, David J. Binks,** The Univ. of Manchester (United Kingdom)

13391-71 • 4:30 PM - 5:00 PM
A fast and robust quantum random number generator with a self-contained integrated photonic randomness core *(Invited Paper)*
Author(s): **Davide Giacomo Marangon,** Univ. degli Studi di Padova (Italy); **Peter Raymond Smith**, **Nathan Walk**, **Taofiq Paraiso**, **James F. Dynes**, **Victor Lovic**, **Mirko Sanzaro**, **Thomas Roger**, **Innocenzo De Marco**, **Marco Lucamarini**, **Zhiliang Yuan, Andrew Shields,** Toshiba Research Europe (United Kingdom)

13391-73 • 5:00 PM - 5:20 PM
Fine structure splitting cancellation in highly asymmetric InAs/InP droplet epitaxy quantum dots
Author(s): **Niels van Venrooij**, **Adonai R. Da Cruz,** The Univ. of Iowa (United States); **Raja S. R. Gajjela**, **Paul M. Koenraad,** Technische Univ. Eindhoven (Netherlands); **Michael E. Flatté, Craig E. Pryor,** The Univ. of Iowa (United States)

13391-74 • 5:20 PM - 5:40 PM
Multi-partite nonlocality in photonic quantum networks
Author(s): **Sergei Slussarenko,** Griffith Univ. (Australia)

13391-12 • 5:40 PM - 6:00 PM
Over 40 Gbps tri-type quantum random number generator
Author(s): **Jiapeng Zhao**, **Eneet Kaur**, **Michael Kilzer,** Cisco Systems, Inc. (United States); **Yihan Liu,** Univ. of Rochester (United States); **Stephen DiAdamo**, **Hassan Shapourian**, **Ramana Kompella, Reza Nejabati,** Cisco Systems, Inc. (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13391-89 • 6:00 PM - 8:00 PM
PL6 centers in 4H-SiC for spin-based quantum technologies
Author(s): **Raphael Woernle**, **Jonathan Körber**, **Timo Steidl,** 3. Physikalisches Institut, Univ. Stuttgart (Germany); **Georgy Astakhov,** Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); **Florian Kaiser,** Luxembourg Institute of Science and Technology (Luxembourg), Univ. du Luxembourg (Luxembourg); **Vadim Vorobyov, Jörg Wrachtrup,** 3. Physikalisches Institut, Univ. Stuttgart (Germany)

13391-90 • 6:00 PM - 8:00 PM
Photonics with thin-film silicon carbide for enhancing the fluorescence of single-color centers
Author(s): **Jonathan Körber,** Univ. Stuttgart (Germany); **Jonah Heiler,** Luxembourg Institute of Science and Technology (Luxembourg); **Jannis Hessenauer,** Karlsruher Institut für Technologie (Germany); **Raphael Woernle,** Univ. Stuttgart (Germany); **Philipp Fuchs,** Univ. des Saarlandes (Germany); **Philipp Flad,** Univ. Stuttgart (Germany); **Jawad Ul-Hassan,** Linköping Univ. (Sweden); **Wolfgang Knolle,** Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany); **Georgy Astakhov,** Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); **Christoph Becher,** Univ. des Saarlandes (Germany); **David Hunger,** Karlsruher Institut für Technologie (Germany); **Florian Kaiser,** Luxembourg Institute of Science and Technology (Luxembourg); **Jörg Wrachtrup,** Univ. Stuttgart (Germany)

13391-91 • 6:00 PM - 8:00 PM
A software-defined management platform for quantum-optical networks
Author(s): **Amar Abane**, **Abderrahim Amlou**, **Lydia Ait Oucheggou**, **Mheni Merzouki**, **Anis Bekri**, **Thomas Gerrits, Abdella Battou,** National Institute of Standards and Technology (United States)

13391-92 • 6:00 PM - 8:00 PM
High spectral purity polarization entanglement source based on dual-element PPKTP waveguides
Author(s): **Jason Mickel**, **Josh Aller**, **Philip Battle**, **Alex Bierut,** AdvR, Inc. (United States); **Catherine Lee,** MIT Lincoln Lab. (United States); **Tony Roberts,** AdvR, Inc. (United States)

13391-93 • 6:00 PM - 8:00 PM
Toward entanglement swapping between moving platforms
Author(s): **John C. Floyd, Paul Kwiat,** Univ. of Illinois (United States)

13391-94 • 6:00 PM - 8:00 PM
Adaptive optics for single photons with parametrically varied emulated turbulence
Author(s): **Robert Von Holle**, **Keith Wyman, Anil Patnaik,** Air Force Institute of Technology (United States)

13391-95 • 6:00 PM - 8:00 PM
Comparative analysis of quantum and classical task mapping algorithms in heterogeneous environments
Author(s): **Luis D. Sanchez**, **Yaroslav Koshka, Samee Khan,** Mississippi State Univ. (United States)

13391-96 • 6:00 PM - 8:00 PM
Image compression using quantum wavelet transforms
Author(s): **Sri Harshavardhan Reddy Devarapalli**, **Harshdeep Jadhav, Jayasri Dontabhaktuni,** Mahindra Univ. (India)

Thursday 30 January 2025

SESSION 14: SINGLE-PHOTON DETECTION COMPONENTS I

30 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **David J. Binks**, The Univ. of Manchester (United Kingdom)

13391-75 • 8:00 AM - 8:20 AM
Accurately modeling the recovery time of superconducting nanowire single-photon detectors as a function of bias current
Author(s): **Leo Oshiro**, **Hudson Jones**, **Timothy Rambo**, **Josh Cassada**, **Stephanie Boyd, Aaron Miller,** Quantum Opus, LLC (United States)

13391-76 • 8:20 AM - 8:40 AM
Generation of nonclassical photon states via free electron scattering
Author(s): **Germaine Arend**, **Armin Feist**, **Jan-Wilke Henke**, **Hao Jeng**, **Rudolf Haindl**, **Claus Ropers,** Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany), Georg-August-Univ. Göttingen (Germany); **Guanhao Huang**, **Yujia Yang**, **Zheru Qiu**, **Arslan Sajid Raja**, **Rui Ning Wang, Tobias J. Kippenberg,** EPFL (Switzerland)

13391-77 • 8:40 AM - 9:00 AM
High photon-number efficiencies with a 28-pixel parallel SNSPD detecting at > 200 Mcps
Author(s): **Lorenzo Stasi,** ID Quantique SA (Switzerland), Univ. de Genève (Switzerland); **Towsif Taher,** Univ. de Genève (Switzerland); **Giovanni V. Resta,** ID Quantique SA (Switzerland), Univ. de Genève (Switzerland); **Hugo Zbinden**, **Rob Thew,** Univ. de Genève (Switzerland); **Félix Bussières,** ID Quantique SA (Switzerland)

13391-78 • 9:00 AM - 9:20 AM
Mid-infrared time correlated single photon counting with superconducting nanowires
Author(s): **Daniel Kuznesof**, **Dmitry Morozov**, **Nidhi Choudhary, Robert H. Hadfield,** Univ. of Glasgow (United Kingdom)

13391-79 • 9:20 AM - 9:40 AM
Photon distillation with reduced resource costs for fault-tolerant quantum computation
Author(s): **Frank Somhorst**, **Kite Sauër**, **Stefan van den Hoven, Jelmer Renema,** Univ. Twente (Netherlands)

Coffee Break 9:40 AM - 10:10 AM

SESSION 15: SINGLE-PHOTON DETECTION COMPONENTS II

30 January 2025 • 10:10 AM - 11:40 AM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Timothy M. Rambo**, Quantum Opus, LLC (United States)

13391-80 • 10:10 AM - 10:40 AM
Interfacing superconducting nanowire single photon detectors with cryogenic opto-electronics in lithium niobate for quantum photonic applications *(Invited Paper)*
Author(s): **Niklas Lamberty**, **Frederik Thiele**, **Thomas Hummel, Tim J. Bartley,** Univ. Paderborn (Germany)

13391-81 • 10:40 AM - 11:00 AM
A 24-mode laser-written universal photonic processor in a glass-based platform
Author(s): **Andrea Barzaghi**, **Francesco Ceccarelli**, **Giacomo Corrielli**, **Valerio Galli**, **Marco Gardina**, **Vittorio Grimaldi**, **Jakub Kaczorowski**, **Francesco Malaspina**, **Roberto Osellame**, **Ciro Pentangelo**, **Andrea Rocchetto,** Ephos (United States); **Alessandro Rudi,** SDA Bocconi School of Management (Italy), Ephos (United States)

13391-82 • 11:00 AM - 11:20 AM
Indistinguishability between arbitrary signal and idler photons for scalable quantum networks
Author(s): **Nijil Lal Cheriya Koyyottummal,** National Institute of Standards and Technology (United States); **Ivan A. Burenkov,** National Institute of Standards and Technology (United States), Joint Quantum Institute, Univ. of Maryland, College Park (United States); **Paulina S. Kuo**, **Oliver Slattery,** National Institute of Standards and Technology (United States); **Sergey V. Polyakov,** National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States)

13391-84 • 11:20 AM - 11:40 AM
Narrowband tunable fiber laser for versatile quantum dot excitation
Author(s): **Niklas M. Lüpken**, **Maximilian Brinkmann**, **Sven Dobner, Tim Hellwig,** Refined Laser Systems GmbH (Germany)

Lunch/Exhibition Break 11:40 AM - 1:30 PM

SESSION 16: SINGLE-PHOTON DETECTION COMPONENTS III

30 January 2025 • 1:30 PM - 2:40 PM | Moscone South, Room 158 (Upper Mezz)
Session Chair(s): **Tim J. Bartley**, Univ. Paderborn (Germany)

13391-85 • 1:30 PM - 1:50 PM
Multi wavelength spectroscopy of quantum emitters in hexagonal boron nitride
Author(s): **Andreas W. Schell,** Johannes Kepler Univ. Linz (Austria); **Pablo Tieben,** Leibniz Univ. Hannover (Germany)

13391-86 • 1:50 PM - 2:10 PM
Classical and non-classical regimes in four-wave mixing from an ensemble of cold two-level atoms
Author(s): **Gabriel C. Borges,** Univ. Federal de Pernambuco (Brazil); **Lucas S. Marinho,** Univ. Federal do Piauí (Brazil); **Wellington Martins**, **Alexandre A. C. de Almeida**, **Guillermo Palacios**, **Michelle O. Araújo, Daniel Felinto,** Univ. Federal de Pernambuco (Brazil)

13391-88 • 2:10 PM - 2:40 PM
Towards 100 ms electron spin coherence of telecom quantum emitters in silicon *(Invited Paper)*
Author(s): **Alexey Lyasota**, **Ian R. Berkman**, **Gabriele de Boo,** Ctr. for Quantum Computation & Communication Technology, The Univ. of New South Wales (Australia); **John G. Bartholomew,** ARC Ctr. of Excellence for Engineered Quantum Systems, The Univ. of Sydney (Australia), The Univ. of Sydney Nano Institute, The Univ. of Sydney (Australia); **Shao Qi Lim,** Ctr. for Quantum Computation & Communication Technology, The Univ. of Melbourne (Australia); **Brett C. Johnson,** RMIT Univ. (Australia); **Jeffrey C. McCallum,** Ctr. for Quantum Computation & Communication Technology, The Univ. of Melbourne (Australia); **Bin-Bin Xu,** Ctr. for Quantum Computation & Communication Technology (Australia), The Univ. of New South Wales (Australia); **Shouyi Xie,** Ctr. for Quantum Computation & Communication Technology, The Univ. of New South Wales (Australia); **Rose L. Ahlefeldt**, **Matthew J. Sellars,** Ctr. for Quantum Computation & Communication Technology, The Australian National Univ. (Australia); **Chunming Yin,** Ctr. for Quantum Computation & Communication Technology, The Univ. of New South Wales (Australia), Univ. of Science and Technology of China (China); **Sven Rogge,** Ctr. for Quantum Computation & Communication Technology, The Univ. of New South Wales (Australia); **Justin Brown,** The Univ. of New South Wales (Australia)

CONFERENCE 13392

Quantum Sensing, Imaging, and Precision Metrology III

25 - 30 January 2025 | Moscone South, Room 157/159 (Upper Mezz)

Conference Chair(s): **Selim M. Shahriar,** Northwestern Univ. (United States)

Program Committee: **Hadiseh Alaeian,** Purdue Univ. (United States); **Angelo Bassi,** Univ. degli Studi di Trieste (Italy); **Jason Bonacum,** Digital Optics Technologies, Inc. (United States); **Robert W. Boyd,** Univ. of Ottawa (Canada), Univ. of Rochester (United States); **Danielle A. Braje,** MIT Lincoln Lab. (United States); **John H. Burke,** Defense Advanced Research Projects Agency (United States); **Eliahu Cohen,** Bar-Ilan Univ. (Israel); **Robert Compton,** Honeywell (United States); **Brian D'Urso,** Montana State Univ. (United States); **Andrew Geraci,** Northwestern Univ. (United States); **Philip R. Hemmer,** Texas A&M Univ. (United States); **Yonatan F. Kahn,** Univ. of Toronto (Canada); **Brian Kasch,** Air Force Research Lab. (United States); **Jacob B. Khurgin,** Johns Hopkins Univ. (United States); **May Eun Yeon Kim,** MIT Lincoln Lab. (United States); **John E. Kitching,** National Institute of Standards and Technology (United States); **Shimon Kolkowitz,** Univ. of California, Berkeley (United States); **Tim Kovachy,** Northwestern Univ. (United States); **Shau-Yu Lan,** National Taiwan Univ. (Taiwan); **Uriel Levy,** The Hebrew Univ. of Jerusalem (Israel); **Alan L. Migdall,** National Institute of Standards and Technology (United States); **Frank A. Narducci,** Naval Postgraduate School (United States); **Irina Novikova,** William & Mary (United States); **Gour S. Pati,** Delaware State Univ. (United States); **Stefania Residori,** HOASYS SAS (France); **Jacob Scheuer,** Tel Aviv Univ. (Israel); **Monika H. Schleier-Smith,** Stanford Univ. (United States); **Margaret Shea,** DEVCOM Army Research Lab. (United States); **Swati Singh,** Univ. of Delaware (United States); **David D. Smith,** NASA Marshall Space Flight Ctr. (United States); **Misha Sumetsky,** Aston Univ. (United Kingdom); **Renu Tripathi,** Delaware State Univ. (United States); **Dalziel J. Wilson,** Wyant College of Optical Sciences (United States); **Yanhong Xiao,** Fudan Univ. (China); **Avinoam Zadok,** Bar-Ilan Univ. (Israel)

Saturday 25 January 2025

SESSION 1: ATOM INTERFEROMETRY AND MATTER WAVES I

25 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Selim M. Shahriar**, Northwestern Univ. (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-1 • 8:00 AM - 8:30 AM
Quantum sensing using trapped atom interferometry *(Invited Paper)*
Author(s): **Marybeth Beydler**, **Eddie Moan, Cass A. Sackett,** Univ. of Virginia (United States)

13392-2 • 8:30 AM - 8:50 AM
Measuring AC Zeeman shifts using a trapped cold atom interferometer on chip
Author(s): **Benjamin Wirtschafter,** Thales Research & Technology (France); **Soizic Hello,** Thales AVS France SAS (France), Lab. Charles Fabry, Institut d'Optique Graduate School (France); **Christoph Westbrook,** Lab. Charles Fabry, Institut d'Optique Graduate School (France); **Matthieu Dupont-Nivet,** Thales Research & Technology (France)

13392-3 • 8:50 AM - 9:20 AM
To be determined *(Invited Paper)*
Author(s): **Frank A. Narducci,** Naval Postgraduate School (United States)

13392-4 • 9:20 AM - 9:40 AM
Preliminary noise budget of an on-chip cold atom Ramsey interferometer with a state selective spatial splitting
Author(s): **Soizic Hello,** Thales AVS France SAS (France), Lab. Charles Fabry, Institut d'Optique Graduate School (France); **Benjamin Wirtschafter,** Thales Research & Technology (France); **Frédéric Seguineau,** Thales AVS France SAS (France); **Christoph Westbrook,** Lab. Charles Fabry, Institut d'Optique Graduate School (France); **Matthieu Dupont-Nivet,** Thales Research & Technology (France)

13392-5 • 9:40 AM - 10:10 AM
Light-mediated XYZ Hamiltonians and beyond in a Bragg Matterwave Interferometer: collective recoil, two-axis counter-twisting, and n-body interactions *(Invited Paper)*
Author(s): **James K. Thompson,** Univ. of Colorado Boulder (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 2: ATOM INTERFEROMETRY AND MATTER WAVES II

25 January 2025 • 10:40 AM - 11:50 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Adam T. Black**, U.S. Naval Research Lab. (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-6 • 10:40 AM - 11:10 AM
Techniques for sensitive measurements of gravitational acceleration using single state echo atom interferometers *(Invited Paper)*
Author(s): **Gehrig Carlse**, **Jaskaran Randhawa**, **Alex Pouliot**, **Thomas Vacheresse**, **Eduardo Ramos, Anantharaman Kumarakrishnan,** York Univ. (Canada)

13392-7 • 11:10 AM - 11:30 AM
A quantum-classical cold atom system for inertial navigation
Author(s): **Alex Webber-Date**, **Maxwell Rowley**, **Paul Osborn,** CPI TMD Technologies Ltd. (United Kingdom); **Robert Shah**, **Teodor Krastev,** Imperial College London (United Kingdom); **Rachel Cannon**, **Paul Griffin**, **Erling Riis,** Univ. of Strathclyde (United Kingdom); **Joseph Cotter,** Imperial College London (United Kingdom); **Oliver Burrow,** Univ. of Strathclyde (United Kingdom); **Edward Boughton,** CPI TMD Technologies Ltd. (United Kingdom)

13392-9 • 11:30 AM - 11:50 AM
Improving the performances of a compact atom interferometer gyroscope
Author(s): **Joseph Junca**, **John Kitching, William R. McGehee,** National Institute of Standards and Technology (United States)

Lunch/Exhibition Break 11:50 AM - 1:20 PM

SESSION 3: ATOM INTERFEROMETRY AND MATTER WAVES III

25 January 2025 • 1:20 PM - 5:40 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Cass A. Sackett**, Univ. of Virginia (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-10 • 1:20 PM - 1:50 PM
To be determined *(Invited Paper)*
Author(s): **Holger Müller,** Univ. of California, Berkeley (United States)

13392-11 • 1:50 PM - 2:10 PM
The Hannover Very Long Baseline Atom Interferometry facility
Author(s): **Dennis Schlippert,** Leibniz Univ. Hannover (Germany)

13392-12 • 2:10 PM - 2:40 PM
Dark energy detection at the Einstein-Elevator using atom interferometry *(Invited Paper)*
Author(s): **Sheng-wey Chiow**, **Nan Yu,** Jet Propulsion Lab. (United States); **Charles Garcion**, **Sukhjovan Gill**, **Magdalena Misslisch**, **Ernst M. Rasel,** Leibniz Univ. Hannover (Germany); **Ioannis Papadakis, Markus Krutzik,** Humboldt-Univ. zu Berlin (Germany)

13392-145 • 2:40 PM - 3:10 PM
Programmable quantum sensing using ultracold atoms in 3D optical lattices *(Invited Paper)*
Author(s): **Murray Holland**, **Kendall Mehling, Catie LeDesma,** JILA (United States)

Coffee Break • 3:10 PM - 3:40 PM

13392-13 • 3:40 PM - 4:10 PM
Progress toward a dual-beam 3D-cooled atom interferometer gyroscope *(Invited Paper)*
Author(s): **Adam T. Black**, **Jonathan M. Kwolek, Sunil Upadhyay,** U.S. Naval Research Lab. (United States)

13392-14 • 4:10 PM - 4:40 PM
Vector atom accelerometry in an optical lattice *(Invited Paper)*
Author(s): **Catherine LeDesma**, **Kendall Mehling, Murray Holland,** JILA (United States)

13392-15 • 4:40 PM - 5:10 PM
Multi-photon clock atom interferometry *(Invited Paper)*
Author(s): **Jan Rudolph**, **Samuel P Carman**, **Benjamin E. Garber**, **Michael J Van de Graaff**, **Hunter Swan**, **Yijun Jiang**, **Megan Nantel**, **Mahiro Abe**, **Rachel L Barcklay, Jason M Hogan,** Stanford Univ. (United States)

13392-16 • 5:10 PM - 5:40 PM
Quantum sensing with Bose-Einstein condensates interferometry *(Invited Paper)*
Author(s): **Naceur Gaaloul,** Leibniz Univ. Hannover (Germany)

SESSION 4: MAGNETOMETRY

25 January 2025 • 8:30 AM - 10:20 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Matthew C. Cambria**, Univ. of California, Berkeley (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-17 • 8:30 AM - 8:50 AM
Laser threshold magnetometry with a combined laser diode, nitrogen-vacancy center cavity
Author(s): **Lukas Lindner**, **Yves Rottstaedt**, **Florian Schall**, **Felix A. Hahl**, **Tingpeng Luo**, **Can Dogan,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany); **Guillermo Nava Antonio,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany), Cavendish Laboratory, University of Cambridge (United Kingdom); **Xavier Vidal,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany), TECNALIA, Basque Research and Technology Alliance (BRTA) (Spain); **Joachim Sacher,** Sacher Lasertechnik GmbH (Germany); **Alexander Zaitsev,** College of Staten Island (United States), Gemological Institute of America (United States); **Takeshi Ohshima,** Tohoku Univ. (Japan), National Institutes for Quantum Science and Technology (Japan); **Marco Capelli**, **Brant C. Gibson**, **Andrew D. Greentree,** ARC Centre of Excellence for Nanoscale BioPhotonics, School of Science, RMIT University (Australia); **Marcel Rattunde**, **Jan Jeske, Rüdiger Quay,** Fraunhofer-Institut für Angewandte Festkörperphysik IAF (Germany)

13392-19 • 8:50 AM - 9:20 AM
A compact vectorized magnetometer for measuring Earth's magnetic field in space *(Invited Paper)*
Author(s): **Michaela Ellmeier,** Univ. of Colorado Boulder (United States); **Ricardo Jiménez-Martínez,** FieldLine Industries (United States); **Dean Allison**, **Tyler Maydew,** FieldLine Medical (United States); **Jeramy Hughes,** FieldLine (United States); **Carolina Chism**, **Robert Marshall,** Univ. of Colorado Boulder (United States); **Orang Alem,** FieldLine (United States); **Svenja A. Knappe,** Univ. of Colorado Boulder (United States)

13392-20 • 9:20 AM - 9:50 AM
Super-resolution covariance magnetometry with NV centers: detecting field correlators at nanometer distances *(Invited Paper)*
Author(s): **Jared Rovny,** Princeton Univ. (United States); **Shimon Kolkowitz,** Univ. of California, Berkeley (United States); **Nathalie de Leon,** Princeton Univ. (United States)

13392-22 • 9:50 AM - 10:20 AM
Atomic magnetometer based on Electromagnetically Induced Transparency (EIT) *(Invited Paper)*
Author(s): **Mario Alberto González Maldonado,** National Institute of Standards and Technology (United States)

Coffee Break 10:20 AM - 10:50 AM

SESSION 5: SENSING WITH NV-DIAMOND AND OTHER COLOR CENTERS I

25 January 2025 • 10:50 AM - 11:40 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Jared Rovny**, Princeton Univ. (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-23 • 10:50 AM - 11:20 AM
Near-field sensing of a topological metasurface via scanning color center microscopy *(Invited Paper)*
Author(s): **Carlos A. Meriles**, **Raman Kumar**, **Gabriel Lopez Morales**, **Chandan Chandan**, **Anton Vakulenko**, **Svetlana Kiriushechkina**, **Alexander Khanikaev, Johannes Flick,** The City College of New York (United States)

13392-25 • 11:20 AM - 11:40 AM
Rare Earth element detection using nitrogen vacancies in nanodiamonds
Author(s): **Gary R. Lander**, **Scott E. Crawford**, **Hari P. Paudel**, **Matthew M. Brister**, **Jeffrey Wuenschell**, **Michael P. Buric, Yuhua Duan,** National Energy Technology Lab. (United States)

Lunch/Exhibition Break 11:40 AM - 1:10 PM

SESSION 6: SENSING WITH NV-DIAMOND AND OTHER COLOR CENTERS II

25 January 2025 • 1:10 PM - 2:20 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Carlos Meriles**, The City College of New York (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-26 • 1:10 PM - 1:30 PM
Nitrogen vacancy center in diamond for the stress and field sensing: first principles density functional theory and experimental approach
Author(s): **Hari P. Paudel,** National Energy Technology Lab. (United States)

13392-27 • 1:30 PM - 1:50 PM
Quantum sensor for measuring deuterium-to-hydrogen ratio in water using NV centers
Author(s): **Fabrizio Sgrignuoli**, **Ivan Viti**, **Sina Soleimanikahnoj, Zhi-Gang Yu,** QuantCAD LLC (United States)

13392-29 • 1:50 PM - 2:20 PM
Scalable platform for parallel measurement and control of individual nitrogen-vacancy centers in diamond *(Invited Paper)*
Author(s): **Matthew C. Cambria**, **Saroj Chand, Shimon Kolkowitz,** Univ. of California, Berkeley (United States)

Coffee Break 2:20 PM - 2:50 PM

SESSION 7: INTEGRATED PHOTONICS AND ATOMICS I

25 January 2025 • 2:50 PM - 5:10 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Selim M. Shahriar**, Northwestern Univ. (United States)
Sessions 1-3 run concurrently with sessions 4-7

13392-30 • 2:50 PM - 3:20 PM
Monolithic Al/Ge/Al nanostructures: a novel platform for quantum sensing and photodetection *(Invited Paper)*
Author(s): **Mauro David**, **Masiar Sistani**, **Lukas Wind**, **Zehao Song**, **Francesco Maraspini**, **Fabian Schwingshandl**, **Gottfried Strasser, Alois Lugstein,** Technische Univ. Wien (Austria)

13392-31 • 3:20 PM - 3:50 PM
Signature of collective emission from a dense atomic ensemble coupled to a nanophotonic resonator *(Invited Paper)*
Author(s): **Xinchao Zhou, Chen-Lung Hung,** Purdue Univ. (United States)

13392-32 • 3:50 PM - 4:10 PM
An all glass, high finesse miniature integrated fiber Fabry-Perot microcavity produced by 3D femtosecond laser processing
Author(s): **Antoine Duret,** EPFL (Switzerland); **Jakob Reichel**, **Romain Long,** Ecole normale supérieure - PSL, Sorbonne Univ. (France); **Yves Bellouard,** EPFL (Switzerland)

13392-33 • 4:10 PM - 4:40 PM
Distributed quantum sensing with integrated quantum photonics *(Invited Paper)*
Author(s): **Jonathan C. F. Matthews, Beth Puzio,** Univ. of Bristol (United Kingdom)

13392-188 • 4:40 PM - 5:10 PM
Challenges and opportunities in implementations of rubidium vapor coherent processes in chip-scale devices *(Invited Paper)*
Author(s): **Roy Zektzer,** The Hebrew Univ. of Jerusalem (Israel)

Sunday 26 January 2025

SESSION 8: ATOM INTERFEROMETRY AND MATTER WAVES IV

26 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Dmitry A. Pushin**, Univ. of Waterloo (Canada)
Sessions 8-11 run concurrently with sessions 12-14

13392-36 • 8:00 AM - 8:30 AM
Exploring frontiers of quantum physics and gravity with atom interferometry *(Invited Paper)*
Author(s): **Philippe Bouyer,** Lab. Photonique, Numérique et Nanosciences (France)

13392-34 • 8:30 AM - 9:00 AM
Multi-axis inertial sensing using matter-wave arrays *(Invited Paper)*
Author(s): **Dennis Schlippert,** Leibniz Univ. Hannover (Germany)

13392-35 • 9:00 AM - 9:30 AM
Trapped atom interferometry for precision gravity surveys and fundamental physics *(Invited Paper)*
Author(s): **Matthew Jaffe,** Montana State Univ. (United States)

13392-37 • 9:30 AM - 9:50 AM
Atom interferometric sensing over large baselines
Author(s): **Michael Werner**, **Ali Lezeik**, **Dennis Schlippert**, **Ernst M. Rasel**, **Naceur Gaaloul, Klemens Hammerer,** Leibniz Univ. Hannover (Germany)

Coffee Break 9:50 AM - 10:20 AM

SESSION 9: ATOM INTERFEROMETRY AND MATTER WAVES V

26 January 2025 • 10:20 AM - 11:40 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Philippe Bouyer**, Lab. Photonique, Numérique et Nanosciences (France)
Sessions 8-11 run concurrently with sessions 12-14

13392-38 • 10:20 AM - 10:50 AM
To be determined *(Invited Paper)*
Author(s): **Dmitry A. Pushin,** Univ. of Waterloo (Canada)

13392-39 • 10:50 AM - 11:10 AM
Precise Raman control of spinor matterwave with nanosecond composite biased rotations
Author(s): **Jiangyong Hu,** Fudan Univ. (China); **Liangyang Qiu,** Max-Planck-Institut für Quantenoptik (Germany); **Saijun Wu,** Fudan Univ. (China)

13392-40 • 11:10 AM - 11:40 AM
"Ultrafast" control of spinor atomic matterwave: from optical acceleration to accessing subradience *(Invited Paper)*
Author(s):

Lunch/Exhibition Break 11:40 AM - 1:10 PM

SESSION 10: ATOMIC, OPTICAL, AND NUCLEAR CLOCK I

26 January 2025 • 1:10 PM - 3:10 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Vladimir S. Malinovsky**, DEVCOM Army Research Lab. (United States)
Sessions 8-11 run concurrently with sessions 12-14

13392-41 • 1:10 PM - 1:40 PM
Trapped ion approach to miniaturizing high performance atomic clocks *(Invited Paper)*
Author(s): **Thai Hoang,** Jet Propulsion Lab. (United States)

13392-42 • 1:40 PM - 2:10 PM
High-resolution absorption spectroscopy in laser-cooled rubidium atoms with bichromatic laser excitation *(Invited Paper)*
Author(s): **Gour S. Pati**, **Renu Tripathi**, **Gustavo Acosta, Mauricio Pulido,** Delaware State Univ. (United States)

13392-43 • 2:10 PM - 2:40 PM
Chasing stability in chip-scale atomic beam clocks *(Invited Paper)*
Author(s): **William R. McGehee,** National Institute of Standards and Technology (United States); **Gabriela D. Martinez**, **Alexander L. Staron,** National Institute of Standards and Technology (United States), Univ. of Colorado Boulder (United States); **Travis M. Autry,** HRL Labs., LLC (United States); **John Kitching,** National Institute of Standards and Technology (United States)

13392-44 • 2:40 PM - 3:10 PM
Compact platforms for cold-atom clocks *(Invited Paper)*
Author(s): **Erling Riis,** Univ. of Strathclyde (United Kingdom)

Coffee Break 3:10 PM - 3:40 PM

SESSION 11: ATOMIC, OPTICAL, AND NUCLEAR CLOCK II

26 January 2025 • 3:40 PM - 6:00 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Gour S. Pati**, Delaware State Univ. (United States)
Sessions 8-11 run concurrently with sessions 12-14

13392-45 • 3:40 PM - 4:10 PM
Microfabricated vapor cell atomic clocks at FEMTO-ST *(Invited Paper)*
Author(s): **Clément Carlé**, **Martin Callejo**, **Andrei Mursa**, **Moustafa Abdel Hafiz**, **Quentin Tanguy**, **Jacques Millo,** FEMTO-ST (France); **Vincent Maurice,** Institut d'Electronique de Microélectronique et de Nanotechnologie, Ecole Centrale de Lille (France); **Emmanuel Klinger**, **Nicolas Passilly,** FEMTO-ST (France); **Rodolphe Boudot,** Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

13392-46 • 4:10 PM - 4:40 PM
Nuclear clocks and nuclear quantum memories *(Invited Paper)*
Author(s): **Olga Kocharovskaya,** Texas A&M Univ. (United States)

13392-47 • 4:40 PM - 5:00 PM
Micro-integrated laser distribution modules for low-SWaP optical atomic clocks
Author(s): **Jonas Hamperl**, **Martin Gärtner**, **Nora Goossen-Schmidt**, **Bassem Arar**, **Marcel Bursy**, **Sriram Hariharan**, **Simon Kubitza**, **Armin Liero**, **Sonja Nozinic**, **Max Schiemangk**, **Sandy Szermer**, **Christoph Tyborski, Andreas Wicht,** Ferdinand-Braun-Institut gGmbH (Germany)

13392-48 • 5:00 PM - 5:30 PM
Laser spectroscopy of a nucleus *(Invited Paper)*
Author(s): **Eric Hudson,** Univ. of California, Los Angeles (United States)

13392-189 • 5:30 PM - 6:00 PM
Advanced Ramsey interferometry with tailored pulses *(Invited Paper)*
Author(s): **Sebastián Carrasco**, **Sean Lourette,** DEVCOM Army Research Lab. (United States); **Andrey Jarmola,** DEVCOM Army Research Lab. (United States), Univ. of California, Berkeley (United States); **Jabir Chathanathil,** DEVCOM Army Research Lab. (United States); **Dmitry Budker,** Univ. of California, Berkley (United States), Helmholtz-Institut Mainz (Germany), Johannes Gutenberg Univ. Mainz (Germany); **Svetlana Malinovskaya,** Stevens Institute of Technology (United States); **Ignacio R. Sola,** Univ. Complutense de Madrid (Spain); **Anthony G. Birdwell**, **Tony G. Ivanov, Vladimir S. Malinovsky,** DEVCOM Army Research Lab. (United States)

SESSION 12: INTEGRATED PHOTONICS AND ATOMICS II

26 January 2025 • 8:00 AM - 10:00 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Roy Zektzer**, The Hebrew Univ. of Jerusalem (Israel)
Sessions 8-11 run concurrently with sessions 12-14

13392-49 • 8:00 AM - 8:30 AM
Robust quantum integrated photonics *(Invited Paper)*
Author(s): **Haim Suchowski,** 3DOptix (Israel), Tel Aviv Univ. (Israel)

13392-50 • 8:30 AM - 9:00 AM
Nonlinear integrated photonics and electro-optics for high-resolution spectroscopy of quantum systems *(Invited Paper)*
Author(s): **Kartik Srinivasan,** National Institute of Standards and Technology (United States)

13392-51 • 9:00 AM - 9:30 AM
Entanglement complexity and atom interferometry with cold atom qubits *(Invited Paper)*
Author(s): **Grant Biedermann,** The Univ. of Oklahoma (United States)

13392-52 • 9:30 AM - 10:00 AM
Quantum sensing and information with thermal atomic beams on chip *(Invited Paper)*
Author(s): **Chandra Raman,** Georgia Institute of Technology (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 13: FREQUENCY COMBS FOR SENSING

26 January 2025 • 10:30 AM - 12:20 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Chandra Raman**, Georgia Institute of Technology (United States)
Sessions 8-11 run concurrently with sessions 12-14

13392-53 • 10:30 AM - 11:00 AM
Active frequency combs in fast and slow gain media *(Invited Paper)*
Author(s): **David Burghoff,** The Univ. of Texas at Austin (United States)

13392-54 • 11:00 AM - 11:30 AM
Applications of mid-infrared quantum cascade laser frequency combs to precision spectroscopy and remote sensing *(Invited Paper)*
Author(s): **Gerard Wysocki,** Princeton Univ. (United States)

13392-57 • 11:30 AM - 11:50 AM
Machine learning techniques for frequency comb optimization
Author(s): **Maximilian Floridia,** Univ. of California, Los Angeles (United States); **Scott Wynn,** Univ. of Washington (United States); **Jayan Nitsche,** Pomona College (United States); **Bishop Placke,** Univ. of Nebraska-Lincoln (United States); **Matthew J. Tyler**, **Jack Diab**, **Mirali Shariatdoust**, **Sergio Carbajo**, **Prineha Narang, Andrea L. Bertozzi,** Univ. of California, Los Angeles (United States)

13392-55 • 11:50 AM - 12:20 PM
Tunable superluminal-to-negative group velocities in free-space and fiber using frequency combs *(Invited Paper)*
Author(s): **Alan E. Willner,** The Univ. of Southern California (United States)

Lunch/Exhibition Break 12:20 PM - 1:50 PM

SESSION 14: RECENT DEVELOPMENTS IN QUANTUM SENSING I

26 January 2025 • 1:50 PM - 5:40 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **David Burghoff**, The Univ. of Texas at Austin (United States)
Sessions 8-11 run concurrently with sessions 12-14

13392-59 • 1:50 PM - 2:20 PM
Quasi-probabilities in quantum mechanics: fundamental ideas and applications *(Invited Paper)*
Author(s): **Paolo Solinas,** Univ. degli Studi di Genova (Italy)

13392-60 • 2:20 PM - 2:50 PM
Observing ultrafast coherent exciton dynamics in a single epitaxial quantum dot *(Invited Paper)*
Author(s): **Frieder Conradt**, **Philipp Gebauer,** Univ. Konstanz (Germany); **Chenglian Zhu,** ETH Zurich (Switzerland); **Eva Haage,** Univ. Konstanz (Germany); **Ihor Cherniukh,** ETH Zurich (Switzerland); **Claudio Bruschini,** EPFL (Switzerland); **Gabriele Rainò,** ETH Zurich (Switzerland); **Edoardo Charbon,** EPFL (Switzerland); **Maksym Kovalenko,** ETH Zurich (Switzerland); **Alfred Leitenstorfer, Ron Tenne,** Univ. Konstanz (Germany)

13392-18 • 2:50 PM - 3:20 PM
Design and development of a field-deployable vector magnetometer prototype *(Invited Paper)*
Author(s): **Renu Tripathi**, **Gour S. Pati, Mauricio Pulido,** Delaware State Univ. (United States)

Coffee Break • 3:20 PM - 3:50 PM

13392-61 • 3:50 PM - 4:10 PM
Development of 3D microwave resonator for nanodiamond temperature measurement
Author(s): **Hiromu Nakashima**, **Keisuke Oshimi, Masazumi Fujiwara,** Okayama Univ. (Japan)

13392-62 • 4:10 PM - 4:40 PM
Imaging of bi-photon states and their applications in quantum imaging *(Invited Paper)*
Author(s): **Ebrahim Karimi,** Univ. of Ottawa (Canada)

13392-63 • 4:40 PM - 5:10 PM
Quantum jump photodetector for narrowband photon counting with a single atom *(Invited Paper)*
Author(s): **Morgan W. Mitchell,** ICFO - Institut de Ciències Fotòniques (Spain)

13392-21 • 5:10 PM - 5:40 PM
Integrating NV-center diamonds with hollow whispering gallery resonators for quantum sensing *(Invited Paper)*
Author(s): **Mohammed Zia Jalaludeen**, **Samuel Begumya,** Okinawa Institute of Science and Technology Graduate Univ. (Japan); **Shilong Li,** Zhejiang Univ. (China); **Síle Nic Chormaic,** Okinawa Institute of Science and Technology Graduate Univ. (Japan)

Monday 27 January 2025

SESSION 15: ATOMIC, OPTICAL, AND NUCLEAR CLOCK III

27 January 2025 • 8:30 AM - 9:50 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Robert Compton**, Safran Federal Systems Inc. (United States)
Sessions 15-17 run concurrently with sessions 18-21

13392-64 • 8:30 AM - 9:00 AM
A new Yb+ duplex optical ion clock with enhanced common-mode noise suppression *(Invited Paper)*
Author(s): **Christian Sanner,** Colorado State Univ. (United States)

13392-65 • 9:00 AM - 9:30 AM
Enhancing optical clocks: strontium lattice clock with a record precision and accuracy *(Invited Paper)*
Author(s): **Kyungtae Kim,** JILA (United States)

13392-67 • 9:30 AM - 9:50 AM
Gallium nitride laser development for optical atomic clock applications
Author(s): **Finlay Walton**, **Shuqiao Cai**, **Daehyun Kim,** Univ. of Glasgow (United Kingdom); **Sean Mulholland**, **Ian Hill,** National Physical Lab. (United Kingdom); **Stephen P. Najda,** TopGaN Ltd. (Poland); **Piotr Perlin**, **Tadek Suski**, **Lucja Marona**, **Mike Leszczynski**, **Szymon Stanczyk,** TopGaN Ltd. (Poland), Institute of High Pressure Physics (Poland); **Thomas J. Slight,** Sivers Photonics Ltd. (United Kingdom); **Mohsin Haji**, **Patrick Gill,** National Physical Lab. (United Kingdom); **Anthony E. Kelly, Scott Watson,** Univ. of Glasgow (United Kingdom)

Coffee Break 9:50 AM - 10:20 AM

SESSION 16: ATOMIC, OPTICAL, AND NUCLEAR CLOCK IV

27 January 2025 • 10:20 AM - 11:40 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Christian Sanner**, Colorado State Univ. (United States)
Sessions 15-17 run concurrently with sessions 18-21

13392-68 • 10:20 AM - 10:50 AM
Benchmarking optical clock technologies for future applications *(Invited Paper)*
Author(s): **Robert Compton,** Safran Federal Systems Inc. (United States); **Alexandre Didier,** Safran Timing Technologies SA (Switzerland)

13392-69 • 10:50 AM - 11:20 AM
Photonic integrated lasers for optical atomic clocks *(Invited Paper)*
Author(s): **William Loh,** MIT Lincoln Lab. (United States)

13392-70 • 11:20 AM - 11:40 AM
Sub-Hz VECSEL platform for optical clocks
Author(s): **Jussi-Pekka Penttinen**, **Emmi Kantola**, **Topi Uusitalo**, **Sanna Ranta, Mircea Guina,** Vexlum Oy (Finland)

Lunch Break 11:40 AM - 1:00 PM

QUANTUM WEST PLENARY SESSION

27 January 2025 • 1:00 PM - 3:05 PM | Moscone South, Room 207/215 (Level 2)
Session Chair: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks
Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

13393-501 • 1:05 PM - 1:45 PM
Quantum structured light takes shape (Plenary Presentation)
Author(s): **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13392-501 • 1:45 PM - 2:25 PM
Optical clocks: time and the future of metrology (Plenary Presentation)
Author(s): **Tara M. Fortier,** National Institute of Standards and Technology (United States)

13392-502 • 2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory (Plenary Presentation)
Author(s): **Eric A. Cornell,** National Institute of Standards and Technology (United States)

Coffee Break 3:05 PM - 3:30 PM

SESSION 17: OPTOMECHANICS AND LEVITATED MECHANICS I

27 January 2025 • 3:30 PM - 4:30 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Michael R. Vanner**, Imperial College London (United Kingdom)
Sessions 15-17 run concurrently with sessions 18-21

13392-71 • 3:30 PM - 4:00 PM
Precision measurements with levitated optomechanics *(Invited Paper)*
Author(s): **Brian D'Urso**, **Cody Jessup**, **Larson Pavey**, **Yateendra Sihag**, **Tahereh Naderishahab**, **Sophia Balderrama, Connor Murphy,** Montana State Univ. (United States)

13392-73 • 4:00 PM - 4:30 PM
Quantum sensing with optomechanical systems *(Invited Paper)*
Author(s): **David Vitali,** Univ. degli Studi di Camerino (Italy); **Najmeh Eshaqi-Sani,** Dipartimento di Scienze Matematiche, Fisiche e Informatiche, Università di Parma (Italy); **Stefano Zippilli,** Univ. degli Studi di Camerino (Italy)

SESSION 18: SUPEROSCILLATION AND SUPERRESOLUTION

27 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Ebrahim Karimi**, Univ. of Ottawa (Canada)
Sessions 15-17 run concurrently with sessions 18-21

13392-75 • 8:00 AM - 8:30 AM
Reconstructing superoscillations buried deeply in noise *(Invited Paper)*
Author(s): **Derek White**, **John C. Howell**, **Andrew N. Jordan**, **Daniele C. Struppa**, **Shunxing Zhang,** Chapman Univ. (United States); **Achim Kempf, Barbara Soda,** Perimeter Institute for Theoretical Physics (Canada)

13392-76 • 8:30 AM - 9:00 AM
Advances in superradar and super resolution *(Invited Paper)*
Author(s): **Andrew N. Jordan,** Univ. of Rochester (United States), Chapman Univ. (United States)

13392-77 • 9:00 AM - 9:30 AM
Parameter-estimation approach to super resolution *(Invited Paper)*
Author(s): **Alexander Boeschoten**, **Nicolas Treps**, **Antonin Grateau**, **Clémentine Rouvière**, **Ilya Karuseichyk,** Lab. Kastler Brossel (France); **Giacomo Sorelli,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Manuel Gessner,** Univ. de València (Spain); **Claude Fabre,** Lab. Kastler Brossel (France)

13392-79 • 9:30 AM - 9:50 AM
Theory for super-resolution quantum microscopy with Heisenberg scaling
Author(s): **Wenyu Liu, Lihong V. Wang,** Caltech (United States)

Coffee Break 9:50 AM - 10:20 AM

SESSION 19: ENABLING TECHNOLOGY FOR SENSING I

27 January 2025 • 10:20 AM - 11:00 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Simeon Bogdanov**, Univ. of Illinois (United States)
Sessions 15-17 run concurrently with sessions 18-21

13392-80 • 10:20 AM - 10:40 AM
Photonic integration of GaN laser diodes for quantum sensing and precision metrology
Author(s): **Stephen P. Najda,** Topgan Quantum Technologies, Ltd. (United Kingdom); **Piotr Perlin,** TopGaN Ltd. (Poland); **Tadek Suski**, **Szymon Stanczyk**, **Anna Kafar**, **Mike Leszczynski,** Institute of High Pressure Physics (Poland); **Nicola Parry**, **Anthony E. Kelly,** Univ. of Glasgow (United Kingdom); **Brendan Casey**, **David Burt,** Kelvin Nanotechnology Ltd. (United Kingdom); **Shaun Jones,** ALTER TECHNOLOGY TÜV NORD UK Ltd. (United Kingdom); **Sia Andersson**, **John MacArthur,** Fraunhofer Ctr. for Applied Photonics (United Kingdom); **Mohsin Haji,** National Physical Lab. (United Kingdom)

13392-81 • 10:40 AM - 11:00 AM
Teaching single-photon detection metrology with off-the-shelf CMOS SPAD detectors
Author(s): **Claudio E. Bruschini**, **Utku Karaca**, **Ekin Kizilkan, Edoardo Charbon,** EPFL (Switzerland)

Lunch Break 11:00 AM - 1:00 PM

QUANTUM WEST PLENARY SESSION

27 January 2025 • 1:00 PM - 3:05 PM | Moscone South, Room 207/215 (Level 2)
Session Chair: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks
Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

13393-501 • 1:05 PM - 1:45 PM
Quantum structured light takes shape (Plenary Presentation)
Author(s): **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13392-501 • 1:45 PM - 2:25 PM
Optical clocks: time and the future of metrology (Plenary Presentation)
Author(s): **Tara M. Fortier,** National Institute of Standards and Technology (United States)

13392-502 • 2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory (Plenary Presentation)
Author(s): **Eric A. Cornell,** National Institute of Standards and Technology (United States)

Coffee Break 3:05 PM - 3:30 PM

SESSION 20: ENABLING TECHNOLOGY FOR SENSING II

27 January 2025 • 3:30 PM - 4:20 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Andrew N. Jordan**, Univ. of Rochester (United States)
Sessions 15-17 run concurrently with sessions 18-21

13392-82 • 3:30 PM - 3:50 PM
Unlocking quantum potential with widely tunable OPO lasers: from frequency conversion to atomic transitions in hard-to-reach infrared
Author(s): **Siamak Dadras**, **Andrew Ross**, **Pei-Wen Tsai**, **Christopher Haimberger, Adam Heiniger,** TOPTICA Photonics, Inc. (United States)

13392-83 • 3:50 PM - 4:20 PM
Planar type-II superlattices for high operating temperature broadband MWIR and LWIR sensing *(Invited Paper)*
Author(s): **Manijeh Razeghi,** Northwestern Univ. (United States)

SESSION 21: RECENT DEVELOPMENTS IN QUANTUM SENSING II

27 January 2025 • 4:20 PM - 6:10 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Alexander Boeschoten**, Lab. Kastler Brossel (France)
Sessions 15-17 run concurrently with sessions 18-21

13392-84 • 4:20 PM - 4:50 PM
Feasibility of microwave-to-optical transduction via sub-terahertz states for sensing and quantum photonics *(Invited Paper)*
Author(s): **Simeon Bogdanov,** Univ. of Illinois (United States)

13392-85 • 4:50 PM - 5:20 PM
Quantum metrology with alkaline-earth atom arrays *(Invited Paper)*
Author(s): **Nelson Darkwah Oppong,** Caltech (United States)

13392-86 • 5:20 PM - 5:50 PM
To be determined *(Invited Paper)*
Author(s): **Michael Holynski,** Univ. of Birmingham (United Kingdom)

13392-56 • 5:50 PM - 6:10 PM
Industry progress in high precision measurement and sensing using fiber-based frequency combs
Author(s): **Saeed Pegahan,** TOPTICA Photonics, Inc. (United States)

Tuesday 28 January 2025

SESSION 22: OPTOMECHANICS AND LEVITATED MECHANICS II

28 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Selim M. Shahriar**, Northwestern Univ. (United States)
Sessions 22-25 run concurrently with sessions 26-28

13392-87 • 8:00 AM - 8:30 AM
Combining an ultra-high-Q nanomechanical oscillator with a trapped atomic ion: a novel hybrid platform *(Invited Paper)*
Author(s): **Dmitry S. Bykov,** Univ. Innsbruck (Austria)

13392-88 • 8:30 AM - 9:00 AM
Toward resonant coupling between a nm-scale electromechanical membrane and a MHz qubit *(Invited Paper)*
Author(s): **Pierre-Francois Cohadon,** Sorbonne Univ. (France); **Kyrylo Gerashchenko**, **Léo Balembois**, **Luis Najera**, **Himanshu Patange**, **Rémi Rousseau**, **Paul Manset**, **Antoine Heidmann**, **Tristan Briant**, **Thibaut Jacqmin, Samuel Deléglise,** Lab. Kastler Brossel (France)

13392-89 • 9:00 AM - 9:30 AM
Towards quantum science and technology with Brillouin-Mandelstam scattering *(Invited Paper)*
Author(s): **Michael R. Vanner,** Imperial College London (United Kingdom)

13392-90 • 9:30 AM - 9:50 AM
Cavity quantum optomechanical nonlinearities: from position measurement beyond the linearized regime to deterministic mechanical nonclassicality
Author(s): **Jack Clarke,** Imperial College London (United Kingdom)

Coffee Break 9:50 AM - 10:20 AM

SESSION 23: DARK MATTER AND DARK ENERGY SEARCH

28 January 2025 • 10:20 AM - 12:00 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Onur Hosten**, Institute of Science and Technology Austria (Austria)
Sessions 22-25 run concurrently with sessions 26-28

13392-91 • 10:20 AM - 10:50 AM
Levitodynamic detection of dark matter and weak forces *(Invited Paper)*
Author(s): **Peter F. Barker,** Univ. College London (United Kingdom)

13392-92 • 10:50 AM - 11:10 AM
New direct detection constraints on the axion-photon coupling from LIDA
Author(s): **Joscha Heinze**, **Artemiy Dmitriev**, **Alex Gill**, **Jiří Smetana**, **Tianliang Yan, Denis Martynov,** Univ. of Birmingham (United Kingdom)

13392-93 • 11:10 AM - 11:30 AM
The invisible drummer: a search for ultralight dark matter with a membrane
Author(s): **Mitul Dey Chowdhury**, **Jack P. Manley**, **Charles A. Condos**, **Aman R. Agrawal**, **Atkin D. Hyatt, Dalziel J. Wilson,** Wyant College of Optical Sciences (United States)

13392-94 • 11:30 AM - 12:00 PM
Search for ultralight bosonic dark matter using two optical cavities *(Invited Paper)*
Author(s): **Tejas Deshpande**, **Andra Ionescu**, **Nicholas Miller**, **Aaron Wang**, **Gerald Gabrielse**, **Andrew Geraci, Tim Kovachy,** Northwestern Univ. (United States)

Lunch/Exhibition Break 12:00 PM - 1:30 PM

SESSION 24: QUANTUM GRAVITY, GW DETECTION, AND FUNDAMENTAL PHYSICS I

28 January 2025 • 1:30 PM - 3:30 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Peter F. Barker**, Univ. College London (United Kingdom)
Sessions 22-25 run concurrently with sessions 26-28

13392-95 • 1:30 PM - 2:00 PM
Feasibility of a table-top gravitational wave detector *(Invited Paper)*
Author(s): **Jean-Claude M. Diels,** The Univ. of New Mexico (United States); **Stephen Eikenberry, Eric Van Stryland,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13392-96 • 2:00 PM - 2:30 PM
A superconducting levitated detector of gravitational waves *(Invited Paper)*
Author(s): **Michael Wentzel,** Univ. of Illinois (United States); **Daniel Carney,** Lawrence Berkeley National Lab (United States); **Gerard Higgins,** Institute for Quantum Optics and Quantum Information (Austria); **Giacomo Marocco,** Lawrence Berkeley National Lab (United States)

13392-97 • 2:30 PM - 3:00 PM
Ways to test the quantum nature of gravity *(Invited Paper)*
Author(s): **Angelo Bassi,** Univ. degli Studi di Trieste (Italy)

13392-98 • 3:00 PM - 3:30 PM
Tests of quantum nature of gravity in a lab via Stern-Gerlach interferometry *(Invited Paper)*
Author(s): **Anupam Mazumdar,** Univ. of Groningen (Netherlands)

Coffee Break 3:30 PM - 4:00 PM

SESSION 25: QUANTUM GRAVITY, GW DETECTION, AND FUNDAMENTAL PHYSICS II

28 January 2025 • 4:00 PM - 5:20 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Anupam Mazumdar**, Univ. of Groningen (Netherlands)
Sessions 22-25 run concurrently with sessions 26-28

13392-99 • 4:00 PM - 4:30 PM
Controlling and sensing milligram pendulums: towards interfacing quantum and gravity *(Invited Paper)*
Author(s): **Onur Hosten,** Institute of Science and Technology Austria (Austria)

13392-100 • 4:30 PM - 5:00 PM
Fluctuation-induced decoherence of macroscopic superpositions *(Invited Paper)*
Author(s): **Kanupriya Sinha,** Wyant College of Optical Sciences (United States); **Clemens Jakubec,** University of Vienna (Austria)

13392-102 • 5:00 PM - 5:20 PM
A high-finesse suspended interferometric sensor for macroscopic quantum mechanics with femtometer sensitivity
Author(s): **Tianliang Yan**, **Jiří Smetana**, **Artemiy Dmitriev**, **Vincent Boyer, Denis Martynov,** Univ. of Birmingham (United Kingdom)

SESSION 26: RECENT DEVELOPMENTS IN QUANTUM SENSING III

28 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **David D. Smith**, NASA Marshall Space Flight Ctr. (United States)
Sessions 22-25 run concurrently with sessions 26-28

13392-103 • 8:00 AM - 8:20 AM
Near-surface quantum sensing via Casimir-Polder interaction
Author(s): **Mohsen Izadyari**, **Lea Gassab**, **Ali Pedram,** Koç Univ. (Turkey); **Kanupriya Sinha,** The Univ. of Arizona (United States); **Özgür E. Müstecaplioglu,** Koç Univ. (Turkey), TÜBİTAK Research Institute for Fundamental Sciences (Turkey)

13392-104 • 8:20 AM - 8:40 AM
Intuitive and versatile software for real-world quantum sensors
Author(s): **Jan-Niclas Kirsten-Siemß**, **Stefan Seckmeyer**, **Gabriel Müller**, **Christian Struckmann**, **Gina Kleinsteinberg, Naceur Gaaloul,** Leibniz Univ. Hannover (Germany)

13392-106 • 8:40 AM - 9:10 AM
Massively multiplexed sensing of photon statistics with large format SPAD arrays *(Invited Paper)*
Author(s): **Shay Elmalem**, **Gur Lubin,** Weizmann Institute of Science (Israel); **Michael Wayne**, **Claudio Bruschini**, **Edoardo Charbon,** EPFL (Switzerland); **Dan Oron,** Weizmann Institute of Science (Israel)

13392-107 • 9:10 AM - 9:40 AM
Modulation transfer protocol for Rydberg RF receivers: theory and experiments *(Invited Paper)*
Author(s): **Duc-Anh Trinh**, **Mickael Branco**, **Adwaith Kalluvayal-Varooli**, **Alienor Rouxel,** LuMIn (France); **Sacha Welinski**, **Perrine Berger,** Thales Research & Technology (France); **Fabienne Goldfarb, Fabien Bretenaker,** LuMIn (France)

Coffee/Exhibition Break 9:40 AM - 10:40 AM

SESSION 27: NONLINEAR OPTICS FOR SENSING APPLICATIONS

28 January 2025 • 10:40 AM - 12:30 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Virginia O. Lorenz**, Univ. of Illinois (United States)
Sessions 22-25 run concurrently with sessions 26-28

13392-111 • 10:40 AM - 11:10 AM
Programming generalized measurements of time inside a multi-mode fibre *(Invited Paper)*
Author(s): **Mehul Malik,** Heriot-Watt Univ. (United Kingdom)

13392-108 • 11:10 AM - 11:30 AM
Investigation of quantum optical phenomena in MXene with fiber Bragg grating technique
Author(s): **Sweta Rath**, **Koushik S.S.S.D., Shivananju Bannur Nanjunda,** Indian Institute of Technology Madras (India)

13392-109 • 11:30 AM - 12:00 PM
Slow and fast light interferometers: how symmetry permits their interchange *(Invited Paper)*
Author(s): **David D. Smith,** NASA Marshall Space Flight Ctr. (United States)

13392-110 • 12:00 PM - 12:30 PM
Slow-light augmented interferometry for precision measurement of frequency shifts *(Invited Paper)*
Author(s): **Selim M. Shahriar,** Northwestern Univ. (United States)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 28: QUANTUM IMAGING I

28 January 2025 • 2:00 PM - 5:10 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Mehul Malik**, Heriot-Watt Univ. (United Kingdom)
Sessions 22-25 run concurrently with sessions 26-28

13392-112 • 2:00 PM - 2:30 PM
High-dimensional Bell violations via Young's two-photon multi-slit interference and optimised self-guided quantum tomography *(Invited Paper)*
Author(s): **Jonathan Leach,** Heriot-Watt Univ. (United Kingdom)

13392-113 • 2:30 PM - 3:00 PM
Spectroscopy and imaging using entangled photon pairs and a time-of-arrival camera *(Invited Paper)*
Author(s): **Jeff S. Lundeen,** Univ. of Ottawa (Canada)

13392-114 • 3:00 PM - 3:30 PM
Quantum-enhanced distributed imaging *(Invited Paper)*
Author(s): **Virginia O. Lorenz,** Univ. of Illinois (United States)

Coffee Break • 3:30 PM - 4:00 PM

13392-115 • 4:00 PM - 4:20 PM
Image resolution limit optimization for quantum imaging with undetected light
Author(s): **Marta Gilaberte Basset,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Institut für Angewandte Physik, Friedrich-Schiller-Univ. Jena (Germany); **Valerio Flavio Gili,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **René Sondenheimer,** Institut für Festkörpertheorie und Optik, Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

13392-116 • 4:20 PM - 4:50 PM
Sharper images through quantum imaging *(Invited Paper)*
Author(s): **Robert W. Boyd,** Univ. of Rochester (United States)

13392-117 • 4:50 PM - 5:10 PM
Focusing entangled state through scattering media via coincidence-based feedback
Author(s): **Baptiste Courme,** Institut des nanosciences de Paris (France); **Daniele Faccio,** Univ. of Glasgow (United Kingdom); **Sylvain Gigan,** Lab. Kastler Brossel (France); **Hugo Defienne,** Institut des nanosciences de Paris (France)

Wednesday 29 January 2025

SESSION 29: QUANTUM SENSING WITH ENTANGLED STATES I

29 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Lex Joosten**, Univ. Basel (Switzerland)
Sessions 29-33 run concurrently with sessions 34-37

13392-118 • 8:00 AM - 8:20 AM
Large wavelength-small quantum interferometer module: shrinking MIR OCT systems via quantum entanglement
Author(s): **Gunnar Blume**, **David Feise**, **Alexander Sahm**, **Philipp Hildenstein**, **Nils Werner,** Ferdinand-Braun-Institut gGmbH (Germany); **Fabian Wendt,** Fraunhofer-Institut für Lasertechnik ILT (Germany); **Atta Sherwani**, **Emma Pearce**, **Sven Ramelow,** Institut für Physik, Humboldt-Univ. zu Berlin (Germany); **Katrin Paschke,** Ferdinand-Braun-Institut gGmbH (Germany)

13392-119 • 8:20 AM - 8:40 AM
Imaging birefringent patterns using radial polarizations of entangled biphotons
Author(s): **Jiung Kim**, **Jeeseong Hwang, Martin Y. Sohn,** National Institute of Standards and Technology (United States)

13392-120 • 8:40 AM - 9:10 AM
Ideal sensing of entanglement by stimulated nonlinear interaction: the pathway to a quantum RADAR *(Invited Paper)*
Author(s): **Avi Pe'er,** Bar-Ilan Univ. (Israel)

13392-121 • 9:10 AM - 9:40 AM
Scalable generation of continuous variable multipartite entangled states of light *(Invited Paper)*
Author(s): **Alberto M. Marino,** Oak Ridge National Lab. (United States)

13392-122 • 9:40 AM - 10:10 AM
High dimensional optical cluster states for error correction and sensing *(Invited Paper)*
Author(s): **Meng-Chang Wu**, **Zhifan Zhou,** Univ. of Maryland, College Park (United States); **Luis de Araujo,** Instituto de Física "Gleb Wataghin", Univ. of Campinas (Brazil); **Matt Dimario**, **Jie Zhao**, **Jing Su,** Univ. of Maryland, College Park (United States); **Brielle Anderson,** American Univ. (United States); **Kevin Jones,** Williams College (United States); **Paul D. Lett,** National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States)

Coffee Break 10:10 AM - 10:40 AM

SESSION 30: OVERVIEW OF RESEARCH SUPPORTED BY ARMY RESEARCH OFFICE

29 January 2025 • 10:40 AM - 11:10 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Selim M. Shahriar**, Northwestern Univ. (United States)
Sessions 29-33 run concurrently with sessions 34-37

13392-123 • 10:40 AM - 11:10 AM
Government funding opportunities: Army Research Office overview *(Invited Paper)*
Author(s): **James Joseph,** DEVCOM Army Research Lab. (United States)

SESSION 31: QUANTUM SENSING WITH ENTANGLED STATES II

29 January 2025 • 11:10 AM - 12:10 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Avi Pe'er**, Bar-Ilan Univ. (Israel)
Sessions 29-33 run concurrently with sessions 34-37

13392-124 • 11:10 AM - 11:40 AM
Entanglement-enhanced multiparameter sensing: leveraging cavity-mediated programmable interactions *(Invited Paper)*
Author(s): **Eric Cooper, Monika H. Schleier-Smith,** Stanford Univ. (United States)

13392-126 • 11:40 AM - 12:10 PM
Multiparameter estimation with an array of entangled atomic sensors *(Invited Paper)*
Author(s): **Lex E. Joosten**, **Yifan Li**, **Tilman Zibold**, **Paolo Colciaghi, Philipp Treutlein,** Univ. Basel (Switzerland)

Lunch/Exhibition Break 12:10 PM - 2:10 PM

SESSION 32: OPTICAL AND SPIN SQUEEZING AND NON-CLASSICAL STATES OF LIGHT I

29 January 2025 • 2:10 PM - 3:40 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Yanhong Xiao**, Shanxi Univ. (China)
Sessions 29-33 run concurrently with sessions 34-37

13392-127 • 2:10 PM - 2:40 PM
Quantum imaging and communication with intensity squeezed light *(Invited Paper)*
Author(s): **Mahdi Hosseini,** Northwestern Univ. (United States); **Haechan An,** Purdue Univ. (United States); **Mehrdad Sourki,** Northwestern Univ. (United States)

13392-128 • 2:40 PM - 3:10 PM
Revealing invisible spatial structure of quantum squeezed vacuum *(Invited Paper)*
Author(s): **Eugeniy E. Mikhailov**, **Charris Gabaldon,** William & Mary (United States); **Pratik Barge,** Louisiana State Univ. (United States); **Lior Cohen,** Univ. of Colorado Boulder (United States); **Hwang Lee,** Louisiana State Univ. (United States); **Irina Novikova,** William & Mary (United States)

13392-129 • 3:10 PM - 3:40 PM
Frequency-dependent squeezing for a sub-SQL optomechanical measurement *(Invited Paper)*
Author(s): **Pierre-Francois Cohadon,** Sorbonne Univ. (France); **Pierre-Edouard Jacquet**, **Amin Lakhal,** Lab. Kastler Brossel (France); **Michaël Croquette,** Institut NÉEL (France); **Thibaut Jacqmin**, **Tristan Briant**, **Antoine Heidmann, Samuel Deléglise,** Lab. Kastler Brossel (France)

Coffee Break 3:40 PM - 4:10 PM

SESSION 33: OPTICAL AND SPIN SQUEEZING AND NON-CLASSICAL STATES OF LIGHT II

29 January 2025 • 4:10 PM - 6:00 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Pierre-Francois Cohadon**, Sorbonne Univ. (France)
Sessions 29-33 run concurrently with sessions 34-37

13392-130 • 4:10 PM - 4:30 PM
A compact and modular source of highly squeezed light
Author(s): **Hudson Loughlin,** Massachusetts Institute of Technology (United States); **Alvaro Fernández Galiana,** Univ. of Oxford (United Kingdom); **Masaya Ono,** The Univ. of Tokyo (Japan); **Jacques H. Ding,** Univ. Paris Cité (France); **Malo Le Gall,** Ecole Polytechnique (France); **Eric Oelker**, **Matthew Evans, Nergis Mavalvala,** Massachusetts Institute of Technology (United States)

13392-131 • 4:30 PM - 5:00 PM
Cooperative internal and collective spin squeezing in atomic vapor *(Invited Paper)*
Author(s): **Yanhong Xiao,** Fudan Univ. (China)

13392-132 • 5:00 PM - 5:30 PM
Quantum sensing and laser spectroscopy aided by plasmonic nanoantennas and nonclassical states of light *(Invited Paper)*
Author(s): **Alexei V. Sokolov**, **Zhi Gao**, **Marlan O. Scully**, **Jizhou Wang, Zhenhuan Yi,** Texas A&M Univ. (United States)

13392-133 • 5:30 PM - 6:00 PM
Creating non-classical states of light through photon arithmetic with single emitters and atomic ensembles *(Invited Paper)*
Author(s): **Michal Bajcsy,** Univ. of Waterloo (Canada)

SESSION 34: QUANTUM IMAGING II

29 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Nicholas Nardelli**, National Institute of Standards and Technology (United States)
Sessions 29-33 run concurrently with sessions 34-37

13392-135 • 8:00 AM - 8:20 AM
Quantum-limited imaging of a nanomechanical resonator by spatial mode sorting
Author(s): **Morgan Choi**, **Christian M. Pluchar,** The Univ. of Arizona (United States); **Wenhua He**, **Saikat Guha,** Univ. of Maryland, College Park (United States); **Dalziel J. Wilson,** The Univ. of Arizona (United States)

13392-136 • 8:20 AM - 8:40 AM
Atmospheric turbulence in quantum illumination
Author(s): **Joseph Fasone**, **Mikaela Morris**, **Keith A. Wyman, Anil K. Patnaik,** Air Force Institute of Technology (United States)

13392-137 • 8:40 AM - 9:00 AM
Hiding images in quantum correlations
Author(s): **Chloé Vernière,** Institut des nanosciences de Paris, Sorbonne Univ. (France); **Hugo Defienne, Baptiste Courme,** Institut des nanosciences de Paris (France)

13392-138 • 9:00 AM - 9:20 AM
Mueller polarimetry via nonlocal correlations
Author(s): **Enrique J. Galvez**, **Leia Francis, Chan-Ju You,** Colgate Univ. (United States)

13392-139 • 9:20 AM - 9:40 AM
3D quantum ghost imaging microscope
Author(s): **Dominique Davenport**, **Audrey Eshun**, **Brandon Demory**, **Shervin Kiannejad,** Lawrence Livermore National Lab. (United States); **Paul Mos**, **Yang Lin**, **Edoardo Charbon,** EPFL (Switzerland); **Tiziana Bond**, **Mike Rushford,** Lawrence Livermore National Lab. (United States); **Claudio E. Bruschini,** EPFL (Switzerland); **Ted Laurence,** Lawrence Livermore National Lab. (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 35: QUANTUM COMMUNICATION AND QUANTUM NETWORKS I

29 January 2025 • 10:10 AM - 11:40 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Ryan T. Glasser**, Tulane Univ. (United States)
Sessions 29-33 run concurrently with sessions 34-37

13392-140 • 10:10 AM - 10:40 AM
Enabling quantum networks through metrology *(Invited Paper)*
Author(s): **Thomas Gerrits,** National Institute of Standards and Technology (United States)

13392-141 • 10:40 AM - 11:10 AM
Advancements in deployed quantum communication networks *(Invited Paper)*
Author(s): **Alessandro Zavatta,** Istituto Nazionale di Ottica (Italy); **Domenico Ribezzo**, **Luca Bianchi,** Università di Firenze (Italy); **Carlo Marconi,** Istituto Nazionale di Ottica (Italy); **Giulia Guarda**, **Sebastiano Cocchi,** Università di Firenze (Italy); **Marco Pinel,** Istituto Nazionale di Ottica (Italy); **Tommaso Occhipinti,** QTI S.r.l. (Italy); **Davide Bacco,** Università di Firenze (Italy)

13392-142 • 11:10 AM - 11:40 AM
Merging classical and quantum techniques to enable next-generation quantum networks *(Invited Paper)*
Author(s): **Nicholas Nardelli, Tara M. Fortier,** National Institute of Standards and Technology (United States)

Lunch/Exhibition Break 11:40 AM - 1:10 PM

SESSION 36: QUANTUM COMMUNICATION AND QUANTUM NETWORKS II

29 January 2025 • 1:10 PM - 2:00 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Thomas Gerrits**, National Institute of Standards and Technology (United States)
Sessions 29-33 run concurrently with sessions 34-37

13392-143 • 1:10 PM - 1:40 PM
Classifying turbulent single photons in higher-order spatial modes with machine learning *(Invited Paper)*
Author(s): **Ryan T. Glasser,** Tulane Univ. (United States)

13392-144 • 1:40 PM - 2:00 PM
Quantum phase estimation-enabled phase tracking for coexisting quantum/classical metropolitan networks
Author(s): **Jabir Marakkarakath Vadakkepurayil**, **Daehyun H. Ahn**, **Nur Fajar R. Annafianto**, **Ivan Burenkov**, **Abdella Battou, Sergey Polyakov,** National Institute of Standards and Technology (United States)

SESSION 37: RECENT DEVELOPMENTS IN QUANTUM SENSING IV

29 January 2025 • 2:00 PM - 6:10 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Nicholas Nardelli**, National Institute of Standards and Technology (United States)
Sessions 29-33 run concurrently with sessions 34-37

13392-146 • 2:00 PM - 2:30 PM
To be determined *(Invited Paper)*
Author(s): **Spencer E. Olson,** Air Force Research Lab. (United States)

13392-147 • 2:30 PM - 3:00 PM
Optical timekeeping in the field *(Invited Paper)*
Author(s): **Martin Boyd**, **Jamil Abo-Shaeer**, **Evan Atchison**, **Paul Carney**, **Arman Cingoz**, **Andrew Dowd**, **Abijith Kowligy**, **Micah Ledbetter**, **Guthrie Partridge**, **Parth Patel**, **Evan Popp**, **Akash Rakholia**, **Frank Roller**, **Jonathan Roslund, Daniel Sheredy,** Vector Atomic Inc. (United States)

13392-148 • 3:00 PM - 3:20 PM
Theory of optically detected magnetic resonance of spin centers in hexagonal boron nitride
Author(s): **David A. Fehr,** The Univ. of Iowa (United States); **Raj N. Patel**, **Rebecca E. K. Fishman**, **Tzu-Yung Huang**, **Jordan A. Gusdorff**, **David A. Hopper**, **Alex Breitweiser**, **Benjamin Porat,** Univ. of Pennsylvania (United States); **Joseph Sink,** The Univ. of Iowa (United States); **Lee C. Bassett,** Univ. of Pennsylvania (United States); **Michael E. Flatté,** The Univ. of Iowa (United States)

Coffee Break • 3:20 PM - 3:50 PM

13392-149 • 3:50 PM - 4:10 PM
Efficient non-classical light sources based on deterministic photon subtraction
Author(s): **Abdolreza Pasharavesh, Michal Bajcsy,** Univ. of Waterloo (Canada)

13392-28 • 4:10 PM - 4:40 PM
Advances in intracellular temperature measurements with NV colour centres in diamond *(Invited Paper)*
Author(s): **Claudia Stella,** Polytechnic of Turin (Italy); **Ekaterina Moreva**, **Ettore Bernardi**, **Elena Losero**, **Paolo Traina**, **Ivo Pietro Degiovanni,** Istituto Nazionale di Ricerca Metrologica (Italy); **Giulia Petrini**, **Giulia Tomagra,** University of Turin (Italy); **Fabio Saccomandi,** Istituto Nazionale di Ricerca Metrologica (Italy); **Valentina Carabelli,** University of Turin (Italy); **Petr Cígler,** Institute of Organic Chemistry and Biochemistry of the CAS (Czech Republic); **Marco Genovese,** Istituto Nazionale di Ricerca Metrologica (Italy)

13392-190 • 4:40 PM - 5:10 PM
Remote sensing with quantum-enhanced Raman spectroscopy *(Invited Paper)*
Author(s): **Jabir Chathanathil,** DEVCOM Army Research Lab. (United States), Stevens Institute of Technology (United States); **Aneesh Ramaswamy,** Stevens Institute of Technology (United States), DEVCOM Army Research Lab. (United States); **Dmitry Budker,** Johannes Gutenberg Univ. Mainz (Germany), Univ. of California, Berkeley (United States), Helmholtz-Institut Mainz (Germany); **Frank A. Narducci,** Naval Postgraduate School (United States); **Svetlana Malinovskaya,** Stevens Institute of Technology (United States)

13392-101 • 5:10 PM - 5:40 PM
Renormalized cavity shifts for precision measurements of the electron magnetic moment *(Invited Paper)*
Author(s): **Yonatan Kahn,** Univ. of Toronto (Canada)

13392-191 • 5:40 PM - 6:10 PM
Low temperatures and precision probes in cold atom-based simulations of the Hubbard model *(Invited Paper)*
Author(s): **Aaron Young**, **Muqing Xu**, **Lev H Kendrick**, **Anant Kale**, **Youqi Gang,** Harvard Univ. (United States); **Chunhan Feng**, **Shiwei Zhang,** Flatiron Institute (United States); **Martin Lebrat, Markus Greiner,** Harvard Univ. (United States)

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)
Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13392-181 • 6:00 PM - 8:00 PM
Weak measurement-controlled signal-to-noise ratio enhancement in non-linear interferometer
Author(s): **Shouvik Sadhukhan,** Indian Institute of Space Science and Technology (India)

13392-182 • 6:00 PM - 8:00 PM
Isotopically purified NV diamonds for enhanced quantum sensing
Author(s): **Johannes Lang**, **Christian Osterkamp**, **Christoph Findler, Philipp Vetter,** Diatope GmbH (Germany)

13392-183 • 6:00 PM - 8:00 PM
Development of a quantum-enhanced optical interferometric axion detector
Author(s): **Alex Gill**, **Artemiy Dmitriev**, **Joscha Heinze**, **Jiří Smetana**, **Tianliang Yan**, **Denis Martynov, Vincent Boyer,** Univ. of Birmingham (United Kingdom)

13392-184 • 6:00 PM - 8:00 PM
Entanglement-enhanced atomic force microscope
Author(s): **Sanjukta Kundu**, **Colin P. Lualdi**, **Ronan Hanley**, **Patrick J. Snyder,** Univ. of Illinois (United States); **Ali Passian**, **Rubye Farahi,** Oak Ridge National Lab. (United States); **Paul Kwiat,** Univ. of Illinois (United States)

13392-185 • 6:00 PM - 8:00 PM
Frequency of light chronometry via higher harmonic generation
Author(s): **Ashish Samantaray**, **John Floyd**, **Sanjukta Kundu, Paul Kwiat,** Univ. of Illinois (United States)

Thursday 30 January 2025

SESSION 38: OPTICAL AND SPIN SQUEEZING AND NON-CLASSICAL STATES OF LIGHT III

30 January 2025 • 8:00 AM - 9:50 AM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Eugeniy E. Mikhailov**, William & Mary (United States)
Sessions 38-40 run concurrently with sessions 41-43

13392-150 • 8:00 AM - 8:30 AM
Photon bunching in high-harmonic emission controlled by quantum light *(Invited Paper)*
Author(s): **Samuel Lemieux,** Univ. of Ottawa (Canada)

13392-151 • 8:30 AM - 9:00 AM
Integrated sources of multiphoton entanglement *(Invited Paper)*
Author(s): **Ravitej Uppu,** The Univ. of Iowa (United States)

13392-152 • 9:00 AM - 9:30 AM
Direct generation of time-energy-entangled W-triphotons in atomic vapor *(Invited Paper)*
Author(s): **Jianming Wen,** Kennesaw State Univ. (United States), Binghamton Univ. (United States)

13392-153 • 9:30 AM - 9:50 AM
Photon statistics modal reconstruction via detected and undetected light
Author(s): **Ivo Pietro Degiovanni,** Istituto Nazionale di Ricerca Metrologica (Italy); **Laura T. Knoll,** Instituto de Investigaciones Científicas y Técnicas para la Defensa, Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina); **Fabrizio Piacentini**, **Paolo Traina,** Istituto Nazionale di Ricerca Metrologica (Italy); **Sergey V. Polyakov,** National Institute of Standards and Technology (United States); **Ekaterina Moreva, Marco Genovese,** Istituto Nazionale di Ricerca Metrologica (Italy)

Coffee Break 9:50 AM - 10:20 AM

SESSION 39: RYDBERG SENSORS

30 January 2025 • 10:20 AM - 12:40 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Liron Stern**, The Hebrew Univ. of Jerusalem (Israel)
Sessions 38-40 run concurrently with sessions 41-43

13392-154 • 10:20 AM - 10:40 AM
Millimeter wave sensing and imaging using Autler-Townes induced fluorescence in Rydberg vapor
Author(s): **Gour S. Pati**, **Renu Tripathi, Daniel Mechael,** Delaware State Univ. (United States)

13392-155 • 10:40 AM - 11:10 AM
Microwave sensing with cold Rydberg atoms *(Invited Paper)*
Author(s): **Sylvain Schwartz,** ONERA (France)

13392-157 • 11:10 AM - 11:40 AM
Rydberg atomic receiver for AM, FM, and phase shift keying data transmission *(Invited Paper)*
Author(s): **He Wang**, **Carl T. Boone, Gebriel H. Iyanu,** The Aerospace Corp. (United States)

13392-158 • 11:40 AM - 12:10 PM
Light-matter interfaces with Rydberg atomic ensembles and arrays *(Invited Paper)*
Author(s): **Alex M. Kuzmich,** Univ. of Michigan (United States)

13392-159 • 12:10 PM - 12:40 PM
Multiband RF field reception in Rydberg atoms via dual-band frequency comb spectroscopy *(Invited Paper)*
Author(s): **David Long**, **Alexandra Artusio-Glimpse,** National Institute of Standards and Technology (United States); **Sean Bressler,** National Institute of Standards and Technology (United States), University of Maryland (United States); **Christopher Holloway,** National Institute of Standards and Technology (United States)

Lunch/Exhibition Break 12:40 PM - 2:10 PM

SESSION 40: VAPOR CELL TECHNOLOGY FOR SENSING APPLICATIONS

30 January 2025 • 2:10 PM - 5:20 PM | Moscone South, Room 157 (Upper Mezz)
Session Chair(s): **Sylvain Schwartz**, ONERA (France)
Sessions 38-40 run concurrently with sessions 41-43

13392-160 • 2:10 PM - 2:40 PM
Critical dynamics in alkali spin vapor *(Invited Paper)*
Author(s): **Ofer Firstenberg**, **Yahel Horowicz,** Weizmann Institute of Science (Israel); **Or Katz,** Cornell Univ. (United States); **Oren Raz,** Weizmann Institute of Science (Israel)

13392-161 • 2:40 PM - 3:10 PM
New avenues in chip-scale vapor-based quantum sensors *(Invited Paper)*
Author(s): **Liron Stern,** The Hebrew Univ. of Jerusalem (Israel)

13392-162 • 3:10 PM - 3:40 PM
Three-photon Rydberg atom electrometry with enhanced sensitivity *(Invited Paper)*
Author(s): **Vijin Venu**, **Stephanie Bohaichuk**, **Florian Christaller,** Quantum Valley Ideas Lab. (Canada); **Matthias Schmidt**, **Harald Kubler,** University of Stuttgart (Germany); **James P. Shaffer,** Quantum Valley Ideas Lab. (Canada)

Coffee Break • 3:40 PM - 4:10 PM

13392-163 • 4:10 PM - 4:40 PM
Wafer-scale fabrication of alkali vapor cells *(Invited Paper)*
Author(s): **Yang Li**, **Marlou Slot**, **Dongyu Sohn**, **Susan Schima**, **Matthew Hummon, John Kitching,** National Institute of Standards and Technology (United States)

13392-164 • 4:40 PM - 5:00 PM
An all-fibered iodine photonic microcell for portable frequency references
Author(s): **Devang Naik,** GLOphotonics (France); **Fetah Benabid**, **Benoit Debord**, **Thomas Billotte,** CNRS (France); **Clement Goicoechea,** GLOphotonics (France)

13392-165 • 5:00 PM - 5:20 PM
Additive manufacturing of functionalized atomic vapour cells for next-generation quantum technologies
Author(s): **Feiran Wang**, **Nathan Cooper**, **Yinfeng He**, **Ben Hopton**, **David Johnson**, **Peng Zhao**, **Chris Tuck**, **Richard Hague**, **Mark Fromhold**, **Ricky Wildman**, **Lyudmila Turyanska, Lucia Hackermueller,** The Univ. of Nottingham (United Kingdom)

SESSION 41: RECENT DEVELOPMENTS IN QUANTUM SENSING V

30 January 2025 • 8:00 AM - 9:40 AM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Michael Drewsen**, Aarhus Univ. (Denmark)
Sessions 38-40 run concurrently with sessions 41-43

13392-166 • 8:00 AM - 8:30 AM
Mechanical detection of nuclear decays *(Invited Paper)*
Author(s): **Jiaxiang Wang, David C. Moore,** Yale Univ. (United States)

13392-167 • 8:30 AM - 8:50 AM
Numerical investigation of the waveform dependence in sympathetic cooling of trapped particles
Author(s): **Andreas W. Schell,** Johannes Kepler Univ. Linz (Austria); **Oskar Sund,** Leibniz Univ. Hannover (Germany)

13392-168 • 8:50 AM - 9:20 AM
An endoscope the thickness of a human hair: using adaptive transmission matrices to create a scanning spot at the output of a multimode fibre *(Invited Paper)*
Author(s): **Miles Padgett,** Univ. of Glasgow (United Kingdom)

13392-170 • 9:20 AM - 9:40 AM
Derivations of Bloch (Majorana-Bloch) equation, von Neumann equation, and Schrödinger-Pauli equation
Author(s): **Lihong V. Wang,** Caltech (United States)

Coffee Break 9:40 AM - 10:10 AM

SESSION 42: RECENT DEVELOPMENTS IN QUANTUM SENSING VI

30 January 2025 • 10:10 AM - 12:10 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Miles Padgett**, Univ. of Glasgow (United Kingdom)
Sessions 38-40 run concurrently with sessions 41-43

13392-171 • 10:10 AM - 10:40 AM
Practical and robust quantum sensing in fiber by four-waves-mixing and quantum interference *(Invited Paper)*
Author(s): **Avinoam Zadok,** Technion-Israel Institute of Technology (Israel)

13392-172 • 10:40 AM - 11:10 AM
Quantum optics with free electrons: from quantum sensing to strong coupling and single-photon nonlinearity *(Invited Paper)*
Author(s): **Aviv Karnieli**, **Shanhui Fan**, **Charles Roques-Carmes, Renwen Yu,** Stanford Univ. (United States)

13392-173 • 11:10 AM - 11:40 AM
Quantum optical classifier with superexponential speedup *(Invited Paper)*
Author(s): **Simone Roncallo**, **Angela Rosy Morgillo**, **Chiara Macchiavello**, **Lorenzo Maccone,** Univ. degli Studi di Pavia (Italy); **Seth Lloyd,** Massachusetts Institute of Technology (United States)

13392-174 • 11:40 AM - 12:10 PM
Nonlinear classical and quantum sensing by thermal noise *(Invited Paper)*
Author(s): **Gershon Kurizki**, **Nilakantha Meher,** Weizmann Institute of Science (Israel); **Tomás Opatrný,** Palacký Univ. Olomouc (Czech Republic)

Lunch/Exhibition Break 12:10 PM - 1:40 PM

SESSION 43: RECENT DEVELOPMENTS IN QUANTUM SENSING VII

30 January 2025 • 1:40 PM - 4:50 PM | Moscone South, Room 159 (Upper Mezz)
Session Chair(s): **Gershon Kurizki**, Weizmann Institute of Science (Israel)
Sessions 38-40 run concurrently with sessions 41-43

13392-175 • 1:40 PM - 2:10 PM
Quantum noise sensing via quantum Zeno and anti-Zeno effects *(Invited Paper)*
Author(s): **Fabrizio Piacentini**, **Salvatore Virzì,** Istituto Nazionale di Ricerca Metrologica (Italy); **Laura T. Knoll,** Instituto de Investigaciones Científicas y Técnicas para la Defensa, Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina); **Alessio Avella,** Istituto Nazionale di Ricerca Metrologica (Italy); **Stefano Gherardini,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Tomás Opatrný,** Palacký Univ. Olomouc (Czech Republic); **Abraham G. Kofman,** Weizmann Institute of Science (Israel), Shanghai Univ. (China); **Gershon Kurizki,** Weizmann Institute of Science (Israel); **Marco Gramegna,** Istituto Nazionale di Ricerca Metrologica (Italy); **Filippo Caruso,** LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy), Univ. degli Studi di Firenze (Italy); **Ivo Pietro Degiovanni, Marco Genovese,** Istituto Nazionale di Ricerca Metrologica (Italy), Istituto Nazionale di Fisica Nucleare (Italy)

13392-176 • 2:10 PM - 2:40 PM
Towards Doppler laser cooling of trapped Ba+ ions to near the ground state *(Invited Paper)*
Author(s): **Michael Drewsen,** Aarhus Univ. (Denmark)

13392-177 • 2:40 PM - 3:10 PM
Software-ruggedized quantum sensing in the field *(Invited Paper)*
Author(s): **Russell Anderson,** Q-CTRL Inc. (Australia)

Coffee Break • 3:10 PM - 3:40 PM

13392-178 • 3:40 PM - 4:10 PM
Agnostic phase estimation for quantum sensing and quantum computation *(Invited Paper)*
Author(s): **Flavio Salvati,** Univ. of Cambridge (United Kingdom); **Xingrui Song**, **Chandrashekhar Gaikwad,** Washington Univ. in St. Louis (United States); **Nicole Y. Halpern,** Joint Ctr. for Quantum Information and Computer Science, National Institute of Standards and Technology and Univ. of Maryland, College Park (United States); **David R. M. Arvidsson-Shukur,** Hitachi Cambridge Lab. (United Kingdom); **Kater Murch,** Washington Univ. in St. Louis (United States)

13392-179 • 4:10 PM - 4:30 PM
Intensity interferometry second order correlation measured on Sirius with 10" telescopes
Author(s): **Thomas Mozdzen**, **Richard M. Scott**, **Philip D. Mauskopf,** Arizona State Univ. (United States); **Ricardo R. Rodriguez,** Case Western Reserve Univ. (United States)

13392-180 • 4:30 PM - 4:50 PM
Efficient MIR sensing with undetected photons: high brightness, miniaturized SPDC module for real world applications
Author(s): **Philipp Hildenstein**, **Gunnar Blume**, **Alexander Sahm**, **Nils Werner**, **David Feise,** Ferdinand-Braun-Institut gGmbH (Germany); **Atta Sherwani**, **Emma Pearce,** Institut für Physik, Humboldt-Univ. zu Berlin (Germany); **Björn Kemper**, **Alvaro Barroso**, **Jürgen Schnekenburger,** Biomedizinisches Technologiezentrum, Univ. Münster (Germany); **Sven Ramelow,** Institut für Physik, Humboldt-Univ. zu Berlin (Germany); **Katrin Paschke,** Ferdinand-Braun-Institut gGmbH (Germany)

CONFERENCE 13393

Complex Light and Optical Forces XIX

27 - 29 January 2025 | Moscone South, Room 160 (Upper Mezz)

Conference Chair(s): **David L. Andrews,** Univ. of East Anglia (United Kingdom); **Enrique J. Galvez,** Colgate Univ. (United States); **Halina Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

Program Committee: **Antonio Ambrosio,** Istituto Italiano di Tecnologia (Italy); **Kishan Dholakia,** The Univ. of Adelaide (Australia); **Angela Louise Dudley**, **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa); **Kayn A. Forbes,** Univ. of East Anglia (United Kingdom); **Sonja Franke-Arnold,** Univ. of Glasgow (United Kingdom); **Simon Hanna,** Univ. of Bristol (United Kingdom); **Martin P. J. Lavery,** Univ. of Glasgow (United Kingdom); **Ting-Hua Lu,** National Taiwan Normal Univ. (Taiwan); **Mehul Malik,** Heriot-Watt Univ. (United Kingdom); **Takashige Omatsu,** Chiba Univ. (Japan); **Daryl C. Preece,** Beckman Laser Institute and Medical Clinic (United States); **Monika Ritsch-Marte,** Medizinische Univ. Innsbruck (Austria); **Nirmal K. Viswanathan,** Univ. of Hyderabad (India); **Karen P. Volke-Sepúlveda,** Univ. Nacional Autónoma de México (Mexico)

Monday 27 January 2025

SESSION 1: OPTICAL FORCES I

27 January 2025 • 9:30 AM - 10:30 AM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **David L. Andrews**, Univ. of East Anglia (United Kingdom)

13393-1 • 9:30 AM - 9:50 AM
Bolstering the optomechanical performances of optically levitated nanoparticles through wavefront shaping
Author(s): **Nicolas Bachelard,** Univ. of California, Berkeley (United States)

13393-2 • 9:50 AM - 10:10 AM
Optical trapping for charge detection and spinning
Author(s): **Yera Ussembayev**, **Filip Beunis**, **Filip Strubbe,** Univ. Gent (Belgium); **Kristiaan Neyts,** Hong Kong Univ. of Science and Technology (Hong Kong, China)

13393-3 • 10:10 AM - 10:30 AM
Optical force dynamics on microscopic beads for different objective lenses using geometrical ray tracing
Author(s): **Shilpa Singh,** Indian Institute of Technology Guwahati (India); **Karuna S. Malik,** Brainware Univ. (India); **Bosanta R. Boruah,** Indian Institute of Technology Guwahati (India)

Coffee Break 10:30 AM - 10:50 AM

SESSION 2: VECTOR MODES

27 January 2025 • 10:50 AM - 12:00 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Enrique J. Galvez**, Colgate Univ. (United States)

13393-4 • 10:50 AM - 11:20 AM
Generation and characterization of complex vector modes with digital micromirror devices *(Invited Paper)*
Author(s): **Carmelo Rosales-Guzmán,** Centro de Investigaciones en Óptica, A.C. (Mexico)

13393-5 • 11:20 AM - 11:40 AM
Structuring spatiotemporal states of polarization
Author(s): **Danilo Gomes Pires**, **Hooman Barati Sedeh, Natalia Litchinitser,** Duke Univ. (United States)

13393-6 • 11:40 AM - 12:00 PM
Experimental creation of programmable arbitrary spatiotemporal exotic beams
Author(s): **Andrew V. Komonen**, **Martin Ploschner**, **Marcos M. Morote**, **Daniel S. Dahl,** The Univ. of Queensland (Australia); **Nicolas K. Fontaine,** Nokia Bell Labs. (United States); **Joel Carpenter, Mickael Mounaix,** The Univ. of Queensland (Australia)

Lunch Break 12:00 PM - 1:00 PM

QUANTUM WEST PLENARY SESSION

27 January 2025 • 1:00 PM - 3:05 PM | Moscone South, Room 207/215 (Level 2)
Session Chair: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

1:00 PM - 1:05 PM
Welcome and Opening Remarks
Announcement of the 2024 IBM-SPIE HBCU Faculty Accelerator Award in Quantum Optics and Photonics

13393-501 • 1:05 PM - 1:45 PM
Quantum structured light takes shape (Plenary Presentation)
Author(s): **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13392-501 • 1:45 PM - 2:25 PM
Optical clocks: time and the future of metrology (Plenary Presentation)
Author(s): **Tara M. Fortier,** National Institute of Standards and Technology (United States)

13392-502 • 2:25 PM - 3:05 PM
Looking for fossils of the Big Bang in the laboratory (Plenary Presentation)
Author(s): **Eric A. Cornell,** National Institute of Standards and Technology (United States)

Coffee Break 3:05 PM - 3:30 PM

SESSION 3: OPTICAL FORCES II

27 January 2025 • 3:30 PM - 4:30 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Simon Hanna**, Univ. of Bristol (United Kingdom)

13393-8 • 3:30 PM - 3:50 PM
Light sheet optical tweezers as a force transducer for biological tissues
Author(s): **Krishangi Krishna**, **Joshua A. Burrow**, **Wenyu Liu**, **Shayaan Chaudhary,** Brown Univ. (United States); **Kimani C. Toussaint,** Brown Univ. (United States), Brown-Lifespan Ctr. for Digital Health (United States)

13393-9 • 3:50 PM - 4:10 PM
Optical forces for many particle systems in complex beams
Author(s): **Michael J. O'Donnell, Simon Hanna,** Univ. of Bristol (United Kingdom)

13393-10 • 4:10 PM - 4:30 PM
Acoustic pressure wave trajectory tracking using structured light
Author(s): **Mark Main,** Univ. of Glasgow (United Kingdom); **Robert Nuster,** Karl-Franzens-Univ. Graz (Austria), Christian Doppler Lab. for Structured Matter Based Sensing (Austria); **Lennart Hirsch,** Univ. of Glasgow (United Kingdom); **Peter Banzer,** Karl-Franzens-Univ. Graz (Austria), Christian Doppler Lab. for Structured Matter Based Sensing (Austria); **Martin P. J. Lavery,** Univ. of Glasgow (United Kingdom)

Tuesday 28 January 2025

SESSION 4: TOPOLOGICAL STRUCTURES

28 January 2025 • 8:10 AM - 11:30 AM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Mehul Malik**, Heriot-Watt Univ. (United Kingdom); **Carmelo Rosales-Guzmán**, Centro de Investigaciones en Óptica, A.C. (Mexico)

13393-11 • 8:10 AM - 8:40 AM
Plasmonic twistronics: skyrmion bags in two- and three layer structures *(Invited Paper)*
Author(s): **Harald Giessen,** Univ. Stuttgart (Germany)

13393-12 • 8:40 AM - 9:00 AM
Green optical quasiparticles fiber laser
Author(s): **Srinivasa Rao Allam**, **Yuto Yoneda,** Chiba Univ. (Japan); **R. Kerriddge-Johns William,** Univ. of Southampton (United Kingdom); **Yasushi Fujimoto,** Chiba Institute of Technology (Japan); **Takashige Omatsu,** Chiba Univ. (Japan)

13393-13 • 9:00 AM - 9:20 AM
Spacetime-topological events in synthetic photonic lattices
Author(s): **Joshua Feis**, **Sebastian Weidemann,** Univ. Rostock (Germany); **Tom Sheppard**, **Hannah Price,** Univ. of Birmingham (United Kingdom); **Alexander Szameit,** Univ. Rostock (Germany)

13393-14 • 9:20 AM - 9:40 AM
Optical trapping and binding in skyrmionic beams
Author(s): **Simon Hanna, Michael J. O'Donnell,** Univ. of Bristol (United Kingdom)

13393-15 • 9:40 AM - 10:00 AM
Multipole moment matching in OAM light-matter interaction
Author(s): **Sandra Mamani,** Institute for Ultrafast Spectroscopy and Lasers (United States); **Alexander Doronin,** Victoria Univ. of Wellington (New Zealand); **Robert Alfano,** Institute for Ultrafast Spectroscopy and Lasers (United States)

Coffee Break • 10:00 AM - 10:30 AM

13393-16 • 10:30 AM - 10:50 AM
Topological winding protected coherent orthogonal scattering
Author(s): **Cheng Guo, Shanhui Fan,** Stanford Univ. (United States)

13393-17 • 10:50 AM - 11:10 AM
Sub-cycle nondiffracting and nondispersing vector optical pulsed bullets: polarization structures and group velocity effects
Author(s): **Sergej Orlov, Klemensas Laurinavičius,** Ctr. for Physical Sciences and Technology (Lithuania)

13393-44 • 11:10 AM - 11:30 AM
Focused scalar and vector Laguerre-Gauss beams in nanophotonics
Author(s): **Vittorio Aita,** King's College London (United Kingdom); **Kayn A. Forbes,** Univ. of East Anglia (United Kingdom); **Anatoly V. Zayats,** King's College London (United Kingdom)

SESSION 5: FIBERS AND WAVEGUIDES

28 January 2025 • 11:30 AM - 12:30 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Antonio Ambrosio**, Istituto Italiano di Tecnologia (Italy)

13393-18 • 11:30 AM - 12:00 PM
Structured light in waveguide-based quantum simulators *(Invited Paper)*
Author(s): **Christina Jörg**, **Julian Schulz, Georg von Freymann,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13393-19 • 12:00 PM - 12:30 PM
A complex media platform for quantum networking using structured light *(Invited Paper)*
Author(s): **Natalia Herrera Valencia**, **Annameng Ma**, **Suraj Goel,** Heriot-Watt Univ. (United Kingdom); **Saroch Leedumrongwatthanakun,** Prince of Songkla Univ. (Thailand); **Francesco Graffitti**, **Alessandro Fedrizzi**, **Will McCutcheon, Mehul Malik,** Heriot-Watt Univ. (United Kingdom)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

SESSION 6: OPTICAL ANGULAR MOMENTUM

28 January 2025 • 2:00 PM - 3:10 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Enrique J. Galvez**, Colgate Univ. (United States)

13393-20 • 2:00 PM - 2:30 PM
Nonlinear up-conversion of spatiotemporal vortices into the EUV via high harmonic generation *(Invited Paper)*
Author(s): **Carlos Hernández García**, **Rodrigo Martín-Hernández,** Univ. de Salamanca (Spain); **Guan Gui,** Univ. of Colorado at Boulder (United States); **Luis Plaja,** Univ. de Salamanca (Spain); **Henry C. Kapteyn**, **Margaret M. Murnane,** Univ. of Colorado at Boulder (United States); **Chen-Ting Liao,** Indiana Univ. Bloomington (United States); **Miguel A. Porras,** Univ. Politécnica de Madrid (Spain)

13393-35 • 2:30 PM - 2:50 PM
Near-field measure of optical chirality
Author(s): **Kayn A. Forbes, David L. Andrews,** Univ. of East Anglia (United Kingdom)

13393-22 • 2:50 PM - 3:10 PM
Sub-cycle time-varying orbital angular momentum beams
Author(s): **Antonio Ambrosio, Michael Almeida De Oliveira,** Istituto Italiano di Tecnologia (Italy)

Coffee Break 3:10 PM - 3:40 PM

SESSION 7: SENSING APPLICATIONS I

28 January 2025 • 3:40 PM - 5:40 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Anatoly V. Zayats**, King's College London (United Kingdom)

13393-23 • 3:40 PM - 4:10 PM
Higher order Bessel beams integrated in time (HOBBIT) using engineered light frequencies (ELFs) for maritime sensing *(Invited Paper)*
Author(s): **Eric G. Johnson,** Clemson Univ. (United States)

13393-24 • 4:10 PM - 4:40 PM
OAM vortex phase masks for enhanced scatter rejection in transmissometry *(Invited Paper)*
Author(s): **Shawn Divitt**, **K. Peter Judd**, **Matthew B. Hart**, **William F. Spruill**, **Tareik J. Jackson**, **Vasanthi Sivaprakasam, Abbie T. Watnik,** U.S. Naval Research Lab. (United States)

13393-25 • 4:40 PM - 5:00 PM
Modelling the interaction of structured light in turbulent environments through statistical interpolation of computational fluid dynamic phase screens
Author(s): **Ultan Daly**, **Zhaozhong Chen, Martin P. J. Lavery,** Univ. of Glasgow (United Kingdom)

13393-26 • 5:00 PM - 5:20 PM
Gravitational lensing of a binary system with complex light beams
Author(s): **Enrique J. Galvez**, **Kwakye Kendja**, **Thao Nguyen,** Colgate Univ. (United States); **Oleg Bulashenko, Anna Moreso Serra,** Univ. de Barcelona (Spain)

13393-46 • 5:20 PM - 5:40 PM
Multimode-fibre calibration guided by fibre mode correlations for imaging through bending fibres
Author(s): **Simon Peter Mekhail,** Univ. of Glasgow (United Kingdom)

Wednesday 29 January 2025

SESSION 8: QUANTUM EFFECTS AND INFORMATION

29 January 2025 • 8:00 AM - 10:10 AM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Alexander B. Stilgoe**, The Univ. of Queensland (Australia)

13393-27 • 8:00 AM - 8:30 AM
Complex light for simulating quantum computing algorithms using reconfigurable optical vector-matrix multiplication *(Invited Paper)*
Author(s): **Isaac M. Nape,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13393-28 • 8:30 AM - 9:00 AM
Quantum searching algorithms using entangled structured light *(Invited Paper)*
Author(s): **Paola Andrea Concha Obando**, **Isaac Nape**, **Neelan Gounden**, **Andrew Forbes, Fazilah Nothlawala,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13393-29 • 9:00 AM - 9:30 AM
Quantum effects in ultra-subwavelength light-matter interaction *(Invited Paper)*
Author(s): **Sathwik Bharadwaj,** Purdue Univ. (United States); **Jungho Mun,** Purdue Univ. (United States), Pohang Univ. of Science and Technology (Korea, Republic of); **Pronoy Das**, **Shoaib Mahmud**, **Wenbo Sun**, **Wei Zhang, Zubin Jacob,** Purdue Univ. (United States)

13393-30 • 9:30 AM - 9:50 AM
Using optical-electronic neural network for demultiplexing OAM-coded signals
Author(s): **Jiachi Ye**, **Belal Jahannia**, **Qian Cai**, **Hao Wang**, **Chandraman Patil**, **Haoyan Kang**, **Elham Heidari**, **Navid Asadizanjani, Hamed Dalir,** Univ. of Florida (United States)

13393-31 • 9:50 AM - 10:10 AM
Engineering space-time wavepackets into non-paraxial regime by dispersion magnifier
Author(s): **Dongha Kim**, **Cheng Guo**, **Peter B. Catrysse, Shanhui Fan,** Stanford Univ. (United States)

Coffee Break 10:10 AM - 10:35 AM

SESSION 9: MODE CONSTRUCTIONS

29 January 2025 • 10:35 AM - 12:15 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Andrew Forbes**, Univ. of the Witwatersrand, Johannesburg (South Africa)

13393-32 • 10:35 AM - 11:05 AM
Shaping linear and angular momentum transfer to matter *(Invited Paper)*
Author(s): **Alexander B. Stilgoe, Halina Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

13393-33 • 11:05 AM - 11:35 AM
Topological optical textures of free space *(Invited Paper)*
Author(s): **Yijie Shen,** Univ. of Southampton (Singapore); **Haiwen Wang,** Stanford Univ. (United States)

13393-34 • 11:35 AM - 11:55 AM
Radially and azimuthally polarized non-diffracting Airy vector beams and their particle-like topologies
Author(s): **Sergej Orlov, Justas Berškys,** Ctr. for Physical Sciences and Technology (Lithuania)

13393-36 • 11:55 AM - 12:15 PM
Harnessing optical aberrations for mode sorting
Author(s): **Hadrian Bezuidenhout**, **Cade Peters**, **Andrew Forbes, Isaac M. Nape,** Univ. of the Witwatersrand, Johannesburg (South Africa)

Lunch/Exhibition Break 12:15 PM - 1:50 PM

SESSION 10: SENSING APPLICATIONS II

29 January 2025 • 1:50 PM - 3:00 PM | Moscone South, Room 160 (Upper Mezz)
Session Chair(s): **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia)

13393-37 • 1:50 PM - 2:20 PM
Recent advances on ultra-sensitive, selective, and label-free optical sensing for fundamental science, environmental monitoring, and translational medicine *(Invited Paper)*
Author(s): **Tsu-Te Judith Su,** Wyant College of Optical Sciences, The Univ. of Arizona (United States)

13393-38 • 2:20 PM - 2:40 PM
Determining the azimuthal index of a light field with orbital angular momentum to high precision using speckle metrology
Author(s): **Chris Perrella**, **Aman Punse,** The Univ. of Adelaide (Australia); **Anastasia Zalogina,** The Univ. of Adelaide (Australia), Univ. of Technology Sydney (Australia); **Crispin Szydzik,** RMIT Univ. (Australia); **Megan Lim**, **Andy Boes,** The Univ. of Adelaide (Australia); **Arnan Mitchell,** RMIT Univ. (Australia); **Kylie R. Dunning,** The Univ. of Adelaide (Australia); **Kishan Dholakia,** The Univ. of Adelaide (Australia), Univ. of St. Andrews (United Kingdom)

13393-39 • 2:40 PM - 3:00 PM
Refractive index profilometry using polarization-controlled weak measurement through total internal reflection
Author(s): **Shouvik Sadhukhan**, **Dakshin Tillo,** Indian Institute of Space Science and Technology (India); **Jagroop .,** Indian Space Research Organisation (India); **Shirsendu Sarkar, Debabrata Bhadra,** Bhairab Ganguly College (India)

Coffee Break 3:00 PM - 3:30 PM

WORKSHOP ON METHODS OF COMPLEX LIGHT

29 January 2025 • 3:30 PM - 5:00 PM | Moscone South, Room 160 (Upper Mezz)

Session Chair(s): **Martin P. J. Lavery**, Univ. of Glasgow (United Kingdom)

Join this interactive workshop that focuses on the tools, techniques, and technology being used in the field of complex light, providing insight into how to integrate these into your own photonic systems. The format will be small group discussion, where attendees will get the opportunity to see live experimental demonstrations and discuss in small groups the topics outlined below. Please note, these are not regular scheduled talks. In this session attendees will be organized into small groups and rotated around each speaker. The session is drop-in, so please join at any time during the workshop; however, to allow ample time to engage with all the speakers, we suggest arriving early in the session.

Imaging Through Fibres: Simon Mekhail, Research Fellow, University of Glasgow (United Kingdom)
An introduction to the tips, tricks and technology required to image through fiber with high fidelity. The core challenges will be discussed and methods for managing alignment, fibre perturbation, setup mechanical instability, and wavelength instability will be presented. This is a great opportunity to learn the tools of the trade for anyone interesting in imaging through fibers or general scattering media.

Advances in Spatial Light Modulation: Kelly Gregorak, VP, Sales & Marketing, Meadowlark Optics (United States)
Meadowlark is a global leader in Spatial Light Modulators (SLMs), used widely in optical beamforming, manipulation, and microscopy systems. They will present an introduction to the latest hardware and software on the market, while giving perspective into the use of SLM in a range of applications. A range of systems will be demonstrated and will provide a unique opportunity to explore how SLMs can be integrated into your experimental optical systems.

Diffractive Optics for Structure Light Generation and Measurement: Eric Johnson, Professor, College of Optics and Photonics, University of Central Florida (United States)
Passive diffractive optics are an ideal method for beam sharpening for compact, mass-manufactured, or high-power applications. Prof. Johnson is a world leader in the design and fabrication of ultra-high-efficiency diffractive optics for a broad range of academic and industrial applications. Recently, he has pioneered the creation of mode multiplexers and demultiplexers that allow for rapidly tunable orbital angular momentum, enabling beam shaping in space and time, which he will discuss in detail at the workshop. He will provide insight into the do's and don'ts in diffractive optical design and provide unique insight into where they can be used in advanced optical systems.

Communicating in Turbulence Channels: Mark Main, PhD Student, and Martin Lavery, Professor, University of Glasgow (United Kingdom)
Free-space optical communications (FSOC) has gone through many technical revolutions since the invention of the Photophone in 1880. Core technology advancements in recent years have focused on active schemes for the mitigation of turbulence and pointing accuracy. The current state of the art in communication technologies will be discussed, and remaining challenges outlined. They will demonstrate a creative reuse of off-the-shelf components to realize a low-complexity spatial diversity scheme for turbulence mitigation that can be used for bridging the digital divide for rural and peri-urban communities at a range of 1.3km in moderate turbulence conditions.

POSTERS-WEDNESDAY

29 January 2025 • 6:00 PM - 8:00 PM | Moscone West, Room 2003 (Level 2)

Conference attendees are invited to attend the OPTO and Quantum West poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Setup: Wednesday 10:00 AM - 5:00 PM
Poster authors, view poster presentation guidelines and set-up instructions at https://spie.org/PWPosterGuidelines.

13393-40 • 6:00 PM - 8:00 PM
Propagation features of the superposition of finite energy Airy plasmon polaritons
Author(s): **Rosario Martínez-Herrero**, **Mireya Pando, Javier Hernandez Rueda,** Univ. Complutense de Madrid (Spain)

13393-41 • 6:00 PM - 8:00 PM
Arbitrary control of orbital angular momentum entanglement using a diffractive deep neural network-based inverse design technique
Author(s): **Youngbin Na, Do-Kyeong Ko,** Gwangju Institute of Science and Technology (Korea, Republic of)

13393-42 • 6:00 PM - 8:00 PM
Self-learning photonic matrix multiplier
Author(s): **Hadrian Bezuidenhout**, **Isaac M. Nape**, **Andrew Forbes**, **Paola Andrea Concha Obando**, **Mwezi Koni,** Univ. of the Witwatersrand, Johannesburg (South Africa); **Jonathan Leach,** Heriot-Watt Univ. (United Kingdom)

13393-43 • 6:00 PM - 8:00 PM
Development of quantum-inspired mode-entangled structured light interferometry to enhance imaging performance
Author(s): **Hui Min Leung**, **Kefu Mu**, **Hsiao-Chih Huang, Chen-Ting Liao,** Indiana Univ. Bloomington (United States)

13393-45 • 6:00 PM - 8:00 PM

Free space optical sensing using vector beam spectra

Author(s): **Giovanni Milione**, **Sarper Ozharar**, **Jian Fang**, **Philip Ji, Ting Wang,** NEC Labs. America, Inc. (United States)

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Be well agreement

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https://spie.org/about-spie/the-society/policies-and-reporting

SPIE Conferences app messaging policy

The SPIE Conferences app supports attendee-to-attendee messaging to facilitate professional networking among meeting participants. This feature should not be used to push high-volume solicitations, and messaging will be disabled for attendees who exceed reasonable use or are in violation of other SPIE event policies. Attendees should report inappropriate use via the app reporting feature. SPIE will also monitor for high-volume patterns suggesting improper use.

SPIE Conferences app connect feature

The connect feature in the SPIE Conferences app is a personal networking tool that allows individuals to share their contact information with other attendees via their phones while using the SPIE app. This tool should not be used for systematic scanning of badges for managing sales leads. Inappropriate use is a violation of event policy.

SPIE Conferences app lead retrieval feature

The lead retrieval feature in the SPIE Conferences app is a lead generation tool that allows attendees to share their contact information with SPIE exhibitors. Exhibitor representatives using the lead retrieval app may scan attendee badges in the exhibition or supporting company events after receiving permission from an attendee. It should not be used in the technical conference area. The lead retrieval feature will be disabled for exhibitor representatives who exceed reasonable use or are in violation of other SPIE event policies. Attendees should report inappropriate use by notifying staff or contacting support via the help link in the app.

Attendee registration and admission policies

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry of or to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

Capture and use of a person's image

By registering for an SPIE event, you grant full permission to SPIE to capture, store, use, and/or reproduce your image or likeness, including incidental capture of any individuals in your household or workplace, by any audio and/or visual recording technique and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE purpose. By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify, and hold harmless SPIE from and against any claims, damages, or liability arising from or related to the use of the images, recordings, or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion, or use in composite form that may occur or be produced in taking, processing, reduction, or production of the finished product, its publication or distribution.

Code of conduct

SPIE is committed to providing a harassment- and discrimination-free experience for everyone at our events, an experience that embraces the richness of diversity where participants may exchange ideas, learn, network, and socialize in the company of colleagues in an environment of mutual respect.

Read complete code:
https://spie.org/about-spie/the-society/policies-and-reporting

Event and course cancellation by SPIE

If for some unforeseen reason, SPIE should have to cancel a course or an entire event, processed registration fees for the canceled activity will be refunded to registrants. Registrants will be responsible for the cancellation of travel arrangements or housing reservations and the applicable fees.

Family-friendly policy

CONFERENCE EVENTS: all conference technical and networking events require a badge for admission. Registered attendees may bring children with them if they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

EXHIBITION HALL: everyone who attends the exhibition must be registered and have a badge. Badges for children are free and available onsite at the registration desk. Children under 14 years of age must be accompanied by an adult at all times. Guardians are asked to help maintain a professional, disturbance-free exhibition environment. Children under 18 are not allowed in the exhibition area during exhibition move-in and move-out.

Identification requirement

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials. Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

For online events, SPIE requires individuals to register with their legal identity.

Laser-pointer safety policy

SPIE events are subject to the applicable laser safety rules and regulations of the host location. SPIE supplies industry-standard Class 2 presentation laser pointers for all conference and other meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers. The use of a personal laser pointer represents the user's acceptance of liability for any damage or injuries to the presenter or others.

No smoking policy

Attendees will observe all non-smoking regulations that are publicly posted by the facilities used by the event.

Online commenting policy

SPIE moderates all comments posted in an online event. We encourage robust discussion, the exchange of scientific ideas, and the sharing of multiple, diverse perspectives. We expect the discussion to be consistent with the norms of scholarly research community interactions at events. Online event participants should report any comments or content that falls short of those community norms. We will remove comments, content, or people that are considered inappropriate by SPIE standards or that:

- are defamatory, libelous, obscene, indecent, abusive, or threatening to others
- infringe the copyright, trademark, or other rights of a third party
- upload viruses or are a cybersecurity hazard
- are off-topic or inappropriately commercial in nature
- are in violation of any applicable laws or regulations

Payment policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks, and wire transfers. Onsite registrations can also be paid with cash.

Recording policy

CONFERENCES AND POSTER SESSIONS: audio and video recordings are prohibited without prior written consent of SPIE and the presenter. Consent forms are available at Speaker Check-in, SPIE Registration, or the Chair Services Desk. Individuals not complying with this policy will be asked to surrender their recording media and leave the conference room. Refusal to comply with such requests is grounds for expulsion from the event. Please see the SPIE code of conduct.

COURSES: audio and video recordings are prohibited without explicit permission from SPIE and the instructor. Individuals not complying with this policy will be asked to surrender their recording media and leave the classroom. Refusal to comply with such requests is grounds for expulsion from the event.

EXHIBITION: attendees may not record interviews on the exhibition floor nor record or photograph exhibitor booth displays and/or products without explicit permission from SPIE and on-site company representatives. Consent forms are available at Exhibitor Assistance. Individuals not complying with this policy will be asked to surrender their recording media and leave the exhibition hall. Refusal to comply with such requests is grounds for expulsion from the event.

Unauthorized solicitation

Unauthorized solicitation in the exhibition hall is prohibited. Any non-exhibiting organization observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

Unsecured items

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

Wireless internet service

At most events, SPIE provides wireless access for attendees. Properly secure your computer before accessing the public wireless network. SPIE is not responsible for computer viruses or other kinds of computer damage.

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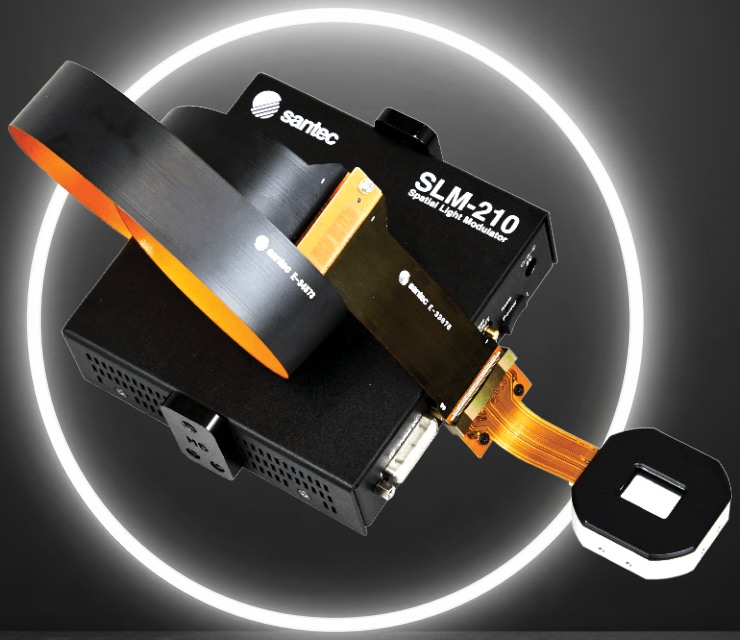
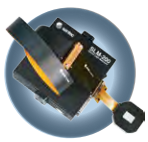


High Resolution
WUXGA (1920 x 1200) resolution,
10-bit (1024 gray levels)

Excellent Phase Stability
The world's highest level of phase stability less than 0.002 π

Innovative Customization
Santec's in-house-developed SLM for tailored solutions

Preliminary

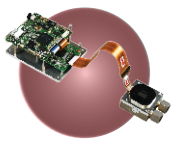

SLM-200
Standard model

SLM-20
Standard model
(Embedded module)

SLM-210
High Speed

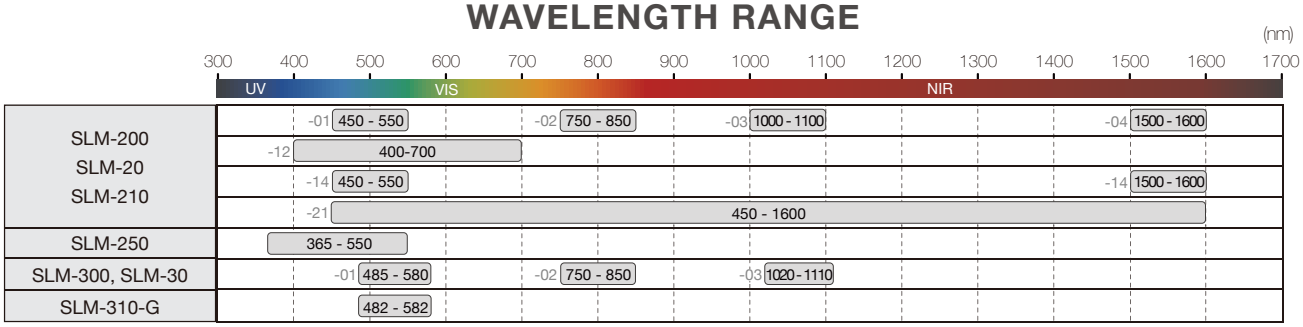
SLM-250
UV Hardened

SLM-300
High Power


SLM-30
High Power
(Embedded module)

SLM-310-G
Laser processing
(500W durable)

WAVELENGTH RANGE



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