TECHNICAL PROGRAMME

SPIE. OPTICAL METROLOGY

SPIE. DIGITAL OPTICAL TECHNOLOGIES

23–26 June 2025

ICM - International Congress Center Messe

Munich, Germany

www.spie.org/eom
#SPIEOpticalMetrology

www.spie.org/edo
#SPIEDigitalOptics

Download the

SPIE Conference App

Enhance your SPIE conference experience

Download the free mobile app to enrich your meeting experience. View events and connect with participants all in the palm of your hand. The app is free, easy to use, and loaded with features designed for planning and connecting on the go.

Make the most of your time with these app features:

» Real-time programme updates
» Customize your schedule
» Organize your meeting notes
» Add new connections to your contacts
» Navigate the venue
» Bookmark specific research
» Create meeting reports
» And a whole lot more.

Get the App

Download Now

My Schedule

Create and manage your personalized event schedule

WHAT IS MY SCHEDULE?

My Schedule allows you to create a custom, personalized schedule to help keep you from missing the events you want to attend. Paper presentations, poster presentations, courses, and special events can be added to My Schedule. Once you're done customizing My Schedule, it directly links to the SPIE Conference App for onsite use, or it can be printed or exported to your personal calendar.

USING MY SCHEDULE

» Sign In to your account
» Browse or search the conference program
» Click the "Add To My Schedule" to add items to your custom, printable schedule
» Your My Schedule will automatically save to your account
» Retrieve My Schedule
» Sign In to your account
» Retrieve your My Schedule by clicking on the "My Schedule" icon in the heade.

Your registration to SPIE Optical Metrology and SPIE Digital Optical Technologies grants you admission to all conferences held as part of the World of Photonics Congress.

CO-LOCATED WITH

LASER WORLD OF PHOTONICS

International Congress on Photonics in Europe
June 22–27, 2025 | ICM—International Congress Center Messe München
www.photonics-congress.com

SPIE. OPTICAL METROLOGY | SPIE. DIGITAL OPTICAL TECHNOLOGIES

23–26 June 2025
ICM—International Congress Center Messe
Munich, Germany

Experience the Energy of SPIE Optical Metrology and SPIE Digital Optical Technologies

---

Optical Metrology Technical Conference Overview—PAGES 8–11

CONFERENCE 13567—PAGE 12
Optical Measurement Systems for Industrial Inspection XIV
23 - 26 June 2025
ICM, Saal 14c

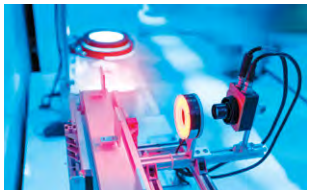
CONFERENCE 13568—PAGE 23
Modeling Aspects in Optical Metrology X
23 - 25 June 2025
ICM, Saal 22a

CONFERENCE 13569—PAGE 29
Optics for Arts, Architecture, and Archaeology (O3A) X
23 - 25 June 2025
ICM, Saal 12b

CONFERENCE 13570—PAGE 37
Multimodal Sensing and Artificial Intelligence for Sustainable Future
24 - 26 June 2025
ICM, Saal 12a

Technical Conferences—PAGES 12–63

CONFERENCE 13571—PAGE 47
Optical Methods for Inspection, Characterization, and Imaging of Biomaterials VII
23 - 26 June 2025
Hall B1-LEVEL 2, Room B13

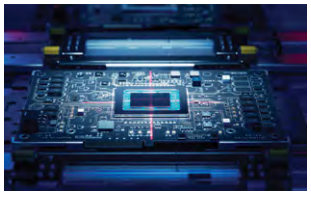


CONFERENCE 13572—PAGE 59
Automated Visual Inspection and Machine Vision VI
26 June 2025
ICM, Saal 12b

CONFERENCE CA100—PAGE 62
COST Action Special Session: Properties, Design, Fabrication, Optical Metrology, and Applications of Nano-/Micro-structured Surfaces
26 June 2025
ICM Room 21

Digital Optical Technologies Technical Conference Overview—PAGES 64

Technical Conferences—PAGES 65–71



CONFERENCE 13573—PAGE 64
Digital Optical Technologies 2025
23 - 25 June 2025
ICM Room 21

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.

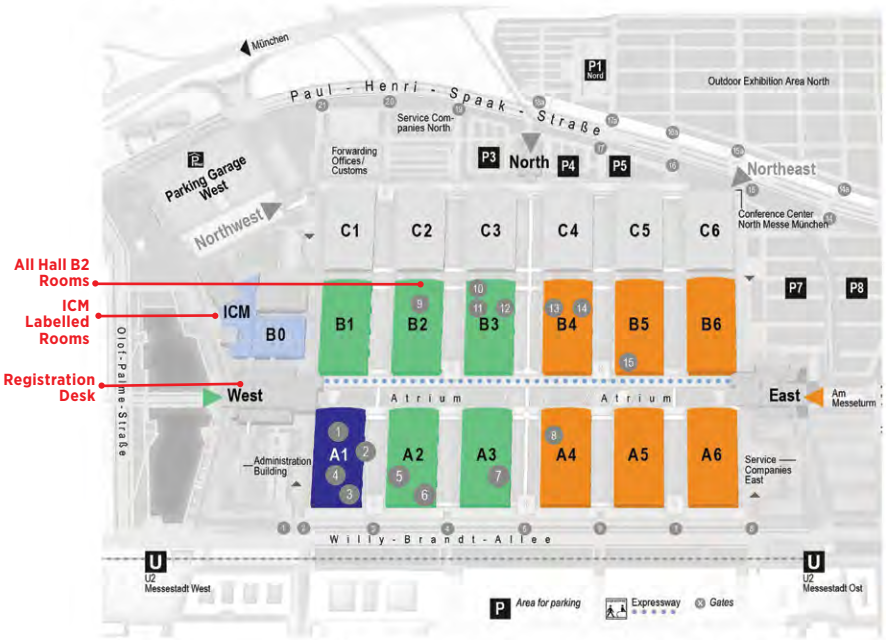
SPIE International Headquarters: PO Box 10, Bellingham, WA 98227-0010 USA • Tel: +1 360 676 3290 • customerservice@spie.org • www.SPIE.org
SPIE Europe Offices: 2 Alexandra Gate, Ffordd Pengam, Cardiff, CF24 2SA UK • Tel: +44 29 2089 4747 • info@spieeurope.org • www.SPIE.org

FACILITY MAPS

Fairgrounds map

June 24–27, 2025
Trade Fair Center Messe München

MESSE MÜNCHEN



1 Insights Forum
2 Forum World of Quantum
3 Qiskit Hackathon @ World of Quantum
4 Quantum Future Boulevard
5 Integrated Photonics Area
6 Forum Lasers and Optics
7 Special Area: Photonics Meets Robotics: AI Success Stories
8 MedtecLIVE Healthtech Pavilion
9 Forum Biophotonics and Medical Applications
10 Career Center & Job Board
11 Forum Laser Materials Processing
12 Special exhibition: Photons in Production
13 Start-up Arena
14 SummitStage MedtecSUMMIT, June 25–26, 2025
15 Vision Expert Huddles

LASER WORLD OF PHOTONICS

- A2 Laser and optoelectronics, integrated photonics, optical information and communication
- A3 Laser and laser systems for production engineering, sensors, test and measurement, optical measurement systems, imaging
- B1 Optics, manufacturing technology for optics
- B2 Lasers and optoelectronics, biophotonics and medical engineering
- B3 Laser and laser systems for production engineering

ICM B0 WORLD OF PHOTONICS CONGRESS

World of Quantum

- A1 Laser systems, subsystems and components for quantum technology, quantum computing and simulation, quantum communication and cryptography, quantum sensing and quantum imaging

automatica

- B6 Industrial robots, drive technology, control systems technology and industrial communications, software and cloud computing, electrical engineering
- B5 Machine vision, sensor technology, industrial robots
- B4 Industrial robots (incl. collaborative, mobile), professional service robotics, start-ups
- A6 Assembly and handling technology, fluid technology
- A5 Assembly and handling technology, clamping and gripping technology, drive technology
- A4 Machine vision, safety components, industrial robots (incl. collaborative, mobile), professional service robotics

ICM — Ground Floor

ICM – Internationales Congress Center München

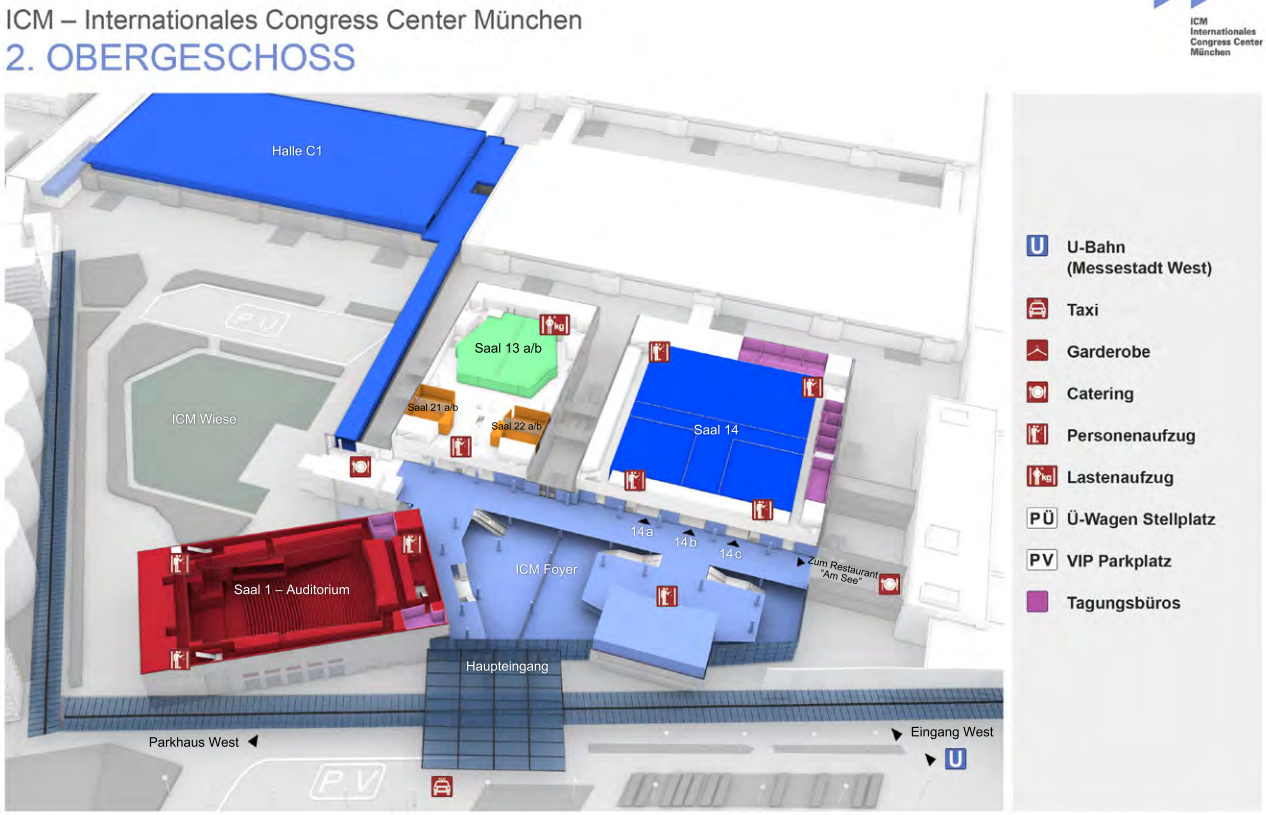
ERDGESCHOSS

ICM Internationales Congress Center München

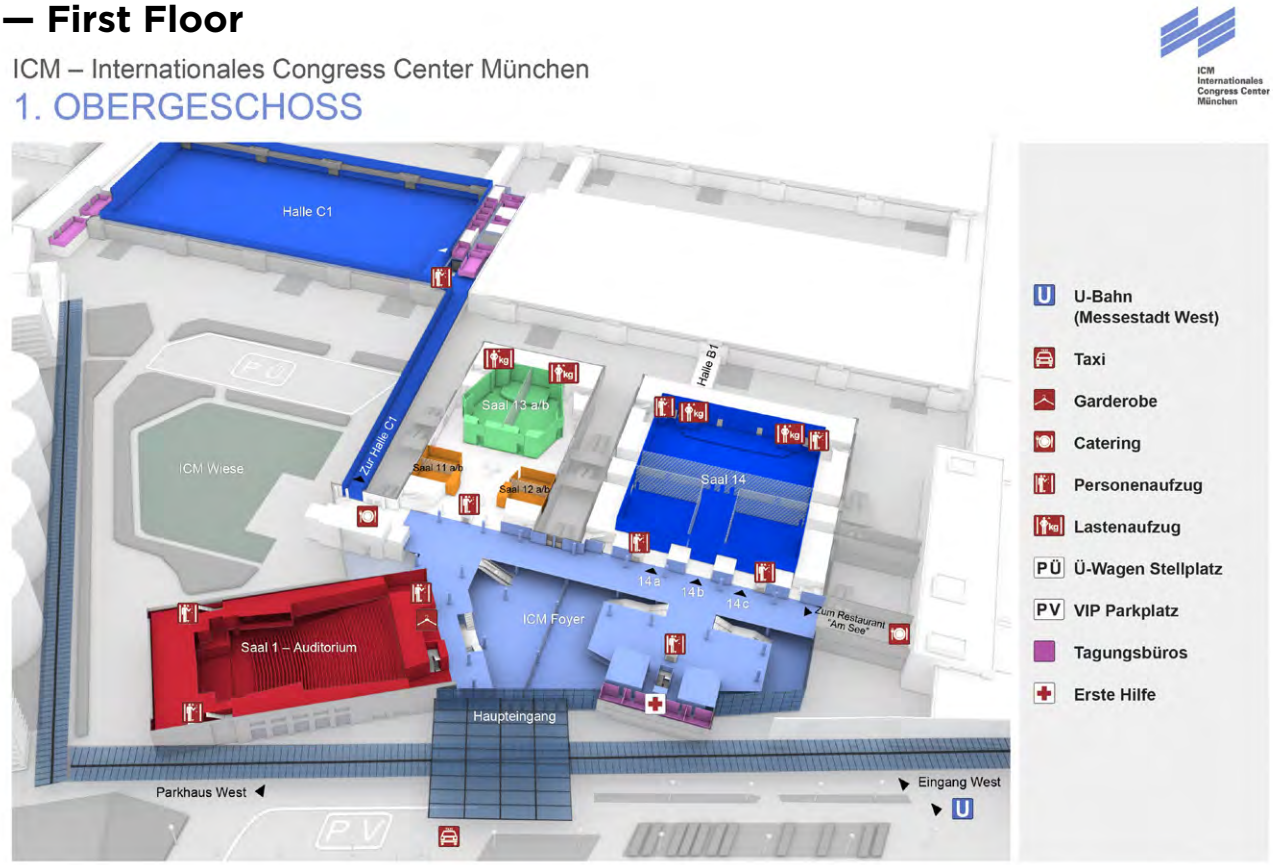
Messe München

- U-Bahn (Messestadt West)
- Taxi
- Garderobe
- Information
- Catering
- Personenaufzug
- Lastenaufzug
- PÜ Ü-Wagen Stellplatz
- PV VIP Parkplatz
- Tagungsbüros

ICM — Second Floor



ICM — First Floor



SPECIAL EVENTS

Plenary Sessions

HEAR FROM THE BEST SPEAKERS IN THE INDUSTRY

Hot Topics in Digital Optical Technologies

23 June 2025 • 09:00 - 10:00 | ICM Room 21

9:00 to 9:05

Welcome Address and Plenary Speaker Introduction
Bernard C. Kress, Google, United States
Jürgen Czarske, TU Dresden, Germany
2025 Symposium Chairs

9:05 to 9:55

Programming light diffraction for information processing and computational imaging

Aydogan Ozcan
Univ. of California, Los Angeles, United States

I will discuss the integration of programmable diffraction with digital neural networks. Diffractive optical networks are designed by deep learning to all-optically implement various complex functions as the input light diffracts through spatially engineered surfaces. These diffractive processors integrated with digital neural networks have various applications, e.g., image analysis, feature detection, object classification, computational imaging and seeing through diffusers, also enabling task-specific camera designs and new optical components for spatial, spectral and temporal beam shaping and spatially-controlled wavelength division multiplexing. These deep learning-designed diffractive systems can broadly impact (1) optical statistical inference engines, (2) computational camera and microscope designs and (3) inverse design of optical systems that are task-specific. In this talk, I will give examples of each group, enabling transformative capabilities for various applications of interest in e.g., autonomous systems, defense/security, telecommunications, as well as biomedical imaging and sensing.

Optical Metrology Plenary Session

23 June 2025 • 16:00 - 17:40 | ICM, Saal 1

16:00 to 16:10

Welcome and Introduction
Jörg Seewig, Technische Univ. Kaiserslautern, Germany
Pietro Ferraro, CNR, Institute of Applied Sciences & Intelligent Systems (ISASI), Italy
Symposium Chairs

16:10 to 16:55

The wide scale range of optical measurement technology and its exploration

Wolfgang Osten
Univ. Stuttgart, Institut für Technische Optik, Germany

High quality standards are a must for the majority of manufacturers in all industrial branches. Above all, optical principles have some exceptional properties that make them indispensable for use in all aspects of quality control. To them belong in particular the contactless and high speed interaction with the object under test, the largely free scalability of the dimension of the measuring tool, the high resolution of the measured data, the diversity of information channels transported by the light field, and the flexible adaptability of the measuring standard – the wavelength of light. However, to the outstanding unique selling points of the technology belong especially the extremely wide scale range of the objects that can be examined, their modalities and dimensions.

After an explanation of my understanding of the wide scale range of optical metroloy and a short excurse in its history, we describe some important fields of application and the optical principles used there. Finally, we give an overview of the challenges with which the measurement technology is currently confronted and illustrate this on example of several new measurement devices.

16:55 to 17:40

The intelligent microscope at the nanoscale: multimodal microscopy from fluorescence to label-free

Alberto Diaspro
Univ. of Genoa and CNR-IBF, Italy

Advanced optical microscopes, from fluorescence-based super resolved methods to quantum optical microscopy, are analytical instruments able to produce images that are rich sources of quantitative information towards an unprecedented insight into the molecular mechanisms that govern and determine the fate of living cells. Their developments are positioned at the interface between biology and physics. Multimodal optical microscopy is a growing attitude boosted by artificial intelligence that makes intelligent the microscope. Definitely, fluorescence plays a key role coupling microscopy and spectroscopy by adding to image formation photochemical parameters, from brightness to lifetime, and non-linear approaches, like those associated with multi-photon excitation able to exploit intrinsic fluorescence and SHG/THG. In this framework, polarization methods like Mueller matrix microscopy expand those contrast mechanisms available for imaging towards labe-free. Such an “optical and probe” based state of the art is boosted by the growing use of artificial intelligence and the increasing availability of single photon detectors. The microscope becomes intelligent with the ambitious target to create a robust virtual environment “to see “what we could not perceive before”. An interesting case study is related to understanding the visualization of chromatin organization.

World of Photonics Plenary Session

24 June 2025 • 08:30 - 10:00 | ICM, Saal 1

Scaling photonic systems for quantum information processing

Christine Silberhorn
Paderborn University, Germany

Quantum technologies promise a change of paradigm for many applications in high-performance computing, communication and metrology, because they can shift the boundaries of today's systems and devices beyond classical limits and seemingly fundamental limitations. Current efforts in photonic quantum science target the implementation of integrated devices and scalable systems, where the realization of quantum devices for real-word deployment and controlled quantum network structures is key for many applications. Here we review different approaches to advance current experimental approaches for scaling multi-dimensional photonic quantum systems and show our most advanced system for photonic quantum computing. Our research comprises integrated quantum circuits based on c(2)-materials, quantum source engineering and spectral-temporal multiplexing architectures and features the needed experimental functionalities for future photonic quantum technologies.

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

Technical Events

Connect with your peers on topics critical to your work and interest area.

Digital Optical Technologies Poster Session

24 June 2025 • 12:10 - 12:55 | ICM, Hall B0

Symposium attendees are invited to attend the poster session on Tuesday. 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. Remember to wear your registration badge.

Poster Setup: Tuesday 9:00 - 12:00 hrs

Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/EOMPosterGuidelines. SPIE assumes no responsibility for posters left up after 14:30 hrs, following the end of the poster session.

Optical Metrology Poster Session

25 June 2025 • 12:30 - 13:30 | ICM, Hall B0

Symposium attendees are invited to attend the poster session on Wednesday afternoon. 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. Remember to wear your registration badge.

Poster Setup: Wednesday 9:00 - 12:00 hrs

Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/EOMPosterGuidelines. SPIE assumes no responsibility for posters left up after the end of the poster session.

Networking Events

These live, interactive sessions give you the opportunity to network, learn, and discuss with optics and photonics professionals from around the world.

SPIE Fellow & Senior Member Luncheon

23 June 2025 • 12:00 - 13:30 | Entrance West, Seeblick

SPIE Fellows and Senior Members are invited to join your colleagues for this SPIE-hosted luncheon, by invitation.

Digital Optical Technologies Welcome Reception

23 June 2025 • 19:00 - 22:00 CEST
Augustiner Stammhaus, Weißer Saal

All registered DOT attendees are invited to relax, socialise, and enjoy food and drink at Munich's historic Augustiner Stammhaus. Please remember to wear your conference registration badges. Dress is casual.

Lessons learned from a Career in Optics and Photonics

24 June 2025 • 14:30 - 15:30 | ICM, Connection Corner

SPIE is hosting events around the world in celebration of twenty years of the SPIE Women in Optics Notebook; come listen to leaders featured in past issues of this popular outreach publication.

Beer & Pretzel Networking

24 June 2025 • 17:30 - 19:30 | ICM Foyer

SPIE invites all attendees to a Beer & Pretzel networking reception. All registered congress attendees are welcome; please remember to wear your conference registration badges. Dress is casual.

SPIE Student Member Meetup

25 June 2025 • 18:00 - 18:30 | Ratskeller, Marienplatz, Ratskeller, Ludwig-der-Erste-Raum

Optical Metrology Welcome Reception

25 June 2025 • 19:00 - 21:30
Ratskeller, Alte Küferei

All registered EOM attendees are invited to relax, socialise, and enjoy light refreshments at the Ratskeller (Marienplatz 8), located in the very heart of Munich. Please remember to wear your conference registration badges. Dress is casual.

Registration and badge pickup hours

Location: ICM Foyer West

Sunday 22 June	07:30 – 17:30
Monday 23 June	07:30 – 17:00
Tuesday 24 June	08:00 – 17:00
Wednesday 25 June	08:30 – 17:00
Thursday 26 June	08:30 – 16:00

SPIE CASHIER

Location: SPIE Registration desk

Open during registration hours

REGISTRATION PAYMENTS

If you are planning to register onsite, your credit card payment will be processed during registration. If you wish to pay with cash, register at the "Need to Register" stations; you will be directed to the Cashier once you have completed registration except for final payment.

If you have already registered and wish to add a 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 have your badge removed from the badge holder and marked with your changes before approaching the counter.

Speaker Check-in and Preview Station

Speaker Check-In will be open during the following hours, with technicians from local AV supplier Neumann & Müller available to assist:

Sunday 22 June	07:30 – 18:30
Monday 23 June	07:30 – 18:30
Tuesday 24 June	07:30 – 18:30
Wednesday 25 June	07:30 – 18:00
Thursday 26 June	07:30 – 18:00

All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. Speakers can upload their presentations at the Speaker Check-In, located in the foyer on the 1st floor of the ICM – International Congress Center, München.

SPIE will record the audio plus screen content of all presentations; Recordings will be published on the SPIE Digital Library with author permission only.

SPIE Conference App and event information

This useful tool allows you to search and browse the program, special events, participants, exhibitors, and more. It is free and available for iPhone and Android phones. If you don't already have the app you can download it here: Download the SPIE App.

Internet access

Location: ICM Foyer areas

Complimentary wireless internet access will be available; connection speed depends on the number of users. Please read the SPIE Wireless Service Policy.

Luggage and coat check

Location: Foyer West, Level-1

Open during registration hours

Luggage, packages, and coat storage are available against charge. Please note opening hours.

Business Centre

Location: ICM Foyer

Open during registration hours

Services include copying, and, printing services at cost.

Riem Arcaden Shopping Centre amenities and services
The nearby Riem Arcaden Shopping centre is situated on the other side of the Messe West underground station and has a multitude of shops and services such as First Aid, supermarkets, restaurants, banks, post office, charging stations. Core opening hours are 10:00 - 20:00 hrs. https://www.riemarcaden.de/en

Urgent message line

Messages for attendees can be left by calling **+44 29 2089 4747**. Message will be taken during registration hours Monday – Thursday. It is the attendees' responsibility to check the message board on a regular basis.

Lost and Found

Location: SPIE Cashier

Found items will be kept at the SPIE Cashier in the Registration area during the meeting and available only during registration hours. After hours, Lost and Found will be given to the facility's security service.

Food and beverage services

COFFEE BREAKS

Location: ICM Foyers

Complimentary Coffee will be served twice daily at the times indicated in the programme. Check individual listings for exact times and locations.

FOOD AND REFRESHMENTS FOR PURCHASE

The ICM has three permanent food-service operations in the foyer area: the ICM Bistro, ICM Bar, and ICM Café where guests can purchase food.

There is also the Am See restaurant located on the first floor above the registration in Entrance West. In good weather, a beer garden is operated in the courtyard between Halls A and C.

There are also a number of bars and restaurants located in the surrounding hotels as well as the Riem Arcaden shopping centre on the other side of the underground station Messestadt West.

Restaurants

Places to eat and drink in Munich:
Close to the Messe, there are restaurants in the Riem Arcaden area.

Furthermore, there are a host of restaurants in the city. Attendees are advised to use a site such as Trip Advisor to narrow down choices in their preferred area.

TECHNICAL CONFERENCE OVERVIEW

PROGRAMME IS CURRENT AS OF 2 JUNE 2025

TIME	**CONFERENCE 13567** Optical Measurement Systems for Industrial Inspection XIV Chairs: Peter Lehmann; Wolfgang Osten; Armando Albertazzi Gonçalves Jr. **ICM, Saal 14c**	**CONFERENCE 13568** Modeling Aspects in Optical Metrology X Chairs: Bernd Bodermann; Karsten Frenner; Bryan M. Barnes **ICM, Saal 22a**	**CONFERENCE 13569** Optics for Arts, Architecture, and Archaeology (O3A) X Chairs: Haida Liang; Roger Groves **ICM, Saal 12b**	**CONFERENCE 13570** Multimodal Sensing and Artificial Intelligence for Sustainable Future Chairs: Francesco Soldovieri; Pascal Picart; Vittorio Bianco; Claas Falldorf **ICM, Saal 12a**
MONDAY 23 JUNE 2025				
MORNING	08:30 - 10:00 SESSION 1: **Digital Holography**	08:30 - 08:40 **Welcome and Opening Remarks**	08:50 - 10:00 SESSION 1: **Tribute to John Asmus: In Memoriam Session I** 	**IN MEMORIAM** This year's conference is dedicated to the memory of Dr. Ettore Stella, Director of Research at National Research Council (CNR, Italy) and the Founding Chair of the Multimodal Sensing and Artificial Intelligence Conference.  Ettore served as the 2019-2023 Chair of the SPIE conference on Multimodal Sensing and Artificial Intelligence.
		08:40 - 10:10 SESSION 1: **Numerical Methods and Maxwell Solvers**		
	10:00 - 10:30 • Coffee Break	10:10 - 10:40 • Coffee Break	10:00 - 10:30 • Coffee Break	
	10:30 - 13:00 SESSION 2: **Structured Light and Fringe Projection**	10:40 - 12:30 SESSION 2: **Machine Learning in Optical Metrology**	10:30 - 12:20 SESSION 2: **Tribute to Austin Nevin: In Memoriam Session II** 	
AFTERNOON	13:00 - 14:00 • Lunch Break	12:30 - 13:40 • Lunch Break	12:20 - 13:30 • Lunch Break	
	14:00 - 15:40 SESSION 3: **Interferometry**	13:40 - 15:30 SESSION 3: **Superresolution and Nanometrology**	13:30 - 15:30 SESSION 3: **Tribute to Vincent Detalle: In Memoriam Session III** 	
	15:40 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break	
	16:00 - 17:40 • ICM, Saal 1 **Optical Metrology Plenary Session**			
TUESDAY 24 JUNE 2025				
MORNING	08:30 - 10:00 • ICM, Saal 1 **World of Photonics Plenary Session**			
	10:00 - 10:30 • Coffee Break	10:00 - 10:30 • Coffee Break	10:00 - 10:30 • Coffee Break	10:00 - 10:30 • Coffee Break
	10:30 - 12:00 • | ICM, Saal 14c SESSION 4: **In-situ and In-line Measurement**	10:30 - 12:10 SESSION 4: **Optical Systems and 3D Shape Metrology**	10:30 - 12:10 SESSION 4: **Structural Analysis**	10:30 - 12:10 SESSION 1: **Environmental Monitoring I**
AFTERNOON	12:00 - 13:10 • Lunch Break	12:10 - 13:20 • Lunch Break	12:10 - 13:30 • Lunch Break	12:10 - 13:20 • Lunch Break
	13:10 - 14:50 SESSION 5: **Shearography and Nondestructive Testing**	13:20 - 15:30 SESSION 5: **Ellipsometry, Polarimetry and OCD**	13:30 - 15:20 SESSION 5: **Applications to Art, Archaeology, and Architecture**	13:20 - 15:30 SESSION 2: **Advanced Microscopy**
	14:50 - 18:00 SESSION 6: **Low-coherence Interferometry, Confocal Sensing and Calibration**			
	15:30 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break
	16:00 SESSION 6 continued:	16:00 - 18:10 SESSION 6: **Interferometry**	16:00 - 18:00 SESSION 6: **Machine Learning and Data Visualisation**	16:00 - 18:00 SESSION 3: **Remote Sensing**

	CONFERENCE 13571 Optical Methods for Inspection, Characterization, and Imaging of Biomaterials VII Chairs: Pietro Ferraro; Simonetta Grilli; Demetri Psaltis; Andreas E. Vasdekis **Hall B1-Level 2, Room B13**	CONFERENCE 13572 Automated Visual Inspection and Machine Vision VI Chairs: Michael Heizmann; Thomas Längle **ICM, Saal 12b**	CONFERENCE CA100 COST Action Special Session: Properties, Design, Fabrication, Optical Metrology, and Applications of Nano-/Micro-structured Surfaces Chairs: Virgil-Florin Duma; Malgorzata Szczerska **ICM Room 21**
	08:40 - 10:00 SESSION 1: **Imaging and Characterization in Biology**		
	10:00 - 10:20 • Coffee Break		
	10:20 - 12:20 SESSION 2: **Optical Methods for Clinical Applications**		
	12:20 - 13:20 • Lunch Break		
	13:20 - 15:35 SESSION 3: **Advanced Microscopy I**		
	15:35 - 16:00 • Coffee Break		
	10:00 - 10:30 • Coffee Break		
	10:30 - 12:20 SESSION 4: **QPM and Tomography I**		
	12:20 - 13:20 • Lunch Break		
	13:20 - 15:40 SESSION 5: **Super-resolution Techniques**		
	15:40 - 16:10 • Coffee Break		
	16:10 - 18:10 SESSION 6: **AI-powered Microscopy**		

Event Schedule continues on next page

SYMPOSIUM CHAIRS

Pietro Ferraro
ISASI-CNR (Italy)

Jörg Seewig
Technische Univ. Kaiserslautern (Germany)

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

TECHNICAL CONFERENCE OVERVIEW

PROGRAMME IS CURRENT AS OF 2 JUNE 2025

TIME	CONFERENCE 13567 Optical Measurement Systems for Industrial Inspection XIV Chairs: Peter Lehmann; Wolfgang Osten; Armando Albertazzi Gonçalves Jr. ICM, Saal 14c	CONFERENCE 13568 Modeling Aspects in Optical Metrology X Chairs: Bernd Bodermann; Karsten Frenner; Bryan M. Barnes ICM, Saal 22a	CONFERENCE 13569 Optics for Arts, Architecture, and Archaeology (O3A) X Chairs: Haida Liang; Roger Groves ICM, Saal 12b	CONFERENCE 13570 Multimodal Sensing and Artificial Intelligence for Sustainable Future Chairs: Francesco Soldovieri; Pascal Picart; Vittorio Bianco; Claas Falldorf ICM, Saal 12a
WEDNESDAY 25 JUNE 2025				
MORNING	08:30 - 10:00 • JOINT SESSION I • **ICM, Saal 14c**		08:30 - 10:50 SESSION 7: **Imaging and Spectroscopy: Instrument and Method Development**	08:30 - 10:00 SESSION 4: **Advances in Optofluidics I**
	10:00 - 10:30 • Coffee Break		10:00 - 10:30 • Coffee Break	10:00 - 10:30 • Coffee Break
	10:30 - 11:30 SESSION 8: **Microsphere-assisted Microscopy**		10:50 - 11:30 SESSION 8: **Poster Slam: Optics for Arts, Architecture, and Archaeology**	10:30 - 11:30 SESSION 5: **Advances in Optofluidics II**
AFTERNOON	11:30 - 12:30 • Lunch Break		11:30 - 12:30 • Lunch Break	11:30 - 12:30 • Lunch Break
	12:30 - 13:40 | ICM, Hall B0 **POSTERS-WEDNESDAY — SEE ONLINE FOR FULL LIST OF POSTERS** Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.			
	13:40 - 15:20 SESSION 9: **LiDAR Techniques**		13:40 - 15:10 SESSION 9: **3D Imaging and Spectroscopy**	13:40 - 15:30 SESSION 6: **Environmental Monitoring II**
	15:30 - 16:00 • Coffee Break		15:30 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break
	16:00 - 18:00 SESSION 10: **SPECIAL SESSION: Measurement Systems for UAVs and Satellites**		16:00 - 17:10 SESSION 10: **Multimodal Imaging and Spectroscopy**	16:00 - 18:00 • JOINT SESSION 16:00 - 18:00 SESSION 7: **JOINT SESSION: Multimodal Quantitative Phase Bioimaging I**
THURSDAY 26 JUNE 2025				
MORNING	08:40 - 10:00 SESSION 11: **Dynamic and Thermal Measurement**			08:10 - 10:00 • **ICM Saal 12a** SESSION 8: **Multimodal Computational Microscopy**
	10:00 - 10:30 • Coffee Break			10:00 - 10:30 • Coffee Break
	10:30 - 12:10 SESSION 12: **Light Scattering Techniques**			10:30 - 12:10 SESSION 9: **Nondestructive Testing**
				10:30 - 12:20 • JOINT SESSION 10:30 - 12:20 SESSION 10: **JOINT SESSION: Multimodal Quantitative Phase Bioimaging II**
AFTERNOON	12:10 - 13:10 • Lunch Break			12:20 - 13:30 • Lunch Break
	13:10 - 15:30 SESSION 13: **Measurement of Precision Components**			13:30 - 15:30 • **ICM Saal 12a** SESSION 11: **Artificial Intelligence for Nondestructive Sensing: Memorial Session in Honor of Dr. Ettore Stella**
	15:30 - 16:00 • Coffee Break			15:30 - 16:00 • Coffee Break
	16:00 - 17:40 SESSION 14: **Characterization of Optical Materials and Components**			16:00 - 17:50 SESSION 12: **Multimodal Sensing for Industrial Applications**

	CONFERENCE 13571 Optical Methods for Inspection, Characterization, and Imaging of Biomaterials VII Chairs: Pietro Ferraro; Simonetta Grilli; Demetri Psaltis; Andreas E. Vasdekis **Hall B1-Level 2, Room B13**	CONFERENCE 13572 Automated Visual Inspection and Machine Vision VI Chairs: Michael Heizmann; Thomas Längle **ICM, Saal 12b**	CONFERENCE CA100 COST Action Special Session: Properties, Design, Fabrication, Optical Metrology, and Applications of Nano-/Micro-structured Surfaces Chairs: Virgil-Florin Duma; Malgorzata Szczerska **ICM Room 21**
	08:10 - 10:10 SESSION 8: **JOINT SESSION: COST Action, Understanding Interaction Light-Biological Surfaces (PhoBioS) I**		
	10:00 - 10:30 • Coffee Break		
	10:40 - 11:40 SESSION 8: **JOINT SESSION: COST Action, Understanding Interaction Light-Biological Surfaces (PhoBioS) I**		
	11:40 - 12:30 • Lunch Break		
	13:35 - 15:30 SESSION 9: **Machine Learning and Classification**		
	15:30 - 16:00 • Coffee Break		
	Hall B1-LEVEL 2, Room B13		
	16:00 - 18:00 SESSION 10: **JOINT SESSION: Multimodal Quantitative Phase Bioimaging I**		
	08:30 - 10:00 SESSION 11: **Advanced Microscopy II**	08:40 - 10:00 SESSION 1: **Quality Assurance**	09:00 - 10:00 SESSION 1: **COST Action (PhoBioS) Special Session I**
	10:00 - 10:30 • Coffee Break	10:00 - 10:40 • Coffee Break	10:00 - 10:30 • Coffee Break
		10:40 - 12:20 SESSION 2: **Image Acquisition and Simulation**	09:00 - 10:00 SESSION 2: **COST Action (PhoBioS) Special Session II**
	Hall B1-LEVEL 2, Room B13		
	10:30 - 12:20 SESSION 12: **JOINT SESSION: Multimodal Quantitative Phase Bioimaging II**		
	12:20 - 13:20 • Lunch Break	12:20 - 14:00 • Lunch Break	12:30 - 13:40 • Lunch Break
	13:20 - 15:30 SESSION 13: **QPM and Tomography II**	14:00 - 15:20 SESSION 3: **Machine Learning and Classification**	13:40 - 15:30 SESSION 3: **COST Action (PhoBioS) Special Session III**
	15:30 - 16:00 • Coffee Break	15:20 - 16:00 • Coffee Break	15:30 - 16:00 • Coffee Break
	16:00 - 17:10 SESSION 14: **Advanced FPM**	16:00 - 17:20 SESSION 4: **Image-based Position Measurement**	16:00 - 18:00 SESSION 4: **COST Action (PhoBioS) Special Session IV: Young Researchers Workshop**

SPIE. DIGITAL LIBRARY

INCLUDED WITH REGISTRATION

Presentations on the Digital Library

The conference proceedings papers and presentations of both SPIE symposia are published in the SPIE Digital Library. All paid conference registrations include 50 downloads for ongoing access.

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

SPIE. DIGITAL OPTICAL TECHNOLOGIES TECHNICAL CONFERENCE OVERVIEW

PROGRAMME IS CURRENT AS OF 2 JUNE 2025

TIME	MONDAY 23 JUNE 2025
MORNING **ICM Room 21**	08:45 - 09:05 **Welcome and Introduction** **Opening Presentation,** Bernard C. Kress, Jürgen Czarske
	09:05 - 10:00 **Digital Optical Technologies Plenary Session**
	Welcome Address and Plenary Speaker Introduction, Bernard C. Kress, Google (USA), Jürgen Czarske, TU Dresden (Germany)
	Hot Topics in Digital Optical Technologies • Plenary Presentation **Programming light diffraction for information processing and computational imagings,** Aydogan Ozcan, UCLA Samueli School of Engineering (USA)
	10:00 • **Coffee Break**
	10:30 - 12:30 **SESSION 1: Wavefront Shaping by Digital Optics** Session Chair: Aydogan Ozcan, UCLA Samueli School of Engineering (USA)
AFTERNOON	12:30 • **Lunch Break**
	13:40 - 15:30 **SESSION 2: Holographic Imaging and Display** Session Chair: Andreas Hermerschmidt, HOLOEYE Photonics AG (Germany)
	15:30 • **Coffee Break**
	16:00 - 18:00 **SESSION 3: AI-aided Design Techniques for Digital Optics** Session Chairs: Rafael Piestun, Univ. of Colorado Boulder (United States), Ivan B. Djordjevic, The Univ. of Arizona (United States)
	16:00 - 17:40 • ICM, Saal 1 **Optical Metrology Plenary Session**
	TUESDAY 24 JUNE 2025
MORNING	08:30 - 10:00 • ICM, Saal 1 **World of Photonics Plenary Session**
	10:00 • **Coffee Break**
	10:40 - 12:00 **SESSION 4: Digital Optics for AR/VR/MR I** Session Chair: Florian Willomitzer, Wyant College of Optical Sciences (United States)
AFTERNOON	12:50 • **Lunch Break**
	13:50 - 15:30 **SESSION 5: Fabrication and Metrology Using Digital Optics** Session Chairs: Pietro Ferraro, Istituto di Scienze Applicate e Sistemi Intelligenti “Eduardo Caianiello” (Italy), Peter J. de Groot, Zygo Corporation (United States)
	15:30 • **Coffee Break**
	16:00 - 18:10 **SESSION 6: Digital Optics for AR/VR/MR II** Session Chairs: Uwe Vogel, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany), Angus Wu, Kinko Optical Co., Ltd. (Taiwan)
	WEDNESDAY 25 JUNE 2025
MORNING	08:20 - 10:00 **SESSION 7: Adaptive Optics by Digital Technologies** Session Chairs: Jiachen Wu, Tsinghua Univ. (China), Sachleen Singh, Univ. of the Witwatersrand, Johannesburg (South Africa)
	10:00 • **Coffee Break**
	10:30 - 12:40 **SESSION 8: Dynamic Digital Optics** Session Chairs: Martin J. Booth, Univ. of Oxford (United Kingdom)
AFTERNOON	12:40 • **Lunch Break**
	13:50 - 15:30 **SESSION 9: Metrology, Displays and Optical Components for Digital Technologies** Session Chairs: Wataru Watanabe, Ritsumeikan Univ. (Japan), Jakob Dremel, TU Dresden (Germany)
	15:30 • **Coffee Break**
	16:00 - 17:20 **SESSION 10: Computational Techniques for Digital Optics** Session Chair: Claas Falldorf, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

SYMPOSIUM CHAIRS

Bernard C. Kress
Google (United States)

Jürgen Czarske
TU Dresden (Germany)

CONFERENCE 13567

Optical Measurement Systems for Industrial Inspection XIV

23 - 26 June 2025 | ICM, Saal 14c

Conference Chair(s): **Peter Lehmann,** Univ. Kassel (Germany)

Conference Co-Chair(s): **Wolfgang Osten,** Univ. Stuttgart (Germany); **Armando Albertazzi Gonçalves,** Univ. Federal de Santa Catarina (Brazil)

Program Committee: **Oleg V. Angelsky,** Yuriy Fedkovych Chernivtsi National Univ. (Ukraine); **Andrei G. Anisimov,** Technische Univ. Delft (Netherlands); **Anand Krishna Asundi,** Nanyang Technological Univ. (Singapore); **Partha P. Banerjee,** Univ. of Dayton (United States); **Ralf B. Bergmann,** Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Harald Bosse,** Physikalisch-Technische Bundesanstalt (Germany); **Rémi Bourgois,** Safran Reosc (France); **Jan Burke,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **Chau-Jern Cheng,** National Taiwan Normal Univ. (Taiwan); **Jürgen W. Czarske,** Technische Univ. Dresden (Germany); **Peter J. de Groot,** Zygo Corporation (United States); **Konstantinos Falaggis,** The Univ. of North Carolina at Charlotte (United States); **Pietro Ferraro,** CNR-Institute of Applied Sciences and Intelligent Systems "Eduardo Caianiello" (Italy); **Andreas Fischer,** Bremer Institut für Messtechnik, Automatisierung und Qualitätswissenschaft (BIMAQ) (Germany); **Cosme Furlong,** Worcester Polytechnic Institute (United States); **Marc P. Georges,** Univ. de Liège (Belgium); **Sen Han,** Univ. of Shanghai for Science and Technology (China); **Yoshio Hayasaki,** Utsunomiya Univ. (Japan); **Xiangqian Jiang,** Univ. of Huddersfield (United Kingdom); **Myung K. Kim,** Univ. of South Florida (United States); **Thomas Kissinger,** Technische Univ. Ilmenau (Germany); **Tomasz Kozacki,** Warsaw Univ. of Technology (Poland); **Andrew John Moore,** Heriot-Watt Univ. (United Kingdom); **Gunther Notni,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Yukitoshi Otani,** Utsunomiya Univ. (Japan); **Xiang Peng,** Shenzhen Univ. (China); **Pascal Picart,** Univ. du Maine (France); **Stephan Reichelt,** Univ. Stuttgart (Germany); **Christian Rembe,** TU Clausthal (Germany); **Luigi Rovati,** Univ. degli Studi di Modena e Reggio Emilia (Italy); **Robert Schmitt,** RWTH (Germany); **Jörg Seewig,** Technische Univ. Kaiserslautern (Germany); **Rainer Tutsch,** Technische Univ. Braunschweig (Germany); **Eriko Watanabe,** The Univ. of Electro-Communications (Japan); **Toyohiko Yatagai,** Utsunomiya Univ. (Japan); **Changhe Zhou,** Shanghai Institute of Optics and Fine Mechanics (China)

Monday 23 June 2025

SESSION 1: DIGITAL HOLOGRAPHY

23 June 2025 • 8:30 - 10:00 | ICM, Saal 14c
Session Chair(s): **Peter Lehmann**, Univ. Kassel (Germany)

13567-1 • 8:30 - 9:00
Full vectorial field detection of metasurface devices *(Invited Paper)*
Author(s): **Chau-Jern Cheng**, **Ssu-Chia He, Chung-Hsuan Huang,** National Taiwan Normal Univ. (Taiwan)

13567-2 • 9:00 - 9:20
Digital holography for shape measurement of a moving object
Author(s): **Yuma Sato, Yoshio Hayasaki,** Utsunomiya Univ. Ctr. for Optical Research & Education (Japan)

13567-3 • 9:20 - 9:40
Multi-wavelength holography with flexible synthetic wavelengths
Author(s): **Leonard Voßgrag,** Univ. of Freiburg (Germany); **Annelie Schiller**, **Markus Fratz,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Ingo Breunig,** Univ. of Freiburg (Germany), Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

13567-4 • 9:40 - 10:00
Multi-wavelength varifocal common-path configuration for digital holographic microscopy
Author(s): **Chung-Hsuan Huang,** National Taiwan Normal Univ. (Taiwan); **Han-Yen Tu,** Chinese Culture Univ. (Taiwan); **Chau-Jern Cheng,** National Taiwan Normal Univ. (Taiwan)

Coffee Break 10:00 - 10:30

SESSION 2: STRUCTURED LIGHT AND FRINGE PROJECTION

23 June 2025 • 10:30 - 13:00 | ICM, Saal 14c
Session Chair(s): **Wolfgang Osten**, Univ. Stuttgart (Germany)

13567-5 • 10:30 - 11:00
High-speed structured light 3D imaging and metrology empowered by deep learning *(Invited Paper)*
Author(s): **Chao Zuo,** Nanjing Univ. of Science and Technology (China)

13567-6 • 11:00 - 11:20
Approach for assessing compressor blade leading edge damage without CAD model reference
Author(s): **Theresa Thiel**, **Markus Kästner, Eduard Reithmeier,** Leibniz Univ. Hannover (Germany)

13567-7 • 11:20 - 11:40
In situ optical 3D sensor for precise extrusion die measurement
Author(s): **Max Brower-Rabinowitsch**, **Jannis Drangmeister**, **Lennart Hinz**, **Markus Kästner, Eduard Reithmeier,** Leibniz Univ. Hannover (Germany)

13567-8 • 11:40 - 12:00
Temporally super-resolved multiplexed fringe projection structured light 3D imaging empowered by deep learning
Author(s): **Wenwu Chen**, **Yifan Liu**, **Shijie Feng, Chao Zuo,** Nanjing Univ. of Science and Technology (China)

13567-9 • 12:00 - 12:20
3D surface imaging using structured-light illumination and cross-domain learning
Author(s): **Shijie Feng,** Nanjing Univ. of Science and Technology (China)

13567-10 • 12:20 - 12:40
3D imaging of highlighted samples using adaptive fringe intensity projection
Author(s): **Yan Hu**, **Sudong Ding, Chao Zuo,** Nanjing Univ. of Science and Technology (China)

13567-11 • 12:40 - 13:00
Multi-device vs mirror-based system for 360-degrees fringe projection profilometry
Author(s): **Sofia Esquivel-Hernandez**, **Rigoberto Juarez-Salazar, Victor H. Díaz Ramírez,** Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

Lunch Break 13:00 - 14:00

SESSION 3: INTERFEROMETRY

23 June 2025 • 14:00 - 15:40 | ICM, Saal 14c
Session Chair(s): **Peter J. de Groot**, Zygo Corporation (United States)

13567-12 • 14:00 - 14:20
Inspection of linear axicon surface by double-pass interferometry
Author(s): **Huy Vu, Joohyung Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of)

13567-13 • 14:20 - 14:40
Development of dual-wavelength polarization interferometer for profile measurement of rough surface
Author(s): **Ju-Yi Lee, Zhi-Cheng Wang,** National Central Univ. (Taiwan)

13567-14 • 14:40 - 15:00
Waveplates retardance multispectral metrology with a Wollaston prism generated fringe field
Author(s): **Dariusz Litwin**, **Kamil Radziak**, **Jacek Galas**, **Adam Czyzewski**, **Tadeusz Kryszczyński**, **Narcyz Błocki,** Tele and Radio Research Institute (Poland); **Robert Szumski, Justyna Niedziela,** Central Office of Measures (Poland)

13567-15 • 15:00 - 15:20
Ultrasensitive nonlinear phase metrology
Author(s): **Javier García Monreal**, **Adolfo Esteban-Martin**, **Andreu Molina-Garcia**, **José Ángel Picazo-Bueno**, **Fernando Silva, Germán J. de Valcárcel,** Univ. de València (Spain)

13567-16 • 15:20 - 15:40
Stitching interferometry with atomic and close-to-atomic form accuracy for X-ray flat surfaces
Author(s): **Shuai Xue,** National Univ. of Defense Technology (China)

Coffee Break 15:40 - 16:00

OPTICAL METROLOGY PLENARY SESSION

23 June 2025 • 16:00 - 17:40 | ICM, Saal 1
16:00 to 16:10 hrs
Welcome Address and Plenary Speaker Introduction

Jörg Seewig, Technische Univ. Kaiserslautern (Germany)
Piero Ferraro, CNR, Institute of Applied Sciences & Intelligent Systems (ISASI) (Italy)
2025 Symposium Chairs

13567-500 • 16:10 - 16:55
The wide scale range of optical measurement technology and its exploration (Plenary Presentation)
Author(s): **Wolfgang Osten,** Univ. Stuttgart (Germany)

13571-600 • 16:55 - 17:40
The intelligent microscope at the nanoscale: multimodal microscopy from fluorescence to label-free (Plenary Presentation)
Author(s): **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy)

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1
This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:30

SESSION 4: IN-SITU AND IN-LINE MEASUREMENT

24 June 2025 • 10:30 - 12:00 | ICM, Saal 14c
Session Chair(s): **Matthias Eifler**, IU International Univ. of Applied Sciences (Germany)

13567-17 • 10:30 - 11:00
Optical Inline metrology with digital holography: the ongoing path from lab into production *(Invited Paper)*
Author(s): **Daniel Carl**, **Markus Fratz**, **Tobias Seyler**, **Annelie Schiller**, **Marc Johannes Aslan**, **Tobias Störk, Alexander Bertz,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

13567-18 • 11:00 - 11:20
In situ Shack-Hartmann-based surface metrology of liquid mirrors in microgravity
Author(s): **Omer Luria**, **Khaled Gommed**, **Mor Elgarisi**, **Israel Gabay**, **Jonathan Ericson**, **Valeri Frumkin**, **Daniel Widerker,** Technion-Israel Institute of Technology (Israel); **Ruslan Belikov**, **Jay Bookbinder,** NASA Ames Research Ctr. (United States); **Vivek Dwivedi,** NASA Goddard Space Flight Ctr. (United States); **Howard Cannon**, **Edward Balaban,** NASA Ames Research Ctr. (United States); **Moran Bercovici,** Technion-Israel Institute of Technology (Israel)

13567-19 • 11:20 - 11:40
Robot-assisted high-dynamic-range optical measurement
Author(s): **Mingyu Liu,** Univ. of Lincoln (United Kingdom); **Helia Hooshmand,** The Univ. of Nottingham (United Kingdom); **Xin Liu,** Univ. of Lincoln (United Kingdom); **Donglei Liu**, **Shaojian Zhang,** Nanchang Univ. (China); **Samanta Piano,** The Univ. of Nottingham (United Kingdom)

13567-20 • 11:40 - 12:00
Observation of laser-generated ultrasound for in-process control of laser processing
Author(s): **Kaede Yamauchi, Yoshio Hayasaki,** Utsunomiya Univ. (Japan)

Lunch Break 12:00 - 13:10

SESSION 5: SHEAROGRAPHY AND NONDESTRUCTIVE TESTING

24 June 2025 • 13:10 - 14:50 | ICM, Saal 14c
Session Chair(s): **Daniel Carl**, Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

13567-21 • 13:10 - 13:30
OpenSpeckle: open science principles in shearography and ESPI
Author(s): **Andrei G. Anisimov**, **Nan Tao**, **Luis A. Garza-Soto, Roger M. Groves,** Technische Univ. Delft (Netherlands)

13567-22 • 13:30 - 13:50
Reliable full-field reconstruction of Lamb waves with shearography
Author(s): **Luis A. Garza-Soto**, **Nan Yue, Andrei G. Anisimov,** Technische Univ. Delft (Netherlands)

13567-23 • 13:50 - 14:10
A flexible three-directional shearography module attachable to a high-resolution digital still camera
Author(s): **Tainara P. Lima**, **Gabriel Cazakevicius**, **João Andrade**, **Mauro Benedet, Armando Albertazzi,** Univ. Federal de Santa Catarina (Brazil)

13567-24 • 14:10 - 14:30
100 MHz SPML-OCT for high-throughput inspection
Author(s): **Seungwan Cho,** KAIST (Korea, Republic of); **Benjamin J. Vakoc,** Massachusetts General Hospital, Wellman Ctr. for Photomedicine (United States), Massachusetts Institute of Technology (United States), Harvard Medical School (United States); **Wang-Yuhl Oh,** KAIST (Korea, Republic of)

13567-25 • 14:30 - 14:50
Infrared Frequency Comb-Based Depth and Index Sensing in Silicon Structures
Author(s): **Hyoungsu Choi,** KAIST (Korea, Republic of); **Hyunsoo Kwak**, **Sungyoon Ryu**, **Younghoon Sohn,** SAMSUNG Electronics Co., Ltd. (Korea, Republic of); **Jungwon Kim,** KAIST (Korea, Republic of)

SESSION 6: LOW-COHERENCE INTERFEROMETRY, CONFOCAL SENSING AND CALIBRATION

24 June 2025 • 14:50 - 18:00 | ICM, Saal 14c
Session Chair(s): **Liang-Chia Chen**, National Taiwan Univ. (Taiwan)

13567-26 • 14:50 - 15:10
Additively manufactured material measures for resolution determination in optical surface texture measurement
Author(s): **Matthias Eifler,** IU International Univ. of Applied Sciences (Germany); **Julian Hering-Stratemeier**, **Hagen Schmidt**, **Georg von Freymann, Jörg Seewig,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13567-27 • 15:10 - 15:30
Full-field optical coherence tomography (TD-FF-OCT) as an interferometry-based measurement system for analyzing droplet geometry and dynamics on structured surfaces
Author(s): **Georgis Bulun**, **Jörg Seewig**, **Gerhard Stelzer**, **Marvin Lotz**, **Egbert Oesterschulze, Daniel Fotachov,** Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

Coffee Break • 15:30 - 16:00

13567-28 • 16:00 - 16:20
Influence of scattering and steepness in optical component characterization using optical coherence tomography (OCT)
Author(s): **Alfredo Velazquez Iturbide**, **Jayanti Mahajan, Robert Schmitt,** Fraunhofer-Institut für Produktionstechnologie IPT (Germany)

13567-29 • 16:20 - 16:40
Phase-modulated differential confocal microscopy with compensating algorithm against specimen-induced aberration
Author(s): **Johannes Belkner**, **Jaqueline Stauffenberg**, **Simon Eisele**, **Chao Fan**, **Eberhard Manske**, **Thomas Kissinger, Thomas Fröhlich,** Technische Univ. Ilmenau (Germany)

13567-30 • 16:40 - 17:00
Mapping and correcting residual flatness errors in optical metrology for high precision surface measurements
Author(s): **Lena Zhukova**, **Roger Artigas, Guillem Carles,** Sensofar-Tech, S.L. (Spain)

13567-31 • 17:00 - 17:20
1D Line-Scan Imaging of Gold Nanoparticles beyond Diffraction Limit with White Light via Absorbance Modulation Nanoscopy
Author(s): **Jingrun Zhang,** Technische Univ. Clausthal (Germany); **Parul Jain**, **Claudia Geisler,** Institut für Nanophotonik Göttingen e.V. (Germany); **Sven Nagorny,** Dept. "NanoBiophotonics", Max Planck Institute for Multidisciplinary Sciences (Germany); **Thea Weingartz,** Institute of Technical Chemistry, Clausthal University of Technology (Germany); **André Eitzeroth,** Institute of Physical Chemistry, Clausthal University of Technology (Germany); **Alexander Egner,** Institut für Nanophotonik Göttingen e.V. (Germany); **Christian Rembe,** Institute for Electrical Information Technology, Clausthal University of Technology (Germany)

13567-32 • 17:20 - 17:40
Confocal versus interference microscopy: 3D resolution analysis
Author(s): **Yijian Zou**, **Tobias Pahl**, **Felix Rosenthal, Peter Lehmann,** Univ. Kassel (Germany)

13567-33 • 17:40 - 18:00
Reference calibration of white-light interferometers for testing advanced X-ray surfaces with atomic accuracy
Author(s): **Zubo Hu,** National Univ. of Defense Technology (China)

Wednesday 25 June 2025

SESSION 7: JOINT SESSION: QUANTITATIVE MICROSCOPY

25 June 2025 • 8:30 - 10:00 | ICM, Saal 14c
Session Chair(s): **Richard Quintanilha**, Carl Zeiss AG-CRT (Germany)
Joint Session between conference 13567, Optical Measurement Systems for Industrial Inspection, and 13568, Modeling Aspects in Optical Metrology.

13568-10 • 8:30 - 9:00
Comparative simulation study of computational imaging microscopy for nanoscale defect measurement *(Invited Paper)*
Author(s): **Hyo Mi Park,** National Institute of Standards and Technology (United States); **Ki-Nam Joo,** Chosun Univ. (Korea, Republic of); **Bryan M. Barnes, Martin Y. Sohn,** National Institute of Standards and Technology (United States)

13568-33 • 9:00 - 9:20
Comparison of two fit algorithms to find the maximum of a simulated confocal intensity curve
Author(s): **Silvana Wyss**, **Matthias Wurm**, **Bernd Bodermann**, **Sai Gao,** Physikalisch-Technische Bundesanstalt (Germany); **Liwei Fu, Stephan Reichelt,** Institut für Technische Optik, Univ. Stuttgart (Germany)

13567-34 • 9:20 - 9:40
Multi-functional coherence scanning interferometric microscopy and measuring techniques
Author(s): **Rong Su,** Shanghai Institute of Optics and Fine Mechanics (China)

13568-34 • 9:40 - 10:00
Development and verification of a new through focus algorithm for the evaluation of microscopic linewidth measurements
Author(s): **Bernd Bodermann,** Physikalisch-Technische Bundesanstalt (Germany); **Jan Krüger,** Carl Zeiss Industrielle Messtechnik GmbH (Germany), Physikalisch-Technische Bundesanstalt (Germany); **Sven Dopslaff**, **Detlef Bergmann**, **Rainer Köning**, **Gaoliang Dai**, **Wolfgang Hässler-Grohne,** Physikalisch-Technische Bundesanstalt (Germany); **Phillip Manley**, **Sven Burger, Philipp-Immanuel Schneider,** JCMwave GmbH (Germany), Zuse Institute Berlin (Germany)

Coffee Break 10:00 - 10:30

SESSION 8: MICROSPHERE-ASSISTED MICROSCOPY

25 June 2025 • 10:30 - 11:30 | ICM, Saal 14c
Session Chair(s): **Rong Su**, Shanghai Institute of Optics and Fine Mechanics, CAS (China)

13567-35 • 10:30 - 10:50
Range-resolved interferometry for metrological measurements using retroreflective microspheres
Author(s): **Jaqueline Stauffenberg**, **Johannes Belkner**, **Simon Eisele**, **Vitalii Shmagun**, **Guido Straube**, **Juan Sebastian Fischer Calderón**, **Ulrike Blumröder**, **Folker Schwesinger, Thomas Kissinger,** Technische Univ. Ilmenau (Germany)

13567-36 • 10:50 - 11:10
Comparison of microcylinder and microsphere assistance in interferometry - simulation and experiments
Author(s): **Lucie Hüser**, **Tobias Pahl,** Univ. Kassel (Germany); **Tony Hajj**, **Sylvain Lecler,** Univ. de Strasbourg (France); **Peter Lehmann,** Univ. Kassel (Germany)

13567-37 • 11:10 - 11:30
How the concept of evanescent point sources contributes to the understanding of microsphere-assisted microscopy
Author(s): **Sylvain Lecler,** ICube (France), Univ. de Strasbourg (France), Institut National des Sciences Appliquées de Strasbourg (France); **Rayenne Boudoukha,** ICube (France), Univ. de Strasbourg (France); **Stéphane Perrin,** Photonics Bretagne (France); **Assia Guessoum**, **Nacer E. Demagh,** Univ. Ferhat Abbas Sétif 1 (Algeria); **Paul Montgomery,** ICube (France), Univ. de Strasbourg (France)

Lunch Break 11:30 - 12:30

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:40 | ICM, Hall B0
Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13567-52 • 12:30 - 13:40
Advanced speckle methods with high-speed imaging for impact testing of composites
Author(s): **Mikhail Levchenko**, **Elena Stoykova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria); **Andrei G. Anisimov,** Technische Univ. Delft (Netherlands)

13567-70 • 12:30 - 13:40
Realization of SI unit "Metre" using an optical frequency comb
Author(s): **Mukesh Jewariya,** Council of Scientific & Industrial Research (India)

13567-71 • 12:30 - 13:40
FMCW-digital holography for utilizing the spatiotemporal frequency domain as a multiplexable bandwidth: simultaneous two-wavelength profile measurement for multiple objects
Author(s): **Hikaru Hamada**, **Varun Kumar, Masayuki Yokota,** Shimane Univ. (Japan)

13567-72 • 12:30 - 13:40
Enhancing measurement stability in ultra-precise angular deflection sensors via cylindrical lens correction
Author(s): **Ahmad Khamaysa, O. Iwasinska Kowalska,** Warsaw Univ. of Technology (Poland)

13567-73 • 12:30 - 13:40
Cost-effective BRDF spectroscopic bench involving gimbal-based sample positioning system
Author(s): **Juriy Hastanin**, **Emmanuel Mazy**, **Lionel Clermont**, **Céline Michel**, **Colin Dandumont**, **Marc Georges**, **Laurence Rossi**, **Sara Marcotte**, **Frédéric Rabecki, Cédric Thizy,** Liège Univ. (Belgium)

13567-74 • 12:30 - 13:40
Comparison of two technologies for the automated optical inspection (AOI) of PCBs
Author(s): **Sorina Coroban,** Univ. Politehnica Timisoara (Romania), Forvia Hella (Romania); **Corina Mnerie,** Univ. "Aurel Vlaicu" din Arad (Romania); **Virgil-Florin Duma,** Univ. "Aurel Vlaicu" din Arad (Romania), Univ. Politehnica Timisoara (Romania)

13567-75 • 12:30 - 13:40
Using confocal scanning for the definition of a relation between physical and equivalent roughness in hydraulic concrete pipes
Author(s): **Luis F. Lages Martins**, **Álvaro Silva Ribeiro**, **Teresa Diaz Gonçalves**, **Catarina Simões**, **Ricardo Mendes, Alexandre Pinheiro,** Nacional de Engenharia Civil (Portugal)

13567-76 • 12:30 - 13:40
Precision inspection of transparent optical materials quality by interferometry
Author(s): **Saïd Meguellati,** Univ. Ferhat Abbas Sétif 1 (Algeria)

13567-77 • 12:30 - 13:40
Cheap targets for expensive equipment: a novel integrated, high-contrast approach to LWIR camera calibration
Author(s): **Peter Shobowale**, **Lennart Hinz, Markus Kästner,** Leibniz Univ. Hannover (Germany)

13567-78 • 12:30 - 13:40
Methodology to manufacturing and testing freeform aluminum mold
Author(s): **Agustín Santiago-Alvarado,** Univ. Tecnológica de la Mixteca (Mexico); **Fermín-Salomón Granados-Agustín**, **María Elizabeth Percino-Zacarías,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Victor Manuel Cruz-Martínez,** Univ. Tecnológica de la Mixteca (Mexico); **Oliver Huerta-Carranza,** Universidad Nacional Autonoma de México (Mexico); **Jorge de Jesús Alvarado-Martínez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Rodolfo Palma Gúzman,** Univ. Tecnológica de la Mixteca (Mexico)

13567-79 • 12:30 - 13:40
Deep learning assisted fringe normalization for handling dynamic intensity fluctuations in digital holographic interferometry
Author(s): **Viren S. Ram, Rajshekhar Gannavarapu,** Indian Institute of Technology Kanpur (India)

13567-80 • 12:30 - 13:40
Null-type lateral shearing interferometry for measuring surface figures of large optics
Author(s): **Seongwook Jang, Ki-Nam Joo,** Chosun Univ. (Korea, Republic of)

13567-81 • 12:30 - 13:40
Temporal defect identification using deep learning method in digital holographic interferometry
Author(s): **Subrahamanya Keremane**, **Viren S Ram, Rajshekhar Gannavarpu,** Indian Institute of Technology Kanpur (India)

13567-82 • 12:30 - 13:40
Dielectric hollow core glass-waveguide-based cavity-enhanced trace gas analysis for inline measurement of methane using mid-infrared interband cascade LED
Author(s): **David Geßner,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); **Tobias Baselt,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Daniel Ruf,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); **Thomas Brabant**, **Manfred Wittmann,** Fiberware GmbH (Germany); **Andreas Hänel,** DBI Gas- und Umwelttechnik GmbH (Germany); **Jeffrey Knossalla**, **Jeske Steffen,** Micro-Hybrid Electronic GmbH (Germany); **Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany)

13567-83 • 12:30 - 13:40
Wavefront error characterization of SurfCam using interferometry for lunar surface imaging
Author(s): **Yunjong Kim**, **Jihun Kim,** Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); **Sung-Joon Park,** Korea Astronomy and Space Science Institute (Korea, Republic of); **Woojin Kim,** Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); **Minsup Jeong,** Korea Astronomy and Space Science Institute (Korea, Republic of); **Bongkon Moon,** Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); **Seonghwan Choi**, **Dae-Hee Lee,** Korea Astronomy and Space Science Institute (Korea, Republic of); **Dukhang Lee**, **Chae Kyung Sim,** Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); **Jehyuck Shin**, **Seul-Min Baek**, **Mingyeong Lee,** Korea Astronomy and Space Science Institute (Korea, Republic of); **Sungsoo S. Kim,** Kyung Hee Univ. (Korea, Republic of); **Young-Jun Choi,** Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of)

13567-84 • 12:30 - 13:40
Multimodal sensing prototype for robust autonomous driving under adverse weather conditions
Author(s): **Gerard de Mas Giménez**, **Adrià Subirana,** Univ. Politècnica de Catalunya (Spain); **Pablo García-Gómez,** BEAMAGINE S.L. (Spain); **Eduardo Bernal**, **Santiago Royo, Josep R. Casas,** Univ. Politècnica de Catalunya (Spain)

13567-85 • 12:30 - 13:40
Experimental analysis of additive manufactured particle damping structures for vibration-sensitive optical systems
Author(s): **Weijia Yu**, **Tobias Ehlers**, **Tobias Biermann**, **Marcus Oel**, **Ina Meyer**, **Panpan Xia**, **Jens Niedermeyer**, **Lennart Mesecke**, **Myriam Maalaoui, Roland Lachmayer,** Leibniz Univ. Hannover (Germany)

13567-88 • 12:30 - 13:40
A novel time domain single arm locking control approach for laser frequency stabilization in space-based gravitational wave detectors
Author(s): **Yongbin Shao**, **Xinyi Zhao**, **Shihao Su**, **Long Ma,** Civil Aviation Univ. of China (China); **Shaobo Fang,** Institute of Physics, Chinese Academy of Sciences / University of Chinese Academy of Science (China)

13567-89 • 12:30 - 13:40
Noncontact anisotropic roughness measurement with the generalized Harvey-Shack theory
Author(s): **Yoshitaka Igarashi, Kazunori Yamazaki,** Sumitomo Heavy Industries, Ltd. (Japan)

13567-90 • 12:30 - 13:40
Limits of detection of defects near edges of nanostructures for coherent Fourier scatterometry
Author(s): **Anubhav Paul, Silvania F. Pereira,** Technische Univ. Delft (Netherlands)

13567-92 • 12:30 - 13:40
Aberration characterisation in coherent Fourier scatterometry
Author(s): **Sarika Soman, Silvania F. Pereira,** Technische Univ. Delft (Netherlands)

13567-95 • 12:30 - 13:40
Model-based uncertainty correction for raycasting-based image projection onto 3D reference geometries
Author(s): **Adrian Kaune**, **Lennart Hinz, Eduard Reithmeier,** Leibniz Univ. Hannover (Germany)

13567-97 • 12:30 - 13:40
Validation of optical surface texture measurements on a milled technical surface using a stylus profilometer
Author(s): **Sai Gao**, **Andre Felgner, Uwe Brand,** Physikalisch-Technische Bundesanstalt (Germany)

13567-98 • 12:30 - 13:40
Free-space testbed for interferometric spacecraft-to-spacecraft laser ranging acquisition
Author(s): **Elena Germano,** Airbus Defence and Space (Germany), Univ. Ulm (Germany); **Samuele Malta,** European Space Operations Ctr. (Germany), Airbus Defence and Space (Germany); **Oliver Mandel**, **Alexander Sell**, **Dennis Weise,** Airbus Defence and Space (Germany); **Claus Braxmaier,** Univ. Ulm (Germany)

13567-99 • 12:30 - 13:40
Fringe value measurement of intrinsic-birefringent flexible substrate
Author(s): **Jiong-Shiun Hsu, Hong-ming Zhang,** National Formosa Univ. (Taiwan)

13567-100 • 12:30 - 13:40
Wavelet transform for surface roughness measurement using laser speckle imaging technique
Author(s): **Shanta Patil,** Indian Institute of Technology Guwahati (India)

13567-101 • 12:30 - 13:40
Heat flow visualization and thermal anomaly detection using phase measuring deflectometry
Author(s): **Vismay Trivedi,** Technische Univ. Delft (Netherlands); **Ragni Trivedi,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Shivam Sharma,** National Institute of Technology, Delhi (India); **Rahul Sharma,** Sardar Patel Univ. (India); **Gyanendra Sheoran,** National Institute of Technology, Delhi (India); **Roger M. Groves,** Technische Univ. Delft (Netherlands); **Arun Anand,** Sardar Patel Univ. (India)

13567-103 • 12:30 - 13:40
Broadband multi-LED reference emitter for the high-speed calibration of non-contact temperature measuring devices
Author(s): **Tobias Baselt**, **Marko Seifert**, **Stefan Kühn**, **Christoph Kaufmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Michel Biedermann**, **Clemens Richter,** Westsächsische Hochschule Zwickau (Germany); **Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany), Forschungs- und Transferzentrum e.V. (Germany)

13567-104 • 12:30 - 13:40
Design of high impact resistance micro hemispherical resonators for optical measurement systems in industrial inspection
Author(s): **Ang Li**, **Shilei Zhang**, **Junlin Luo**, **Pengfu Lu**, **Xiaobin Xu**, **Fuyu Gao, Ningfang Song,** Tianmushan Lab., Beihang Univ. (China)

13567-105 • 12:30 - 13:40
Fiber feedback controlled, power and spectral regulated high power laser module for laser welding
Author(s): **Tobias Baselt,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Daniel Ruf**, **Karsten Schmiedel,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany); **Elena Kabardiadi-Virkovski,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Forschungs- und Transferzentrum, Westsächsischen Hochschule Zwickau (Germany); **Fred Kallweit,** LEC Laser Electronic Components GmbH (Germany); **Alexander Kabardiadi-Virkovski, Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

SESSION 9: LIDAR TECHNIQUES

25 June 2025 • 13:40 - 15:20 | ICM, Saal 14c
Session Chair(s): **Thomas Kissinger**, Technische Univ. Ilmenau (Germany)

13567-39 • 13:40 - 14:00
Optimization of kinetic elements in a dynamic all-optical beam steering system
Author(s): **Aurélie Hentz**, **Marc Sciamanna**, **Michel Alassir, Jean-Louis Gutzwiller,** CentraleSupélec (France)

13567-40 • 14:00 - 14:20
A fiber optic lidar sensor for navigation in confined spaces
Author(s): **Jannis Drangmeister,** Leibniz Univ. Hannover (Germany)

13567-41 • 14:20 - 14:40
A Monte Carlo model for analyzing the propagation of polarized TOF-LIDAR pulses through turbid media
Author(s): **Maria Ballesta-Garcia**, **Aleix R. Bobi-Olmo**, **Sara Giménez-Aragón, Santiago Royo,** Univ. Politècnica de Catalunya (Spain)

13567-42 • 14:40 - 15:00
Design and construction of a multimodal perception system based on lidar for underwater applications
Author(s): **Aleix R. Bobi-Olmo**, **Eduardo Bernal,** Univ. Politècnica de Catalunya (Spain); **Pablo García-Gómez,** BEAMAGINE S.L. (Spain); **Maria Ballesta-Garcia, Santiago Royo,** Univ. Politècnica de Catalunya (Spain)

13567-38 • 15:00 - 15:20
A UAV-mounted dual-wavelength LiDAR for leaf water content retrieval
Author(s): **Jana Seiler,** Univ. of Freiburg (Germany), Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Kilian Gerberding,** Chair for Sensor-based Geoinformatics (geosense), University of Freiburg (Germany); **Annette Schmitt,** Univ. of Freiburg (Germany), Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Teja Kattenborn,** Univ. of Freiburg (Germany); **Alexander Reiterer,** Univ. of Freiburg (Germany), Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany)

Coffee Break 15:30 - 16:00

SESSION 10: SPECIAL SESSION: MEASUREMENT SYSTEMS FOR UAVS AND SATELLITES

25 June 2025 • 16:00 - 17:40 | ICM, Saal 14c
Session Chair(s): **Andreas Fischer**, Bremer Institut für Messtechnik, Automatisierung und Qualitätswissenschaft (BIMAQ) (Germany)

13567-43 • 16:00 - 16:20
Improved BRDF metrology platform for Copernicus CO2I FCU calibration
Author(s): **Emmanuel Mazy,** Liège Univ. (Belgium), Ctr. Spatial de Liège (Belgium); **Céline Michel**, **Juriy Hastanin**, **Lionel Clermont**, **Laurence Rossi,** Liège Univ. (Belgium); **Colin Dandumont,** Ctr. Spatial de Liège (Belgium); **Marc Georges**, **Sara Marcotte, Cédric Thizy,** Liège Univ. (Belgium)

13567-44 • 16:20 - 16:40
Uncertainty evaluation for a drone-based laser triangulation system
Author(s): **Ahraar Shareef Muqsit**, **Axel von Freyberg, Andreas Fischer,** Bremer Institut für Messtechnik, Automatisierung und Qualitätswissenschaft (BIMAQ) (Germany), Univ. Bremen (Germany)

13567-45 • 16:40 - 17:00
Fiber-optic shape sensing for motion compensation in vibration-prone optical measurements
Author(s): **Jiekai Wang**, **Thomas Kissinger**, **Christoph-Ferdinand Hemeling**, **Vitalii Shmagun, Marvin Henkel,** Technische Univ. Ilmenau (Germany)

13567-46 • 17:00 - 17:20
Drone-based single-shot fault detection method for wind turbines: conception and initial feasibility study
Author(s): **Tim Czasch, Peter Lehmann,** Univ. Kassel (Germany)

13567-47 • 17:20 - 17:40
Differential laser Doppler vibrometry with integrated alignment camera to reduce disturbances in airborne vibration measurements with a UAV
Author(s): **Fangjian Wang, Christian Rembe,** Technische Univ. Clausthal (Germany)

Thursday 26 June 2025

SESSION 11: DYNAMIC AND THERMAL MEASUREMENT

26 June 2025 • 8:40 - 10:00 | ICM, Saal 14c
Session Chair(s): **Andrei G. Anisimov**, Technische Univ. Delft (Netherlands)

13567-49 • 8:40 - 9:00
Dynamical system regularized object positioning from diffraction movie
Author(s): **Yaocheng Tian,** Massachusetts Institute of Technology (United States); **Boyu Zhang,** Northwestern Univ. (United States); **Difei Zhang,** Massachusetts Institute of Technology (United States); **Diptiman Kundu,** Northwestern Univ. (United States); **Xiaoyin Zheng**, **Yichen Gan**, **Varun Kankanallu,** Stony Brook Univ. (United States); **Zirui Gao**, **Ajith Pattammattel**, **Hanfei Yan,** Brookhaven National Lab. (United States); **Karen Chen-Wiegart,** Stony Brook Univ. (United States); **Chris Jacobsen**, **Horacio D. Espinosa,** Northwestern Univ. (United States); **George Barbastathis,** Massachusetts Institute of Technology (United States)

13567-50 • 9:00 - 9:20
Thermal light section sensor for real-time 3D measurement of transparent objects
Author(s): **Martin Landmann**, **Henri Speck,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Yannick Höffner,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Friedrich-Schiller-Univ. Jena (Germany); **Stefan Heist**, **Peter Kühmstedt,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); **Gunther Notni,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Technische Univ. Ilmenau (Germany)

13567-96 • 9:20 - 9:40
A comparative research on the measurement capability of two industrial large-space measurement system, iGPS and OptiTrack
Author(s): **Rui Han,** Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF (Germany), Shenyang Institute of Automation (China), Univ. of Chinese Academy of Sciences (China); **Thomas Dunker**, **Erik Trostmann,** Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF (Germany); **Zhigang Xu,** Shenyang Institute of Automation (China), Univ. of Chinese Academy of Sciences (China)

13567-87 • 9:40 - 10:00
Active control of refractive index of air for improving the performance of optical systems
Author(s): **Maximilian Hoffmann**, **Ulrike Blumröder**, **Thomas Fröhlich**, **Thomas Kissinger**, **Eberhard Manske, Ingo Ortlepp,** Technische Univ. Ilmenau (Germany)

Coffee Break 10:00 - 10:30

SESSION 12: LIGHT SCATTERING TECHNIQUES

26 June 2025 • 10:30 - 12:10 | ICM, Saal 14c
Session Chair(s): **Jörg Seewig**, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

13567-53 • 10:30 - 10:50
Implementation of quad detection scheme in coherent Fourier scatterometry for inspection of patterned structures
Author(s): **Anubhav Paul, Silvania F. Pereira,** Technische Univ. Delft (Netherlands)

13567-54 • 10:50 - 11:10
Inline surface analysis through combined evaluation of scattering and geometric properties: exemplary possibilities for integration in bipolar plate production
Author(s): **Leander Kläber**, **Alexander Kabardiadi-Virkovski,** Westsächsische Hochschule Zwickau (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Christopher Taudt,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Peter Hartmann,** Westsächsische Hochschule Zwickau (Germany), Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Forschungs- und Transferzentrum e.V. (Germany)

13567-55 • 11:10 - 11:30
Scatterometric defect detection of nanowire surfaces - evaluating the effect of sensor position density
Author(s): **Tajim Md Hasibur Rahman**, **Dirk Stöbener,** Bremer Institut für Messtechnik, Automatisierung und Qualitätswissenschaft (BIMAQ) (Germany), Univ. Bremen (Germany); **Mehdi Abdollahpour**, **Carsten Bockelmann,** Univ. Bremen (Germany); **Andreas Fischer,** Bremer Institut für Messtechnik, Automatisierung und Qualitätswissenschaft (BIMAQ) (Germany), Univ. Bremen (Germany)

13567-56 • 11:30 - 11:50
Optical broadband characterization of scattering and absorbing media
Author(s): **Peter Naglič**, **Florian Foschum**, **David Hevisov, Alwin Kienle,** Institut für Lasertechnologien in der Medizin und Meßtechnik an der Univ. Ulm (Germany)

13567-57 • 11:50 - 12:10
SWIR oblique-scanning scatterometry with global sensitivity analysis and back focal plane imaging for hidden HAR microstructure CD measurement
Author(s): **Liang-Chia Chen**, **Bo-Chen Kuo**, **Fu-Sheng Yang**, **Surajit Das**, **Yuan-Ci Lin**, **Wei-Xiang Chou**, **Ting-Hui Huang, Luis Najera,** National Taiwan Univ. (Taiwan)

Lunch Break 12:10 - 13:10

SESSION 13: MEASUREMENT OF PRECISION COMPONENTS

26 June 2025 • 13:10 - 15:30 | ICM, Saal 14c
Session Chair(s): **Chao Zuo**, Nanjing Univ. of Science and Technology (China)

13567-58 • 13:10 - 13:30
Angle-resolved chromatic confocal microscopy for accurate free-form surface reconstruction employing back focal plane projection and ANN modeling
Author(s): **Liang-Chia Chen**, **Fu-Sheng Yang**, **Yi-Yuan Lu**, **Hao-Yu Cheng**, **Yuan-Ci Lin**, **Bo-Chen Kuo, Surajit Das,** National Taiwan Univ. (Taiwan)

13567-59 • 13:30 - 13:50
Non-contact metrology of datum surfaces and fiducials on freeform telescope mirrors
Author(s): **William J. Hall**, **Monil Neema**, **Joshua R Wygal,** Opto-Alignment Technology, Inc. (United States); **Lucas Ochs, Glenn D Boreman,** University of North Carolina at Charlotte (United States)

13567-60 • 13:50 - 14:10
Performance evaluation of the first modules of the of the gradient-phase interferometer within the ELT M1 Local Coherencer
Author(s): **Alexander Díaz**, **Gaizka Murga,** IDOM S.A. (Spain); **Santiago Royo,** Univ. Politècnica de Catalunya (Spain); **Maialen González**, **Borja Vega**, **Afonso Teixeira**, **Juan Francisco Márquez,** IDOM S.A. (Spain); **Noel Rodrigo**, **Pau Santos,** Univ. Politècnica de Catalunya (Spain); **Andreas Förster**, **Sebastian P. Schmid**, **Samuel Lévêque**, **Philippe Gitton, Martin Dimmler,** European Southern Observatory (Germany)

13567-61 • 14:10 - 14:30
Compact AR-HUD optical evaluation system using MTF measurement
Author(s): **Manning Sun**, **Nathan Hagen,** Utsunomiya Univ. (Japan); **Toshihiko Koga,** Polytechnic Univ. (Japan); **Ryoichi Kuwano,** Hiroshima Institute of Technology (Japan); **Yukitoshi Otani,** Utsunomiya Univ. (Japan)

13567-62 • 14:30 - 14:50
Different plane-parallel optics testing methods for at-wavelength filter surface error and shape characterization
Author(s): **Diego Ormaechea**, **Xavier Levecq, Rafael Porcar-Guezenec,** Imagine Optic SA (France)

13567-64 • 15:10 - 15:30
Development of a 5D nanopositioning and nanomeasuring machine concept for precise measurement and fabrication of complex free-form surfaces
Author(s): **Simon Eisele**, **Johannes Belkner**, **Ingo Ortlepp**, **Chao Fan**, **Thomas Kissinger,** Technische Univ. Ilmenau (Germany); **Denis Dontsov,** SIOS Messtechnik GmbH (Germany); **Thomas Fröhlich,** Technische Univ. Ilmenau (Germany)

Coffee Break 15:30 - 16:00

SESSION 14: CHARACTERIZATION OF OPTICAL MATERIALS AND COMPONENTS

26 June 2025 • 16:00 - 17:40 | ICM, Saal 14c
Session Chair(s): **Armando Albertazzi Gonçalves**, Univ. Federal de Santa Catarina (Brazil)

13567-65 • 16:00 - 16:20
Characterizing and reporting effects of refractive index homogeneity structure to lens assembly performance
Author(s): **Max Hotkowski, Ryker W. Eads,** Corning Incorporated (United States)

13567-66 • 16:20 - 16:40
Design and measurement techniques of essential parameters for all-silica step-index fibers for demanding applications
Author(s): **Andreas Langner**, **Dörte Schönfeld, Peter Bauer,** Heraeus Quarzglas GmbH & Co. KG (Germany)

13567-67 • 16:40 - 17:00
Birefringence metrology analysis for CaF2
Author(s): **Ryker W. Eads, Max Hotkowski,** Corning Incorporated (United States)

13567-68 • 17:00 - 17:20
Characterization of femtosecond laser-structured materials using interferometric microscopy: local spectroscopy, colorimetry, and topography
Author(s): **Farid Mahfoud,** ICube (France), Institut Charles Sadron (France); **Baptiste De Azevedo**, **Sebastien Marbach**, **Jesse Schiffler**, **Christophe Cordier**, **Essia Belhaj-Trabelsi**, **Paul Montgomery,** ICube (France); **Olivier Felix,** Institut Charles Sadron (France); **Matthias Pauly,** Ecole Normale Supérieure (France); **Manuel Flury, Sylvain Lecler,** ICube (France)

13567-69 • 17:20 - 17:40
Optical metrology for mass production of microLED displays & wafers
Author(s): **Roland Schanz, Tobias Steinel,** Instrument Systems GmbH (Germany)

CONFERENCE 13568

Modeling Aspects in Optical Metrology X

23 - 25 June 2025 | ICM, Saal 22a

Conference Chair(s): **Bernd Bodermann,** Physikalisch-Technische Bundesanstalt (Germany)

Conference Co-Chair(s): **Karsten Frenner,** Institut für Technische Optik (Germany); **Bryan M. Barnes,** National Institute of Standards and Technology (United States)

Program Committee: **Jörg Bischoff,** Osires Optical Engineering (Germany); **Sven Burger,** Konrad-Zuse-Zentrum fur Informationstechnik (Germany); **Peter Evanschitzky,** Fraunhofer-Institut für Integrierte Systeme und Bauelementetechnologie IISB (Germany); **Liwei Fu,** Univ. Stuttgart (Germany); **Sebastian Heidenreich**, **Rainer Köning,** Physikalisch-Technische Bundesanstalt (Germany); **Stefanie Kroker,** Lab for Emerging Nanometrology, Technische Univ. Braunschweig (Germany); **Richard Quintanilha,** Carl Zeiss AG-CRT (Germany); **Johannes Ruoff,** Carl Zeiss SMT GmbH (Germany); **Thomas Siefke,** Friedrich-Schiller-Univ. Jena (Germany), Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

Monday 23 June 2025

WELCOME AND OPENING REMARKS

23 June 2025 • 8:30 - 8:40 | ICM, Saal 22a
Bernd Bodermann Physikalisch-Technische Bundesanstalt (Germany)
Karsten Frenner Institut für Technische Optik (Germany)
Bryan M. Barnes National Institute of Standards and Technology (United States)
Conference Chairs

SESSION 1: NUMERICAL METHODS AND MAXWELL SOLVERS

23 June 2025 • 8:40 - 10:10 | ICM, Saal 22a
Session Chair(s): **Martin Hammerschmidt**, JCMwave GmbH (Germany)

13568-1 • 8:40 - 9:10
Comparison of Beckmann model and rigorous 3S BSM and SpeckleSim simulators of coherence scanning interferometry *(Invited Paper)*
Author(s): **Nikolay I. Nikolaev,** The Univ. of Nottingham (United Kingdom); **Jeremy M. Coupland,** Loughborough Univ. (United Kingdom); **Helia Hooshmand,** The Univ. of Nottingham (United Kingdom); **Liwei Fu,** Institut für Technische Optik, Univ. Stuttgart (Germany); **Samanta Piano, Richard K. Leach,** The Univ. of Nottingham (United Kingdom)

13568-2 • 9:10 - 9:30
Neural-PDE modeling of reaction-diffusion using time-series imaging for sub-diffraction-limit 3D lithography
Author(s): **Difei Zhang**, **Nischita Kaza**, **Yaocheng Tian**, **Yi Wei**, **Prakitr Srisuma,** Massachusetts Institute of Technology (United States); **Hiroyuki Kusaka**, **Yuichiro Kunai**, **Takahiro Nambara**, **Masahiro Kashiwagi**, **Yumi Yamada,** Fujikura Ltd. (Japan); **Richard Braatz, George Barbastathis,** Massachusetts Institute of Technology (United States)

13568-3 • 9:30 - 9:50
Investigating the optical response of a through silicon via (TSV) for measuring the conic geometry
Author(s): **Lukas Kellermann**, **Wiebke Schöttler, Alejandro Avellan,** FRT GmbH (Germany)

13568-4 • 9:50 - 10:10
Large-scale electromagnetic simulations enabled by the modified Born series with virtual absorbing boundaries
Author(s): **Pinxuan He**, **Jiamin Liu**, **Honggang Gu**, **Hao Jiang, Shiyuan Liu,** Huazhong Univ. of Science and Technology (China)

Coffee Break 10:10 - 10:40

SESSION 2: MACHINE LEARNING IN OPTICAL METROLOGY

23 June 2025 • 10:40 - 12:30 | ICM, Saal 22a

Session Chair(s): **Poul Erik Hansen**, DFM A/S (Denmark)

13568-5 • 10:40 - 11:10
Machine learning for efficient Bayesian parameter reconstruction in optical nanometrology *(Invited Paper)*
Author(s): **Martin Hammerschmidt**, **Matthias Plock,** JCMwave GmbH (Germany), Zuse Institute Berlin (Germany); **Sven Burger,** Zuse Institute Berlin (Germany), JCMwave GmbH (Germany); **Vinh Truong**, **Victor Soltwisch,** Physikalisch-Technische Bundesanstalt (Germany); **Philipp-Immanuel Schneider,** JCMwave GmbH (Germany), Zuse Institute Berlin (Germany)

13568-6 • 11:10 - 11:30
Efficient deep-learning ResNet sparse models for Mueller-matrix Fourier scatterometry
Author(s): **Liwei Fu**, **Xiwei Wang**, **Karsten Frenner, Stephan Reichelt,** Institut für Technische Optik, Univ. Stuttgart (Germany)

13568-7 • 11:30 - 11:50
Machine learning-driven analysis of thickness variations in multilayer thin film coatings for photonics
Author(s): **Qing Liu**, **Tigran Baghdasaryan, Heidi Ottevaere,** Vrije Univ. Brussel (Belgium)

13568-8 • 11:50 - 12:10
Smart ellipsometry: artificial intelligence for thin film characterization
Author(s): **Shuo Liu, Xiuguo Chen,** Huazhong Univ. of Science and Technology (China)

13568-9 • 12:10 - 12:30
Optimizing telescope alignment configuration using finite element methods and machine learning
Author(s): **Thalachanan Saladtook**, **Kritsada Palee**, **Pongphol Suchirapatpong**, **Pearachad Chartsiriwattana**, **Weerapot Wanajaroen**, **Pongpop Sukanunta**, **Thanayuth Panyalert**, **Pakawat Prasit, Peerapong Torteeka,** National Astronomical Research Institute of Thailand (Thailand)

Lunch Break 12:30 - 13:40

SESSION 3: SUPERRESOLUTION AND NANOMETROLOGY

23 June 2025 • 13:40 - 15:30 | ICM, Saal 22a
Session Chair(s): **Liwei Fu**, Univ. Stuttgart (Germany)

13568-32 • 13:40 - 14:10
Digital twin for 3D confocal microscopy, 3D through focus microscopy and confocal Fourier microscopy *(Invited Paper)*
Author(s): **Poul Erik Hansen,** DFM A/S (Denmark); **Tim Käseberg,** Physikalisch-Technische Bundesanstalt (Germany); **Astrid T. Rømer,** DFM A/S (Denmark)

13568-11 • 14:10 - 14:30
Causal inference between depolarizing response and microscopic atributtes of samples doped with nanospheres using Monte-Carlo simulation
Author(s): **Yuxuan Mao,** Univ. Autònoma de Barcelona (Spain); **Albert Van Eeckhout,** ALBA Synchrotron (Spain); **Irene Estévez**, **Juan Campos, Angel Lizana,** Univ. Autònoma de Barcelona (Spain)

13568-12 • 14:30 - 14:50
Resolution test of STED microscopy using nanodiamonds with embedded nitrogen-vacancy centers
Author(s): **Mohammad Nouri,** Institut für Halbleitertechnik, Technische Univ. Braunschweig (Germany), Physikalisch-Technische Bundesanstalt (Germany); **Pietro Aprà,** Istituto Nazionale di Fisica Nucleare (Italy); **Paolo Olivero,** Univ. degli Studi di Torino (Italy); **Stefanie Kroker,** Institut für Halbleitertechnik, Technische Univ. Braunschweig (Germany), Physikalisch-Technische Bundesanstalt (Germany); **Bernd Bodermann,** Physikalisch-Technische Bundesanstalt (Germany)

13568-13 • 14:50 - 15:10
Far-field deep sub-wavelength defect sensing using conjugate structured illumination microscopy (c-SIM)
Author(s): **Jinsong Zhang**, **Hao Jiang**, **Jian Wang**, **Shiyuan Liu, Jinlong Zhu,** Huazhong Univ. of Science and Technology (China)

13568-14 • 15:10 - 15:30
Sensitivity analysis of multi-defocus features using spatial attention mechanism for optimizing optical measurement in TSOM
Author(s): **Haojing Wang**, **Yufu Qu**, **Junnan Hu, Lingchen Meng,** Beihang Univ. (China)

Coffee Break 15:30 - 16:00

OPTICAL METROLOGY PLENARY SESSION

23 June 2025 • 16:00 - 17:40 | ICM, Saal 1
16:00 to 16:10 hrs
Welcome Address and Plenary Speaker Introduction

Jörg Seewig, Technische Univ. Kaiserslautern (Germany)
Piero Ferraro, CNR, Institute of Applied Sciences & Intelligent Systems (ISASI) (Italy)
2025 Symposium Chairs

13567-500 • 16:10 - 16:55
The wide scale range of optical measurement technology and its exploration (Plenary Presentation)
Author(s): **Wolfgang Osten,** Univ. Stuttgart (Germany)

13571-600 • 16:55 - 17:40
The intelligent microscope at the nanoscale: multimodal microscopy from fluorescence to label-free (Plenary Presentation)
Author(s): **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy)

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1
This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:30

SESSION 4: OPTICAL SYSTEMS AND 3D SHAPE METROLOGY

24 June 2025 • 10:30 - 12:10 | ICM, Saal 22a
Session Chair(s): **Karsten Frenner**, Institut für Technische Optik (Germany)

13568-15 • 10:30 - 10:50
Model-based coherence scanning interferometry for reflectivity and film measurement
Author(s): **Cheng Chen**, **Yuanyuan Fang**, **Qiushi Liu, Rong Su,** Shanghai Institute of Optics and Fine Mechanics (China)

13568-16 • 10:50 - 11:10
Optical model for 3D reconstruction of aerodynamic surfaces on blades by using pattern projection
Author(s): **Gabriel Castillo-Santiago,** Univ. del Istmo (Mexico); **Martín Jiménez-Rodríguez,** Instituto de Ciencias Aplicadas y Tecnologia, Univ. Nacional Autónoma de México (Mexico); **Víctor Moreno-Oliva,** Univ. del Istmo (Mexico); **Maximino Avendaño-Alejo,** Instituto de Ciencias Aplicadas y Tecnologia, Univ. Nacional Autónoma de México (Mexico); **Edwin Román-Hernández, Jaime Peña-Antonio,** Univ. del Istmo (Mexico)

13568-17 • 11:10 - 11:30
Multi Gaussian modelling of laser speckle from CFRP
Author(s): **Swaliha Binth Hamza**, **Roger M. Groves, Kunal Masania,** Technische Univ. Delft (Netherlands)

13568-18 • 11:30 - 11:50
Characterization of slow concave stainless steel surfaces through off-axis lcd null-screens
Author(s): **Manuel Campos-García**, **Alexander Pérez-Degante, Francisco Javier Bautista-Clemente,** Univ. Nacional Autónoma de México (Mexico)

13568-19 • 11:50 - 12:10
Optomechanical optimization: automating the link between finite element analysis, structural-thermal-optical performance analysis, and optical calculations to minimize optical form deviation
Author(s): **Pongphol Suchirapatpong**, **Pongpop Sukanunta**, **Thalachanan Saladtook, Pearachad Chartsiriwattana,** National Astronomical Research Institute of Thailand (Thailand)

Lunch Break 12:10 - 13:20

SESSION 5: ELLIPSOMETRY, POLARIMETRY AND OCD

24 June 2025 • 13:20 - 15:30 | ICM, Saal 22a
Session Chair(s): **Bryan M. Barnes**, National Institute of Standards and Technology (United States)

13568-20 • 13:20 - 13:50
Determination of the optical constants of Al2O3 and their uncertainty budget according to the international metrological standards *(Invited Paper)*
Author(s): **Mattia Mulazzi**, **Alexander Gottwald,** Physikalisch-Technische Bundesanstalt (Germany); **Julian Plaickner, Norbert Esser,** Technische Univ. Berlin (Germany)

13568-21 • 13:50 - 14:10
Imaging Mueller matrix ellipsometry for the characterization of nanoscale structures
Author(s): **Jana Reinelt,** Park Systems GmbH (Germany); **Bernd Bodermann,** Physikalisch-Technische Bundesanstalt (Germany)

13568-22 • 14:10 - 14:30
Modeling and validation of a Mueller matrix imaging polarimeter based on liquid crystals and a polarimetric camera
Author(s): **Ivan Montes Gonzalez**, **Juan Campos**, **Irene Estévez, Angel Lizana,** Univ. Autònoma de Barcelona (Spain)

13568-23 • 14:30 - 14:50
Comparative characterization of polarization-stable VCSELs: traditional rotating polarizer vs. advanced one-shot method
Author(s): **Frank Münchow, Thomas Limmer,** Instrument Systems GmbH (Germany)

13568-24 • 14:50 - 15:10
Combining diffraction efficiency measurements with RCWA for high-precision grating characterization
Author(s): **Arpit Gupta**, **Purva Sharnagat**, **Vikram S. Bhandari**, **Deblina Sabui**, **Jasleen Lugani**, **Joby Joseph, Gufran Sayeed Khan,** Indian Institute of Technology Delhi (India)

13568-25 • 15:10 - 15:30
Maximum likelihood calibration method for polarimeters based on photoelastic mldulators
Author(s): **Wenlong Chen, Xiuguo Chen,** Huazhong Univ. of Science and Technology (China)

Coffee Break 15:30 - 16:00

SESSION 6: INTERFEROMETRY

24 June 2025 • 16:00 - 18:10 | ICM, Saal 22a
Session Chair(s): **Bernd Bodermann**, Physikalisch-Technische Bundesanstalt (Germany)

13568-26 • 16:00 - 16:30
A matter of perspective: how nanoscale optical defects limit cosmic-scale gravitational wave observations *(Invited Paper)*
Author(s): **Anna Green**, **Antonella Bianchi,** Nikhef (Netherlands); **Daniel Brown,** The Univ. of Adelaide (Australia); **Félice Feldmann**, **Miron van der Kolk**, **Riccardo Maggiore**, **Jonathan Perry**, **Emma Prins**, **Mischa Salle**, **Enzo Tapia, Andreas Freise,** Nikhef (Netherlands)

13568-27 • 16:30 - 16:50
Model-based reconstruction of reflective freeform surfaces
Author(s): **Friedrich Fleischmann**, **David Hilbig,** Hochschule Bremen Univ. of Applied Sciences (Germany); **Tobias Binkele,** OPTIMARE Systems GmbH (Germany); **Thomas Henning,** Hochschule Bremen Univ. of Applied Sciences (Germany)

13568-28 • 16:50 - 17:10
Aspheric surface metrology: fringe phase modeling and iterative optimization with radial shearing interferometry
Author(s): **Huy Vu**, **Ba Son Nguyen**, **Tri Nguyen**, **Seungwoo Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of); **Tiendung Vu,** Hanoi Univ. of Science and Technology (Vietnam); **Joohyung Lee,** Seoul National Univ. of Science and Technology (Korea, Republic of)

13568-29 • 17:10 - 17:30
Fast scanning quantitative phase microscopy with an infinite field of view
Author(s): **Zedi Li**, **Jinsong Zhang**, **Hang Zhao**, **Jian Wang**, **Shiyuan Liu, Jinlong Zhu,** Huazhong Univ. of Science and Technology (China)

13568-30 • 17:30 - 17:50
Holography with second-order correlations
Author(s): **Amit Yadav,** Indian Institute of Technology (BHU), Varanasi (India); **Gyanendra Sheoran,** National Institute of Technology, Delhi (India); **Takamasa Suzuki,** Niigata Univ. (Japan); **Rakesh Kumar Singh,** Indian Institute of Technology (BHU), Varanasi (India)

13568-31 • 17:50 - 18:10
Error analysis model and test parameters optimization of relative angle determinable stitching interferometry
Author(s): **Yunfeng Mao,** National Univ. of Defense Technology (China)

Wednesday 25 June 2025

SESSION 7: JOINT SESSION: QUANTITATIVE MICROSCOPY

25 June 2025 • 8:30 - 10:00 | ICM, Saal 14c

Session Chair(s): **Richard Quintanilha**, Carl Zeiss AG-CRT (Germany)

Joint Session between conference 13567, Optical Measurement Systems for Industrial Inspection, and 13568, Modeling Aspects in Optical Metrology.

13568-10 • 8:30 - 9:00

Comparative simulation study of computational imaging microscopy for nanoscale defect measurement *(Invited Paper)*

Author(s): **Hyo Mi Park,** National Institute of Standards and Technology (United States); **Ki-Nam Joo,** Chosun Univ. (Korea, Republic of); **Bryan M. Barnes, Martin Y. Sohn,** National Institute of Standards and Technology (United States)

13568-33 • 9:00 - 9:20

Comparison of two fit algorithms to find the maximum of a simulated confocal intensity curve

Author(s): **Silvana Wyss**, **Matthias Wurm**, **Bernd Bodermann**, **Sai Gao,** Physikalisch-Technische Bundesanstalt (Germany); **Liwei Fu, Stephan Reichelt,** Institut für Technische Optik, Univ. Stuttgart (Germany)

13567-34 • 9:20 - 9:40

Multi-functional coherence scanning interferometric microscopy and measuring techniques

Author(s): **Rong Su,** Shanghai Institute of Optics and Fine Mechanics (China)

13568-34 • 9:40 - 10:00

Development and verification of a new through focus algorithm for the evaluation of microscopic linewidth measurements

Author(s): **Bernd Bodermann,** Physikalisch-Technische Bundesanstalt (Germany); **Jan Krüger,** Carl Zeiss Industrielle Messtechnik GmbH (Germany), Physikalisch-Technische Bundesanstalt (Germany); **Sven Dopslaff**, **Detlef Bergmann**, **Rainer Köning**, **Gaoliang Dai**, **Wolfgang Hässler-Grohne,** Physikalisch-Technische Bundesanstalt (Germany); **Phillip Manley**, **Sven Burger, Philipp-Immanuel Schneider,** JCMwave GmbH (Germany), Zuse Institute Berlin (Germany)

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:30 | ICM, Hall B0

Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13568-35 • 12:30 - 13:30

Experimental modeling of polygon mirror-based laser scanning heads

Author(s): **Attila-Tiberiu Teodorovits,** Univ. Politehnica Timisoara (Romania); **Corina Mnerie,** Univ. "Aurel Vlaicu" din Arad (Romania); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania), Univ. "Aurel Vlaicu" din Arad (Romania)

13568-36 • 12:30 - 13:30

Laser scanners with refractive rotational polygons: experimental investigations

Author(s): **Maria-Alexandra Duma,** Utrecht Univ. (Netherlands); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13568-38 • 12:30 - 13:30

New characterization method for measuring extinction ratio and retardance with high accuracy of linear polarizers

Author(s): **Jesus del Hoyo**, **Joaquin Andres-Porras**, **Angela Soria-Garcia**, **Luis Miguel Sanchez-Brea, Javier Alda,** Univ. Complutense de Madrid (Spain)

13568-39 • 12:30 - 13:30

Measure a freeform surface using an SLM combined with a commercial Fizeau interferometer

Author(s): **Reyna Cornelio de Jesus**, **Fermín-Salomón Granados-Agustín**, **María Elizabeth Percino-Zacarías**, **Jorge de Jesús Alvarado Martínez**, **Eduardo Pérez Chaltell,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Agustín Santiago-Alvarado,** Univ. Tecnológica de la Mixteca (Mexico); **Anselmo Alejandro Cornejo Rodríguez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

13568-40 • 12:30 - 13:30

Evaluation of the anterior corneal surface considered as a free-form using null-screens

Author(s): **Luis Ángel Pantoja-Arredondo**, **Manuel Campos-García**, **Daniel Aguirre-Aguirre,** Univ. Nacional Autónoma de México (Mexico); **Christian Camargo-Fierro,** Instituto de Seguridad y Servicios Sociales de Los Trabajadores del Estado (Mexico); **Violeta Guadalupe Camargo-Fierro,** Escuela Nacional de Medicina y Homeopatía, Instituto Politécnico Nacional (Mexico)

13568-41 • 12:30 - 13:30

Some aspects for analytically designing flat aspheric converging Fresnel-type imaging mirror

Author(s): **Maximino Avendaño-Alejo**, **Martín Jiménez-Rodríguez,** Univ. Nacional Autónoma de México (Mexico); **Gabriel Castillo-Santiago**, **Edwin Román-Hernández,** Univ. del Istmo (Mexico); **Osvaldo Ponce-Hernández,** Univ. Nacional Autónoma de México (Mexico)

13568-42 • 12:30 - 13:30
Deep learning-powered small angle X-ray scattering image denoising
Author(s): **Haishuo Zhong**, **Xiuguo Chen**, **Jiahao Zhang**, **Dingxuan Deng**, **Weigang Zhou, Shiyuan Liu,** Huazhong Univ. of Science and Technology (China)

13568-43 • 12:30 - 13:30
Physics-informed machine learning for enhanced optical metrology: FDTD-based modeling and optimization for semiconductor particle detection
Author(s): **Hyoseop Shin,** Sungkyunkwan Univ. (Korea, Republic of)

13568-44 • 12:30 - 13:30
Design of a freeform lens for the transformation of Gaussian beams into top-hat distributions
Author(s): **Eduardo Pérez**, **Fermín-Salomón Granados-Agustín**, **María Elizabeth Percino-Zacarías**, **Reyna Cornelio**, **Anselmo Alejandro Cornejo Rodríguez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Daniel Aguirre Aguirre,** Universidad Nacional Autonoma de México (Mexico); **Jorge de Jesús Alvarado Martínez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

13568-45 • 12:30 - 13:30
Bandwidth-limited filtering via hybrid Mach-Zehnder interferometer and ring resonator structures
Author(s): **Shilei Zhang**, **Ang Li,** Tianmushan Lab., Beihang Univ. (China); **Chenchen Liu,** National Univ. of Defense Technology (China); **Pengfu Lu**, **Junlin Luo**, **Xiaobin Xu**, **Xiaxiao Wang**, **Fuyu Gao, Ningfang Song,** Tianmushan Lab., Beihang Univ. (China)

CONFERENCE 13569

Optics for Arts, Architecture, and Archaeology (O3A) X

23 - 25 June 2025 | ICM, Saal 12b

Conference Chair(s): **Haida Liang,** Nottingham Trent Univ. (United Kingdom); **Roger Groves,** Technische Univ. Delft (Netherlands)

Program Committee: **Dario Ambrosini,** Univ. degli Studi dell'Aquila (Italy); **Aparajita Bandyopadhyay,** Indian Institute of Technology Delhi (India); **Daniela Comelli,** Politecnico di Milano (Italy); **Claudia Daffara,** Univ. degli Studi di Verona (Italy); **Vincent Detalle,** CYU Paris Cergy Univ. (France); **John K. Delaney,** National Gallery of Art (United States); **Martin C. Fischer,** Duke Univ. (United States); **Raffaella E. M. Fontana,** Istituto Nazionale di Ottica (Italy); **Igor P. Gurov,** ITMO Univ. (Russian Federation); **Gaël Latour,** Univ. Paris-Sud (France); **Vadim A. Parfenov,** Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); **Luca Pezzati,** Istituto Nazionale di Ottica-CNR (Italy); **Robert Sitnik,** Warsaw Univ. of Technology (Poland); **Mathieu Thoury,** Synchrotron SOLEIL (France); **Vivi Tornari,** Foundation for Research and Technology-Hellas (Greece)

INFORMATION

In Memoriam

This year's conference is dedicated to the memory of **John Asmus**, University of California, San Diego (United States). **Austin Nevin**, The Courtauld Institute of Art (United Kingdom), and **Vincente Detalle**, CY Cergy Paris Univ. (France).

John Asmus was a physicist with the University of California, San Diego (USA), who pioneered the use of scientific techniques for Cultural Heritage preservation. He performed seminal research in the application of optical methods and digital image processing in art conservation, which placed him among the world's foremost experts in heritage science. His work embraced outstanding artistic treasures, such as Leonardo's Mona Lisa and China's ancient terracotta army. For his work on the latter, he was awarded the Rolex Laureate for Enterprise.

Austin Nevin was the Head of the Conservation Department at The Courtauld Institute of Art and an influential scholar, whose pioneering research on the conservation of paintings, spectroscopy, and chemistry of pigments has been widely cited. He conducted research in Italy, Greece and Sweden, with his work spanning from Chinese wall paintings, Egyptian polychromies, and famous ancient and modern paintings. He was a Vice President and Fellow of the International Institute for Conservation. His enthusiasm and passion for Heritage Science inspired the whole research community.

Vincent Detalle Professor of Cultural Heritage Science at Cergy-Pontoise University. Vincent loved working on new ideas and projects and he was always open to try new techniques and methodologies. He never confined himself just to his field of knowledge, instead he was trying to collaborate and create links with other complementary techniques and methodologies. Transdisciplinary advances in Heritage Science were a necessity and priority for him. He was a pioneer of optics and lasers in Heritage Science research and passionate about developing optical instruments for conservation and material analysis. Vincent joined the Historical Monuments Research Laboratory (LRMH) in the early 2000s, and led the mural paintings division for 12 years; he then continued at the Centre for Research and Restoration of the Museums of France (C2RMF) as Head of the Laser Lab. He was a pioneer in LIBS applications in heritage and was instrumental in establishing E-RIHS and its French national node.

Monday 23 June 2025

SESSION 1: TRIBUTE TO JOHN ASMUS: IN MEMORIAM SESSION I

23 June 2025 • 8:50 - 10:00 | ICM, Saal 12b
Session Chair(s): **Roger M. Groves**, Technische Univ. Delft (Netherlands)

13569-1 • 8:50 - 9:20
Tribute to John Asmus *(Invited Paper)*
Author(s): **Luca Pezzati,** Istituto Nazionale di Ottica (Italy); **Vadim A. Parfenov,** Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation)

13569-2 • 9:20 - 9:40
Optimising DHSPI-SIRT detection diagnostics through combined thermal and humidity excitation procedures on fresco mock-ups
Author(s): **Antonina Chaban,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy); **Vivi Tornari**, **Michalis Andrianakis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); **Maria Rosa Lanfranchi,** Opificio delle Pietre Dure (Italy); **Yannis Vezakis,** Tecreando B.V. (Netherlands); **Jana Striova,** Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (Italy)

13569-4 • 9:40 - 10:00
Automated text restoration in ancient manuscripts: a deep learning approach for document image binarisation based on multispectral data
Author(s): **Pierluigi Carcagnì**, **Marco Del Coco**, **Marco Leo**, **Melania Paturzo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Claudia Daffara,** Univ. degli Studi di Verona (Italy)

Coffee Break 10:00 - 10:30

SESSION 2: TRIBUTE TO AUSTIN NEVIN: IN MEMORIAM SESSION II

23 June 2025 • 10:30 - 12:00 | ICM, Saal 12b
Session Chair(s): **Gianluca Valentini**, Politecnico di Milano (Italy)

13569-5 • 10:30 - 11:00
Beyond the blue color of lapis lazuli: compositional mapping in cross-sections of painting masterpieces *(Invited Paper)*
Author(s): **Iacopo Osticioli,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Silvia Rita Amato**, **Aviva Burnstock,** Courtauld Institute of Art (United Kingdom); **Francesco Carta,** Politecnico di Milano (Italy); **Daniela Comelli,** Politecnico di Milano (United Kingdom); **Giada Magni**, **Lorenzo Marzini,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Sonia Mugnaini,** Univ. degli Studi di Siena (Italy); **Salvatore Siano, Daniele Ciofini,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy)

13569-6 • 11:00 - 11:20
Optimized spatial-spectral selection and multimodal fusion for hyperspectral imaging
Author(s): **Alessia Di Benedetto**, **Alessia Candeo**, **Gianluca Valentini,** Politecnico di Milano (Italy); **Matthias Alfeld,** Technische Univ. Delft (Netherlands); **Daniela Comelli,** Politecnico di Milano (Italy)

13569-7 • 11:20 - 11:40
Visible-induced spectrofluorimetry as a non-invasive tool for the in situ identification of early synthetic dyes in cultural heritage objects dating back to the late 19th or early 20th century
Author(s): **Margherita Longoni**, **Silvia Bruni**, **Maria Vittoria Dozzi**, **Alessia Buttarelli, Valentina Cerutti,** Univ. degli Studi di Milano (Italy)

13569-8 • 11:40 - 12:00
Spatially offset Raman spectroscopy: a new perspective for heritage science
Author(s): **Sara Mosca,** STFC Rutherford Appleton Lab. (United Kingdom); **Wren Montgomery**, **Chelsea McKibbin,** Natural History Museum (United Kingdom); **Robert Stokes,** Agilent Technologies (United Kingdom); **Claudia Conti,** Consiglio Nazionale delle Ricerche (Italy); **Pavel Matousek,** STFC Rutherford Appleton Lab. (United Kingdom)

Lunch Break 12:00 - 13:30

SESSION 3: TRIBUTE TO VINCENT DETALLE: IN MEMORIAM SESSION III

23 June 2025 • 13:30 - 15:30 | ICM, Saal 12b
Session Chair(s): **Luca Pezzati**, Istituto Nazionale di Ottica (Italy)

13569-10 • 13:30 - 14:00
Photothermal radiometry for non-destructive testing and characterization of cultural heritage objects *(Invited Paper)*
Author(s): **Alexandre Semerok,** CEA (France); **Vincent Detalle**, **Nicolas Wilkie-Chancellier**, **Stephane Serfaty,** CY Cergy Paris Univ. (France); **Xueshi Bai**, **Thomas Calligaro**, **Ruven Pillay**, **Elisabeth Ravaud**, **Philippe Salinson,** Ctr. de Recherche et de Restauration des Musées de France (France); **Wilfried Pacquentin,** CEA (France); **Victor Etgens,** Ctr. de Recherche et de Restauration des Musées de France (France)

13569-11 • 14:00 - 14:20
Non-invasive imaging of the Beatus de Saint-Sever: exploring artistic techniques with optical coherence tomography
Author(s): **Xueshi Bai**, **Thomas Calligaro,** Ctr. de Recherche et de Restauration des Musées de France (France); **Christine Andraud**, **Anne Michelin,** Muséum national d'Histoire naturelle (France); **Charlotte Denoel,** Bibliothèque nationale de France (France); **Vincent Detalle,** CY Cergy Paris Univ. (France)

13569-12 • 14:20 - 14:40
Terahertz imaging super-resolution for documental heritage diagnostics
Author(s): **Danae Antunez-Vazquez,** CY Cergy Paris Univ. (France); **Laura Pilozzi,** Istituto per i Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy); **Eugenio Del Re**, **Claudio Conti,** Sapienza Univ. di Roma (Italy); **Silvia Sotgiu**, **Giuliano Locatelli De Maestri,** Biblioteca Nazionale Centrale di Roma (Italy); **Federica Delia,** Accademia di Belle Arti di Roma (Italy), Studio di conservazione Recto Verso (Italy); **Mauro Missori,** Sapienza Univ. di Roma (Italy), Istituto per i Sistemi Complessi (Italy)

13569-13 • 14:40 - 15:00
A high-speed mid-infrared spectral domain optical coherence tomography (OCT) at 4 microns
Author(s): **Chi Shing Cheung, Haida Liang,** Nottingham Trent Univ. (United Kingdom)

13569-14 • 15:00 - 15:30
Micro-LIBS enables fast elemental imaging of marine shells for archaeological and environmental research *(Invited Paper)*
Author(s): **Victor Piñon**, **Panagiotis Siozos**, **Andreas Lemonis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); **Danai Theodoraki**, **Rosa Arniz-Mateos,** Leibniz-Zentrum für Archäologie (Germany); **Konstantinos Mato,** Univ. of Crete (Greece); **Niklas Hausmann,** Leibniz-Zentrum für Archäologie (Germany); **Demetrios Anglos,** Univ. of Crete (Greece)

Coffee Break 15:30 - 16:00

OPTICAL METROLOGY PLENARY SESSION

23 June 2025 • 16:00 - 17:40 | ICM, Saal 1
16:00 to 16:10 hrs
Welcome Address and Plenary Speaker Introduction

Jörg Seewig, Technische Univ. Kaiserslautern (Germany)
Piero Ferraro, CNR, Institute of Applied Sciences & Intelligent Systems (ISASI) (Italy)
2025 Symposium Chairs

13567-500 • 16:10 - 16:55
The wide scale range of optical measurement technology and its exploration (Plenary Presentation)
Author(s): **Wolfgang Osten,** Univ. Stuttgart (Germany)

13571-600 • 16:55 - 17:40
The intelligent microscope at the nanoscale: multimodal microscopy from fluorescence to label-free (Plenary Presentation)
Author(s): **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy)

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1
This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:30

SESSION 4: STRUCTURAL ANALYSIS

24 June 2025 • 10:30 - 12:10 | ICM, Saal 12b
Session Chair(s): **Iacopo Osticioli**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

13569-15 • 10:30 - 10:50
Non-destructive THz techniques for monitoring environmental degradation of marble in iconic structures
Author(s): **Puspita Chanda**, **Karl Bertling,** The Univ. of Queensland (Australia); **Uzair Aalam,** Indian Institute of Technology Delhi (India); **Jari Torniainen**, **Tim Gillespie,** The Univ. of Queensland (Australia); **Lianhe Li**, **Edmund Linfield**, **A. G. Davies**, **Paul Dean,** Univ. of Leeds (United Kingdom); **Aparajita Bandyopadhyay**, **Amartya Sengupta,** Indian Institute of Technology Delhi (India); **Aleksandar D. Rakic,** The Univ. of Queensland (Australia); **Mayuri Kashyap,** Indian Institute of Technology Delhi (India)

13569-16 • 10:50 - 11:10
Diagnostic of artworks using shearography and 3D scan
Author(s): **Chiara Saltarelli**, **Vito Pagliarulo, Melania Paturzo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13569-17 • 11:10 - 11:30
Investigating salt precipitation dynamics in porous media via microCT imaging
Author(s): **Fatima-Zohra Sahraoui**, **Haida Liang,** Nottingham Trent Univ. (United Kingdom); **Ran Holtzman**, **Mykyta Chubynsky,** Coventry Univ. (United Kingdom); **Lucas Goehring,** Nottingham Trent Univ. (United Kingdom)

13569-18 • 11:30 - 11:50
3D measurement of a Chavin stone tenon head by using fringe projection profilometry
Author(s): **Ivan Choque**, **Riquelme Pilco**, **Edith Paredes,** Univ. Nacional Jorge Basadre Grohmann (Peru); **Miguel Asmad,** Pontificia Univ. Católica del Perú (Peru)

13569-19 • 11:50 - 12:10
Harnessing infrared thermography and unsupervised clustering for the non-destructive evaluation of delamination in Chinese cloisonné enamels
Author(s): **Haifeng Tang**, **Zetong Zhang**, **Xue Yang**, **Beichen Chen, Guangkuo Yuan,** Capital Normal Univ. (China)

Lunch Break 12:10 - 13:30

SESSION 5: APPLICATIONS TO ART, ARCHAEOLOGY, AND ARCHITECTURE

24 June 2025 • 13:30 - 15:20 | ICM, Saal 12b
Session Chair(s): **Demetrios Anglos**, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

13569-20 • 13:30 - 14:00
Micro-SORS advancements in heritage science *(Invited Paper)*
Author(s): **Alessandra Botteon,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy); **Marc Vermeulen,** The National Archives (United Kingdom); **Kevin Ambrogioni**, **Matteo Passoni,** Politecnico di Milano (Italy); **Pavel Matousek,** STFC Rutherford Appleton Lab. (United Kingdom); **Francesca Rosi,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Marco Realini**, **Costanza Miliani, Claudia Conti,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy)

13569-21 • 14:00 - 14:20
Investigating Kha's grave goods by means of a transportable, custom-designed x-ray CT system
Author(s): **Matteo Bettuzzi**, **Cecilia Riccardizi**, **Suyi Chen**, **Nayyab Amjad,** Univ. degli Studi di Bologna (Italy); **Enrico Ferraris**, **Valentina Turina,** Museo Egizio (Italy); **Maria Pia Morigi,** Univ. degli Studi di Bologna (Italy)

13569-22 • 14:20 - 14:40
Enhancing manuscript analysis with reflectance transformation imaging: a user study on interactive visualization options
Author(s): **Leonardo Righetto**, **Giacomo Marchioro, Andrea Giachetti,** Univ. degli Studi di Verona (Italy)

13569-23 • 14:40 - 15:00
Infrared imaging techniques for the readability enhancement of Herculaneum papyri: a comparison between technical photography and high-resolution digital microscopy
Author(s): **Sofia Ceccarelli**, **Danilo Paolo Pavone,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy); **Irene Gasperini**, **Ilaria A. Serra**, **Graziano Ranocchia,** Dept. of Philology, Literature and Linguistics, University of Pisa, Italy (Italy); **Costanza Miliani,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy)

13569-24 • 15:00 - 15:20
Enhancing hyperspectral imaging for cultural heritage: a versatile multi-scale approach for biofilm analysis on stone
Author(s): **Elisabetta Martinelli**, **Alessia Di Benedetto**, **Alessia Candeo**, **Paulina Guzmán García Lascurain,** Politecnico di Milano (Italy); **Letizia Berti,** Sapienza Univ. di Roma (Italy), Politecnico di Milano (Italy), Univ. degli Studi di Milano (Italy); **Sara Goidanich,** Politecnico di Milano (Italy); **Francesca Cappitelli,** Univ. degli Studi di Milano (Italy); **Daniela Comelli,** Politecnico di Milano (Italy)

Coffee Break 15:20 - 16:00

SESSION 6: MACHINE LEARNING AND DATA VISUALISATION

24 June 2025 • 16:00 - 18:00 | ICM, Saal 12b
Session Chair(s): **Haida Liang**, Nottingham Trent Univ. (United Kingdom)

13569-26 • 16:00 - 16:20
Interference fringe pattern direct defect detection analysis based on deep learning
Author(s): **Vivi Tornari,** Foundation for Research and Technology-Hellas (Greece); **Yannis Vezakis,** Tecreando B.V. (Netherlands); **Michalis Andrianakis,** Foundation for Research and Technology-Hellas (Greece)

13569-27 • 16:20 - 16:40
AI-based methods and hyperspectral imaging techniques towards an automated translation of ancient Egyptian hieroglyphs: perspectives and open problems
Author(s): **Costanza Cucci**, **Andrea Barucci**, **Fabio Nesi**, **Vittoria Del Vecchio**, **Marcello Picollo**, **Lorenzo Stefani,** Istituto di Fisica Applicata "Nello Carrara", Consiglio Nazionale delle Ricerche (Italy); **Maria Messineo, Fabrizio Argenti,** Univ. degli Studi di Firenze (Italy)

13569-28 • 16:40 - 17:00
A multimodal neural network approach for multispectral analysis of paintings and cultural heritage
Author(s): **Marie Didier**, **Vincent Carrel**, **Gabriel Bernasconi**, **Charlotte Bonniot,** MATIS SA (Switzerland); **Cornelius Palmbach, Markus Kueffner,** Bern Univ. of Applied Sciences (Switzerland)

13569-29 • 17:00 - 17:20
Dual-domain feature extraction and reference image guidance for large-area digital mural restoration
Author(s): **Huixin Chen,** Northwest Univ. (China); **Qunxi Zhang,** Xi'an Siyuan Univ. (China), Northwest Univ. (China); **Qingqing Kang**, **Zhe Yu**, **Shuyi Qu**, **Lin Wang**, **Jun Wang, Xianlin Peng,** Northwest Univ. (China)

13569-30 • 17:20 - 17:40
Digital restoration of paintings using convolutional neural network trained on cleaned edges and local patches
Author(s): **Mark Jeremy G. Narag,** National Institute of Physics, Univ. of the Philippines Diliman (Philippines); **Julian Baumgartner,** Baumgartner Fine Art Restoration (United States); **Maricor Soriano,** National Institute of Physics, Univ. of the Philippines Diliman (Philippines)

13569-31 • 17:40 - 18:00
Mining implicit information in rock art via band selection and hyperspectral image unmixing
Author(s): **Tong Gao**, **Yihao Fu**, **Cheng Liu**, **Shenglin Peng**, **Jun Wang, Jinye Peng,** Northwest Univ. (China)

Wednesday 25 June 2025

SESSION 7: IMAGING AND SPECTROSCOPY: INSTRUMENT AND METHOD DEVELOPMENT

25 June 2025 • 8:30 - 10:50 | ICM, Saal 12b
Session Chair(s): **Aparajita Bandyopadhyay**, Indian Institute of Technology Delhi (India)

13569-32 • 8:30 - 9:00
A compact hyperspectral camera in the thermal infrared *(Invited Paper)*
Author(s): **Matteo Corti,** CNR-Istituto di Fotonica e Nanotecnologie (Italy); **Fabrizio Preda**, **Antonio Perri,** NIREOS s.r.l. (Italy); **Giulio Cerullo**, **Gianluca Valentini,** Politecnico di Milano (Italy); **Ondřej Ballada**, **Čestmír Barta**, **Lukáš Chroust,** BBT-Materials Processing, s.r.o. Ltd. (Czech Republic); **Cristian Manzoni,** CNR-Istituto di Fotonica e Nanotecnologie (Italy)

13569-33 • 9:00 - 9:20
A new method for analysis of light-induced fading of historical artists' paints
Author(s): **Florence Gadsby**, **Haida Liang**, **David Robinson**, **Chi Shing Cheung,** Nottingham Trent Univ. (United Kingdom); **Amelia Suzuki,** Nottingham Trent Univ. (United Kingdom), Istituto di Scienze del Patrimonio, Consiglio Nazionale delle Ricerche (Italy)

13569-34 • 9:20 - 9:40
Hyperspectral imaging of cultural heritage: from micro- to remote scale using a single device
Author(s): **Marta Ghirardello,** NIREOS s.r.l. (Italy); **Sabrina Samela**, **Lorenzo Vinco**, **Daniala Comelli,** Politecnico di Milano (Italy); **Antonio Perri, Fabrizio Preda,** NIREOS s.r.l. (Italy)

13569-35 • 9:40 - 10:00
Retardance and axis orientation measurements for characterization of the collagen fiber network in parchments
Author(s): **Julie Bouhy**, **Catherine Charles, Olivier Deparis,** Univ. de Namur (Belgium)

Coffee Break • 10:00 - 10:30

13569-36 • 10:30 - 10:50
Advancing fiber optics reflectance spectroscopy with remote detection
Author(s): **Mauro Missori,** Istituto per i Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy), Sapienza Univ. di Roma (Italy); **Ricardo P. Vicente Rojas,** Sapienza Univ. di Roma (Italy), Istituto per i Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy); **Chiara Casarin**, **Renata Codello,** Fondazione Giorgio Cini (Italy); **Guido Caldarelli,** Consiglio Nazionale delle Ricerche (Italy), Univ. Ca' Foscari di Venezia (Italy)

SESSION 8: POSTER SLAM: OPTICS FOR ARTS, ARCHITECTURE, AND ARCHAEOLOGY

25 June 2025 • 10:50 - 11:30 | ICM, Saal 12b
Session Chair(s): **Claudia Daffara**, Univ. degli Studi di Verona (Italy)
Join the poster presenters of the Optics for Arts, Architecture, and Archaeology conference for their four-minute oral slams. Each poster author is invited to give a brief (four-minute) preview of their research during this poster slam session.
Following the poster slam session on Wednesday morning the posters will also be available for viewing during the Poster Session 12:30 to 13:30 hrs on Wednesday.

Lunch Break 11:30 - 12:30

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:30 | ICM, Hall B0

Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13569-45 • 12:30 - 13:30

The applications of MA-XRF technology in the research of ancient artifacts with curved surface

Author(s): **Peiquan Duan**, **Zhikang Hu**, **Xueyan Zhang**, **Hongying Duan**, **Hang Yin,** The Palace Museum (China); **Yifan Wang**, **Qiong Xu,** Institute of High Energy Physics, CAS (China); **Liang Qu,** The Palace Museum (China)

13569-46 • 12:30 - 13:30

A data analytical strategy for color degradation of dyes on unearthed silks based on microfading spectrometry

Author(s): **Ming Guan,** The Palace Museum (China); **Xiaojing Kang,** Institute of Cultural Relics and Archaeology, Xinjiang Uygur Autonomous Region Museum (China); **Yao Chen,** The Palace Museum (China); **Xin Li,** Beijing Institute of Computer and Electronics Application (China); **Xingjun Hu,** Institute of Cultural Relics and Archaeology, Xinjiang Uygur Autonomous Region Museum (China); **Liang Qu, Zhikang Hu,** The Palace Museum (China)

13569-47 • 12:30 - 13:30

Infrared thermography analyses in the early Christian basilica complex in Cimitile (Italy)

Author(s): **Antimo Di Meo**, **Pasquale Mormile,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Maria Palma Recchia,** Soprintendenza Archeologia Belle Arti e Paesaggio per l'Area Metropolitana di Napoli (Italy); **Massimo Rippa,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13569-51 • 12:30 - 13:30

Infrared imaging for the analysis of a 16th-century canvas: Annunciation by Francesco Salviati, a case study

Author(s): **Antimo Di Meo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Barbara Balbi,** Ministero della Cultura (Italy); **Karin Tortora,** Studio Karin Tortora (Italy); **Massimo Rippa,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13569-52 • 12:30 - 13:30

Non-invasive full-field physics techniques for innovative violins inspection: first results from "AMATI VI(H)OLIN" Project

Author(s): **Melania Paturzo**, **Chiara Saltarelli**, **Vito Pagliarulo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Marco Malagodi,** Univ. degli Studi di Pavia (Italy); **Sara Mazzocato**, **Dumitru Scutelnic, Claudia Daffara,** Univ. degli Studi di Verona (Italy)

13569-53 • 12:30 - 13:30

Artificial intelligence and physics for art diagnostics: first results from "AIPAD" project

Author(s): **Claudia Daffara**, **Nicole de Manincor**, **Laura Gazzani**, **Sara Mazzocato**, **Dumitru Scutelnic**, **Anna Trovati**, **Paolo Pellegrini,** Univ. degli Studi di Verona (Italy); **Pierluigi Carcagnì**, **Marco Del Coco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Marco Leo**, **Vito Pagliarulo**, **Chiara Saltarelli,** Istituto di Scienze Applicate e Sistemi Intelligenti (Italy); **Melania Paturzo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

SESSION 9: 3D IMAGING AND SPECTROSCOPY

25 June 2025 • 13:40 - 15:10 | ICM, Saal 12b

Session Chair(s): **Haida Liang**, Nottingham Trent Univ. (United Kingdom)

13569-37 • 13:40 - 14:10

Multimodal optical approach for cultural heritage characterisation: 3D scanning and spectral mapping techniques *(Invited Paper)*

Author(s): **Valentina Righetti**, **Luca Pezzati**, **Diego Quintero Balbas**, **Antonina Chaban,** Istituto Nazionale di Ottica (Italy); **Silvia Innocenti,** Istituto Nazionale di Ottica (Italy), Università "La Sapienza" (Italy); **Jana Striova,** Istituto Nazionale di Ottica (Italy)

13569-38 • 14:10 - 14:30

Surface adaptive micro x-ray fluorescence scanning: an innovative technology for archaeological analysis on curved surfaces

Author(s): **Qiong Xu**, **Yifan Wang**, **Xu Zhou**, **Cunfeng Wei,** Institute of High Energy Physics (China); **Peiquan Duan,** The Palace Museum (China); **Yong Liu,** Institute of Archaeology, Chinese Academy of Social Sciences (China); **Liang Qu,** The Palace Museum (China); **Long Wei,** Institute of High Energy Physics (China)

13569-41 • 14:50 - 15:10
Sustainable preservation strategies for street art (superstar) through the integration and comparison of hyperspectral techniques at close and ultra-close range
Author(s): **Nicodemo Abate**, **Maria Sileo**, **Antonio Minervino Amodio,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy); **Aldo Romani,** Univ. degli Studi di Perugia (Italy); **Fauzia Albertin,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **David Buti,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy); **Laura Cartechini,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Nicola Masini, Costanza Miliani,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy)

Coffee Break 15:30 - 16:00

SESSION 10: MULTIMODAL IMAGING AND SPECTROSCOPY

25 June 2025 • 16:00 - 17:10 | ICM, Saal 12b
Session Chair(s): **Sara Mosca**, STFC Rutherford Appleton Lab. (United Kingdom)

13569-42 • 16:00 - 16:30
Brillouin and Raman micro-spectroscopy for cultural heritage: an innovative tool for correlative exploration of mechanical and chemical changes in artworks *(Invited Paper)*
Author(s): **Martina Alunni Cardinali**, **Irene Bargagli,** Univ. degli Studi di Perugia (Italy), Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Sara Mattana,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Marco Paolantoni,** Univ. degli Studi di Perugia (Italy); **Daniele Fioretto,** Univ. degli Studi di Perugia (Italy), Istituto Officina dei Materiali, Consiglio Nazionale delle Ricerche (Italy); **Costanza Miliani,** Istituto di Scienze del Patrimonio Culturale, Consiglio Nazionale delle Ricerche (Italy); **Laura Cartechini,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Paola Sassi,** Univ. degli Studi di Perugia (Italy), Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy); **Lucia Comez,** Istituto Officina dei Materiali, Consiglio Nazionale delle Ricerche (Italy); **Francesca Rosi,** Istituto di Scienze e Tecnologie Chimiche 'Giulio Natta', Consiglio Nazionale delle Ricerche (Italy)

13569-43 • 16:30 - 16:50
Combining optical coherence tomography and small angle neutron scattering for assessing blanching degradation of varnishes on paintings
Author(s): **Alessia Venturi**, **Lucas Goehring,** Nottingham Trent Univ. (United Kingdom); **Najet Mahmoudi,** STFC Rutherford Appleton Lab. (United Kingdom); **Haida Liang,** Nottingham Trent Univ. (United Kingdom); **Antonella Scherillo,** STFC Rutherford Appleton Lab. (United Kingdom); **Chi Shing Cheung, Patrick Atkinson,** Nottingham Trent Univ. (United Kingdom)

13569-44 • 16:50 - 17:10
Non-invasive optoacoustic and nonlinear microscopy techniques reveal in-depth aging of CH objects
Author(s): **Meropi Mari,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); **Eleanna Pirgianaki,** Univ. of Crete (Greece); **Kristalia Melessanaki**, **George Filippidis**, **George J. Tserevelakis, Costas Fotakis,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece)

CONFERENCE 13570

Multimodal Sensing and Artificial Intelligence for Sustainable Future

24 - 26 June 2025 | ICM, Saal 12a

Conference Chair(s): **Francesco Soldovieri,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); **Pascal Picart,** Lab. d'Acoustique de l'Univ. du Mans (France); **Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Claas Falldorf,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

Program Committee: **Mostafa Agour,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Roger Artigas Pursals,** Sensofar-Tech, S.L. (Spain); **Jürgen W. Czarske,** TU Dresden (Germany); **Peter J. de Groot,** Zygo Corporation (United States); **Cosimo Distante,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Stefania Federici,** Univ. degli Studi di Brescia (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Cosme Furlong,** Worcester Polytechnic Institute (United States); **Peng Gao,** Xidian Univ. (China); **Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland); **Helia Hooshmand-Ziafi,** The Univ. of Nottingham (United Kingdom); **Michal Józwik,** Warsaw Univ. of Technology (Poland); **Björn Kemper,** Univ. Münster (Germany); **Robert Kuschmierz,** TU Dresden (Germany); **Edmund Y. Lam,** The Univ. of Hong Kong (Hong Kong, China); **Denis Lebrun,** Complexe de Recherche Interproffessionnel en Aerothermochimie (France); **Sylvain Lecler,** ICube (France); **Peter Lehmann,** Univ. Kassel (Germany); **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Nicola Mosca,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Aditya Nayak,** Florida Atlantic Univ. (United States); **Heidi Ottevaere,** Vrije Univ. Brussel (Belgium); **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Mikael Sjödahl,** Luleå Univ. of Technology (Sweden); **Elena V. Stoykova,** Institute of Optical Materials and Technologies (Bulgaria); **Fabian Thiemicke,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Nicolas Verrier,** Univ. de Haute-Alsace (France)

INFORMATION

In Memoriam

This year's conference is dedicated to the memory of **Dr. Ettore Stella**, Director of Research at National Research Council (CNR, Italy) and the Founding Chair of the Multimodal Sensing and Artificial Intelligence Conference.

Ettore served as the 2019-2023 Chair of the SPIE conference on Multimodal Sensing and Artificial Intelligence.

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1

This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:30

SESSION 1: ENVIRONMENTAL MONITORING I

24 June 2025 • 10:30 - 12:10 | ICM Saal 12a

Session Chair(s): **Bryan M. Hennelly**, National Univ. of Ireland, Maynooth (Ireland); **Vittorio Bianco**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-1 • 10:30 - 10:50

Correlation of refractive index to morphology for polystyrene nanospheres by optical modelling of UV-VIS spectra

Author(s): **Mattia Andrini,** Univ. Cattolica del Sacro Cuore (Italy); **Stefania Federici,** Univ. degli Studi di Brescia (Italy); **Luca Gavioli,** Univ.

Cattolica del Sacro Cuore (Italy)

13570-2 • 10:50 - 11:10
Machine learning for scalable and adaptive estuarine modeling: understanding dynamics and environmental patterns
Author(s): **Leonardo Saccotelli**, **Giorgia Verri**, **Alessandro De Lorenzis,** Fondazione Ctr. Euro-Mediterraneo sui Cambiamenti Climatici (Italy); **Gianluca Epifani**, **Giovanni Dimauro,** Univ. degli Studi di Bari Aldo Moro (Italy); **Giovanni Coppini,** Fondazione Ctr. Euro-Mediterraneo sui Cambiamenti Climatici (Italy); **Rosalia Maglietta,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-3 • 11:10 - 11:30
Detection of blue nanoplastics using resonance Raman spectroscopy coupled with plasmonic nanostructured substrates
Author(s): **Ioana Cârdan,** Univ. Babes-Bolyai (Romania), Institutul National de Cercetare-Dezvoltare pentru Technologii Izotopice si Moleculare Cluj-Napoca (Romania); **Simona Cintă-Pinzaru,** Univ. Babes-Bolyai (Romania); **Lucian Barbu-Tudoran,** Univ. Babes-Bolyai (Romania), Institutul National de Cercetare-Dezvoltare pentru Technologii Izotopice si Moleculare Cluj-Napoca (Romania); **Cosmin Farcău,** Institutul National de Cercetare-Dezvoltare pentru Technologii Izotopice si Moleculare Cluj-Napoca (Romania)

13570-4 • 11:30 - 11:50
AI-enabled monitoring of water pollutants by clusters of optical microresonators
Author(s): **Anton V. Saetchnikov, Andreas Ostendorf,** Ruhr-Univ. Bochum (Germany)

13570-5 • 11:50 - 12:10
Polarization digital holography for advanced classification of microplastic particles
Author(s): **Maria Pia Pierro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy), Univ. degli Studi della Campania Luigi Vanvitelli (Italy); **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Jaromír Béhal,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy), Palacký Univ. Olomouc (Czech Republic); **Stefania Federici**, **Serena Ducoli,** Univ. degli Studi di Brescia (Italy); **Francesca Borrelli**, **Marco Leo**, **Cosimo Distante,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Ettore Stella,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Lisa Miccio**, **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

Lunch Break 12:10 - 13:40

SESSION 2: ADVANCED MICROSCOPY

24 June 2025 • 13:40 - 15:30 | ICM Saal 12a
Session Chair(s): **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

13570-6 • 13:40 - 14:20
AI-based advances in computational microscopy and sensing (Keynote Presentation)
Author(s): **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

13570-8 • 14:20 - 14:40
In-flow digital holographic tomography for 3D phytoplankton visualization and characterization
Author(s): **Francesca Borrelli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy), Univ. degli Studi della Campania Luigi Vanvitelli (Italy); **Jaromír Béhal**, **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Leonilde Roselli**, **Angela Sardo**, **Emilie Houliez**, **Valerio Zupo**, **Maria Costantini,** Stazione Zoologica Anton Dohrn (Italy); **Lisa Miccio**, **Pasquale Memmolo**, **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-9 • 14:40 - 15:10
Fluorescence and quantitative phase imaging combination using a cost-effective imaging platform *(Invited Paper)*
Author(s): **Vicente Micó Serrano**, **David Alonso, Javier García,** Univ. de València (Spain)

13570-10 • 15:10 - 15:30
Physics-driven polarization-sensitive holographic denoising for microplastic detection
Author(s): **Fraser Montandon, Fred Nicolls,** Univ. of Cape Town (South Africa)

Coffee Break 15:30 - 16:00

SESSION 3: REMOTE SENSING

24 June 2025 • 16:00 - 18:00 | ICM Saal 12a
Session Chair(s): **Mostafa Agour**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Francesco Soldovieri**, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy)

13570-11 • 16:00 - 16:20
Winter wheat management zoning and optimization study using GF-6 satellite image
Author(s): **Xiaoyu Song**, **Haitao Zhao**, **Yuanyuan Ma**, **Jie Zhang**, **Xingang Xu**, **Pingping Li, Qiang Wu,** National Engineering Research Ctr. for Information Technology in Agriculture (China)

13570-12 • 16:20 - 16:40
Coupling ensemble learning with multi-sensor images from UAV to estimate leaf nitrogen content in rice
Author(s): **Xingang Xu**, **Xiaoyu Song**, **Yang Meng, Hanyu Xue,** Beijing Academy of Agriculture and Forestry Sciences (China)

13570-13 • 16:40 - 17:00
Enhancing marine ecosystem monitoring using machine learning: addressing autocorrelation in cetacean feeding behavior prediction
Author(s): **Carla Cherubini,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Leonardo Saccotelli,** Fondazione Ctr. Euro-Mediterraneo sui Cambiamenti Climatici (Italy); **Giulia Cipriano**, **Giovanni Dimauro,** Univ. degli Studi di Bari Aldo Moro (Italy); **Giovanni Coppini,** Fondazione Ctr. Euro-Mediterraneo sui Cambiamenti Climatici (Italy); **Carmelo Fanizza,** Jonian Dolphin Conservation (Italy); **Roberto Carlucci,** Univ. degli Studi di Bari Aldo Moro (Italy); **Rosalia Maglietta,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-14 • 17:00 - 17:20
Detecting the content of water in agricultural soils by GPR data and autoencoders
Author(s): **Adriano Liso,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Nuria Rodríguez Calderón**, **Vega Pérez-Gracia,** Univ. Politècnica de Catalunya (Spain); **Tiziana D'Orazio, Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-15 • 17:20 - 17:40
Amplitude inversion analysis to estimate the soil permittivity from UAV-based GPR data sets
Author(s): **Matteo Dossi**, **Giuseppe Esposito**, **Ilaria Catapano, Francesco Soldovieri,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Consiglio Nazionale delle Ricerche (Italy)

13570-16 • 17:40 - 18:00
UAV-based GPR and microwave tomography: 2D and 3D results
Author(s): **Giuseppe Esposito**, **Ilaria Catapano**, **Gianluca Gennarelli, Francesco Soldovieri,** Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Consiglio Nazionale delle Ricerche (Italy)

Wednesday 25 June 2025

SESSION 4: ADVANCES IN OPTOFLUIDICS I

25 June 2025 • 8:30 - 10:00 | ICM Saal 12a
Session Chair(s): **Violeta Dimitrova Madjarova**, Bulgarian Academy of Sciences (Bulgaria)

13570-17 • 8:30 - 9:00
Advancing Raman imaging in opto-acousto-fluidic microchips *(Invited Paper)*
Author(s): **Mehrdad Lotfi Choobbari**, **Margot Vandermotten, Heidi Ottevaere,** Vrije Univ. Brussel (Belgium)

13570-21 • 9:00 - 9:20
Smart deep learning application for single cell classification
Author(s): **David Dannhauser**, **Paolo Antonio Netti, Filippo Causa,** Univ. degli Studi di Napoli Federico II (Italy)

13570-19 • 9:20 - 9:40
Deep learning-based optical metrology for real-time sensing: optical flow estimation
Author(s): **Yuvarajendra Anjaneya Reddy, Mikael Sjödahl,** Luleå Univ. of Technology (Sweden)

13570-20 • 9:40 - 10:00
Continuous flow technology for particle focusing in microscopy
Author(s): **Julia Sophie Boeke**, **Mark Kielpinski,** Leibniz-Institut für Photonische Technologien e.V. (Germany); **Enrico Ehrhardt,** Gesellschaft zur Förderung von Medizin-, Bio- und Umwelttechnologien e.V. (Germany); **Thomas Henkel,** Leibniz-Institut für Photonische Technologien e.V. (Germany)

Coffee Break 10:00 - 10:30

SESSION 5: ADVANCES IN OPTOFLUIDICS II

25 June 2025 • 10:30 - 11:30 | ICM Saal 12a
Session Chair(s): **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Nicola Mosca**, Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-18 • 10:30 - 10:50
Machine-learning-based measurement of fluid properties through observation of particle train evolution in microchannels
Author(s): **Maurizio De Micco**, **Gaetano D'Avino**, **Marco Trofa**, **Massimiliano M. Villone, Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy)

13570-22 • 10:50 - 11:10
High-speed sCMOS acquisition with optical pixel reassignment
Author(s): **Biagio Mandracchia,** Univ. de Valladolid (Spain); **Corey Zheng**, **Suraj Rajendran**, **Wenhao Liu**, **Parvin Forghani**, **Chunhui Xu, Shu Jia,** Georgia Institute of Technology (United States)

13570-23 • 11:10 - 11:30
Combination of nanofluidic scattering microscopy (NSM) and continuously controlled spectral-resolution (CoCoS) microscopy for multimodal analysis
Author(s): **Bohdan Yeroshenko**, **Victor Enevold**, **Leyla Beckerman**, **Joachim Fritzsche, Christoph Langhammer,** Chalmers Univ. of Technology (Sweden)

Lunch Break 11:30 - 12:30

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:30 | ICM, Hall B0
Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13570-54 • 12:30 - 13:30
Addressing spatial and temporal uncertainty in predicting sea surface temperature using "BiSeq" a novel ensemble method
Author(s): **Lalita Chaudhary,** Bennett Univ. (India)

13570-55 • 12:30 - 13:30
Laser-based mobile railway measurement systems: an overview
Author(s): **Kira Zschiesche,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Jana Seiler,** Univ. of Freiburg (Germany); **Claudia Baulig**, **Martin Dambacher**, **Bogdan Galuska**, **Lukas Jäger**, **Johannes Pelz**, **Jonas Rombach**, **Andreas Sutorius,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany); **Alexander Reiterer,** Fraunhofer-Institut für Physikalische Messtechnik IPM (Germany), Univ. of Frieburg (Germany)

13570-56 • 12:30 - 13:30
Online 3D reconstruction of parts printed by LP-DED via data fusion of coaxial and off-axis camera images
Author(s): **Vittorio Sala**, **Ambra Vandone**, **Michele Banfi**, **Federico Mazzucato**, **Stefano Baraldo, Anna Valente,** SUPSI (Switzerland)

13570-57 • 12:30 - 13:30
Inversion of potato chlorophyll content based on radiation transfer model and machine learning algorithm
Author(s): **Yuanyuan Ma**, **Xiaoyu Song**, **Xingang Xu**, **Jie Zhang**, **Di Pan**, **Guijun Yang, Haikuan Feng,** Beijing Academy of Agriculture and Forestry Sciences (China)

13570-58 • 12:30 - 13:30
Demonstration of optical metrology for rail vehicle and track condition monitoring
Author(s): **Sepehr Abdi Goudarzi,** Sapienza Univ. di Roma (Italy); **Angelo Cardellicchio,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Riccardo Licciardello**, **Shahab Mansouri,** Sapienza Univ. di Roma (Italy); **Simone Pio Negri**, **Massimiliano Nitti**, **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Sina Shahidzadeh Arabani,** Sapienza Univ. di Roma (Italy)

13570-59 • 12:30 - 13:30
A probabilistic approach for evaluating crack defects in reinforced concrete bridges
Author(s): **Angelo Cardellicchio**, **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Sergio Ruggieri**, **Vincenzo Mario Di Mucci**, **Andrea Nettis, Giuseppina Uva,** Politecnico di Bari (Italy)

13570-60 • 12:30 - 13:30
High density polyurethane blocks handling with an AI-powered multimodal vision system on a custom compact omnidirectional mobile robot: a case study
Author(s): **Vito Renò**, **Cosimo Patruno**, **Angelo Cardellicchio**, **Giovanna Guaragnella**, **Nicola Pedrocchi, Massimiliano Nitti,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-61 • 12:30 - 13:30
Unsupervised learning techniques for finding missing bolts in railways combining 3D data, deep learning, and weighted content loss
Author(s): **Udith Krishnan Vadakkum Vadukkal**, **Angelo Cardellicchio**, **Nicola Mosca**, **Maria Di Summa**, **Massimiliano Nitti, Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-62 • 12:30 - 13:30
Automated quality inspection of fastening screws for furniture using 3D computer vision and data analysis techniques
Author(s): **Cosimo Patruno**, **Massimiliano Nitti**, **Chiara Tagliaferri,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Luca Mauri,** F.lli Mauri SpA (Italy); **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-64 • 12:30 - 13:30
Efficient averaging for enhanced resolution with acceptable quality in laser speckle imaging
Author(s): **Elena Stoykova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria), National Ctr. of Mechatronics and Clean Technologies (Bulgaria); **Branimir Ivanov**, **Maryam Viqar**, **Ginka Ivanova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria); **Keehoon Hong,** Electronics and Telecommunications Research Institute (Korea, Republic of); **Violeta Madjarova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria), National Ctr. of Mechatronics and Clean Technologies (Bulgaria)

13570-65 • 12:30 - 13:30
Biophilic elements for employee well-being through extended reality solutions: creating digital plants
Author(s): **Nicola Mosca**, **Marina Ricci**, **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Michele Gattullo,** Politecnico di Bari (Italy); **Maria Di Summa,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-66 • 12:30 - 13:30
Super-resolution microsphere digital holographic microscopy imaging based on phase-intensity feature fusion
Author(s): **Yanmin Zhu**, **Yuxing Li**, **Yunping Zhang, Edmund Y. Lam,** The Univ. of Hong Kong (Hong Kong, China)

13570-69 • 12:30 - 13:30
Using floral bract withering to identify green-ripe pineapples with deep learning
Author(s): **Guo-Fong Hong, Shean-Jen Chen,** National Yang Ming Chiao Tung Univ. (Taiwan)

13570-70 • 12:30 - 13:30
Open-source framework for multimodal microscopy
Author(s): **Sara Cruz-Adrados**, **Rosa Maria Menchón-Lara, Biagio Mandracchia,** Univ. de Valladolid (Spain)

13570-71 • 12:30 - 13:30
Generalizability of speckle-based particle size distribution estimation for pharmaceutical powders
Author(s): **Nischita Kaza**, **Yi Wei**, **Ajinkya Pandit**, **Difei Zhang**, **Qihang Zhang**, **Shashank V. Muddu,** Massachusetts Institute of Technology (United States); **Neda Nazemifard**, **Charles Papageorgiou**, **Wenlong Tang,** Takeda Pharmaceuticals International, Inc. (United States); **Richard D. Braatz**, **Allan S. Myerson, George Barbastathis,** Massachusetts Institute of Technology (United States)

13570-72 • 12:30 - 13:30
Extracting the proportion of particles in a mixture through speckle polarization information
Author(s): **Yi Wei**, **Peter Hou**, **Ajinkya Pandit**, **Shashank V. Muddu**, **Difei Zhang**, **Nischita Kaza**, **Jeong Hee Kim**, **Yanmin Zhu**, **Qihang Zhang,** Massachusetts Institute of Technology (United States); **Wenlong Tang**, **Charles Papageorgiou**, **Neda Nazemifard,** Takeda Pharmaceuticals International, Inc. (United States); **Richard D. Braatz**, **Allan S. Myerson**, **Loza F. Tadesse, George Barbastathis,** Massachusetts Institute of Technology (United States)

13570-73 • 12:30 - 13:30
3D tracking and behavioral analysis of *Tetraselmis* as a bioindicator of copper pollution in marine environment
Author(s): **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy), Univ. degli Studi della Campania Luigi Vanvitelli (Italy); **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Elena Cavalletti,** Stazione Zoologica Anton Dohrn (Italy); **Pasquale Memmolo**, **Lisa Miccio**, **Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Angela Sardo,** Stazione Zoologica Anton Dohrn (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-74 • 12:30 - 13:30
Motility-based scrutiny of probiotic bacteria in vitro digestive environment achieved by an all-optical platform
Author(s): **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Jaromír Béhal,** Palacký Univ. Olomouc (Czech Republic); **Michela Schiavo,** Telethon Institute of Genetics and Medicine (Italy); **Pasquale Memmolo**, **Lisa Miccio**, **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Filomena Nazzaro,** Istituto di Scienze dell'Alimentazione (Italy); **Pietro Ferraro, Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-76 • 12:30 - 13:30
Detection and recognition of drones by using coherent micro Doppler LiDAR sensor
Author(s): **Jongpil La**, **Jieun Choi,** Lambda Innovision (Korea, Republic of); **Byungin Choi,** Hanwha Systems Co., Ltd. (Korea, Republic of)

13570-77 • 12:30 - 13:30
Hyperspectral imaging system with switchable spontaneous Raman spectroscopy and broadband CARS
Author(s): **Timothy McNamara, Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland)

13570-78 • 12:30 - 13:30
Use of natural compounds to fight biofilm: the case of borage seed oil
Author(s): **Francesca Coppola,** Univ. degli Studi di Napoli Federico II (Italy), Istituto di Scienze dell'Alimentazione, Consiglio Nazionale delle Ricerche (Italy); **Nunzio D'Agostino,** Univ. degli Studi di Napoli Federico II (Italy); **Filomena Nazzaro, Florinda Fratianni,** Istituto di Scienze dell'Alimentazione, Consiglio Nazionale delle Ricerche (Italy)

13570-79 • 12:30 - 13:30
Evaluation of damage in composite panels using NDI techniques
Author(s): **Veronica Vespini**, **Sara Coppola**, **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Pietro Russo,** Istituto per i Polimeri, Compositi e Biomateriali (Italy); **Giuseppe Del Prete**, **Valerio Dentico**, **Nicola Gallo,** Leonardo S.p.A. (Italy); **Vittorio Memmolo**, **Ernesto Monaco, Fabrizio Ricci,** Univ. degli Studi di Napoli Federico II (Italy)

13570-80 • 12:30 - 13:30
Multimodal optical non-destructive evaluation of impact damage in composite materials
Author(s): **Daryna Budiakivska,** Warsaw Univ. of Technology (Poland); **Dr. Nan Tao,** Technische Univ. Delft (Netherlands); **Adam Styk**, **Małgorzata Kujawińska,** Warsaw Univ. of Technology (Poland); **Andrei G. Anisimov,** Technische Univ. Delft (Netherlands)

13570-81 • 12:30 - 13:30
Coherence effects in off-axis holography: simulations and experiment
Author(s): **Damien P. Kelly**, **Peter Naglič**, **Hussein Kamel, Moaaz Rauf Nizami,** Institut für Lasertechnologien in der Medizin und Meßtechnik an der Univ. Ulm (Germany)

SESSION 6: ENVIRONMENTAL MONITORING II

25 June 2025 • 13:40 - 15:30 | ICM Saal 12a
Session Chair(s): **Vittorio Bianco**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

13570-24 • 13:40 - 14:20
New technology and measurements for understanding marine bioluminescence (Keynote Presentation)
Author(s): **Michael S. Twardowski,** Harbor Branch Oceanographic Institute (United States)

13570-25 • 14:20 - 14:40
Dose-dependent effects of copper pollution on living diatoms by label-free Fourier ptychographic microscopy and fractal analysis
Author(s): **Lisa Miccio**, **Vittorio Bianco**, **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Elena Cavalletti,** Stazione Zoologica Anton Dohrn (Italy); **Jaromír Béhal**, **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Angela Sardo,** Stazione Zoologica Anton Dohrn (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13570-26 • 14:40 - 15:10
Chasing nanoplastics by optical means *(Invited Paper)*
Author(s): **Mattia Andrini,** Univ. Cattolica del Sacro Cuore (Italy); **Stefania Federici,** Univ. degli Studi di Brescia (Italy); **Luca Gavioli,** Univ. Cattolica del Sacro Cuore (Italy)

13570-27 • 15:10 - 15:30
A portable AI-powered rotifer-tracking system for in-situ water quality assessment
Author(s): **Yunping Zhang**, **Yunfei Tian**, **Yuxing Li, Edmund Y. Lam,** The Univ. of Hong Kong (Hong Kong, China)

Coffee Break 15:30 - 16:00

SESSION 7: JOINT SESSION: MULTIMODAL QUANTITATIVE PHASE BIOIMAGING I

25 June 2025 • 16:00 - 18:00 | Hall B1-LEVEL 2, Room B13

Session Chair(s): **Björn Kemper**, Universitätsklinikum Münster (Germany); **Mostafa Agour**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

Joint Session between Multimodal Sensing and Artificial Intelligence for Sustainable Future Conf. 13570 and Optical Methods for Inspection, Characterization, and Imaging of Biomaterials Conf. 13571.

13570-28 • 16:00 - 16:30

Additive manufacturing powered by holography *(Invited Paper)*

Author(s): **Christophe Moser,** EPFL (Switzerland)

13570-29 • 16:30 - 16:50

A self-reference approach to synthetic aperture digital holographic microscopy

Author(s): **Bryan M. Hennelly, Zhengyuan Tang,** National Univ. of Ireland, Maynooth (Ireland)

13571-43 • 16:50 - 17:10

An electrohydrodynamic approach for the estimation of fluid viscosity

Author(s): **Volodymyr Tkachenko,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Cosimo Ieracitano,** Univ. Mediterranea di Reggio Calabria (Italy); **Daniele Tammaro,** Univ. degli Studi di Napoli Federico II (Italy); **Asieh Amousoltani Arani**, **Sara Coppola**, **Veronica Vespini**, **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy); **Stefania Carbone**, **Concetta Di Natale,** Univ. degli Studi di Napoli Federico II (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-30 • 17:10 - 17:40

Lensless holographic microscopy for 2D and 3D high-content label-free amplitude and phase bioimaging *(Invited Paper)*

Author(s): **Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13570-31 • 17:40 - 18:00

Non-interferometric phase imaging by speckle correlation

Author(s): **Mikael Sjödahl, Ronja Eriksson,** Luleå Univ. of Technology (Sweden)

Thursday 26 June 2025

SESSION 8: MULTIMODAL COMPUTATIONAL MICROSCOPY

26 June 2025 • 8:10 - 10:00 | ICM Saal 12a

Session Chair(s): **Edmund Y. Lam**, The Univ. of Hong Kong (Hong Kong, China); **Björn Kemper**, Universitätsklinikum Münster (Germany)

13570-32 • 8:10 - 8:30

Self-supervised defocus blur kernel estimation with symmetry and smoothness constraints

Author(s): **Yunfei Tian**, **Yunping Zhang**, **Yuxing Li**, **Shuo Zhu, Edmund Y. Lam,** The Univ. of Hong Kong (Hong Kong, China)

13570-33 • 8:30 - 8:50

Enhancing gradient optical diffraction tomography with deep learning for missing amplitude estimation

Author(s): **Julianna Winnik**, **Aleksandra Parys**, **Piotr Zdańkowski**, **Maria Cywińska, Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13570-34 • 8:50 - 9:10

Dynamic characterization of MEMS-SPM in liquid for biomechanical phenotyping using fiber interferometry

Author(s): **Zhi Li,** Physikalisch-Technische Bundesanstalt (Germany); **Lakshmishri Jayachandran Menon,** Leibniz Univ. Hannover (Germany); **Sai Gao**, **Uwe Brand,** Physikalisch-Technische Bundesanstalt (Germany); **Karla Hiller, Susann Hahn,** Technische Univ. Chemnitz (Germany)

13570-35 • 9:10 - 9:30

Artificial neural network supported multimodal analysis of living cells using simultaneous bright field and off-axis digital holographic microscopy

Author(s): **José Ángel Picazo Bueno**, **Álvaro Barroso**, **Steffi Ketelhut**, **Jürgen Schnekenburger, Björn Kemper,** Universitätsklinikum Münster (Germany)

13570-75 • 9:30 - 10:00

Computational phase imaging for label-free 3D microscopy: non-interferometric phase retrieval and intensity diffraction tomography *(Invited Paper)*

Author(s): **Chao Zuo,** Nanjing Univ. of Science and Technology (China)

Coffee Break 10:00 - 10:30

SESSION 9: NONDESTRUCTIVE TESTING

26 June 2025 • 10:30 - 12:10 | ICM Saal 12a

Session Chair(s): **Mikael Sjödahl**, Luleå Univ. of Technology (Sweden); **Vito Renò**, Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

NOTE:
Session 9, Nondestructive Testing (ICM Saal 12a), runs concurrently with Session 10, Joint Session 2 Multimodal Quantitative Phase Bioimaging II (Hall B1-LEVEL 2, Room B13)

13570-36 • 10:30 - 10:50

Model updating of structures with uncertain multiple parameters: from traditional trial-and-error approaches to autonomous intelligent agents *(Invited Paper)*

Author(s): **Sergio Ruggieri**, **Gianluca Bruno**, **Fabio Parisi, Giuseppina Uva,** Politecnico di Bari (Italy)

13570-37 • 10:50 - 11:10

Fizeau type polarization electronic speckle pattern interferometry for deformation studies

Author(s): **Violeta Madjarova**, **Elena Stoykova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria), National Ctr. of Mechatronics and Clean Technologies (Bulgaria); **Maryam Viqar**, **Ginka Ivanova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria); **Nataliya Berberova-Buhova,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria), Univ. of Chemical Technology and Metallurgy (Bulgaria); **Kihong Choi**, **Keehoon Hong,** Electronics and Telecommunications Research Institute (Korea, Republic of); **Branimir Ivanov,** Institute of Optical Materials and Technologies "Acad. Jordan Malinowski" (Bulgaria)

13570-38 • 11:10 - 11:30

Shearographic and thermographic non-destructive testing of composite materials using embedded carbon nanotube (CNT) strips as heaters

Author(s): **Nan Tao,** Technische Univ. Delft (Netherlands); **Kamil Dydek**, **Michał Misiak,** Warsaw Univ. of Technology (Poland); **Andrei G. Anisimov**, **Otto Bergsma, Roger M. Groves,** Technische Univ. Delft (Netherlands)

13570-39 • 11:30 - 11:50

Addressing scanning and imaging distortions in decryption of secured computer-generated holograms using convolutional neural networks

Author(s): **Mostafa Agour,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Zakaria E. Ahmed**, **Rania M. Abdelazeem,** National Institute of Laser Enhanced Sciences (Egypt); **Yasser A. Attia,** Cairo Univ. (Egypt); **Tawfik Khattab,** National Research Ctr. (Egypt); **Claas Falldorf, Ralf B. Bergmann,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

13570-40 • 11:50 - 12:10

Full-aperture reflective remote Fourier ptychography with sample match

Author(s): **Dayong Wang**, **Jiahao Meng**, **Jie Zhao, Yunxin Wang,** Beijing Univ. of Technology (China)

Lunch Break 12:10 - 13:30

SESSION 10: JOINT SESSION: MULTIMODAL QUANTITATIVE PHASE BIOIMAGING II

26 June 2025 • 10:30 - 12:20 | Hall B1-LEVEL 2, Room B13

Session Chair(s): **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

Joint Session between Multimodal Sensing and Artificial Intelligence for Sustainable Future Conf. 13570 and Optical Methods for Inspection, Characterization, and Imaging of Biomaterials Conf. 13571.

NOTE:
Session 10, Joint Session 2 Multimodal Quantitative Phase Bioimaging II (Hall B1-LEVEL 2, Room B13) runs concurrently with Session 9, Nondestructive Testing, (ICM, Saal 12a)

13570-41 • 10:30 - 11:00

A high-resolution digital holographic microscope for space flight *(Invited Paper)*

Author(s): **Jay L. Nadeau**, **Nikki Johnston**, **Andrew Greenberg,** Portland State Univ. (United States); **Max Riekeles,** Technische Univ. Berlin (Germany); **Ernest Thomas**, **Daniel Sillivant,** Teledyne Brown Engineering (United States); **Carlos Sahagun,** GeoControl Systems (United States); **Chris Lindensmith,** Caltech (United States)

13570-42 • 11:00 - 11:20
High content in vitro nanotoxicity assessment with enhanced throughput utilizing automated multimodal digital holographic microscopy
Author(s): **Anne Marzi,** Univ. Münster (Germany); **Álvaro Barroso**, **Jürgen Schnekenburger, Björn Kemper,** Universitätsklinikum Münster (Germany)

13571-48 • 11:20 - 11:40
Label-free intracellular multispecificity in bioengineered yeast cells enables characterization of biolensing effects by holotomographic flow cytometry
Author(s): **Daniele Pirone,** ISASI CNR (Italy); **Massimo D'Agostino,** Univ. degli Studi di Napoli Federico II (Italy); **Matteo Lombini**, **Fausto Cortecchia**, **Emiliano Diolaiti,** INAF - Osservatorio di Astrofisica e Scienza dello Spazio (Italy); **Giuseppe Mongelluzzo,** INAF - Osservatorio Astronomico di Capodimonte (Italy); **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Nicola Mosca**, **Maria di Summa,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Tommaso Russo,** Univ. degli Studi di Napoli Federico II (Italy); **Ettore Stella,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Vittorio Bianco**, **Lisa Miccio**, **Pasquale Memmolo, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-49 • 11:40 - 12:00
Dual wavelength interferometry application to evaluate shapes for corneas and intraocular lens
Author(s): **Nieves Andrés,** Univ. de Zaragoza (Spain); **Martina Puyuelo,** AJL Ophthalmic S.A. (Spain); **Ana M. López Torres**, **Francisco José Torcal-Milla**, **Virginia Palero-Díaz, Julia Lobera,** Univ. de Zaragoza (Spain)

13570-43 • 12:00 - 12:20
Towards an explainable automatic phenotypic characterization of hereditary anemias
Author(s): **Cosimo Ieracitano,** Univ. Mediterranea di Reggio Calabria (Italy); **Roberta Russo**, **Immacolata Andolfo**, **Anthony Iscaro**, **Antonella Nostroso,** Univ. degli Studi di Napoli Federico II (Italy); **Lisa Miccio**, **Vittorio Bianco**, **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Muhammad Suffian**, **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy)

Lunch Break 12:20 - 13:30

SESSION 11: ARTIFICIAL INTELLIGENCE FOR NONDESTRUCTIVE SENSING: MEMORIAL SESSION IN HONOR OF DR. ETTORE STELLA

26 June 2025 • 13:30 - 15:30 | ICM Saal 12a
Session Chair(s): **Nicola Mosca**, Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Vittorio Bianco**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

Memorial Session in Honor of Dr. Ettore Stella
National Research Council (CNR, Italy)
2019-2023 Multimodal Sensing and Artificial Intelligence Conference Chair

This session is dedicated to the career and memory of Dr. Ettore Stella, Director of Research at National Research Council (CNR) and the Founding Chair of the Multimodal Sensing and Artificial Intelligence Conference.

13:30 to 13:35
Opening Remarks
Pietro Ferraro
Institute of Applied Sciences and Intelligent Systems (ISASI-CNR) (Italy)

13570-44 • 13:35 - 14:10
Ultraprecision polishing asphere and freeform optics using robot-based CCOS and MRF (Keynote Presentation)
Author(s): **Xuejun Zhang,** Chinese Academy of Sciences (China)

13570-45 • 14:10 - 14:30
Lensless sideways imaging with digital holography for in-line process monitoring in additive manufacturing
Author(s): **Beñat Gutiérrez-Cañas Pazos**, **Claas Falldorf,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Ralf B. Bergmann,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany), Univ. Bremen (Germany)

13570-46 • 14:30 - 14:50
Enhancing railway infrastructure monitoring using hybrid VTOL drones: a case study on inspection and surveillance using custom YOLOv12 object detector
Author(s): **Angelo Cardellicchio,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Leonardo Faccini,** Politecnico di Milano (Italy); **Massimiliano Nitti**, **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Davide Tarsitano, Emanuele Zappa,** Politecnico di Milano (Italy)

13570-47 • 14:50 - 15:10
Skeleton-based human action recognition for manufacturing in assembly task by deep learning
Author(s): **Cosimo Patruno**, **Laura Romeo**, **Annaclaudia Bono**, **Tiziana D'Orazio, Grazia Cicirelli,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy)

13570-48 • 15:10 - 15:30
Structured illumination microscopy for 3D shape and deformation measurement
Author(s): **Peng Gao,** Xidian Univ. (China); **Dan Dan,** Xi'an Institute of Optics and Precision Mechanics (China)

Coffee Break 15:30 - 16:00

SESSION 12: MULTIMODAL SENSING FOR INDUSTRIAL APPLICATIONS

26 June 2025 • 16:00 - 17:50 | ICM Saal 12a
Session Chair(s): **Vito Renò**, Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Lisa Miccio**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-49 • 16:00 - 16:30
Physical model-based AI for industrial inspection from optical far field measurements *(Invited Paper)*
Author(s): **George Barbastathis**, **Yi Wei**, **Nischita Kaza**, **Difei Zhang**, **Yaocheng Tian**, **Ajinkya Pandit**, **Shashank V. Muddu,** Massachusetts Institute of Technology (United States); **Neda Nazemifard**, **Wenlong Tang**, **Charles Papageorgiou,** Takeda Pharmaceuticals International, Inc. (United States); **Richard D. Braatz, Allan S. Myerson,** Massachusetts Institute of Technology (United States)

13570-53 • 16:30 - 16:50
A decision support system for damage identification in RC bridges using deep neural networks
Author(s): **Sergio Ruggieri,** Politecnico di Bari (Italy); **Angelo Cardellicchio,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Andrea Nettis,** Politecnico di Bari (Italy); **Vito Renò,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato (Italy); **Giuseppina Uva,** Politecnico di Bari (Italy)

13570-50 • 16:50 - 17:10
A deep learning-based brain computer interface for eye movement decoding using QVAR sensors
Author(s): **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Vincenzo Mazzullo,** STMicroelectronics (Italy); **Cosimo Ieracitano,** Univ. Mediterranea di Reggio Calabria (Italy); **Arcangelo Bruna**, **Valeria Tomaselli,** STMicroelectronics (Italy); **Marcel Musuamba Mukandila**, **Massimo Merenda, Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy)

13570-51 • 17:10 - 17:30
Multimodal characterization of fasteners enables quantitative modeling and evaluation
Author(s): **Rufei Zou**, **Chen Cui,** Institute of Optical Devices and Applications (China); **Yuexiang Peng, Tianlong Man,** Beijing Univ. of Technology (China)

13570-52 • 17:30 - 17:50
Phase extraction and denoising through deep learning-based interference pattern analysis
Author(s): **Yannis Vezakis,** Tecreando B.V. (Netherlands); **Michalis Andrianakis, Vivi Tornari,** Foundation for Research and Technology-Hellas (Greece)

CONFERENCE 13571

Optical Methods for Inspection, Characterization, and Imaging of Biomaterials VII

23 - 26 June 2025 | Hall B1-LEVEL 2, Room B13

Conference Chair(s): **Pietro Ferraro**, **Simonetta Grilli,** Institute of Applied Sciences and Intelligent Systems (ISASI-CNR) (Italy); **Demetri Psaltis,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Andreas E. Vasdekis,** Univ. of Idaho (United States)

Program Committee: **Sophie Brasselet,** Institut Fresnel (France); **Mercedes Carrascosa Rico,** Univ. Autónoma de Madrid (Spain); **Giuseppe Chirico,** Univ. degli Studi di Milano-Bicocca (Italy); **Gabriella Cincotti,** Univ. degli Studi di Roma Tre (Italy); **Jürgen W. Czarske,** TU Dresden (Germany); **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy); **Frank Dubois,** Univ. Libre de Bruxelles (Belgium); **David C. Duffy,** Quanterix Corp. (United States); **Wolfgang A. Ertmer,** Leibniz Univ. Hannover (Germany); **Jochen R. Guck,** Technische Univ. Dresden (Germany); **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti (ISASI-CNR) (Italy); **Fernando Mendoza Santoyo,** Ctr. de Investigaciones en Óptica, A.C. (Mexico); **Lisa Miccio,** Institute of Applied Sciences and Intelligent Systems (ISASI-CNR) (Italy); **Serge Monneret,** Institut Fresnel (France); **Heidi Ottevaere,** Vrije Univ. Brussel (Belgium); **Natan Tzvi Shaked,** Tel Aviv Univ. (Israel); **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Zeev Zalevsky,** Bar-Ilan Univ. (Israel); **Yao Zhang,** Jinan Univ. (China); **Guoan Zheng,** Univ. of Connecticut (United States)

Monday 23 June 2025

SESSION 1: IMAGING AND CHARACTERIZATION IN BIOLOGY

23 June 2025 • 8:40 - 10:00 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Simonetta Grilli**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-24 • 8:40 - 9:00
Exploring backscattered light microscopy for visualizing fiber network organization in intact biological tissues
Author(s): **Loes Ettema,** Technische Univ. Delft (Netherlands); **Hamed Abbasi,** Technische Univ. Delft (Netherlands), Erasmus MC (Netherlands); **Miriam Menzel,** Technische Univ. Delft (Netherlands)

13571-2 • 9:00 - 9:20
In-situ 3D monitoring of artificial collagen membranes during pneumatic stimulation
Author(s): **Jonas Golde**, **Antonia Starcke**, **Yvo Schöps**, **Stephan Becker**, **Stephan Behrens**, **Florian Schmieder, Frank Sonntag,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany)

13571-3 • 9:20 - 9:40
Design and implementation of a dual-mode single-pixel microscope for biological imaging using both visible and IR light
Author(s): **Heberley Tobón Maya**, **Samuel Ignacio Zapata-Valencia**, **Luis Ordóñez Angamarca**, **Enrique Tajahuerce, Jesús Lancis,** Univ. Jaume I (Spain)

13571-4 • 9:40 - 10:00
Spectral and spatial performance metrics for effective terahertz spectroscopic imaging
Author(s): **Alexis N. Guidi, Jonathan F. Holzman,** The Univ. of British Columbia (Canada)

Coffee Break 10:00 - 10:20

SESSION 2: OPTICAL METHODS FOR CLINICAL APPLICATIONS

23 June 2025 • 10:20 - 12:20 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Jakob Dremel**, TU Dresden (Germany); **Robert Wendland**, TU Dresden (Germany)

13571-95 • 10:20 - 10:50
AI-driven holography: neuronal microscopy for live-cell biological insights *(Invited Paper)*
Author(s): **Chiara Paviolo,** CEA-LETI (France)

13571-5 • 10:50 - 11:10
Lensless digital holography for imaging highly scattering samples
Author(s): **Emilia Wdowiak**, **Piotr Zdankowski**, **Michal Józwik, Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13571-7 • 11:10 - 11:30
Low-coherence digital inline sideband holography for flow characterization in a blood vessel model
Author(s): **Cristina Errea**, **Francisco José Torcal-Milla, Julia Lobera,** Instituto de Investigación en Ingeniería de Aragón, Univ. de Zaragoza (Spain)

13571-8 • 11:30 - 11:50
Polymeric microneedles for photothermal therapy
Author(s): **Sara Coppola**, **Anna Palma,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Concetta Di Natale,** Univ. degli Studi di Napoli Federico II (Italy); **Veronica Vespini**, **Simonetta Grilli, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-9 • 11:50 - 12:20
A pyroelectric-based approach for high-sensitive detection of stress-related biomarkers *(Invited Paper)*
Author(s): **Concetta Di Natale**, **Stefania Carbone,** Univ. degli Studi di Napoli Federico II (Italy); **Sara Coppola**, **Veronica Vespini,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Volodymyr Tkachenko**, **Giuseppina Luciani**, **Giuseppe Vitiello,** Univ. degli Studi di Napoli Federico II (Italy); **Pietro Ferraro**, **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Francesca Ferranti, Silvia Mari,** Agenzia Spaziale Italiana (Italy)

Lunch Break 12:20 - 13:20

SESSION 3: ADVANCED MICROSCOPY I

23 June 2025 • 13:20 - 15:35 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-94 • 13:20 - 13:55
How phase-only spatial light modulators can help with optical imaging (Keynote Presentation)
Author(s): **Joseph (Yossi) Rosen**, **Jawahar P Desai,** Ben-Gurion Univ. of the Negev (Israel); **Vijayakumar Anand,** Institute of Physics, University of Tartu (Estonia)

13571-10 • 13:55 - 14:25
Techniques for enhancing optical manipulation and characterization of individual colloidal micro and nanoparticles *(Invited Paper)*
Author(s): **José A. Rodrigo, Tatiana Alieva,** Univ. Complutense de Madrid (Spain)

13571-11 • 14:25 - 14:45
Adaptive phase shifting digital holography in continuous line scanning mode for wide-area tissue imaging and flow cytometry
Author(s): **Vittorio Bianco**, **Zhe Wang,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Valentina Brancato**, **Giovanni Smaldone,** Synlab Italia srl (Italy); **Massimiliano d'Aiuto,** Villa Fiorita Aversa S.p.A. (Italy); **Gennaro Mossetti,** Casa di cura Maria Rosaria SPA (Italy); **Marco Salvatore,** Synlab Italia srl (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Lisa Miccio, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-13 • 14:45 - 15:05
Lateral shearing digital holographic microscopy with incoherent illumination
Author(s): **Jaromír Běhal, Miroslav Ježek,** Palacký Univ. Olomouc (Czech Republic)

13571-14 • 15:05 - 15:35
Label-free imaging in live cells at the nanoscale with advanced confocal interferometric scattering microscopy (C-iSCAT) *(Invited Paper)*
Author(s): **Michelle Kueppers, William E. Moerner,** Stanford Univ. (United States)

Coffee Break 15:35 - 16:00

OPTICAL METROLOGY PLENARY SESSION

23 June 2025 • 16:00 - 17:40 | ICM, Saal 1
16:00 to 16:10 hrs
Welcome Address and Plenary Speaker Introduction

Jörg Seewig, Technische Univ. Kaiserslautern (Germany)
Piero Ferraro, CNR, Institute of Applied Sciences & Intelligent Systems (ISASI) (Italy)
2025 Symposium Chairs

13567-500 • 16:10 - 16:55
The wide scale range of optical measurement technology and its exploration (Plenary Presentation)
Author(s): **Wolfgang Osten,** Univ. Stuttgart (Germany)

13571-600 • 16:55 - 17:40
The intelligent microscope at the nanoscale: multimodal microscopy from fluorescence to label-free (Plenary Presentation)
Author(s): **Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy)

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1
This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:30

SESSION 4: QPM AND TOMOGRAPHY I

24 June 2025 • 10:30 - 12:20 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-15 • 10:30 - 11:00
Computational scattering correction in optical diffraction tomography for observing multiple scattering biological specimens
(Invited Paper)
Author(s): **Osamu Yasuhiko, Kozo Takeuchi,** Hamamatsu Photonics K.K. (Japan)

13571-16 • 11:00 - 11:20
Single cell nanoparticle uptake analysis by holotomography and fluorescence microscopy
Author(s): **Esther Teitge**, **Anne Marzi**, **Álvaro Barroso**, **Jürgen Schnekenburger, Björn Kemper,** Univ. Münster (Germany)

13571-17 • 11:20 - 11:40
A self-reference approach for optical diffraction tomography
Author(s): **Zhengyuan Tang,** National Univ. of Ireland, Maynooth (Ireland); **Julianna Winnik,** Institute of Micromechanics and Photonics, Warsaw Univ. of Technology (Poland); **Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland)

13571-18 • 11:40 - 12:00
Computational intracellular specificity enabled by stain-free holographic tomography in flow cytometry
Author(s): **Pasquale Memmolo**, **Daniele Pirone**, **Giusy Giugliano**, **Francesca Borrelli**, **Marika Valentino**, **Vittorio Bianco**, **Lisa Miccio, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-19 • 12:00 - 12:20
High-performance quantitative phase imaging via illumination modulation in Zernike phase contrast microscopy
Author(s): **Yefeng Shu**, **Chao Zuo, Jiasong Sun,** Nanjing Univ. of Science and Technology (China)

Lunch Break 12:20 - 13:20

SESSION 5: SUPER-RESOLUTION TECHNIQUES

24 June 2025 • 13:20 - 15:40 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Maddalena Collini**, Univ. degli Studi di Milano-Bicocca (Italy); **Giuseppe Giberto Chirico**, Univ. degli Studi di Milano-Bicocca (Italy)

13571-20 • 13:20 - 13:50
ISM with SPAD array detector for enhanced information content *(Invited Paper)*
Author(s): **Alessandro Zunino,** Istituto Italiano di Tecnologia (Italy)

13571-21 • 13:50 - 14:20
Temporal resolution of SPAD arrays enhances ISM: two-color SOFISM with fluorescent dyes *(Invited Paper)*
Author(s): **Radek Lapkiewicz,** Univ. of Warsaw (Poland)

13571-22 • 14:20 - 14:40
Aberration-corrected high-throughput transport-of-intensity quantitative phase imaging
Author(s): **Linpeng Lu**, **Shun Zhou**, **Jiasong Sun, Chao Zuo,** Nanjing Univ. of Science and Technology (China)

13571-23 • 14:40 - 15:00
Superresolution phase imaging through the transport of intensity equation
Author(s): **José Ángel Picazo Bueno**, **Luis Granero-Montagud**, **Martin Sanz Sabater**, **Javier García Monreal, Vicente Micó,** Univ. de València (Spain)

13571-25 • 15:00 - 15:20
Characterizing spectral peaks with deep-learning auto encoders
Author(s): **Timothy McNamara, Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland)

13571-6 • 15:20 - 15:40
Optical measurement of cardiac parameters based on the iso-path-length point
Author(s): **Michal Katan**, **Hamootal Duadi, Dror Fixler,** Bar-Ilan Univ. (Israel)

Coffee Break 15:40 - 16:10

SESSION 6: AI-POWERED MICROSCOPY

24 June 2025 • 16:10 - 18:10 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Pasquale Memmolo**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-26 • 16:10 - 16:30
Real-time complex amplitude retrieval in Fourier ptychographic microscopy using dual-channel input GAN
Author(s): **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pierpaolo Fiore**, **Francesco Bardozzo,** Univ. degli Studi di Salerno (Italy); **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Valentina Brancato**, **Giovanni Smaldone**, **Marcello Gambacorta**, **Marco Salvatore,** IRCCS, SYNLAB SDN Srl (Italy); **Lisa Miccio**, **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Roberto Tagliaferri,** Univ. degli Studi di Salerno (Italy); **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-27 • 16:30 - 16:50
Label-free white blood cell analysis using holographic phase imaging flow cytometry
Author(s): **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi della Campania Luigi Vanvitelli (Italy); **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Jaromir Behal,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Palacký Univ. Olomouc (Czech Republic); **Zhe Wang,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Vincenza Cerbone,** CEINGE-Biotecnologie Avanzate (Italy); **Martina Mugnano,** Univ. degli Studi di Napoli Federico II (Italy); **Fabrizio Licitra,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Annalaura Montella,** CEINGE-Biotecnologie Avanzate (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Giulia Scalia,** CEINGE-Biotecnologie Avanzate (Italy); **Mario Capasso,** CEINGE-Biotecnologie Avanzate (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Achille Iolascon,** CEINGE-Biotecnologie Avanzate (Italy); **Silvia Mari**, **Francesca Ferranti,** Agenzia Spaziale Italiana (Italy); **Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Pasquale Memmolo**, **Lisa Miccio, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-28 • 16:50 - 17:10
Automated Raman cytology with pix2pix GANs for virtual staining of cell nuclei
Author(s): **Syed Baryalay, Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland)

13571-29 • 17:10 - 17:30
Human peripheral blood mononuclear cell scattering database
Author(s): **David Dannhauser**, **Paolo Antonio Netti, Filippo Causa,** Univ. degli Studi di Napoli Federico II (Italy)

13571-30 • 17:30 - 17:50
Label-free cell death assessment using digital holographic microscopy by integrating CNNs and vision transformers
Author(s): **Harshal Chaudhari**, **Rishikesh Kulkarni, Manas Bhuyan,** Indian Institute of Technology Guwahati (India)

13571-31 • 17:50 - 18:10
Early detection of urothelial carcinoma allowed by AI-based digital holographic flow cytometry
Author(s): **Jie Yang**, **Xiao Xi**, **Ran Peng,** Peking Univ. Third Hospital (China); **Feng Pan,** Beihang Univ. (China); **Xuemin Li**, **Ruiping Guo**, **Luqi Wang,** Peking Univ. Third Hospital (China); **Sara Coppola,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Hao Wang,** Peking Univ. Third Hospital (China)

Wednesday 25 June 2025

SESSION 7: JOINT SESSION: COST ACTION, UNDERSTANDING INTERACTION LIGHT-BIOLOGICAL SURFACES (PHOBIOS) I

25 June 2025 • 8:10 - 10:10 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Virgil-Florin Duma**, Univ. Politehnica Timisoara (Romania); **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-32 • 8:10 - 8:40
Microstructured imaging windows for live histology *(Invited Paper)*
Author(s): **Giuseppe G. Chirico**, **Mario Marini**, **Davide Panzeri**, **Laura Sironi**, **Maddalena Collini**, **Margaux Bouzin**, **Laura D'Alfonso,** Univ. degli Studi di Milano-Bicocca (Italy); **Donato Inverso,** Univ. Vita-Salute San Raffaele (Italy); **Manuela T. Raimondi**, **Claudio Conci,** Politecnico di Milano (Italy); **Alessandra Nardini,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy), Univ. del Salento (Italy); **Emanuela Jacchetti**, **Behjat S. Kariman,** Politecnico di Milano (Italy); **Giulio N. F. Cerullo,** Politecnico di Milano (Italy), Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Roberto Osellame,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy); **Nikos Kehagias,** Institute of Nanoscience and Nanotechnology (Greece); **Rebeca Martínez-Vázquez,** Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche (Italy)

13571-33 • 8:40 - 9:10
Photonic integrated light sources for sensing and spectroscopy at 2-3 µm *(Invited Paper)*
Author(s): **Mircea Guina, Jukka Viheriälä,** Tampere Univ. (Finland)

13571-34 • 9:10 - 9:40
Learning from nature: how correlated multimodal imaging enhances our understanding of light-biological surface interactions *(Invited Paper)*
Author(s): **Dror Fixler,** Bar-Ilan Univ. (Israel)

13571-35 • 9:40 - 10:10
Lithium niobate as functional substrate for living cells handling *(Invited Paper)*
Author(s): **Lisa Miccio**, **Francesca Borrelli**, **Marika Valentino**, **Pasquale Memmolo**, **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

Coffee Break 10:10 - 10:40

SESSION 8: JOINT SESSION: COST ACTION, UNDERSTANDING INTERACTION LIGHT-BIOLOGICAL SURFACES (PHOBIOS) II

25 June 2025 • 10:40 - 11:40 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Virgil-Florin Duma**, Univ. Politehnica Timisoara (Romania); **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-36 • 10:40 - 11:10
Dynamic surfaces to guide cell behavior and fate decisions *(Invited Paper)*
Author(s): **David Dannhauser,** Univ. degli Studi di Napoli Federico II (Italy); **Francesca Mauro,** Istituto Italiano di Tecnologia (Italy); **Paolo Antonio Netti,** Univ. degli Studi di Napoli Federico II (Italy), Istituto Italiano di Tecnologia (Italy)

13571-37 • 11:10 - 11:40
Bioinspired nanocoatings: self-assembly and photonic properties of insect corneal structures *(Invited Paper)*
Author(s): **Mikhail Kryuchkov, Vladimir Katanaev,** Univ. de Genève (Switzerland)

Lunch Break 11:40 - 12:30

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:30 | ICM, Hall B0

Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13571-59 • 12:30 - 13:30

Multimodal phase imaging reveals the distinct layers of retina and enables lesion detection

Author(s): **Xiang Chen,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Nanjing Normal Univ. (China); **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Vittorio Bianco**, **Sara Coppola,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Yuyi Han,** The Affiliated Hospital of Jiangnan Univ. (China); **Caojin Yuan,** Nanjing Normal Univ. (China); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-60 • 12:30 - 13:30

Spatiotemporal reassembly of holographic interference fringes allows three-dimensional rapid cell-tracking

Author(s): **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Vittorio Bianco**, **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Zhengzhong Huang,** Tsinghua Univ. (China); **Lisa Miccio**, **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Liangcai Cao,** Tsinghua Univ. (China); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-61 • 12:30 - 13:30

Polarization-sensitive digital holography for quality control of textile fibers

Author(s): **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Jaromír Běhal,** Palacký Univ. Olomouc (Czech Republic); **Cinzia Tonetti**, **Riccardo Andrea Carletto,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Ettore Stella,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Lisa Miccio**, **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-62 • 12:30 - 13:30

Holographic imaging flow cytometry for radiation response assessment in lymphocytes

Author(s): **Daniele Pirone,** ISASI CNR (Italy); **Rocco Mottareale,** Univ. degli Studi di Napoli Federico II (Italy); **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Chiara de Vita**, **Giuseppe La Verde,** Univ. degli Studi di Napoli Federico II (Italy); **Jaromir Behal,** Palacký University (Czech Republic); **Cecilia Arrichiello**, **Paolo Muto,** Istituto Nazionale Tumori IRCCS "Fondazione G. Pascale" (Italy); **Ivana Kurelac,** Univ. degli Studi di Bologna (Italy); **Laura Bagnale**, **Mario Medugno**, **Pasquale Memmolo**, **Vittorio Bianco**, **Lisa Miccio,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone**, **Marco Durante,** Univ. degli Studi di Napoli Federico II (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Mariagabriella Pugliese,** Univ. degli Studi di Napoli Federico II (Italy)

13571-63 • 12:30 - 13:30

Holotomographic flow cytometry for label-free imaging of 3D cell clusters

Author(s): **Daniele Pirone**, **Giusy Giugliano**, **Fabrizio Licitra**, **Vittorio Bianco**, **Lisa Miccio**, **Pasquale Memmolo, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-64 • 12:30 - 13:30

Holographic characterization embedded in closed-loop functionalization process of polymeric membranes

Author(s): **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Anna Palma,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Concetta Di Natale,** Univ. degli Studi di Napoli Federico II (Italy); **Vincenzo Ferraro,** Univ. degli Studi di Parma (Italy); **Veronica Vespini,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Francesca Ferranti**, **Silvia Mari,** Agenzia Spaziale Italiana (Italy); **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Sara Coppola,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-65 • 12:30 - 13:30

Pyro-electrohydrodynamic jet printing of gold nanoparticles for label-free protein analysis

Author(s): **Veronica Vespini**, **Sara Coppola**, **Volodymyr Tkachenko**, **Anna Palma**, **Pietro Ferraro**, **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pellegrino Musto, Marianna Pannico,** Istituto per i Polimeri, Compositi e Biomateriali, Consiglio Nazionale delle Ricerche (Italy)

13571-66 • 12:30 - 13:30
Label-free holographic microscopy of red blood cells to identify hereditary anaemias
Author(s): **Maria Pia Pierro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi della Campania Luigi Vanvitelli (Italy); **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Zhe Wang,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy), Univ. degli Studi di Napoli Federico II (Italy); **Gennaro Giordano**, **Pasquale Memmolo**, **Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Anthony Iscaro**, **Antonella Nostroso**, **Immacolata Andolfo**, **Roberta Russo,** Univ. degli Studi di Napoli Federico II (Italy), CEINGE-Biotecnologie Avanzate (Italy); **Cosimo Ieracitano**, **Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy); **Pietro Ferraro, Lisa Miccio,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-67 • 12:30 - 13:30
Au-NP functionalized oolymeric thin film for highly-sensitive biomolecule detection
Author(s): **Concetta Di Natale**, **Simone Russo,** Univ. degli Studi di Napoli Federico II (Italy); **Fabiana Graziano**, **Sara Coppola**, **Veronica Vespini,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Giuseppina Luciani**, **Giuseppe Vitiello**, **Lorenzo Lombardi,** Univ. degli Studi di Napoli Federico II (Italy); **Francesca Ferranti,** Agenzia Spaziale Italiana (Italy); **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Pietro Ferraro**, **Anna Palma,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy)

13571-68 • 12:30 - 13:30
Pyro-electrodynamic platform for additive manufacturing of soft matter
Author(s): **Sara Coppola**, **Anna Palma**, **Zhe Wang**, **Veronica Vespini, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-70 • 12:30 - 13:30
Computational scattered light imaging of 3D-nanofabricated fiber models for an enhanced reconstruction of fiber 3D-orientations and diameters in biological tissues
Author(s): **Mark Vermeulen**, **Pieter van Altena**, **Simon van Staalduine**, **Angelo Accardo, Miriam Menzel,** Technische Univ. Delft (Netherlands)

13571-71 • 12:30 - 13:30
Common path off-axis digital holographic flow cytometry based on lateral shearing using beam splitter
Author(s): **Harshal Chaudhari,** Indian Institute of Technology Guwahati (India); **Arnab Das,** Univ. of Calcutta (India); **Harsh Singh**, **Anik Ghosh**, **Rishikesh Kulkarni**, **Manas Bhuyan, Rajkumar Thummer,** Indian Institute of Technology Guwahati (India)

13571-72 • 12:30 - 13:30
Biomedical adaptive optics: advanced technique for intraocular lens assessment
Author(s): **Rania M. Abdelazeem,** The National Institute of Laser Enhanced Sciences, Cairo Univ. (Egypt); **Mostafa Agour,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

13571-73 • 12:30 - 13:30
TMEnet: a lightweight CNN model for ovarian tumor microenvironment understanding using holographic imaging flow cytometry
Author(s): **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Beatrice Cavina,** Univ. degli Studi di Bologna (Italy); **Giusy Giugliano**, **Michela Schiavo**, **Lisa Miccio**, **Vittorio Bianco,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Francesca Nanetti,** Univ. degli Studi di Bologna (Italy); **Francesca Reggiani,** Azienda Unità Sanitaria Locale, IRCCS di Reggio Emilia (Italy); **Giuseppe Gasparre**, **Ivana Kurelac,** Univ. degli Studi di Bologna (Italy); **Pietro Ferraro, Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-74 • 12:30 - 13:30
Unlocking biomolecular insights with Raman spectroscopy in mesoporous materials
Author(s): **Roman A. Zakoldaev,** UiT The Arctic Univ. of Norway (Norway); **Marko Ristic,** Science for Health (Germany); **James Gates,** Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom)

13571-75 • 12:30 - 13:30
Frequency analysis and cytotoxicity of PDMS for artificial cornea synthesis
Author(s): **Sonia Hernandez-Mota**, **Daniela K. Reyes-Rivera**, **Angel S. Cruz-Félix**, **Teresita Spezzia-Mazzocco**, **Alejandro Landa-Landa, Eduardo Tepichin-Rodriguez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

13571-76 • 12:30 - 13:30
Measurement of the refractive index of potentially biocompatible polymers for applications in vision physics: keratoprosthesis manufacturing
Author(s): **Daniela K. Reyes-Rivera**, **Sonia Hernandez-Mota**, **Angel S. Cruz-Félix**, **Alejandro Landa-Landa, Eduardo Tepichin-Rodriguez,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

13571-77 • 12:30 - 13:30
Holographic phase retrieval enhanced by accelerate Fourier neural networks with physics-driven model
Author(s): **Huifeng Zhu,** Nanjing Normal Univ. (China); **Xiang Chen,** Nanjing Normal Univ. (China), Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Tianwei Ding**, **Xianjie Liu, Caojin Yuan,** Nanjing Normal Univ. (China)

13571-78 • 12:30 - 13:30
High-fidelity sparse-angle holographic tomography based on self-supervised synthesize strategy learning
Author(s): **Feng Pan**, **Yakun Liu, Wen Xiao,** Beihang Univ. (China)

13571-79 • 12:30 - 13:30
Self-supervised learning allows precise positioning of onion-like carbon nanoparticles in colorectal cancer cells
Author(s): **Ran Peng**, **Xiao Xi,** Peking Univ. Third Hospital (China); **Feng Pan,** Beihang Univ. (China); **Xuemin Li**, **Luqi Wang**, **Ruiping Guo**, **Jie Yang, Hao Wang,** Peking Univ. Third Hospital (China)

13571-80 • 12:30 - 13:30
Intelligent fluorescence microscopy
Author(s): **Zhenqian Han**, **Liying Qu**, **Jiahui Gui, Yuanyuan Huang,** Harbin Institute of Technology (China)

13571-81 • 12:30 - 13:30
SSIM-driven compression for single-pixel microscopy
Author(s): **Luis Ordóñez Angamarca**, **Erick Ipus Bados**, **Enrique Tajahuerce, Omel Mendoza Yero,** Univ. Jaume I (Spain)

13571-82 • 12:30 - 13:30
Virtual fluorescent staining of adherent biological cells using deep-learning
Author(s): **Syed Baryalay, Bryan M. Hennelly,** National Univ. of Ireland, Maynooth (Ireland)

13571-83 • 12:30 - 13:30
Calibration method for lensless holographic tomography
Author(s): **Julia Dudek**, **Mikołaj Rogalski**, **Emilia Wdowiak**, **Piotr Arcab**, **Julianna Winnik**, **Piotr Zdańkowski, Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13571-84 • 12:30 - 13:30
Spectroscopic analysis of the spectral penetration depth and absorption coefficients between 0.25 µm and 2.5 µm of the porcine myocardial and mitral valve tissue
Author(s): **Tobias Baselt,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); **Dyana Yasin**, **Daniel Ruf**, **David Gessner, Peter Hartmann,** Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany), Westsächsische Hochschule Zwickau (Germany)

13571-85 • 12:30 - 13:30
Lightweight CNN for 3D refractive index retrieval in holotomographic imaging flow cytometry
Author(s): **Francesca Borrelli**, **Jaromír Běhal**, **Vittorio Bianco**, **Lisa Miccio**, **Pasquale Memmolo, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-86 • 12:30 - 13:30
Thermal treatment of wood using capric acid-tallow mixture stable-form phase change material for thermal storage
Author(s): **Ahmet Can, İsmail Özlüsoylu,** Bartin Üniv. (Turkey)

13571-87 • 12:30 - 13:30
A comparison of different approaches in the failure identification of PCBs
Author(s): **Eduard-Sebastian Csukas,** Univ. Politehnica Timisoara (Romania), Continental Automotive Romania (Romania); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13571-88 • 12:30 - 13:30
Laser scanning spiral modalities: mathematical aspects
Author(s): **Attila Csillag, Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13571-89 • 12:30 - 13:30
Development of a platform for characterizing performances of handheld laser devices using image processing techniques
Author(s): **Emil Ionut Nita**, **Daniel Comeaga,** Univ. Politehnica din Bucuresti (Romania); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13571-90 • 12:30 - 13:30
Colorimetric assessments of automotive displays: approaching metamerisms by using the exact spectrophotometric method
Author(s): **Mihai-Alexandru Batrina,** Continental Automotive Romania (Romania); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13571-91 • 12:30 - 13:30
Optimizing biomedical imaging: ImageJ-based quantitative analysis for life sciences microscopy
Author(s): **Maria-Alexandra Duma,** Utrecht Univ. (Netherlands); **Anca Hermenean,** Univ. de Vest "Vasile Goldis" din Arad (Romania)

13571-92 • 12:30 - 13:30
PECVD-based deposition of anti-reflective thin films: optical and surface characterization
Author(s): **Mehmet Gürsoy,** Konya Technical Univ. (Turkey)

13571-93 • 12:30 - 13:30
HoLLoApp: efficient data processing application for lensless digital holographic microscopy
Author(s): **Bartosz Górski**, **Mikołaj Rogalski**, **Emilia Wdowiak**, **Piotr Arcab**, **Kamil Kalinowski, Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

SESSION 9: UNCONVENTIONAL IMAGING

25 June 2025 • 13:35 - 15:30 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Pasquale Memmolo**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-38 • 13:35 - 14:10
High-speed chemometric imaging with a broadband stimulated Raman microscope driven by a compact fiber laser (Keynote Presentation)
Author(s): **Francesco Crisafi**, **Eric Fantuzzi**, **Gabriele Di Noia,** Cambridge Raman Imaging S.r.l. (Italy); **Andrea C. Ferrari,** Univ. of Cambridge (United Kingdom); **Matteo Negro,** Cambridge Raman Imaging S.r.l. (Italy); **Giulio N. F. Cerullo,** Politecnico di Milano (Italy)

13571-39 • 14:10 - 14:30
Feature-domain phase retrieval for high-fidelity computational microscopy
Author(s): **Shuhe Zhang**, **Yunhui Gao**, **Haoyu Yue, Liangcai Cao,** Tsinghua Univ. (China)

13571-40 • 14:30 - 14:50
Combined fluorescence-Mueller matrix microscopy for the characterization of chiral structures organization
Author(s): **Nicolo Incardona**, **Michele Oneto,** Istituto Italiano di Tecnologia (Italy); **Marco Castello,** Genoa Instruments (Italy); **Paolo Bianchini, Alberto Diaspro,** Istituto Italiano di Tecnologia (Italy)

13571-42 • 14:50 - 15:10
Development of deformable nanophotonic crystal for application as active colour-change-based sensor and tunable reflectors
Author(s): **Arathy Krishna M., Prita Nair,** Shiv Nadar Univ. Chennai (India)

13571-1 • 15:10 - 15:30
Common-path optical feedback interferometry design of single-pixel imaging experiments
Author(s): **Maurizio Dabbicco,** Univ. degli Studi di Bari Aldo Moro (Italy); **Paolo Bardella**, **Lorenzo Columbo,** Politecnico di Torino (Italy); **Massimo Brambilla,** Politecnico di Bari (Italy); **Basak Ersoz,** Politecnico di Torino (Italy)

Coffee Break 15:30 - 16:00

SESSION 10: JOINT SESSION: MULTIMODAL QUANTITATIVE PHASE BIOIMAGING I

25 June 2025 • 16:00 - 18:00 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Björn Kemper**, Universitätsklinikum Münster (Germany); **Mostafa Agour**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

Joint Session between Multimodal Sensing and Artificial Intelligence for Sustainable Future Conf. 13570 and Optical Methods for Inspection, Characterization, and Imaging of Biomaterials Conf. 13571.

13570-28 • 16:00 - 16:30
Additive manufacturing powered by holography *(Invited Paper)*
Author(s): **Christophe Moser,** EPFL (Switzerland)

13570-29 • 16:30 - 16:50
A self-reference approach to synthetic aperture digital holographic microscopy
Author(s): **Bryan M. Hennelly, Zhengyuan Tang,** National Univ. of Ireland, Maynooth (Ireland)

13571-43 • 16:50 - 17:10
An electrohydrodynamic approach for the estimation of fluid viscosity
Author(s): **Volodymyr Tkachenko,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Cosimo Ieracitano,** Univ. Mediterranea di Reggio Calabria (Italy); **Daniele Tammaro,** Univ. degli Studi di Napoli Federico II (Italy); **Asieh Amousoltani Arani**, **Sara Coppola**, **Veronica Vespini**, **Simonetta Grilli,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy); **Stefania Carbone**, **Concetta Di Natale,** Univ. degli Studi di Napoli Federico II (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13570-30 • 17:10 - 17:40
Lensless holographic microscopy for 2D and 3D high-content label-free amplitude and phase bioimaging *(Invited Paper)*
Author(s): **Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13570-31 • 17:40 - 18:00
Non-interferometric phase imaging by speckle correlation
Author(s): **Mikael Sjödahl, Ronja Eriksson,** Luleå Univ. of Technology (Sweden)

Thursday 26 June 2025

SESSION 11: ADVANCED MICROSCOPY II

26 June 2025 • 8:30 - 10:00 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Björn Kemper**, Universitätsklinikum Münster (Germany)

13571-44 • 8:30 - 8:50
Cells resilience to graphene oxide nanoparticles: a multimodal study using digital holography and Fourier ptychography
Author(s): **Marika Valentino**, **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Jaromír Běhal,** Palacký Univ. Olomouc (Czech Republic); **Martina Mugnano,** Univ. degli Studi di Napoli Federico II (Italy); **Rachele Castaldo**, **Giuseppe Lama,** Istituto per i Polimeri, Compositi e Biomateriali, Consiglio Nazionale delle Ricerche (Italy); **Pasquale Memmolo**, **Lisa Miccio**, **Vittorio Bianco**, **Simonetta Grilli, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-45 • 8:50 - 9:10
Spiral phase filtering in digital inline holography for fluid velocimetry
Author(s): **Julia Lobera**, **Ana M. López Torres**, **Nieves Andrés**, **Francisco José Torcal-Milla**, **Eva María Roche, Virginia Palero-Díaz,** Univ. de Zaragoza (Spain)

13571-46 • 9:10 - 9:30
Dynamic quantitative monitoring of tissue optical clearing
Author(s): **Kamil Kalinowski,** Warsaw Univ. of Technology (Poland); **Anna Chwastowicz,** Medical Univ. of Warsaw (Poland), Nencki Institute of Experimental Biology (Poland); **Piotr Arcab**, **Mikołaj Rogalski**, **Weronika Szymska**, **Emilia Wdowiak**, **Julianna Winnik**, **Piotr Zdankowski**, **Michal Józwik,** Warsaw Univ. of Technology (Poland); **Pawel Matryba,** Medical Univ. of Warsaw (Poland), Nencki Institute of Experimental Biology (Poland), National Oncology Institute Maria Sklodowska-Curie - National Research Institute (Poland); **Maciej Trusiak,** Warsaw Univ. of Technology (Poland)

13571-47 • 9:30 - 10:00
Remote focusing-based oblique plane microscopy with system aberration correction *(Invited Paper)*
Author(s): **Paolo Pozzi**, **Xiong Jianxuan**, **Vipin Balan,** Politecnico di Milano (Italy); **Federico Berto**, **Dimitri Kromm**, **Carlas Smith,** Technische Univ. Delft (Netherlands); **Andrea Bassi,** Politecnico di Milano (Italy)

Coffee Break 10:00 - 10:30

SESSION 12: JOINT SESSION: MULTIMODAL QUANTITATIVE PHASE BIOIMAGING II

26 June 2025 • 10:30 - 12:20 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

Joint Session between Multimodal Sensing and Artificial Intelligence for Sustainable Future Conf. 13570 and Optical Methods for Inspection, Characterization, and Imaging of Biomaterials Conf. 13571.

NOTE:
Session 10, Joint Session 2 Multimodal Quantitative Phase Bioimaging II (Hall B1-LEVEL 2, Room B13) runs concurrently with Session 9, Nondestructive Testing, (ICM, Saal 12a)

13570-41 • 10:30 - 11:00
A high-resolution digital holographic microscope for space flight *(Invited Paper)*
Author(s): **Jay L. Nadeau**, **Nikki Johnston**, **Andrew Greenberg,** Portland State Univ. (United States); **Max Riekeles,** Technische Univ. Berlin (Germany); **Ernest Thomas**, **Daniel Sillivant,** Teledyne Brown Engineering (United States); **Carlos Sahagun,** GeoControl Systems (United States); **Chris Lindensmith,** Caltech (United States)

13570-42 • 11:00 - 11:20
High content in vitro nanotoxicity assessment with enhanced throughput utilizing automated multimodal digital holographic microscopy
Author(s): **Anne Marzi,** Univ. Münster (Germany); **Álvaro Barroso**, **Jürgen Schnekenburger, Björn Kemper,** Universitätsklinikum Münster (Germany)

13571-48 • 11:20 - 11:40
Label-free intracellular multispecificity in bioengineered yeast cells enables characterization of biolensing effects by holotomographic flow cytometry
Author(s): **Daniele Pirone,** ISASI CNR (Italy); **Massimo D'Agostino,** Univ. degli Studi di Napoli Federico II (Italy); **Matteo Lombini**, **Fausto Cortecchia**, **Emiliano Diolaiti,** INAF - Osservatorio di Astrofisica e Scienza dello Spazio (Italy); **Giuseppe Mongelluzzo,** INAF - Osservatorio Astronomico di Capodimonte (Italy); **Giusy Giugliano,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Nicola Mosca**, **Maria di Summa,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Tommaso Russo,** Univ. degli Studi di Napoli Federico II (Italy); **Ettore Stella,** Sistemi e Tecnologie Industriali Intelligenti per il Manifattuiero Avanzato, Consiglio Nazionale delle Ricerche (Italy); **Vittorio Bianco**, **Lisa Miccio**, **Pasquale Memmolo, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-49 • 11:40 - 12:00
Dual wavelength interferometry application to evaluate shapes for corneas and intraocular lens
Author(s): **Nieves Andrés,** Univ. de Zaragoza (Spain); **Martina Puyuelo,** AJL Ophthalmic S.A. (Spain); **Ana M. López Torres**, **Francisco José Torcal-Milla**, **Virginia Palero-Díaz, Julia Lobera,** Univ. de Zaragoza (Spain)

13570-43 • 12:00 - 12:20
Towards an explainable automatic phenotypic characterization of hereditary anemias
Author(s): **Cosimo Ieracitano,** Univ. Mediterranea di Reggio Calabria (Italy); **Roberta Russo**, **Immacolata Andolfo**, **Anthony Iscaro**, **Antonella Nostroso,** Univ. degli Studi di Napoli Federico II (Italy); **Lisa Miccio**, **Vittorio Bianco**, **Pasquale Memmolo,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Muhammad Suffian**, **Nadia Mammone,** Univ. Mediterranea di Reggio Calabria (Italy); **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Francesco Carlo Morabito,** Univ. Mediterranea di Reggio Calabria (Italy)

Lunch Break 12:20 - 13:40

SESSION 13: QPM AND TOMOGRAPHY II

26 June 2025 • 13:40 - 15:30 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Lisa Miccio**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

13571-50 • 13:40 - 14:10
High-content digital holographic phenotyping of lysosomal diseases *(Invited Paper)*
Author(s): **Diego L. Medina,** Telethon Institute of Genetics and Medicine (Italy)

13571-51 • 14:10 - 14:30
Resin-embedded murine ex vivo retina as durable models for optical coherence tomography
Author(s): **Álvaro Barroso**, **Steffi Ketelhut**, **Peter Heiduschka,** Universitätsklinikum Münster (Germany); **Rocío del Amor**, **Sandra Morales-Martínez**, **Fernando García-Torres**, **Valery Naranjo,** Univ. Politècnica de València (Spain); **Björn Kemper, Jürgen Schnekenburger,** Universitätsklinikum Münster (Germany)

13571-52 • 14:30 - 14:50
Holographic spatiotemporal analysis reveals the drainage of thin liquid films in different experimental scenarios
Author(s): **Vincenzo Ferraro,** Univ. degli Studi di Parma (Italy); **Zhe Wang**, **Pier Luca Maffettone,** Univ. degli Studi di Napoli Federico II (Italy); **Sara Coppola,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-53 • 14:50 - 15:10
Optical metrology with wide-field-of-view for 3D mapping of tissues
Author(s): **Christos Katopodis,** National Technical Univ. of Athens (Greece); **Dimitris Papazoglou,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece), Univ. of Crete (Greece); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13571-54 • 15:10 - 15:30
Quantitative phase single-pixel microscopy for biological sample imaging under low-power conditions
Author(s): **Samuel Ignacio Zapata-Valencia**, **Heberley Tobón Maya,** Univ. Jaume I (Spain); **Osamu Matoba,** Kobe Univ. (Japan); **Jesús Lancis, Enrique Tajahuerce,** Univ. Jaume I (Spain)

Coffee Break 15:30 - 16:00

SESSION 14: ADVANCED FPM

26 June 2025 • 16:00 - 17:20 | Hall B1-LEVEL 2, Room B13
Session Chair(s): **Bryan M. Hennelly**, National Univ. of Ireland, Maynooth (Ireland)

13571-55 • 16:00 - 16:20
Automized method for FPM calibration
Author(s): **Piotr Zdankowski**, **Piotr Arcab**, **Mikołaj Rogalski, Maciej Trusiak,** The Micromechanics and Photonics Institute, Warsaw Univ. of Technology (Poland)

13571-69 • 16:20 - 16:40
Optimization of cell segmentation in Fourier ptychography images for biological applications
Author(s): **Marika Valentino,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Massimo D'Agostino,** Univ. degli Studi di Napoli Federico II (Italy); **Fabrizio Licitra**, **Daniele Pirone,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Fulvia Vitale**, **Anna Di Micco**, **Luigi Michele Pavone,** Univ. degli Studi di Napoli Federico II (Italy); **Lisa Miccio**, **Vittorio Bianco, Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy)

13571-56 • 16:40 - 17:00
Isotropic resolution enhancement in phase retrieval via Kramers–Kronig relations enabled by grouped asymmetric illumination
Author(s): **Xiang Chen,** Nanjing Normal Univ. (China), Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Guoqing Li**, **Xin Li,** Nanjing Normal Univ. (China); **Zhe Wang,** Univ. degli Studi di Napoli Federico II (Italy); **Sara Coppola**, **Vittorio Bianco**, **Pietro Ferraro,** Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello", Consiglio Nazionale delle Ricerche (Italy); **Caojin Yuan,** Nanjing Normal Univ. (China)

13571-58 • 17:00 - 17:20
Non-interferometric label-free 3D microscopy based on Fourier ptychographic diffraction tomography
Author(s): **Shun Zhou**, **Qian Chen, Chao Zuo,** Nanjing Univ. of Science and Technology (China)

CONFERENCE 13572

Automated Visual Inspection and Machine Vision VI

26 June 2025 | ICM, Saal 12b

Conference Chair(s): **Michael Heizmann,** Karlsruher Institut für Technologie, Institute of Industrial Information Technology (Germany); **Thomas Längle,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Program Committee: **Christian Frese,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **Andreas Heinrich,** Hochschule Aalen (Germany); **Bernd Jähne,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Markus Maurer,** VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme GmbH (Germany); **Wolfgang Osten,** Institut für Technische Optik, Univ. Stuttgart (Germany); **Stephan Reichelt,** Institute of Applied Optics, Univ. Stuttgart (Germany); **Felix Salazar,** Univ. Politécnica de Madrid (Spain); **Robert Schmitt,** Fraunhofer-Institut für Produktionstechnologie (Germany); **Hugo Thienpont,** Vrije Univ. Brussel (Belgium); **Stefan Werling,** Duale Hochschule Baden-Württemberg (Germany); **Ernst Wiedenmann,** Serious Enterprises (Germany); **Volker Willert,** Hochschule für angewandte Wissenschaften Würzburg-Schweinfurt (Germany)

Wednesday 25 June 2025

POSTERS-WEDNESDAY

25 June 2025 • 12:30 - 13:30 | ICM, Hall 80

Poster authors, please set up posters between the morning coffee break and the end of lunch break on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13572-18 • 12:30 - 13:30

Generating and sensing synthetic parasitic data of lymphatic filariasis, using diffusion models and generative adversarial networks

Author(s): **Pranav Misra**, **Vijay R. N. Prabhakar, Satish Kumar Dubey,** Indian Institute of Technology Delhi (India)

Thursday 26 June 2025

SESSION 1: QUALITY ASSURANCE

26 June 2025 • 8:40 - 10:00 | ICM, Saal 12b

Session Chair(s): **Michael Heizmann**, Karlsruher Institut für Technologie (Germany)

13572-1 • 8:40 - 9:00

Automated quality inspection for the manufacturing of highly customized building modules

Author(s): **Daniel Sopauschke**, **Steffen Sauer**, **Florian Warschewske, Erik Trostmann,** Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF (Germany)

13572-2 • 9:00 - 9:20

A fast and accurate spectral imaging system for visual inspection and monitoring in textile production

Author(s): **Marcello Melis**, **Shayesteh Naghinajad**, **Damiano Scalabrin, Xi Chen,** Profilocolore Srl (Italy)

13572-3 • 9:20 - 9:40

Machine vision and learning in the automation of airbags fabrication

Author(s): **Bogdan Negrei,** Univ. Politehnica Timisoara (Romania); **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania), Univ. "Aurel Vlaicu" din Arad (Romania)

13572-4 • 9:40 - 10:00

Automated metrology for additively manufactured parts using deep learning and computer vision

Author(s): **Ayush Chaudhary**, **Ziteng Wen, Davis J. McGregor,** Univ. of Maryland, College Park (United States)

Coffee Break 10:00 - 10:40

SESSION 2: IMAGE ACQUISITION AND SIMULATION

26 June 2025 • 10:40 - 12:20 | ICM, Saal 12b
Session Chair(s): **Thomas Längle**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

13572-5 • 10:40 - 11:00
Enhancing MEMS-based optical droplet detection system: one year of progress
Author(s): **Marcus Baumgart**, **Nabeel Jadoon**, **Povilas Smaliukas,** Silicon Austria Labs. GmbH (Austria); **Georg Brunnhofer,** AVL LIST GmbH (Austria); **Andreas Tortschanoff,** Silicon Austria Labs. GmbH (Austria)

13572-6 • 11:00 - 11:20
Inverse rendering of a digital twin for visual inspection via anomaly detection
Author(s): **Johannes Meyer**, **Pierrick Arpin**, **Lukas Dippon**, **Christian Kludt, Thomas Längle,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

13572-7 • 11:20 - 11:40
Beyond the sparsity paradigm: efficient binary frames for event-based vision
Author(s): **Johannes Baßler, Michael Heizmann,** Karlsruher Institut für Technologie (Germany)

13572-8 • 11:40 - 12:00
Automated polarized optical and interferometric inspection system for surface defects in TFT-LCD glass panel
Author(s): **Chao-Ching Ho**, **Chun-Hsiang Huang,** National Taipei Univ. of Technology (Taiwan); **Ming-Fu Chen,** Taiwan Instrument Research Institute (Taiwan)

13572-9 • 12:00 - 12:20
Spatiotemporal alignment in hybrid vision systems: unifying event cameras and frame-based cameras
Author(s): **Yibo Zhang**, **Zhucheng Tan**, **Jing Jin,** Beihang Univ. (China); **Chenyang Shi,** Beihang University (China); **Yuqing He,** Beihang Univ. (China)

Lunch Break 12:20 - 14:00

SESSION 3: MACHINE LEARNING AND CLASSIFICATION

26 June 2025 • 14:00 - 15:20 | ICM, Saal 12b
Session Chair(s): **Michael Heizmann**, Karlsruher Institut für Technologie (Germany)

13572-10 • 14:00 - 14:20
Real-time fastener detection for automated disassembly of e-waste
Author(s): **Tim König,** Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF (Germany); **Deepu Krishnareddy,** Reutlingen University (Germany); **José Saenz,** Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF (Germany)

13572-11 • 14:20 - 14:40
Automatic microfibers detection in SEM images
Author(s): **Pierluigi Carcagnì**, **Marco Del Coco**, **Gennaro Gentile**, **Mariacristina Cocca**, **Melania Paturzo, Marco Leo,** Consiglio Nazionale delle Ricerche (Italy)

13572-12 • 14:40 - 15:00
Deep learning algorithm-based autofocusing and twin-image removal for volumetric holographic imaging of microparticles with extended depth of field
Author(s): **Deep Arya,** Indian Institute of Technology Guwahati (India); **Raj Katkar,** Indian Institute of Technology Guwahati (India), Oceaneering International, Inc. (India); **Shrihari A.**, **Rishikesh Kulkarni, Prithwijit Guha,** Indian Institute of Technology Guwahati (India)

13572-13 • 15:00 - 15:20
Deep learning-based classification of underwater microplanktons using ShincNet and digital holography
Author(s): **Shrihari A.**, **Deep Arya**, **Prithwijit Guha, Rishikesh Kulkarni,** Indian Institute of Technology Guwahati (India)

Coffee Break 15:20 - 16:00

SESSION 4: IMAGE-BASED POSITION MEASUREMENT

26 June 2025 • 16:00 - 17:20 | ICM, Saal 12b
Session Chair(s): **Thomas Längle**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

13572-14 • 16:00 - 16:20
Impact of the subsurface scattering on fringe projection profilometry: a simulation study
Author(s): **Peter Naglič**, **Christian Blum**, **Johannes Mäder**, **Corinna Konrad, Alwin Kienle,** Institut für Lasertechnologien in der Medizin und Meßtechnik an der Univ. Ulm (Germany)

13572-15 • 16:20 - 16:40
Estimation of the spatial calibration quality of multi-camera systems for tracking surgical instruments in large measuring volumes
Author(s): **Leon Wiese**, **Lennart Hinz, Eduard Reithmeier,** Leibniz Univ. Hannover (Germany)

13572-16 • 16:40 - 17:00
Dynamic track stabilization: development of a real-time sensor for measuring lateral sleeper vibrations during operation
Author(s): **Gerald Zauner,** FH Oberösterreich (Austria); **Martin Buerger,** Plasser & Theurer GmbH (Austria)

13572-17 • 17:00 - 17:20
Efficient sparse-view X-ray 3D reconstruction using neural radiance fields with differential attention mechanisms
Author(s): **Ayushi Verma**, **Tapas Badal, Abhay Bansal,** Bennett Univ. (India)

CONFERENCE CA100

COST Action Special Session: Properties, Design, Fabrication, Optical Metrology, and Applications of Nano-/Micro-structured Surfaces

26 June 2025 | ICM Room 21

Conference Chair(s): **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania); **Malgorzata Szczerska,** Gdansk Univ. of Technology (Poland)

INFORMATION

This Special Session is organized within the frame of the COST Action CA21159, PhoBioS: "Understanding interaction light-biological surfaces: possibility for new electronic materials and devices".
The Session focuses on photonic effects of nano-and micro-structuring of biological surfaces and their bionic applications, and methods of investigation, design, fabrication, properties, and applications of nano-and micro-structured surfaces are discussed.

Thursday 26 June 2025

SESSION 1: COST ACTION (PHOBIOS) SPECIAL SESSION I

26 June 2025 • 9:00 - 10:00 | ICM Room 21
Session Chair(s): **Virgil-Florin Duma**, Univ. Politehnica Timisoara (Romania); **Maurizio Dabbicco**, Univ. degli Studi di Bari Aldo Moro (Italy)

CA100-100 • 9:00 - 9:30
Can we use nature to design and elaborate new photonics materials and devices?
Author(s): **Vladimir Katanaev,** Univ. de Genève (Switzerland); **Dror Fixler,** Bar-Ilan Univ. (Israel); **Martin Lopez Garcia,** Instituto de Óptica "Daza de Valdés" (Spain); **Maria Godinho,** Univ. Nova de Lisboa (Portugal); **Nicolina Pop,** Univ. Politehnica Timisoara (Romania); **Jelena Radovanovic,** Univ. of Belgrade (Serbia); **Maurizio Dabbicco,** Univ. degli Studi di Bari Aldo Moro (Italy); **George A. Mousdis,** National and Kapodistrian Univ. of Athens (Greece); **Ahu Gumrah Parry,** The Univ. of Manchester (United Kingdom); **Panagiotis Keivanidis,** Cyprus Univ. of Technology (Cyprus); **Dragan Indjin,** Univ. of Leeds (United Kingdom); **Ana Almeida,** Univ. Nova de Lisboa (Portugal); **Paweł Wityk,** Gdansk Univ. of Technology (Poland); **Pedro de Almeida,** Instituto Superior de Engenharia de Lisboa (Portugal); **Małgorzata Szczerska,** Gdansk Univ. of Technology (Poland)

CA100-101 • 9:30 - 10:00
Nanoengineered optical interfaces to interrogate/control nano-bio interactions for healthcare applications *(Invited Paper)*
Author(s): **Sivashankar Krishnamoorthy,** Luxembourg Institute of Science and Technology (Luxembourg)

Coffee Break 10:00 - 10:30

SESSION 2: COST ACTION (PHOBIOS) SPECIAL SESSION II

26 June 2025 • 10:30 - 11:50 | ICM Room 21
Session Chair(s): **Dror Fixler**, Bar-Ilan Univ. (Israel)

CA100-102 • 10:30 - 11:00
Terahertz quantum cascade laser modeling for applications in imaging, sensing, and metrology *(Invited Paper)*
Author(s): **Nikola Vuković**, **Milan Ignjatović,** Univ. of Belgrade (Serbia); **Novak Stanojević,** Univ. of Belgrade (Serbia), VLATACOM Institute Ltd. (Serbia); **Mihailo Stojković**, **Nikola Basta**, **Filip Perišić**, **Aleksandar Milićević,** Univ. of Belgrade (Serbia); **Aleksandar Demić**, **Dragan Indjin,** Univ. of Leeds (United Kingdom); **Jelena Radovanović,** Univ. of Belgrade (Serbia)

CA100-103 • 11:00 - 11:30
Characterizing bacterial strains by hyperspectral imaging and optical coherence tomography *(Invited Paper)*
Author(s): **Jost Stergar,** Jozef Stefan Institute (Slovenia)

CA100-104 • 11:30 - 11:50
A decade of galvanometer-based laser scanning optimization for optical coherence tomography
Author(s): **Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

Lunch Break 11:50 - 13:50

SESSION 3: COST ACTION (PHOBIOS) SPECIAL SESSION III

26 June 2025 • 13:50 - 15:20 | ICM Room 21
Session Chair(s): **Jelena Radovanovic**, Univ. of Belgrade (Serbia)

CA100-107 • 13:50 - 14:20
Innovative materials platform to implement detector-free imaging in the infrared: a proposal *(Invited Paper)*
Author(s): **Maurizio Dabbicco,** Univ. degli Studi di Bari Aldo Moro (Italy); **Dragan Indjin,** Univ. of Leeds (United Kingdom); **Santiago Royo,** Univ. Politècnica de Catalunya (Spain); **Aleksandar Demic,** Univ. of Leeds (United Kingdom)

CA100-108 • 14:20 - 14:40
Development of a modular femtosecond laser system for optical fiber and surface micromachining *(Invited Paper)*
Author(s): **Grzegorz Orlicki**, **Jakub Czubek**, **Filip Janiak, Małgorzata Szczerska,** Gdansk Univ. of Technology (Poland)

CA100-110 • 14:40 - 15:00
Requirements for fluorescence lifetime fiber photometry (FLiP) system in neuroscience
Author(s): **Emir Karamehmedovic,** FabLab Association (Bosnia and Herzegovina), Doric Lenses Inc. (Canada)

CA100-111 • 15:00 - 15:20
Fully flexible, low-cost, environmentally friendly yarn-based InP/Ag NW wearable photodetectors for UV-visible light detection
Author(s): **Muzeyyen Savas**, **Akrema Akrema**, **Sema Karabel Ocal, Talha Erdem,** Abdullah Gül Univ. (Turkey)

Coffee Break 15:20 - 16:00

SESSION 4: COST ACTION (PHOBIOS) SPECIAL SESSION IV: YOUNG RESEARCHERS WORKSHOP

26 June 2025 • 16:00 - 18:00 | ICM Room 21
Session Chair(s): **Virgil-Florin Duma**, Univ. Politehnica Timisoara (Romania); **Malgosia Szczerska**, Gdansk Univ. of Technology (Poland)
Young Researchers Workshop is an interactive forum for young and senior researchers addressing the topic of this year's COST Action Session, "Understanding Interaction between Light and Biological Surfaces: Possibility for New Electronic Materials and Devices (PhoBioS)". The workshop will feature oral presentations by PhD Students as well as short oral overviews by COST PhoBioS students participating with their presentations at Laser World of Photonics Congress 2025.

CA100-113 • 16:00 - 16:20
Assessment of laser cutting of textile materials for automotive airbags
Author(s): **Nicolae Dogaru,** Univ. Politehnica Timisoara (Romania), Autoliv Romania (Romania); **Claudiu Godinel,** Autoliv Romania (Romania); **Ralph-Alexandru Erdelyi, Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

CA100-114 • 16:20 - 16:40
UV detector based on few-layer ultra-stable black phosphorus protected with cellulose-based film
Author(s): **Michał Suplewski**, **Malgorzata Szczerska, Pawel Jakobczyk,** Gdansk Univ. of Technology (Poland)

CA100-200 • 16:40 - 18:00
Short oral overviews by COST PhoBioS students

CONFERENCE 13573

Digital Optical Technologies 2025

23 - 25 June 2025 | ICM Room 21

Conference Chair(s): **Bernard C. Kress,** Google (United States); **Jürgen W. Czarske,** TU Dresden (Germany)

Program Committee: **Kaan Akşit,** Univ. College London (United Kingdom); **Pablo Artal,** Univ. de Murcia (Spain); **I Jan Chen,** TLI Co., Ltd. (Taiwan); **Peter J. de Groot,** Zygo Corporation (United States); **Claas Falldorf,** BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany); **Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa); **Andreas Georgiou,** Reality Optics (United Kingdom); **Yoshio Hayasaki,** Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Andreas Hermerschmidt,** HOLOEYE Photonics AG (Germany); **Silvania F. Pereira,** Technische Univ. Delft (Netherlands); **Christophe Peroz,** Sony Corp. (Japan); **Pascal Picart,** Univ. du Maine (France); **Ting-Chung Poon,** Virginia Polytechnic Institute and State Univ. (United States); **Jannick P. Rolland,** The Ctr. for Freeform Optics, Univ. of Rochester (United States); **Yuzuru Takashima,** Wyant College of Optical Sciences (United States); **Uwe Vogel,** Fraunhofer Institute for Photonic Microsystems IPMS (Germany); **Gordon Wetzstein,** Stanford Univ. (United States); **Angus Wu,** Kinko Optical Co., Ltd. (Taiwan); **Jiachen Wu,** Tsinghua Univ. (China); **Shin-Tson Wu,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

Monday 23 June 2025

WELCOME AND INTRODUCTION

23 June 2025 • 8:45 - 9:05 | ICM Room 21
Introductory Remarks
Bernard C. Kress, Google, United States
Jürgen Czarske, TU Dresden, Germany
2023 Symposium Chairs

HOT TOPICS IN DIGITAL OPTICAL TECHNOLOGIES

23 June 2025 • 9:05 - 10:00 | ICM Room 21
Session Chair(s): **Bernard C. Kress**, Google (United States); **Jürgen W. Czarske**, TU Dresden (Germany)

13573-500 • 9:05 - 10:00
Programming light diffraction for information processing and computational imaging (Plenary Presentation)
Author(s): **Aydogan Ozcan,** UCLA Samueli School of Engineering (United States)

Coffee Break 10:00 - 10:30

SESSION 1: WAVEFRONT SHAPING BY DIGITAL OPTICS

23 June 2025 • 10:30 - 12:30 | ICM Room 21
Session Chair(s): **Aydogan Ozcan**, UCLA Samueli School of Engineering (United States)

13573-1 • 10:30 - 11:00
Optical neural networks enabled by nanoscale laser fabrication *(Invited Paper)*
Author(s): **Qiming Zhang,** Univ. of Shanghai for Science and Technology (China)

13573-2 • 11:00 - 11:30
Dynamic 3D diffractive optics *(Invited Paper)*
Author(s): **Rafael Piestun,** Univ. of Colorado Boulder (United States)

13573-3 • 11:30 - 11:50
Digital in design: FPGA-based Implementation of deep learning for demultiplexing and mode decomposition of structured light
Author(s): **Qian Zhang**, **Yuedi Zhang, Jürgen Czarske,** TU Dresden (Germany)

13573-4 • 11:50 - 12:10

Wavefront control of transparent augmented reality display
Author(s): **Peter G. R. Smith**, **Goronwy L. Tawy**, **Corin B. E. Gawith**, **Rex H. S. Bannerman**, **James C. Gates, Glenn M. Churchill,** Univ. of Southampton (United Kingdom)

13573-5 • 12:10 - 12:30
Overcoming catastrophic forgetting in imaging through scattering media by deep learning
Author(s): **Wataru Watanabe**, **Daiki Shingu, Yuki Kamiya,** Ritsumeikan Univ. (Japan)

Lunch Break 12:30 - 13:40

SESSION 2: HOLOGRAPHIC IMAGING AND DISPLAY

23 June 2025 • 13:40 - 15:30 | ICM Room 21
Session Chair(s): **Andreas Hermerschmidt**, HOLOEYE Photonics AG (Germany)

13573-6 • 13:40 - 14:10
Multispectral holography for lensless single-shot 3D imaging in biomedicine using fiber endoscopy *(Invited Paper)*
Author(s): **Jakob Dremel, Jürgen W. Czarske,** TU Dresden (Germany)

13573-7 • 14:10 - 14:30
Dual-path holographic laser rendering for fist-sized volumetric graphics in physical space
Author(s): **Kota Kumagai,** Utsunomiya Univ. (Japan); **Hisahi Oka**, **Kazuki Horikiri**, **Tetsuji Suzuki,** JVC KENWOOD Corp. (Japan); **Yoshio Hayasaki,** Utsunomiya Univ. (Japan)

13573-8 • 14:30 - 14:50
Full-color computer holography with dispersion-engineered wavelength multiplexing
Author(s): **Lizhi Chen,** Chinese Academy of Sciences (China); **Runze Zhu, Hao Zhang,** Tsinghua Univ. (China)

13573-9 • 14:50 - 15:10
Improved far field holograms using spatial light modulators and camera-in-the-loop optimization
Author(s): **Markus Zimmermann**, **Andreas Brenner**, **Tobias Haist, Stephan Reichelt,** Univ. Stuttgart (Germany)

13573-10 • 15:10 - 15:30
Compact and effective zero-order noise suppression in Fresnel holography using a lens and lens compensation
Author(s): **Zhongling Huang**, **Jinze Sha**, **Roubing Meng**, **Dilawer Singh**, **Antoni Wojcik, Timothy Wilkinson,** Univ. of Cambridge (United Kingdom)

Coffee Break 15:30 - 16:00

SESSION 3: AI-AIDED DESIGN TECHNIQUES FOR DIGITAL OPTICS

23 June 2025 • 16:00 - 18:00 | ICM Room 21
Session Chair(s): **Rafael Piestun**, Univ. of Colorado Boulder (United States); **Ivan B. Djordjevic**, The Univ. of Arizona (United States)

13573-11 • 16:00 - 16:30
Fast and accurate gaze estimation with deflectometry-based eye tracking *(Invited Paper)*
Author(s): **Florian Willomitzer,** Wyant College of Optical Sciences (United States)

13573-34 • 16:30 - 17:00
Nonlinear digital holography for light-speed correction of structured light *(Invited Paper)*
Author(s): **Sachleen Singh, Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13573-13 • 17:00 - 17:20
Deep unfolding neural network enables rapid compressive holographic imaging
Author(s): **Jiachen Wu**, **Yunhui Gao**, **Shuhe Zhang, Liangcai Cao,** Tsinghua Univ. (China)

13573-15 • 17:20 - 17:40
Physics-informed neural network with pretraining for mode decomposition of 1-km long multimode fiber
Author(s): **Jiali Sun**, **Qian Zhang, Jürgen Czarske,** TU Dresden (Germany)

13573-64 • 17:40 - 18:00
Optimized scythe-shaped chiroptical metasurface for biosensing application
Author(s): **Semere Araya A. Asefa, Da-Sol Lee,** Yonsei Univ. (Korea, Republic of)

Tuesday 24 June 2025

WORLD OF PHOTONICS PLENARY SESSION

24 June 2025 • 8:30 - 10:00 | ICM, Saal 1

This plenary session features a presentation by **Christine Silberhorn**, Paderborn Univ. (Germany), on scaling photonic systems for quantum information processing.

Coffee Break 10:00 - 10:40

SESSION 4: DIGITAL OPTICS FOR AR/VR/MR I

24 June 2025 • 10:40 - 12:00 | ICM Room 21

Session Chair(s): **Florian Willomitzer**, Wyant College of Optical Sciences (United States)

13573-16 • 10:40 - 11:10

Benchmarking of the AR diffractive waveguide manufacturing techniques available in industry today *(Invited Paper)*

Author(s): **Angus Wu,** Kinko Optical Co., Ltd. (Taiwan)

13573-17 • 11:10 - 11:30

New high-current WUXGA microLED microdisplay backplane derived from previous OLED microdisplay platform

Author(s): **Philipp Wartenberg**, **Stephan Brenner**, **Tim Flegl**, **Simone Lenk**, **Johannes Zeltner**, **Martin Rolle**, **Florian Schuster**, **Andreas Fritscher**, **Bernd Richter, Uwe Vogel,** Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany)

13573-19 • 11:30 - 12:00

Advancements for waveguide-based augmented reality (AR) and diffuser endomicroscopy by Theory-Trained Neural Networks *(Invited Paper)*

Author(s): **Jürgen W. Czarske, Tom Glosemeyer,** TU Dresden (Germany)

POSTERS-TUESDAY

24 June 2025 • 12:05 - 12:50 | ICM, Hall B0

Poster authors, please set up posters between the morning coffee break and the end of lunch break on Tuesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards will be discarded.

13573-51 • 12:10 - 12:55

Mathematical aspects in simulating Lissajous laser scanning

Author(s): **Attila Csillag, Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13573-52 • 12:10 - 12:55

Using simulation-based inference (SBI) for optical imaging

Author(s): **Maximilian Lipp**, **Lyubov V. Amitonova,** Advanced Research Ctr. for Nanolithography (Netherlands); **Patrick Forré,** Univ. of Amsterdam (Netherlands)

13573-53 • 12:10 - 12:55

Investigations of vibration regimes of optical choppers

Author(s): **Eduard-Sebastian Csukas, Virgil-Florin Duma,** Univ. Politehnica Timisoara (Romania)

13573-54 • 12:10 - 12:55

A deep learning approach for the prediction of process parameters in the additive manufacturing of microlenses

Author(s): **Annika Dehm**, **Mike Dohmen, Andreas Heinrich,** Hochschule Aalen - Technik und Wirtschaft (Germany)

13573-55 • 12:10 - 12:55

Evaluating machine learning with simulated Lissajous scans for fast object recognition and rotation estimation

Author(s): **Zongru Shao, Aleš Travnik,** Silicon Austria Labs. GmbH (Austria)

13573-56 • 12:10 - 12:55

Compact multichannel imaging system with wide FOV and 4x optical magnification

Author(s): **Christos Katopodis,** National Technical Univ. of Athens (Greece); **Dimitrios Papazoglou,** Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece), Univ. of Crete (Greece); **Ioanna Zergioti,** National Technical Univ. of Athens (Greece)

13573-57 • 12:10 - 12:55
Characterization of pulsed ultraviolet laser micromachining operation for rapid prototyping of microfluidic devices
Author(s): **Sean S. Worthington**, **Seth N. Lowry**, **Malley B. Richardson, Christopher M. Collier,** The Univ. of British Columbia Okanagan (Canada)

13573-58 • 12:10 - 12:55
Programmable optics and their impact on microscopy
Author(s): **I Jan Chen,** Triad Light Innovation Co., Ltd. (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan); **Yu-Yang Lee**, **Jay Wang,** Triad Light Innovation Co., Ltd. (Taiwan); **Huang-Ming Chen,** National Yang Ming Chiao Tung Univ. (Taiwan)

13573-59 • 12:10 - 12:55
Microresonator-enhanced graphene-based electro-optic modulator with near-zero power consumption
Author(s): **George Ghalanos**, **Christos Pappas**, **Mirko Goldmann**, **Peter Caruana,** Akhetonics GmbH (Germany); **Chris Vagionas,** Dept. of Informatics, Aristotle University of Thessaloniki (Greece); **Mindaugas Lukosius**, **Rasuole Lukose**, **Ashraful I. Raju,** IHP – Leibniz-Institut für innovative Mikroelektronik (Germany); **Michael Kissner, Leonardo Del Bino,** Akhetonics GmbH (Germany)

13573-60 • 12:10 - 12:55
Predictive analysis of manufacturing and long-term variations in a laser combining system
Author(s): **Masato Kawasaki,** Mitsubishi Electric Corp. (Japan)

13573-61 • 12:10 - 12:55
A compact wearable device for correcting ocular aberrations
Author(s): **Lichuan Zheng**, **Alba M. Paniagua-Diaz, Pablo Artal,** Univ. de Murcia (Spain)

13573-62 • 12:10 - 12:55
Generating and sensing synthetic parasitic data of lymphatic filariasis using diffusion models and generative adversarial networks
Author(s): **Pranav Misra**, **Vijay R. N. Prabhakar, Satish Kumar Dubey,** Indian Institute of Technology Delhi (India)

13573-63 • 12:10 - 12:55
Nonlinear holography for efficient frequency conversion of structured light
Author(s): **Sachleen Singh, Andrew Forbes,** Univ. of the Witwatersrand, Johannesburg (South Africa)

13573-66 • 12:05 - 12:50
The ore content estimation in the mineral processing plant with the aid of the ML process: from classification to measurement
Author(s): **Jacek Galas**, **Dariusz Litwin**, **Kamil Radziak**, **Wieslaw Malkinski**, **Marcin Karlinski**, **Narcyz Błocki**, **Adam Czyżewski,** Lukasiewicz-Tele&Radio Research Institute (Poland); **Michał Kozielski,** Łukasiewicz – Institute of Innovative Technologies EMAG (Poland); **Dariusz Foszcz**, **Daniel Saramak**, **Stanislaw Lenczowski,** AGH University of Cracow (Poland); **Ewelina Kasinska-Pilut**, **Rafał Pępkowski, Łukasz Pałka,** KGHM Polska Miedź S.A. (Poland)

Lunch Break 12:50 - 13:50

SESSION 5: FABRICATION AND METROLOGY USING DIGITAL OPTICS

24 June 2025 • 13:50 - 15:30 | ICM Room 21
Session Chair(s): **Pietro Ferraro**, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); **Peter J. de Groot**, Zygo Corporation (United States)

13573-20 • 13:50 - 14:10
Xolography: recent advances and future developments in rapid volumetric 3D printing
Author(s): **Martin Regehly,** Technische Hochschule Wildau (Germany); **Martin Herder**, **Yves Garmshausen**, **Yousef Arzhangnia**, **Marcus Reuter, Niklas Felix König,** Xolo GmbH (Germany)

13573-21 • 14:10 - 14:30
Metrology challenges of digital optical technologies
Author(s): **Thomas Dresel,** Zygo Corporation (United States)

13573-22 • 14:30 - 14:50
Binary polarization gratings recorded via digital polarization holography in azopolymer thin films: experimental study and numerical simulations
Author(s): **Lian Nedelchev**, **Nataliya Berberova-Buhova**, **Georgi Mateev,** Institute of Optical Materials and Technologies (Bulgaria), Univ. of Chemical Technology and Metallurgy (Bulgaria); **Ludmila Nikolova**, **Elena Stoykova,** Institute of Optical Materials and Technologies (Bulgaria); **Dimana Nazarova,** Institute of Optical Materials and Technologies (Bulgaria), Univ. of Chemical Technology and Metallurgy (Bulgaria)

13573-23 • 14:50 - 15:10
High resolution printing for photonic devices
Author(s): **Waqas Kamal,** Univ. of Oxford (United Kingdom)

13573-24 • 15:10 - 15:30
Introducing innovative materials for advanced manufacturing of optical and photonic devices
Author(s): **Maria Russew**, **Alexander Plucinski**, **Mirko Lohse**, **Martin Messerschmidt**, **Arne Schleunitz, Gabi Grützner,** micro resist technology GmbH (Germany)

Coffee Break 15:30 - 16:00

SESSION 6: DIGITAL OPTICS FOR AR/VR/MR II

24 June 2025 • 16:00 - 18:10 | ICM Room 21
Session Chair(s): **Uwe Vogel**, Fraunhofer-Institut für Photonische Mikrosysteme IPMS (Germany); **Angus Wu**, Kinko Optical Co., Ltd. (Taiwan)

13573-25 • 16:00 - 16:30
Optical architectures for all day use smart glasses implementing personal AI assistant use cases *(Invited Paper)*
Author(s): **Bernard C. Kress,** Google (United States)

13573-26 • 16:30 - 16:50
A virtual reality approach to interactive physics case study on the double-slit experiment
Author(s): **Melvin Softic**, **Adrian Kranyak**, **Phelan Niesen**, **Erik Vogel**, **Jeanne Herrmann**, **Stefano Gampe, Dan Curticapean,** Hochschule Offenburg (Germany)

13573-27 • 16:50 - 17:10
Optical sensor positioning for eye-tracking with numerically efficient raytracing models
Author(s): **Tim Barcikowski**, **Oskar Hofmann,** RWTH Aachen Univ. (Germany); **Carsten Reichert**, **Johannes Meyer,** Robert Bosch GmbH (Germany); **Annika Bonhoff, Carlo Holly,** RWTH Aachen Univ. (Germany)

13573-28 • 17:10 - 17:30
Wireframe holography for future augmented reality applications
Author(s): **Paolo Pozzi**, **Marco Astarita**, **Alessandro Cerioni,** Politecnico di Milano (Italy); **Anna Cesaratto**, **Tommaso Ongarello,** EssilorLuxottica (Italy); **Andrea Bassi**, **Giulio Cerullo, Gianluca Valentini,** Politecnico di Milano (Italy)

13573-29 • 17:30 - 17:50
Time-determined display
Author(s): **Matan Naftali**, **Ran Gabai**, **Gadi Yearim**, **Meni Yehiel**, **G. Cahana, Adi Baram,** Maradin Ltd. (Israel)

13573-67 • 17:50 - 18:10
Using focus tunable lenses to address vision correction in shared AR/VR systems
Author(s): **Rob Stevens**, **Alex Edginton, Prashanthan Ganeswaran,** Oxford Optical Labs (United Kingdom)

Wednesday 25 June 2025

SESSION 7: ADAPTIVE OPTICS BY DIGITAL TECHNOLOGIES

25 June 2025 • 8:20 - 10:00 | ICM Room 21
Session Chair(s): **Jiachen Wu**, Tsinghua Univ. (China); **Sachleen Singh**, Univ. of the Witwatersrand, Johannesburg (South Africa)

13573-30 • 8:20 - 8:40
Digital optical phase conjugation exploiting second harmonic generation for deep tissue imaging
Author(s): **John Böhm**, **David Krause**, **Lukas M. Eng**, **Nektarios Koukourakis, Jürgen Czarske,** TU Dresden (Germany)

13573-31 • 8:40 - 9:00
High-speed 3D localisation microscopy with dynamic aberration correction for enhancing imaging
Author(s): **Clemens Bilsing,** TU Dresden (Germany); **Sebastian Burgmann**, **Uwe Janoske,** Bergische Univ. Wuppertal (Germany); **Jürgen Czarske, Lars Büttner,** TU Dresden (Germany)

13573-32 • 9:00 - 9:30
Adaptive optics-based covert communications in strong atmospheric turbulence regime *(Invited Paper)*
Author(s): **Ivan B. Djordjevic,** The Univ. of Arizona (United States)

13573-33 • 9:30 - 10:00
Information optimized adaptive optics for biomedical microscopy *(Invited Paper)*
Author(s): **Martin J. Booth**, **Biwei Zhang**, **Yuyao Xiao**, **Jingyu Wang, Qi Hu,** Univ. of Oxford (United Kingdom)

Coffee Break 10:00 - 10:30

SESSION 8: DYNAMIC DIGITAL OPTICS

25 June 2025 • 10:30 - 12:40 | ICM Room 21
Session Chair(s): **Martin J. Booth**, Univ. of Oxford (United Kingdom)

13573-12 • 10:30 - 11:00
Design of holographic display systems based on artificial intelligence *(Invited Paper)*
Author(s): **Suyeon Choi,** Stanford Univ. (United States)

13573-35 • 11:00 - 11:20
Switchable liquid crystal gratings for holography and dynamic beam steering application
Author(s): **Qihao Han**, **Steve Elston**, **Waqas Kamal**, **Tianxin Wang**, **Jinge Guo**, **Guanxiong Zhang**, **Linpei Xue, Stephen Morris,** Univ. of Oxford (United Kingdom)

13573-36 • 11:20 - 11:40
Review of switchable privacy display technologies for LCD and OLED displays
Author(s): **Yannick Bourgin,** siOPTICA GmbH (Germany)

13573-37 • 11:40 - 12:00
Scattering-resistant ghost imaging by direct-deconvolution
Author(s): **Ryota Keyaki, Susumu Fukatsu,** The Univ. of Tokyo (Japan)

13573-38 • 12:00 - 12:20
Quantum-driven optical security: a hybrid experimental-computational framework for unclonable authentication
Author(s): **Syeda Ramsha Ali, Nema Abdelazim,** Univ. of Southampton (United Kingdom)

13573-65 • 12:20 - 12:40
Al-doped ZnO thin films as alternative transparent conductors in liquid crystal devices
Author(s): **Dimitre Z. Dimitrov,** Institute of Solid State Physics- Bulgarian Academy of Sciences (Bulgaria), Institute of Optical Materials and Technologies-Bulgarian Academy of Sciences (Bulgaria); **Vera Marinova,** Institute of Optical Materials and Technologies-Bulgarian Academy of Sciences (Bulgaria); **Stefan Petrov,** Instutute of Solid State Physics- Bulgarian Academy of Sciences (Bulgaria), Department of Electrophysics, National Yang Ming Chiao Tung University (Taiwan); **Shiuan-Huei Lin,** Department of Electrophysics, National Yang Ming Chiao Tung University (Taiwan)

Lunch Break 12:40 - 13:50

SESSION 9: METROLOGY, DISPLAYS AND OPTICAL COMPONENTS FOR DIGITAL TECHNOLOGIES

25 June 2025 • 13:50 - 15:30 | ICM Room 21
Session Chair(s): **Wataru Watanabe**, Ritsumeikan Univ. (Japan); **Jakob Dremel**, TU Dresden (Germany)

13573-39 • 13:50 - 14:10
Wide-field polarization measurement of the sky using a fisheye lens
Author(s): **Manning Sun**, **Nathan Hagen, Yukitoshi Otani,** Utsunomiya Univ. (Japan)

13573-40 • 14:10 - 14:30
Time-division multiview 3D display based on hyperboloidal mirror reflection
Author(s): **Yusuke Sando**, **Makoto Kawamura, Yutaro Goto,** Osaka Research Institute of Industrial Science and Technology (Japan)

13573-42 • 14:30 - 14:50
Local and global calibration of liquid crystal spatial light modulators using a single interferometric pattern
Author(s): **Erick F. Ipus Bados**, **Luis Ordóñez, Omel Mendoza Yero,** Univ. Jaume I (Spain)

13573-43 • 14:50 - 15:10
Advanced crystalline calibration standards for high-resolution optical metrology
Author(s): **Lars Daul**, **Ingo Busch**, **Michelle Fernandez-Scarion, Florian Weiser,** Physikalisch-Technische Bundesanstalt (Germany)

13573-44 • 15:10 - 15:30
Phase stabilization and calibration techniques for high-fidelity integrated photonic processors
Author(s): **Igor Litvin**, **Gökhan Elmas**, **Paul Kohl, Janis Nötzel,** Technische Univ. München (Germany)

Coffee Break 15:30 - 16:00

SESSION 10: COMPUTATIONAL TECHNIQUES FOR DIGITAL OPTICS

25 June 2025 • 16:00 - 17:20 | ICM Room 21
Session Chair(s): **Claas Falldorf**, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (Germany)

13573-45 • 16:00 - 16:20
Systematic design method of optical system based on off-the-shelf lenses
Author(s): **Hugo Maurey,** Optiive SAS (France), ICube (France); **Patrice Twardowski,** ICube (France); **Robin Pierron,** Optiive SAS (France); **Philippe Gérard, Manuel Flury,** ICube (France)

13573-46 • 16:20 - 16:40
Enhancing camera system design: a comprehensive simulation tool for evolving vision applications
Author(s): **Julie Buquet,** ImmerVision (Canada); **Teodor Todorov,** ImmerVision (Bulgaria); **Patrice Roulet,** ImmerVision (Canada); **Simon Thibault,** Univ. Laval (Canada)

13573-48 • 16:40 - 17:00
A large-scale photonic design pipeline for interconnect routing
Author(s): **Mirko Goldmann**, **Sergio Navarro Reyes**, **Peter Caruana, Leonardo Del Bino,** Akhetonics GmbH (Germany)

13573-49 • 17:00 - 17:20
Physics informed Bayesian optimization for inverse design of diffractive optical elements
Author(s): **Ivan Sekulic**, **Martin Hammerschmidt**, **Sven Burger, Philipp-Immanuel Schneider,** JCMwave GmbH (Germany), Zuse Institute Berlin (Germany)

ADJOURN

25 June 2025 • 17:20 - 17:25 | ICM,Room 21
Session Chair(s): **Jürgen W. Czarske**, TU Dresden (Germany)

▶ 2027 | MARK YOUR CALENDAR

spie.org
#SPIE

THREE CO-LOCATED SYMPOSIA

SPIE. OPTICAL METROLOGY

SPIE. DIGITAL OPTICAL TECHNOLOGIES

EUROPEAN CONFERENCES ON BIOMEDICAL OPTICS

SPIE. | OPTICA

June 2027 | ICM - International Congress Center Messe | Munich, Germany

CO-LOCATED WITH

LASER WORLD OF PHOTONICS

International Congress on Photonics in Europe

www.photonics-congress.com