

Optics and Photonics and the U.N. Sustainable Development Goals

At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. Optics and photonics are important tools in this endeavor.



Gender equality: achieve gender equality and empower all women and girls

Health care for women empowers them in their communities and reduces birth mortality rates. Smaller, more portable diagnostic devices bring advanced optics and photonics technology to clinics in rural areas. The Vscan, a visualization tool for ultrasound imaging, and lensless microscopes which utilize partially coherent light sources and an image sensor chip, can make a difference.

Clean water and sanitation: ensure availability and sustainable management of water and sanitation for all

Less than 1 percent of Earth's water is drinkable, and removing salt from seawater can help satisfy a growing global population. Solar-powered desalination plants can ensure lower energy footprints; researchers have also demonstrated an energy-efficient desalination technology using graphene. Nanopores are created that result in a porous membrane that blocks salt ions.

SPIE is a not-for-profit educational organization that supports sustainable development via optics and photonics. By establishing formal and informal partnerships throughout the world, SPIE enables sharing of information between scientists and engineers, supports students and educators via scholarships and grants, and runs global programs that support women and constituents in both developed and developing nations.

Affordable and clean energy: ensure access to affordable, reliable, sustainable, and modern energy for all

Numerous research areas in solar energy promise dramatic increases in efficiencies while reducing costs, potentially increasing worldwide use. One strategy is to improve light trapping within solar panel cells by incorporating nanowires, which minimize reflection of light. Combining small diameter wires with larger wires traps a greater range of wavelengths, further optimizing efficiency.

Decent work and economic growth: promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all

Optics and photonics technologies made an initial impact in modern economies with the advent of electric lighting in Victorian-era factories. Providing safer and more productive work environments, it continues to play a role in newer technologies such as Remote Sensing (RS) and Geographic Information Systems (GIS). By analyzing soil erosion risk and water resources, long term use and subsequent employment can be improved in new building developments.

IMAGE CREDITS: Aydogan Ozcan; Shutterstock; GE Healthcare Life Sciences; Debdatta Chakraborty

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