

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.



No poverty: end poverty in all its forms everywhere

Connecting underserved communities and their businesses with optically driven internet and cell phone networks enables inclusion into the world market, access to banking services, access to information to assist farming best practices, and greater education opportunities for youth. Internet service and cell phones both utilize light-enabled technologies, performing a key role in ending poverty.

Zero hunger: end hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Agriculture starts with sunlight, essential to growing food. Vertical indoor farms that use spectrum-enhanced LED systems can increase quality and quantity of food in an energy-efficient manner. LIDAR and other light enabled technologies can help conventional farmers maintain healthy crops by monitoring both important pollinators and agricultural pests; insects are identified by their unique wing beat signatures.

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 help women, men, and children learn what is possible with optics and photonics technology.

Good health and well-being: ensure healthy lives and promote well-being for all at all ages

Around the world, 153 million people are visually impaired and require glasses. Optical imaging technologies, in particular wavefront-based auto refractometry which maps the shape of the eye, is an affordable method for conducting eye examinations in underserved communities. Also available are adjustable glasses with inexpensive, adjustable lenses. The innovative variable-focus lens use the incompressibility of liquids to adjust the lens. Constructed with two flexible membranes on the optical surfaces, the lens are shaped by pumping fluid into or out of the central reservoir.

Quality education: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

The One Laptop per Child project provides inexpensive computers around the world that are durable and can be used outdoors in direct sunlight. The low-cost display uses 1% of the power consumption of a regular screen by using a reflector behind the LCD grid to reflect ambient light, which allows the backlight to be turned down while outdoors.

IMAGE CREDITS: iStockphoto; Kris Fricke; One Laptop per Child; Shutterstock; The Centre for Vision in the Developing World

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