

NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE · INTERNATIONAL COMMISSION FOR OPTICS

Next ICO-25/OWLS-16 in Dresden, Germany



ICO-25 · 5 - 9 September 2022 · OWLS-16

25th Congress of the International Commission for Optics (ICO) · 16th International Conference on Optics Within Life Sciences (OWLS)

“We hope everyone will have a fascinating and memorable time at this general meeting.”



The motto of the Congress is "Advancing Society with Light", emphasizing the importance of modern light technology for society. More information is available in the official website: <https://ico25.org>

From 5th September till 9th September 2022 the General Congress for Optics and Photonics of the International Commission for Optics (ICO) and the international society on Optics Within Life Sciences (OWLS) will be celebrated in Dresden (Germany), emphasizing the importance of modern light technology for society. Light has the potential to recognize the origins of diseases, to prevent them, or to cure them early and gently. This is one of the central topics of OWLS, founded at the ICO-15 Congress in 1990.

Therefore, a special commemorative event of the 30+ years anniversary of the foundation of OWLS in Germany will be organized. The General Congress is the most important scientific and technical meeting on all important topics of optics and photonics around the entire world. After 30+ years and continuing the success of the recent previous general congresses, it is our great honor to host the General Congress in our country again. Due to the outbreak of the COVID-19 pandemic and the worldwide restrictions accompanied by it, the World Congress was postponed twice. The general congress, with participants from

all over the world will advance the diffusion of knowledge in the fields of optics and photonics and will be celebrated in-person. The paper submission **deadline was extended to April 24, 2022**. Among the topics offered are:

- Optical Engineering & Design
- Material Processing & Lithography
- Display and Vision
- Optical MEMS and Micro-Optics
- Optical Sensing and Measurement
- Computational Metrology
- Optical Information Processing
- Quantum and Nonlinear Optics
- Ultrafast Optics & High Power Lasers
- X-Ray and High-Energy Optics
- Plasmonics and Meta-materials
- Nanophotonics & Nanosensing
- Fiber Optics & Communications
- Terahertz and Silicon Photonics
- Microscopy, Biomedical Spectroscopy
- Biomechanics & Optical Elastography
- Biomedical Optics
- Nanobiophotonics & Optogenetics
- Optics for Infectious Diseases

Prof. Dr. Jürgen Czarske
ICO V.P. & Chair of ICO-25/OWLS-16
<https://ico25.org>

Optica Helps Regions Hard Hit by Pandemic with Medical Supplies and Equipment

“Light technologies offer many solutions in healthcare that are fast and precise.”

OPTICA
Formerly OSA

Optics and photonics are providing highly targeted and minimally invasive ways of monitoring body signals and symptoms with a huge potential for remotely detecting diseases and directing diagnostic treatment at an early stage. Recently, light science has played a pivotal role in improving healthcare and saving lives by providing solutions for medical teams struggling in parts of the world that the pandemic has hit hard. The global forum for light science and technology, Optica, notably improved the healthcare response for clinicians in limited-resource settings by sending out thousands of medical tools and supplies. Via its Global Health Initiative (GHI) and leveraging its Student Chapters and funding from the Optica Foundation, Optica saved these teams hundreds of thousands of Euros and, more importantly, hundreds, if not thousands of lives. Optica’s GHI shipped oximeters for local distribution through healthcare networks to help medical teams in India, Bangladesh, and Nepal with limited oxygen supplies. Meanwhile, the Foundation issued grants to 30 chapters in emerging-market countries to build personal protection equipment decon-

tamination chambers and partner with hospitals for training and use. Working in collaboration with INDIA COVID SOS, a volunteer group of scientists, clinicians, engineers, policy-makers and epidemiologists from the global community engaged in supporting the fight against COVID-19, Optica sent 12,000 pulse oximeters to India and a further 2,000 to Bangladesh and Nepal, bolstering the local responses to the pandemic. Placed on the tip of the finger, pulse oximeters are small devices that use light to check if a patient’s blood is well oxygenated. Although initially intended for monitoring patients with conditions that affect blood oxygen levels while residing in the hospital, these gadgets have become a routine part of healthcare responses to COVID-19. Transmitting light through a layer of skin, pulse oximeters measure blood oxygen levels to provide a much more accurate reading than smartwatches or phones, which reflect light off the skin. Pulse oximetry can detect several different conditions early, helping to monitor people who are most at risk of becoming seriously ill.



Lt. Col. Dr. Syed Hassan Abdullah, Country Head of Safetynet, with Mr. Dostogir Harun, presents pulse oximeters to city health professionals.



Mr. Dostogir Harun presents pulse oximeters to Dr. Shahin Mia, District civil surgeon, Jashore.

"Five thousand masks per day is an incredible cost to teams in limited resource settings. This technology is safe, reduces cost and waste, allowing hospitals to expand their supply of PPE and keep their workforce protected."

Nichole Starr
(physician and surgical resident working with the Optica GHI)

"Getting things done during the lockdown, it was a difficult experience. We had to also follow safety rules at the same time. We feel very proud and privileged that we are a part of this community and have contributed a little thing to such a great initiative by Optica. It is really a proud moment for all of us"

Rohan Katti
(SRM Institute of Science and Technology in Chennai Tamilnadu, India)

In addition to pulse oximeters, Optica has deployed equipment to decontaminate reusable **N95 surgical masks** with ultraviolet light so that teams in limited-resource settings can stay fully stocked at a fraction of the cost. Disposing of a surgical mask after a one-time use might be an everyday occurrence for many medical health practitioners, but for teams where every piece of equipment is critical, such frequent disposal is a luxury that is not always possible.

To provide immediate help and make protective equipment go further, the Optica Foundation launched a project to build decontamination chambers and deliver them to various public hospitals in 12 countries across Asia, Africa, and the Americas. The chambers would allow medical teams to decontaminate N95 masks with ultraviolet type 'C' light ('UV-C') - a part of the electromagnetic spectrum that operates at short wavelengths with the ability to kill germs.

To get to the teams on the ground, the international group of physicists, engineers, and physicians designed a cheap, easy-to-construct cabinet fitted with UV-C bulbs that allowed these health clinics to decontaminate and reuse over 900,000 protective N95 masks. Decontamination equipment currently used in U.S. hospitals can cost \$80,000 per unit.

But the GHI collaboration team managed to build portable, streamlined units for about \$500 to \$1,500 that could process nearly 5,000 masks per day when running at maximum capacity. Sourcing the materials in their own countries, the student chapter members built and tested the chambers before partnering with their local hospitals to accept and use the equipment, then trained medical staff on its use. The prototype was constructed using a metal office storage cabinet lined with household aluminum foil, with UV-C bulbs at the front and back, as reported by NEJM Catalyst. Overall, 41 cabinets were used in 21 hospitals, and we estimate that 930,000 N95s were decontaminated for reuse from July 2020 to January 2022.

Uniting a diverse, worldwide population of scientists, engineers, and healthcare professionals, Optica provides real-time solutions to societal challenges like the COVID-19 pandemic through light science and technology. Optica's global community includes the brightest minds in academia, industry, and government who are helping improve lives today and ignite the discoveries of tomorrow.

Chad Stark
OPTICA Foundation Executive Director

David Lang
OPTICA Senior Director of Global Policy

Active Learning in Optics activities in Pakistan

Hands on sessions were performed with the help of kits provided by the ICTP, OPTICA and SPIE



Imrana Ashraf, leader of the Active Learning in Optics Group, during one of the practical lessons.

The COVID-19 pandemic has added a new variable of uncertainty in our respective lives. It has caused dramatic loss of human life across the globe and has led to devastating social and economic disruption. Closure of educational institutes impacted student learning and it is yet to be ascertained as how the rapid conversion to online instruction affected student achievement. The leadership of educational institutes continues to grapple with the difficult decision to find the balance between health risk associated with on-campus learning and educational needs of the students, which are better served by in-person instruction. These unprecedented circumstances bring a new set of challenges for the already struggling academic communities. The impact is more severe for developing and economically disadvantaged countries and has led to interrupted learning, compromised healthcare, nutrition and worsening economic conditions. Before 2020, we used to look for a time window to do hands on activities in the middle of each teaching year in annul system colleges, after mid-terms examination in semester system based universities, and just before final exams in most needed government girls schools to support students with hands on knowledge.

Now we need to wait for a time window in which educational schools are open again, for in-person teaching at the end of each fresh Covid wave.

Even being a developing country we have been lucky to have good supply of Covid vaccination. This brings a positive hope of coming back to more or less a normal life.

At the end of fifth wave in November 2021 we decided to do hands on activities in December. Usually these time windows are short and uncertain, so we needed to move fast and did couple of activities, one after another. During first week of December 2021 we had managed to do two hands on activities, especially for under privileged girls institutions.

i) Optics Workshop:

We organized and directed one day optics workshop for high school and college students at Sir Syed school and college Campus-IV, Wah Cantt, Pakistan on 3rd December 2021. This institute is a unique example of co-education, boys section is on ground floor of huge building, while girls section is on first floor. I asked why it is no other way around those girls on ground floor and boys on first floor. The answer was in this way they can keep them segregated in a better way.

Below: Group photo of the Active Learning in Optics (ALO) Group in Islamabad, Pakistan.





Several hands on experiences in optics fundamentals were developed during the optics workshop for girls, celebrated last December.

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We initially planned this activity for girl's section only but when we reached, their Principle requested us to accommodate boys at least for my presentation and demonstration of optical phenomena that we usually do on stage. Being an educator, I cannot refuse it although I am always more inclined to girl's education than boys. When we entered auditorium it was full to its capacity with almost 150 female and 140 male students, eagerly waiting for this wonderful event. The session started with a lecture on importance of Light and Light based technologies, followed by demonstrations. After this first part boys were needed to leave as they did not have enough space and we did not have enough kits to cater both genders. We made a promise with boys to visit again for them. The hands on session was consists of various optical experiments, based on refraction, reflection, diffraction and total internal reflection, performed with kits provided by OPTICA, SPIE and ICTP.

ii) Optics Workshop for Girls:

The second workshop was organized on 7th December 2021 at International Islamic University, Islamabad (Girls campus) for undergraduate students. The girls campus of Islamic University lack teaching laboratories of Physics. Therefore they need to walk down to boys section once per week to perform basic experiments of Physics, that is also not a straight forward arrangement, no boys are allowed near their laboratory on that particular day. The day we conducted this workshop was quite exciting and informative for the girls. The session started with a lecture on Importance of Female education in Basic Sciences, followed by a four hours long hands-on session with girls for experiments of light additive & subtractive colors, filters, polarizers, reflection laws, scattering, converging & diverging lenses.

Prof. Dr Imrana Ashraf is the Leader of the Active Learning in Optics Group in Pakistan

Forthcoming events with ICO participation

Below is a list of forthcoming events with ICO participation. More information in the ICO website.

18-22 July 2022

AOP2022: V International Conference on Applications in Optics and Photonics

Guimarães, Portugal

Contact: Prof. Manuel Costa

info@aop2021.org

<https://aop2022.org/>

5-9 September 2022

OWLS-16: 16th International Conference on Optics within Life Sciences

Dresden, Germany

Contact: Prof. Jürgen Czarske

ico25@intercom.de

<https://ico25.org>

21-25 November 2022

XI Iberoamerican Optics Meeting/XIV Latinamerican Meeting on Optics and Lasers

Costa Rica

Contact: Prof Manuel Costa

president@optica.pt

<https://riao-optilas-2022.org>

3-5 August 2022

13th International Conference on Optics Photonics Design and Fabrication

Sapporo, Japan

Contact: Mr. Tsuyoshi Hayashi

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<http://www.odf.jp/>

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Dresden, Germany

Contact: Prof. Jürgen Czarske

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The Physics Benevolent Fund

An independent charity that offers financial support to IOP members facing hardship. Find more here:

<https://www.iop.org/about/support-grants/physics-benevolent-fund>

Responsibility for the correctness of the information on this page rests with the International Commission for Optics (ICO); <http://www.e-ico.org/>. **President:** Prof. John C Howell, Hebrew University of Jerusalem, Israel; john.howell@mail.huji.ac.il **Treasurer:** Prof. Joseph Niemela, International Center for Theoretical Physics, Italy; niemela@ictp.it. **Secretary:** Prof. Humberto Michinel, Universidade de Vigo, Spain; secretariat@e-ico.org.