

Special commemorative issue from the general world congress ICO-25-OWLS-16-Dresden-Germany-2022-Advancing Society with Light

Juergen W Czarske (General Chairman)* , Nektarios Koukourakis, and Lars Buettner

TU Dresden, School of Engineering, Center BIOLAS (Biomedical Computational Laser Systems),
Laboratory of Measurement and Sensor System Technique (MST), 01062 Dresden, Germany

Received 17 June 2023 / Accepted 19 June 2023

This special issue of JEOS:RP offers a great opportunity to looking back to the general world congress for optics and photonics ICO-25-OWLS-16 of the International Commission for Optics (ICO) and the international society for Optics Within Life Sciences (OWLS), which was celebrated in-person after two postponements from 5th to 9th September 2022 at the TU Dresden, Dresden, Germany. The general world congress was sponsored by ICO, OWLS, and TU Dresden, and financially co-sponsoring by the DGaO – The German Branch of EOS, Carl Zeiss AG, OPTICA (The society advancing optics and photonic worldwide, formerly OSA), SPIE (The International Society for Optics and Photonics – Connect Minds and Advance Light), Photonics Society of IEEE (Institute of Electrical and Electronics Engineers), IUPAP (The International Union of Pure and Applied Physics) and the City of Dresden. The EOS (European Optical Society), LAM (African Laser, Atomic and Molecular Physics Network), and RIAO (The Iberian American Network on Optics) have technically co-sponsored the general world congress. Preparations for the general world congress were underway immediately after the ICO-24 in Tokyo, Japan, 2017, but had to be halted in 2020 due to the Covid-19 pandemic. The general world congress was postponed to 2021, but could not be held again. Luckily, due to a wise decision by ICO, there was no switch to digital presentation. Great efforts have been made to increase the number of female speakers with extraordinary commitment of the international Technical Program Committee (TPC), especially by Wolfgang Osten. The outstanding engagement of Frank Hoeller, Associate Secretary of ICO from 2017 to 2021, has to be highlighted. The ICO mourns his passing away and the participants thought with a moment of silence. To commemorate of Frank Hoeller, the DGaO exhibited a poster at the congress. Most hurdles were taken together with the commitment of the worldwide network of sponsors and co-sponsors, the TPC, especially the program chairs Wolfgang Osten and Alexander

Heisterkamp, the fundraising chair Michael Pfeffer, and the adviser Bernd Kleemann, and the unbelievable commitment of the local team, especially from the chairs of the local team Nektarios Koukourakis and Lars Buettner. “Optics & Photonics for a better World” is the motto of ICO with the objective to contribute, on an international basis, to the progress of the science of optics and photonics and their applications with emphasizes the unity of the cross-disciplinary field of optics. We thank the Secretary General Humberto Michinel and the President John C. Howell for the sustainable decisions and trust. We acknowledge the crucial support of TU Dresden too. The worldwide General Congress was celebrated with participants from 55 countries of 5A (Africa, Asia, Australia, America and Amazing Europe).

For the first time in the history of ICO, a joint General World Congress was celebrated together with OWLS.

Memorable in-person talks by three Nobel Laurates were presented. Gérard Mourou, Nobel prize 1984, titled “Extreme Light for the Benefit of Science and Society”, Stefan W Hell, Nobel prize 2014, titled “Optical Microscopy: The Resolution Revolution”, and Reinhard Genzel, Nobel prize 2020, titled “A 40-Years Journey”. The two-page summaries of the talks and poster have been published on the website <http://ico25.org/>. In this special issue it is our great pleasure to present six extended papers.

Pieter H Neethling et al. presents in the great paper “Novel time-resolved CARS implementation for application in microscopy” a spatial light modulator-based temporal compression for Coherent Anti-stokes Raman Spectroscopy (CARS).

The exciting paper “Evaluation of a Time-Gated-Single-Pixel-Camera as a Promising Sensor for Autonomous Vehicles in Harsh Weather Conditions” by Claudia Bett et al. discusses new application areas of Single-Pixel-Cameras for automotive application.

Dennis Pohle et al. presents in the visionary paper “Intelligent self-calibration tool for adaptive few-mode fiber multiplexers using multiplane light conversion” a digital twin approach for adaptive mode multiplexing in fibers,

* Corresponding author: juergen.czarske@tu-dresden.de

which can be transferred to optical communication technique.

Flavie Gillant et al. shows in the paper “Accurate calibration of optical tweezers close to a glass surface using interference rings in backscattered light” the promising combination of an optical trap with phase contrast microscopy.

Paata Pruidze et al. demonstrates in the impressive paper “Brillouin Scattering Spectroscopy for studying human anatomy: Towards in situ mechanical characterization of soft tissue” the clinical translation using fiber coupled hand-held probes.

The impressive review paper “Medical Femtosecond Laser” of Karsten Koenig discusses label-free optical skin biopsies as well as corneal and cataract surgery in ophthalmology using two-photon microscopy.

The ICO-25-OWLS-16 was the first postponed congress of the ICO and the first combined congress of the ICO and OWLS. But it is much more important that it was probably

the congress with the highest quality density in 75 years history of ICO. Three Nobel Laureates not only gave fantastic plenary lectures on the topic and most recent results, there was also a lively discussion, which was extended with joint lunch and dinner meetings. Furthermore, well-known fantastic plenary, keynote and invited speakers have to be highlighted. There was a very high quality at all talks, posters, and the exhibition. Many invited speakers have won ICO Prizes before, such as the Nobel Laureate Stefan Hell. We express our acknowledgements to all committee members who contributed to the organization, the preparation, and the execution of the General World Congress in Dresden, Germany.

We hope you enjoy reading the six extended contributions in this “special commemorative issue from the world congress ICO-25-OWLS-16-Dresden-Germany-2022” of JEOS:RP. We hope to see you at the next general world congress ICO-26 in Dakar, Senegal, September 30th to October 4th 2024.