INTERNATIONAL COMMISSION FOR OPTICS
COMMISSION INTERNATIONALE d'OPTIQUE

International Society on
Optics Within Life Sciences
OWLS
Non-Profit Organization established on August 13, 1990

The 25th Congress of the International Commission for Optics (ICO) – ICO-25, 2020 Dresden, Germany

30 Years of International Society on Optics Within Life Sciences (OWLS) – Light in Life Sciences, Medical Optics and Biophotonics - 16th International Conference on Optics Within Life Sciences (OWLS-16), Dresden, Germany, 2020

Date: 31 August – 4 September 2020	General Congress of ICO and OWLS	Venue: Dresden

Progress of Society with Light

ICO-25/OWLS-16 Conferences
Honorary Chair: Gert von Bally
General Chair: Juergen Czarske
International Program Committee Chair of ICO-25: Wolfgang Osten
International Program Committee Chair of OWLS-16: Alexander Heisterkamp
Fundraising Committee Chair: Frank Hoeller

First Announcement of ICO-25 and OWLS-16, Dresden, Germany, 2020

The next General Congress of the International Commission for Optics (ICO) and the Conference of International Society on Optics Within Life Sciences (OWLS) will take place from 31st August to 4th September 2020 in Dresden, Germany. The TU Dresden is proud to host ICO-25 and OWLS-16.

The ICO, *"the Place where the World of Optics Meets"*, is an affiliated commission of the International Union of Pure and Applied Physics (IUPAP), and a scientific associate of the International Council of Science (ICSU). Its objective is to contribute, on an international basis, to the progress and diffusion of knowledge in the fields of optics and photonics. The ICO has the missions to foster advanced optics science and technology and to promote the development of science and technology in developing countries. The ICO is an umbrella organization with more than 50 territorial committee members and several international academic societies: OSA (The Optical Society), SPIE (The International Society for Optics and Photonics), EOS (European Optical Society), IEEE (Institute of Electrical and Electronics Engineers), OWLS (International Society on Optics Within Life Sciences), LAM (African Laser, Atomic and Molecular Physics Network), and RIAO (The Iberian American Network on Optics).

The first General Congress of the ICO was held in the Netherlands, in 1948. Since then, the ICO General Congress has been held every three years, and gained participation from all over the world, including developing countries. The ICO General Congress has established itself as the most prestigious world-wide conference on optics and photonics. After 30 years and continuing the success of the recent previous general congresses, held in 2017-Japan/Tokyo, 2014-Spain/Santiago de Compostela, 2011-Mexico/Puebla-Mexico City, 2008-Australia/Sydney, 2005-China/Changchun, 2002-Italy/Florence, 1999-USA/San Francisco, 1996-Korea/Taejon, 1993-Hungary/Budapest and 1990-Germany/Garmisch-Partenkirchen, it is our great honor to host the General Congress and General Assembly of ICO in our country again.

The main theme of ICO-25/OWLS-16 is *"Progress of Society with Light"*. Evidence of the scientific contribution is obvious from the fact that many Nobel laureates have accomplished their achievements in the field of optics and photonics, resulting in more than 40 Nobel prizes.

Optics and photonics will contribute greatly to solving issues on global energy and the environment. The United Nations Educational, Scientific and Cultural Organization of the UNO provides with the International Day of Light on May 16 an annual focal point for the continued appreciation of light and the role it plays in science, culture and art, education, and sustainable development, and in fields as diverse as medicine, communications, and energy. The use of LEDs for the lighting in our cities will save energy. In everyday life we frequently benefit from advanced light technology, as backbone of internet, in smart phones and for human health care. 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, which was founded at the ICO-15 Congress in Garmisch-Partenkirchen in 1990. Therefore, a special commemorative event of the 30 years anniversary of the foundation of OWLS in Germany will be organized. The hosting city Dresden is known as Germany´s Jewel Box, because of its Baroque center. Let yourself be inspired by the ICO-25/OWLS-16 in Dresden for new ideas, their translation into progress for society and to foster developing countries. On behalf of ICO-25/OWLS-16, I hope everyone will have an exciting, fascinating and memorable time at this general meeting. Please take your time to enjoy our culture, delicious cuisine, innovations and attractions in every direction.

Truly yours,

Juergen Czarske
General Chair of ICO-25 and OWLS-16, 31 Aug. to 4 Sep. 2020, Dresden, Germany
Professor and Director at TU Dresden, Fellow of OSA, Fellow of SPIE, Fellow of EOS, Senior Member of IEEE, Member of Saxon Academy of Sciences, Board Member of German Society of Applied Optics (DGaO) - The German Branch of the European Optical Society (EOS)

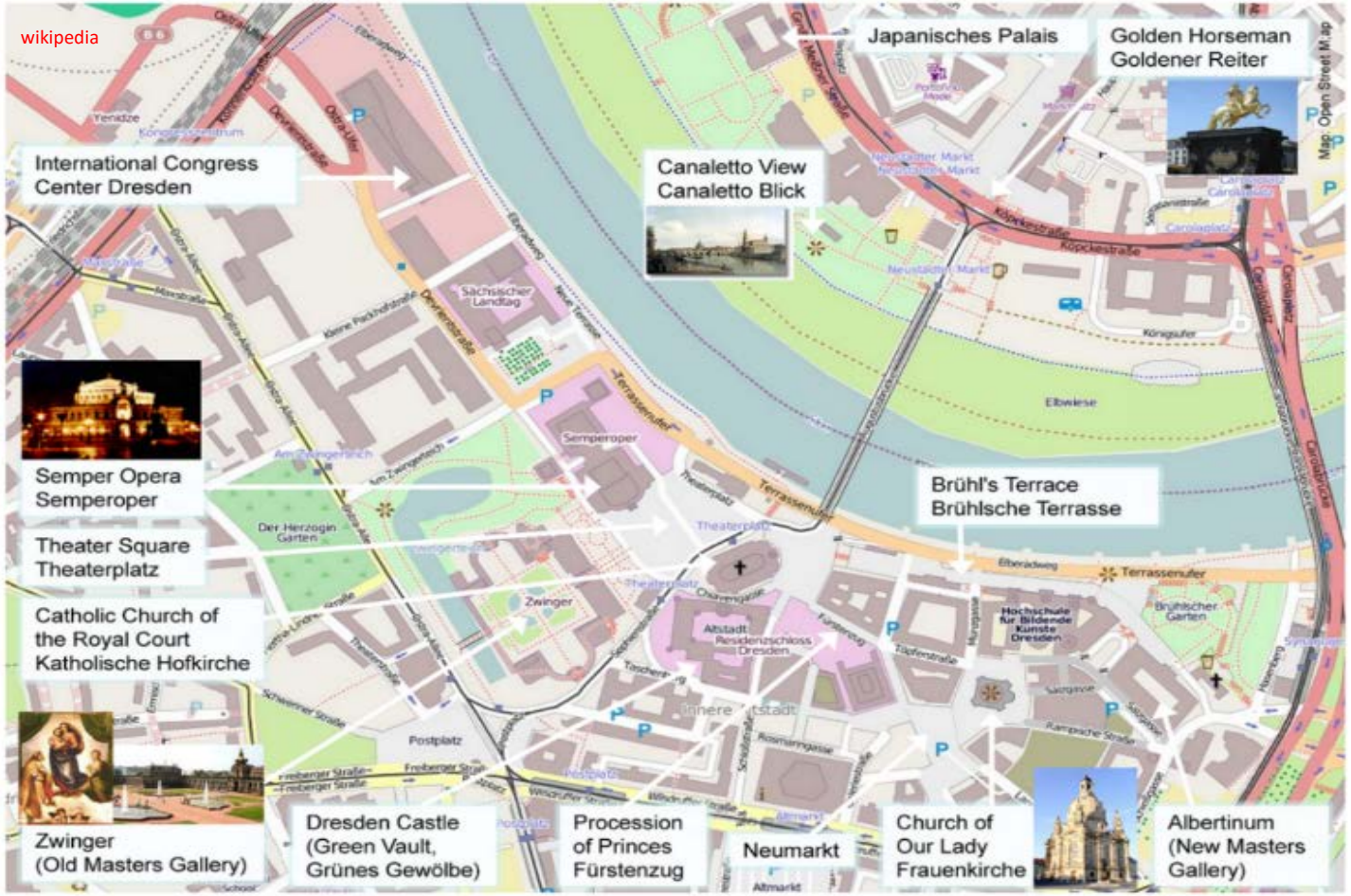
Attractions in our historic city of Dresden - to see everything near the venue

Dresden is the capital of Saxony and has a long history as the royal residence for the Electors and Kings of Saxony, who for centuries furnished the city with cultural and artistic splendour. August the Strong (The Sun King of Saxony, elected King of Poland, 1670-1733) imprinted our city. The most prominent building in the city of Dresden is the Church of our Lady. Built in the 18th century, the church was destroyed in 20th century. The remaining ruins were left for about 50 years as a war memorial. Following the German reunification, the church was rebuilt from 1994 to 2005. The royal buildings are among the most impressive buildings in Europe. Main sights are also the nearby National Park of Saxon Switzerland, the Ore Mountains and the countryside around Moritzburg and Meissen.

The TU Dresden is proud to host ICO-25/OWLS-16. In 1828, the "Saxon Technical School" (the predecessor institution of the TU Dresden) was founded. Today, the TU Dresden belongs to the TU9 German Institutes of Technology e. V. and is one of eleven German universities which succeeded in the Excellence Initiative. The DRESDEN concept (Dresden Research and Education Synergies for the Development of Excellence and Novelty) is an association of the TU Dresden with non-university research facilities at the Dresden location. Many inventions were made in this city and industry is strongly developed. Several inventions are coming from Dresden, for example mouthwash, coasters, toothpaste, filter bag, teabag, and small picture reflex camera. The economy of Dresden and its agglomeration is one of the most dynamic in Germany. It is dominated by high-tech branches, often called as Silicon Saxony. Biopolis Dresden is known for famous research on molecular bioengineering, regenerative medicine and biophotonics.

Conference office of ICO-25/OWLS-16: TU Dresden, Czarske Lab, Chair of Measurement and Sensor System Technique

Mrs. Cathleen John, Phone +49 351 463 37657, email: cathleen.john@tu-dresden.de
Mrs. Bianka Pohle, email: bianka.pohle@tu-dresden.de



The scope of the conferences ICO-25-OWLS-16, 31 Aug. to 4 Sep. 2020, Dresden, Germany, covers the following categories of the field of optics and photonics (and more)

Progress of Society with Light (ICO-OWLS)

- Optics for a Sustainable World, Environmental Protection, Cimiate Change, Food and Water Monitoring, Monitoring Microplastics in Marine Ecosystems
- Human Health Care, Optics and Photonics in Biomedicine of Developing Countries, Deep Learning in Image Processing for Cancer Classification, Superresolution Microscopy in Cancer Research (Nobel Prize 2014), Optical Tweezers for Stem Cell Treatment (Nobel Prize 2018), Femtosecond Lasers in Ophthalmic Surgery (Nobel Prize 2018)
- Large Volume Optics, Digital Cameras (Nobel Prize 2009), Optics for Smart Phones, Consumer Optics, Green Photonics, Global Energy, Solar Energy, Organic Solar Films, Emissive Displays (LED, OLED), Blue Laser Diode (Nobel Prize 2014), Lighting and Illumination, Laser Projection Techniques
- Industry 4.0, Lasers in Manufacturing, 3D Metrology for Machine Vision and Factory Automation, 3D Printed Optics, Lithography for Nanoelectronics
- Glass Fibers as Internet Backbone (Nobel Prize 2009), Energy Efficient Silicon Photonics, Optical Sensors for Internet of Things (IoT)
- Manipulation of Quantum Systems (Nobel Prize 2012), Quantum Microscopy, AI-based Information Technique, Machine Learning, Neural Networks
- Space Optical Systems, Adaptive Optics for Ground-Based Telescopes, Phased Array Techniques for Breakthrough Starshot
- Laser Interferometer Gravitational-Wave Observatory (Nobel Prize 2017), Laser Interferometer Space Antenna, Einstein Telescope

The 25th Congress of the International Commission for Optics, ICO-25

1) Optical Engineering, Materialprocessing, Design and Lithography (ICO-A)

- Optical Systems for Lithography, Novel Patterning Technologies, Extreme Ultraviolet Techniques, Photomask Technology, Inspection, Freeform Optics, Micro Optics, Additive Manufacturing, Rapid Prototyping, Laser Cutting, Laser Welding, 3D Printing, Thin Films, Optical Coatings, Damage Thresholds
- Optical Design, Optical Materials, Optics Simulation, Modeling, Diffractive Optics, Multispectral and Hyperspectral Imaging

2) Display and Vision (ICO-A)

- Quality Assessment of Imaging Processes and Displays, Virtual and Augmented Reality, Micro Display, Advances in Optics of Backlit and Front-Illuminated Displays, Flexible Displays and Transparent Displays, Speckle Issues, Screen Technology, Holographic and Light-Field Displays, Three-Dimensional Display, Low-Cost Light Sources with High Luminous Flux
- Perception, Light Measurement and Vision Systems, Novel Detectors, Reproduction of Material Appearance, Aberration Theory

3) Optical MEMS and Micro-Optics (ICO-A)

- Spatial Light Modulators, Deformable Mirrors, MEMS-based Mirror Matrix, Micro and Nano Actuators for Optical Devices, Tolerancing, Manufacturing
- Tunable Micro Optics, Adaptive Lenses, Optofluidics
- Free-Space Optical Components and Systems, Light Fidelity

4) Laser Sensing (ICO-B)

- Time and Frequency Dissemination, Frequency-Comb Applications, Optical to Microwave Frequency Conversion, Astronomical Instruments
- Remote Sensing, Time, Frequency, Temperature, Distance and Velocity Metrology, Micro and Nano Fluidics, BioMEMS, Hydrogel Sensing, Optofluidic Sensing, Fiber Sensors for Harsh Environments, Atmospheric and Oceanic Light Propagation, LIDAR, Non-Intrusive Sound and Combustion Diagnostics

5) Computational Metrology (ICO-B)

- Computational Image Processing, Structured Light, Scatterometry, Ellipsometry, Metasurface Holograms, Speckle Metrology, Turbulence Metrology, 3D-Particle Image Velocimetry
- Interferometry, Spectroscopy, 3D Camera Metrology, In Process Measurements, Traceability to SI Units, Confocal Sensing, Novel Lasers for Metrology, Phase Retrieval, Computational Shear Interferometry, Deflectometry, Optomechatronics

6) Optical Information Processing and Imaging (ICO-B)

- Digital Optics, Optical Computing, Information Photonics, Volumetric Displays, Holographic Data Storage, Lightfield Camera, Integral Imaging, Single-Pixel Camera
- Unconventional Optical Imaging, Random-Phase Encryption, Propagation in Random Media, Mesoscopic Channels, Computational Adaptive Optics, Wavefront Shaping, Digital Optical Phase Conjugation
- Coherence and Statistical Optics, Nanophotonic Information System, Computational Imaging Devices, Compressive Imaging, Ptychography

7) Quantum and Nonlinear Optics (ICO-C)

- Atom Optics, Matter Waves, Bose-Einstein Condensation, Slow Light, Quantum Simulation and Boson Sampling, Squeezed Light for Laser Interferometer
- Nonlinear Photonics, Micro Solid-State Photonics, Nonlinear Materials and Structured Material, Wavelength Conversion and Frequency Mixing
- Quantum Technology, Entanglement, Schrödinger's Cat States, Single-Photon Qubit, Quantum Computer, Quantum Information Processing, Quantum Sensing, Quantum Cryptography, Quantum Teleportation, Ghost Imaging
- Single Photon Sources and Detectors, Cold Atoms and Trapped Ions, Quantum Dots and Vacancy Defects, Nanodiamonds, Optomechanics

8) Ultrafast Phenomena and Ultrafast Optics (ICO-C)

- Ultrafast Lasers and Pulse Measurements, Nonlinear Frequency Conversion, Ultrafast THz Sources, Pulse Shaping and Coherent Control, Ultrafast Nonlinear Optics, Supercontinuum Sources, Materials Processing by Femtosecond-Lasers
- Ultrafast Plasmonics, Carrier Dynamics and Coherent Phonons, Ultrafast Nano-Optics, Femtochemistry and Femtobiology, Vibrational and Conformational Dynamics, Solvation Dynamics, Electro-Optical Sampling, Micro-Machining, Table-Top Attosecond Laser Systems, Zeptosecond-Scale Pulses, Spectral Phase Interferometry for Direct Electric-Field Reconstruction, Optical Oscilloscopes, Frequency-Resolved Optical Gating

9) High Power Lasers and Applications (ICO-C)

- High Power and High Brightness Lasers, Petawatt Lasers, Laser Particle Acceleration for Cancer Therapy
- Laser-Plasma Interaction, Processing using High Power Lasers, Laser-Based Inertial Confinement Fusion, Super-Intense Lasers for Creation of Matter

10) X-Ray and High-Energy Optics (ICO-C)

- Optics for EUV, X-Rays, and Gamma-Rays, Microscopes, Telescopes, Interferometers
- New Sources for EUV, Optical Elements and Devices, Ultrafast X-Ray Holography, Quantum Optics with X-Rays

11) Nano-Optics, Resonant Nanophotonics and Metamaterials (ICO-D)

- Nearfield Optics and Microscopy, Plasmonics, Metamaterials, Transformation Optics, Nanolasers, Metasurfaces, Photonic Topological Insulators
- Nanophotonics for Solar Energy, Surface Plasmon Resonance, Spin Wave Dynamics, On-Chip Electronic-Plasmonic Transducer, Characterization of Films, Nanofabrication, Nanoimaging, Nanosensing, Nanospectroscopy, Superlenses

12) Photonic Crystals, Nano Structures and Functions (ICO-D)

- Photonic Crystals, Photonic Nanostructures
- Nanowires, Nanomaterials, Nano Functional Devices, Nano Photonic Circuits, Ferroelectric Systems, Integrated Nanophotonics

13) Fiber Optics (ICO-E)

- Fiber Lasers and Amplifiers, Physics of Linear and Nonlinear Propagation in Fibers
- Design, Fabrication, Characterization of Fibers, Nanostructured Fibers, Optical Tapered Fibers
- Photonic Crystal Fibers, Multi-Core Fibers, Fiber Devices, Distributed Fiber Sensors

14) Optical Communications and Photonic Network (ICO-E)

- Optical Telecommunication Systems and Related Technologies, Space Division Multiplexing
- Optical Encryption and Processing, Physical Layer Security, Fiber Distribution Hubs, Data Center Technology
- Free-Space Communication, Deep Space Communication, Optical Switching and Signal Processing Technologies, Optical Interconnection and Advanced Modulation, Node/Network Architecture, Control and Management

15) Optoelectronics, Terahertz Photonics and Silicon Photonics (ICO-E)

- Semiconductor Lasers, VCSELs, Solid-State Lighting Devices, Organic Light-Emitting Devices, Environmental Photonics, Photovoltaic Devices
- Optical Amplifiers, Optical Modulators and Switches, Optical Waveguides, Light Controlling Devices, High-Speed Photodetectors
- Photonic Integrated Circuits, Photonic Integration, Guided-Wave Optics, Emerging Concepts in Silicon Photonics, Graphene–Silicon Modulators, Heterogeneous Integration
- THz MEMS, RF Photonics, Signal Generation, Signal Detection, Signal Control
- Communications, Sensing, Spectroscopy, Thermal Infrared Sensors
- Imaging, Related Integrated devices, Circuits and Systems

The 16th International Conference on Optics Within Life Sciences, OWLS-16

16) Microscopy, Biomedical Spectroscopy and Advanced Imaging (OWLS-A)

- Spectroscopy and Single Molecule Spectroscopy, Raman Microscopy, Hyperspectral and Multimodal Imaging, Diagnostics of Skin Cancer
- Advanced Imaging and Microscopy in Life Sciences: Superresolution Microscopy, Localization Techniques, Lattice Light Sheet Microscopy, Phase-Contrast Techniques, Quantitative Phase Imaging, Label-Free Biomedical Imaging, Vibrational Spectroscopy, Multimodal Biomedical Imaging, Photoacoustic Microscopy, Aberration Correction, Novel Molecular Probes, Agents and Labels, Big Data Instrumentation, Deep Neural Networks
- Nonlinear Microscopy: Multiphoton Microscopy, CARS-Microscopy, Nonlinear Spectroscopy and Imaging
- Tomographic Imaging: Optical Coherence Tomography, Photoacoustic Methods, Diffuse Spectroscopy and Imaging, Optical Diffraction Tomography
- Clinical and Translational Biophotonics, Therapy, Brain Imaging, Tissue Optics, Tissue Engineering, Neurosurgery, Ophthalmology, Tracking Cancer

17) Biomechanics, Optical Elastography and BioBrillouin (OWLS-A)

- Optical Trapping, Optical Tweezers and Stretchers, Dynamic Methods for Characterizing Tissue Vibration, Biomechanics in Developmental Biology, Micro-Rheology Measurements, OCT-Based Elastography, Photoacoustics, Cell Biomechanics, Longitudinal Tension Measurement, Mechanochemical Self-Organization, Physics of Life
- In Vivo Elastography and Applications, Confocal Brillouin Microscopy, Spontaneous and Stimulated Brillouin Scattering for Three-Dimensional Mechanical Mapping

18) Biomedical Optics (OWLS-B)

- Clinical Laser Applications: Lasers in Dentistry, Ophthalmic Technologies, Optical Biopsy/Real-Time Diagnosis, Photo Therapeutics, Laser Tissue/Cell Interactions, Photodynamic Diagnosis and Therapy, Nephrology, Cardiovascular and Intravascular Applications, Cancer Imaging, Modeling of Light Propagation in Tissue, Flow Cytometry
- Guiding Surgery and Biopsy, Ophthalmic Applications, Vision, Imaging and Applications, Laser Systems in Regenerative Medicine
- Light Delivery for In Vivo Applications, Minimal Invasive Monitoring and Stimulation, Endoscopic Imaging, Biomedical Micro-Optical Devices, µLED/OLED Array Based Devices
- New Components and Systems: X-Ray-Microscopy, Imaging, Tomography and Spectroscopy
- HEALTH Aspects: Tele-Medicine, Optical Sensors for Medical Diagnostics, Point-of-Care Diagnostics, Lighting for Health and Amenity, Photonic Diagnosis and Treatment of Infections and Inflammatory Diseases

19) Biophotonics, Optogenetics and Nanosensing (OWLS-B)

- Neurophotonics, Optogenetics and Manipulation of Cellular Systems, Instrumentation for Optogenetic Stimulation, Functional Imaging, Optically-Controlled Delivery and Gene Expression, Stem Cell Research, Optics and the Brain
- Nanosensing: Nanoparticles for Biophotonic Applications, Colloidal Nanoparticles, Reporters, Markers, Dyes, Nanoparticles, Plasmonics-Based Sensing, Molecular Probes, Targeting with Subcellular Resolution