

# NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

## ICO-25 World Congress moved to 2022

**The ICO-25/OWLS-16 Congress will take place 5-9 September 2022 in Dresden (Germany)**



Prof. J. Czarske is the General Chair of ICO-25 to be celebrated in Dresden (Germany).

The **ICO bureau**, during its last meeting celebrated 14<sup>th</sup> January 2021, approved a change in the dates of the next World Congress of the International Commission for Optics (ICO-25). The congress will not take place during 2021 as initially planned and it has been moved to 5-9 September 2022 to guarantee a face-to-face meeting. The 16<sup>th</sup> Conference of the International Society on Optics Within Life Sciences (OWLS) and its 30<sup>th</sup> anniversary will be also celebrated in parallel merging to the world congress ICO-25/OWLS-16. The resolution has been motivated by the situation generated by the covid-19 pandemic and adds another year of extension to the celebration of the mentioned event, which had already been postponed before for another year. It is a difficult decision, which has been unanimously approved by the members of the ICO bureau and that aims on the one hand to ensure the success of the meeting with the maximum participation of delegates from different countries, and on the other side to guarantee health security, given the uncertainty about the possibility of vaccination worldwide during 2021. It is expected as an advantage to the whole world congress that by the delay newest research results on optics and photonics technologies against the covid-19 pandemic will extent and actualize.

Another agreement approved unanimously during the ICO bureau meeting was to hold the ICO General Meeting (also known as the General Assembly, where the delegates from all over the world meet) in September 2021, adopting an online format. Therefore, the assembly will not coincide for the first time in its history with the celebration of the ICO World Congress. The reason for this decision is to dedicate this meeting of all the delegates from the different ICO territories exclusively to the election of the new ICO bureau, given that the current one has been in office for the last year, as it was not possible to hold the general assembly in 2020. An extraordinary General Meeting in person will be held alongside ICO-25/OWLS-16 world congress in Dresden, Germany in 2022 to discuss all other topics normally included in the agenda that cannot be considered in the online meeting format. In the next weeks, detailed instructions on the election process will be sent to all the ICO delegations by the ICO Secretariat as well as by the ICO Past President who chairs the Nomination Committee.

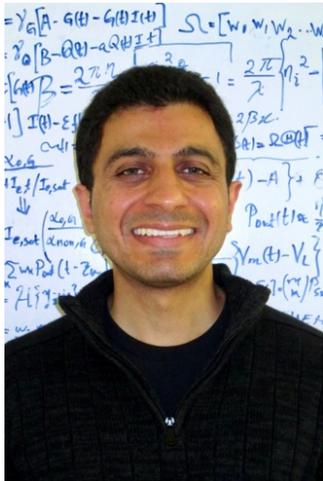
**Prof. Humberto Michinel**  
**ICO Secretary General**



*Photo of the last ICO World Congress celebrated in Tokyo (Japan) in 2017 with the attendance of the emperors of Japan.*

# ICO-IUPAP Prize to Neuromorphic Photonics

**Dr. Shastri has been awarded the 2020 ICO-IUPAP Young Scientist Prize in Optics “for his pioneering contributions to neuromorphic photonics.”**



Dr. Bhavin J. Shastri is an Assistant Professor of Engineering and Applied Physics at Queen's University, Canada.

**Prof. Shastri** received his Honours B.Eng. (with distinction) and Ph.D. from McGill University, Canada. He was an NSERC and Banting Postdoctoral Fellow and an Associate Research Scholar at Princeton University in Prof. Paul R. Prucnal's Lightwave Lab. A central theme of Prof. Shastri's Lab at Queen's is the investigation of optical physics for information processing by unifying nanophotonics and complex systems (e.g., neural networks) on photonic substrates (e.g., 2D materials and silicon photonics). Recently, Shastri Lab's research has focused on the design and experimental demonstration of integrated photonics for artificial intelligence (AI) and neuromorphic (i.e. neuron-isomorphic) computing [1].

The work for which this prize was awarded was on the demonstration of neuromorphic photonic devices and systems [2-8] resulting in a new class of ultrafast information processors. This work was carried out in collaboration with Prof. Paul Prucnal at Princeton University and Dr. Alexander Tait (currently at NIST, Colorado). Today, AI powered by neural networks [9] has had an impact in many fields (medicine, finance, communications, etc.). However, software implementations of neural networks on conventional computers are limited in speed and energy efficiency. Shastri and collaborators demonstrated that the physics of photonic devices such as lasers (graphene-based [4] and III-V1, [5,8]) and optical resonators (silicon-based [7,10], ITO-based [11], and graphene-based [12,13]) mimic neurons and synapses in the brain and, when networked on-

chip with silicon waveguides and wavelength multiplexing techniques [3], can result in scalable hardware-based neural networks [6,8]. These processors are capable of distributed and parallel processing with sub-nanosecond latencies: for example, as demonstrated for solving coupled differential equations (i.e. Lorenz attractor) [6], and predictive control (i.e. nonlinear optimization) problems [14].

Fundamentally, they can enable applications that are physically unattainable by traditional electronics such as nanosecond control loops (solving optimization problems for robotics, autonomous vehicles), or real-time processing of multichannel, gigahertz analog signals (qubit readout classification, high-energy particle collision classification), and complex systems analysis (many-body physics). This work has launched a widespread research effort [15-20] in the nascent field of Neuromorphic Photonics, a term coined by Prucnal and Shastri and in which they co-authored the first textbook [21].

## References:

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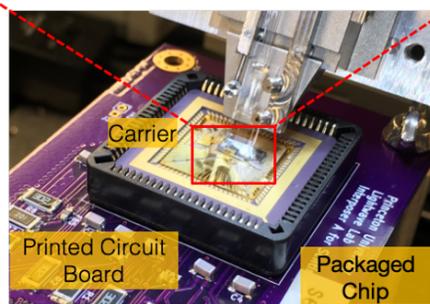
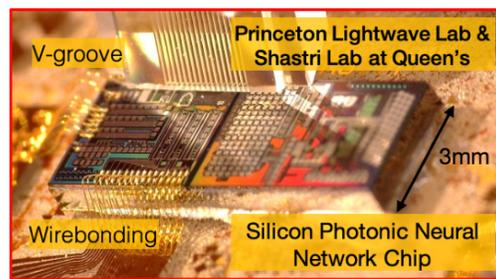


Figure: Fabricated silicon photonic neuromorphic chip packaged with optical and electrical I/O and mounted on a printed circuit board which can be interfaced with a microcontroller to program the chip with machine learning libraries (e.g. TensorFlow and PyTorch).

**Prof. Adrian Podoleanu chaired the ICO-IUPAP Young Scientist Prize in Optics Committee 2020**

# EOSAM-2021 to be celebrated in Rome

**The main photonics conference of the European Optical Society moves to Rome in September 2021**



Gilles Paulliat is the current president of the EOS.

## Contacts

International Commission for Optics (<https://e-ico.org>).

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**The EOS** (European Optical Society) was founded in 1991 on the initiative of national learned optical societies from all over Europe, together with the European Physical Society. During 2020, the EOS has renewed its steering committee, being its current president Gilles Paulliat who works at the Institute of Optics in Palaiseau (France).

Over the years, the EOS has developed its activities to represent and serve the diversity of photonics in Europe. It focuses on strengthening the cooperation and exchanges between its members. Its major conference "European Optical Society Annual Meeting, EOSAM" lies at the center of this strategy. EOSAM is a major international scientific conference covering aspects of optics and photonics. It is attended by top researchers, key leaders, students and industry experts. This congress provides a key platform to bring forth new research results, the state of the art, and bridging the gap between research, education, and industry in all the fields related with optics and photonics.

To better fit into the Photonics European landscape, EOSAM is now held yearly and moves around Europe. It spotlights the local national optical society and gives the attendees the opportunity for visiting some of the greatest

cities with strong optics research laboratories and companies. EOSAM was held in France, Scotland, Germany, the Netherlands and Portugal.

Originally planned to be held in Paris, France, the event was shifted to Rome due to changed event restrictions in Paris. Therefore, in 2021 EOSAM moves to Italy and it will be held on Sept 13th-17th in the premises of the University of Rome, Engineering Faculty. Concita Sibilina and Alessandro Belardini, from the Università di Roma La Sapienza and SIOF members, are the local organizing chairs, with Sapienza Staff of Roberto Li Voti, Marco Centini and Maria Cristina Larciprete.

A full week of novel research results presented from the widest range of optics and photonics fields, tutorials, special sessions, as well as industry oriented program and exhibition, along with networking events will make the event worth a visit! I am looking forward to seeing you in a friendly atmosphere during EOSAM 2021 in Rome next September.

**Gilles Paulliat**

**President, European Optical Society**  
(<http://eosam2021.org>)

## Forthcoming events with ICO participation

For further information, visit the ICO website <https://e-ico.org>

### 19-23 July 2021

#### **AOP2021: International Conference on Applications of Optics and Photonics**

Guimarães, Portugal  
Contact: Manuel F. Costa  
[info@aop2021.org](mailto:info@aop2021.org)  
<http://aop2021.org>

### 13–17 September 2021

#### **EOSAM-2021: Annual Meeting of the European Optical Society**

Paris, France  
Contact: Elina Koistinen  
[elina@europeanoptics.org](mailto:elina@europeanoptics.org)  
<http://eosam2021.org>

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