

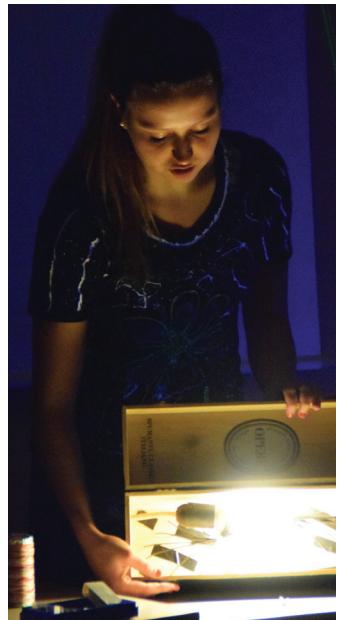


NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

The ICO Award for the Promotion of Optics and Photonics

First Prize awarded to the Spanish Society of Optics & Photonics (SEDOPTICA).



Fibre optics wonders explained by students during the school open-night light show at the high school IS Cavazzi, Pavullo, Italy.



The ICO award for the Promotion of Optics and Photonics among young people in the ICO territories was created by the ICO Bureau in celebration of the International Year of Light 2015. The Bureau put particular emphasis on activities that are sustainable beyond 2015 and that can be replicated in other territories. The ICO will continue calling for initiatives deserving of the award, which will now be established as a regular ICO award, as a legacy of the IYL 2015.

The first prize (US\$5000) was awarded to the Spanish Optical Society (SEDOPTICA) for secondary school outreach activities for the promotion of optics and photonics using the Photonics Explorer, an educational kit developed by an international team of teachers and experts in pedagogy from 11 EU countries to fit into diverse educational systems and teacher cultures, as part of an FP7 European project. The project was initiated by the Brussels Photonics Team (B-PHOT) at the Vrije Universiteit Brussel and brought together European industry, scientists at universities, teachers in secondary schools and students.

Members of SEDOPTICA contacted by secondary schools prepare the correspondent optics and photonics lab, aiding the secondary school teacher to show a wide range of optical experiences to the students. The secondary school then has the possibility of obtaining a Photonics Explorer kit to have a fully equipped lab integrated in the curricula of the educational center.

The ICO Bureau also awarded US\$1000 to a proposal from the Cuban ICO Territorial Committee entitled "Young sky observers in Havana, Optics & Photonics trainees-scientists of the future". A group of scientists and engineers from



Summer course 2015 for young amateur astronomers.

the Laser Technology Laboratory, Institute of Material Science and Technology (IMRE), in collaboration with the astronomical observatory in Havana University, presents young children and teenagers with elements of optics and photonics through hands-on activities with five telescopes.

The main objective is to allow young people to interact with telescopes and resources available, and learn the basic principles of astronomy, develop skills and enrich their knowledge of optical properties of light and the use of software to the location of celestial bodies and recognition of the Moon accidents. Through astronomy, young people are guided to see the fundamental role that optics and photonics play in modern life. In every presentation the participants do the experiment and receive a brief explanation about the physical or optical phenomena involved. This single act could trigger the spark for a future scientist, technician or engineer.

A third award (US\$1000) was awarded for a proposal from the IS Cavazzi, a secondary school with a science focus located in the Apennine mountains at the boundary with Tuscany, that serves students from the surrounding mountain area. The role played by high school in science dissemination in the local community is of crucial importance since there are no universities, research centres or science centres in a range of 45 km.

Thanks to the ICO award they intend to implement three strictly integrated actions impacting on both teachers and students: firstly, a one-day national science fair called "Amazing light" open to middle- and high-school students at national level; second, the setting up of a science show focused on light and its technological applications run by students (15–19) that will become a regular activity at the school with a continuous upgrading; and finally, a long

weekend workshop for educators about science shows and how to organize one. Teachers, science and physics university students – mainly those interested in teaching or science communication careers – and science animators will all be welcome (maximum 30). Full accommodation will be offered in teachers' homes, but travelling expenses will not be covered by the school. Contact Anamaria Lissoti at lisottianamaria@gmail.com.

A meeting highlighting optics in Mexico

The Academia Mexicana de Óptica and the Centro Investigaciones en Óptica hosts MOPM 2015.

Most meetings endorsed by the ICO are strongly international in character, although because of their locations they may be dominated by attendees from, e.g., Europe, Asia, or the United States. Attendees to the recent Mexican Optics and Photonics Meeting, held 9–11 September 2015 in Leon, Mexico, not only had the opportunity to attend seven plenary talks by outstanding scientists from all over the world, including the first by Nobel Laureate William Moerner, but to learn how strong optics programmes are in Mexico.

Mexico hosts three major centres of optics and photonics research – CIO, the Center for Investigations in Optics, in Leon; INAOE, the National Institute of Astrophysics, Optics, and Electronics, in Puebla; and CICESE, the Center for Scientific Research and Higher Education, in Ensenada – plus numerous universities and research institutes with smaller-scale activities in these areas. All were well represented at the meeting.

The meeting venue was CIO, which combines the feel of a compact modern university campus with the atmosphere of a retreat. The facilities were excellent with no real distractions other than the seductive sunshine and pleasant breezes outside. Conference leadership, provided by Oracio Barbosa-Garcia, Amalia Martinez-Garcia, and ICO Bureau member Eric Rosas was outstanding.

ICO President Yasuhiko Arakawa, from the University of Tokyo, gave a plenary talk keyed to the International Year of Light in which he emphasized how light-based technologies contribute to sustainable development and provide solutions to global challenges in energy, education, agriculture, information technologies, and health – in direct agreement with IYL 2015 objectives.

In addition to the seven plenary talks, there were 16 invited talks, all in non-parallel sessions. The scientific content of the meeting included 60 poster presentations. Total attendance reached an impressive 347. One notable event during the meeting was the awarding to Chandra Shakher of the 2014 ICO Galileo Galilei Prize (see the October 2014 issue of this newsletter).



Group photo of meeting attendees. In the front row, left to right and beginning with the second person on the left, are: Eric Masur, Amalia Martinez, Nobel Laureate William Moerner, ICO Board member Eric Rosas, ICO President Yasuhiko Arakawa, and Toyohiko Yatagai, SPIE President. At the far right of the front row is Zeev Zalevsky, 2008 ICO prize-winner.



Mexican Academy of Optics President Amalia Martinez with Nobel Laureate William Moerner.



ICO President Yasuhiko Arakawa presents the ICO Galileo Galilei Award to Prof. Chandra Shakher, from India.

The ICO Galileo Galilei Award 2015

Awarded to Aram Papoyan, Institute for Physical Research of the National Academy of Sciences of Armenia.



Aram Papoyan in the Laboratory of Optics of the Institute for Physical Research in Ashtarak, Armenia (2015).

The ICO Galileo Galilei Award Committee awarded the ICO Galileo Galilei Award 2015 to Aram Papoyan, Director of the Academy of Sciences of Armenia since 2006. The award citation reads: "For his important achievements in high-resolution spectroscopy of alkali atoms and for his valuable contributions to the promotion of experimental atomic physics in Armenia."

Papoyan's main research interests are laser spectroscopy and nonlinear optics of atomic media. He obtained his Master in radiophysics from the Yerevan State University in 1982, his PhD in optics in 1991, and his doctorate in laser physics in 2004.

During the period 1999–2003, Papoyan contributed to an optical experiment, carried out by the group of M A Bouchiat at the Laboratoire Castler-Brossel, Ecole Normale Supérieure (Paris, France), which led to finding evidence of atomic parity violation in cesium (*Phys. Rev. Lett.* **90** 143001).

Being involved in atomic spectroscopy in wavelength-scale-thickness vapor cells since the invention of "nanocells" in 2001 by the group of David Sarkisyan, he made significant contributions to studies of coherent and magneto-optical processes in very specific conditions of resonant interaction of laser radiation with atomic vapor.

The most important achievements of Papoyan relate to studies of selective reflection of light, a process first observed over a century ago by R Wood and that has become a powerful spectroscopic tool. During the past 20 years Papoyan performed a series of experiments where the technique of selective reflection was used to study the onset of the multi-particle interatomic collision regime in ultra-dense vapor, to achieve phase-tunable homodyne detection of atomic radiation by suppression of off-resonance reflection, to the realization of tunable locking of laser radiation frequency to atomic resonance lines, to the determination of isotopic abundance, etc. Recently, Papoyan observed, for the first time, selective reflection from a molecular vapor of rubidium dimers. These studies extend the capability of selective reflection as a spectroscopic instrument and have considerable impact on fundamental and applied atomic physics.

With the help of colleagues from Paris-Nord University, Papoyan built the first Armenian single-frequency tunable diode laser system in 1997 and carried out the first Armenian experiments on high-resolution atomic spectroscopy. Further significant development of research in this area brought international recognition to Armenia: nearly 70 articles on coherent, buffer-gas-induced, and magneto-optical effects in alkali metal vapors have been published since then in highly-ranked peer-reviewed journals. The most



Aram Papoyan (2nd from the left in top row) with participants of the Laser Physics conference held at the Institute for Physical Research in Ashtarak, Armenia (2006).

prominent of those results was a breakthrough technique linked to nanometric-thickness vapor cells, unique throughout the world for more than 13 years, which was developed at Papoyan's home institute the group of Prof. D Sarkisyan.

The most productive scientific period for Papoyan has been the post-Soviet era, despite the fact that Armenia's independence was being built amidst extremely difficult conditions imposed by military clashes, blockade, poverty, and even natural disasters. After more than two decades after the fall of the Soviet Union, the working conditions remain unfavorable due to a fragile ceasefire, continuing blockade and shortage of science funding, which makes carrying out world-class research a real challenge. During this period, intense international research collaboration was developed with partner research institutions in France, Latvia, Germany, Switzerland, Bulgaria, the Netherlands, Italy and Japan.

But Papoyan continues promoting research on optics in Armenia, and was a strong supporter of the creation of an ICO Territorial Committee in Armenia, which he chaired since its creation in 2011. He is editor of the Physical & Mathematical Section of the Armenian popular scientific journal *Gityutyan Ashkharhum (In the World of Science)*, co-director of CNRS-SCS French-Armenian International Associated Laboratory IRMAS, member of the Board of Trustees of the A Alikhanyan National Scientific Laboratory (Yerevan Physics Institute), member of the Governing Board of the "Radioisotope Production Center" CJSC, member of the Scientific Council of the Russian-Armenian University, member of the Scientific Council of the National Bureau of Expertise, and this year became member of the Editorial Board of the *Armenian Journal of Physics*.

The ICO Galileo Galilei Award Committee 2015–2017 consists of professors María J Yzuel (Chair, ICO vice-president), Anna Consortini, Nataliya Kundikova, Fernando Mendoza Santoyo, and Joseph Niemela (ICO vice-president).

First ICO travelling lecturer co-sponsored by IOP

**The Institute of Physics
joins the ICO in joint
sponsorship.**

IOP Institute of Physics



Group of attendees to the lecture series by Colin Sheppard at the University of Buenos Aires.

The Institute of Physics (IOP) has joined the International Commission for Optics in sponsoring the ICO travelling lecturer programme, which enables scientists of international reputation to lecture on modern aspects of optics and photonics.

This year, the IOP co-sponsored a lecture series by Prof. Colin Sheppard, who attended the XVII Giambiagi Winter School Light and Light Based Technologies from 3 to 7 August 2015 at the Physics Department of the School of Sciences of the University of Buenos Aires, in Buenos Aires, Argentina.

The subjects selected for this year offered students and young researchers from the region the opportunity to learn the latest developments in the field of optics and photonics from well known specialists.

Professor Sheppard gave three lectures on the focusing of light, confocal microscopy and superresolution and phase contrast imaging. He interacted with students and young researchers in the poster session. He also contributed with discussions with researchers in the Image Processing Laboratory of the same institution. As a consequence of this fruitful interaction, the possibility if a longer research visit is being considered.

Participants in the school and workshop totalled 86. They came from different parts of Argentina (79), Colombia (3), and Uruguay (4). The school was targeted at a broad audience mainly composed of graduate and undergraduate students and young researchers. There were many rich discussions and interactions between participants and the lecturers during school.

Contacts

International Commission for Optics (e-ico.org).

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Forthcoming events with ICO participation

Below is a list of 2015/17 events with ICO participation. For further information, visit the new ICO webpage at <http://e-ico.org/node/103>.

25–28 October 2015

20th Microoptics Conference (MOC'15)

Fukuoka, Japan
Contact: Ryuichi Katayama
tel: +81-92-606-3135
r-katayama@fit.ac.jp
www.comemoc.com/moc15/

9–13 November 2015

OptoAndina

Quito, Ecuador
Contact: Cesar Costa Vera
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cesar.costa@epn.edu.ec

15–26 February 2016

Wintercollege on Optics

Trieste, Italy
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28 February – 2 March 2016

ODF'16

Weingarten, Germany
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www.odf16.de/

17–21 May 2016

International Conference on Applied Optics and Photonics 2016

Hanover, Germany
Contact: Eduard Reithmeier
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3–8 September 2017

24th Congress of the International Commission for Optics (ICO-24)

Yokohama, Japan
Contact: Yasuhiko Arakawa
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www.scj.go.jp/ja/event/ico2017



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