

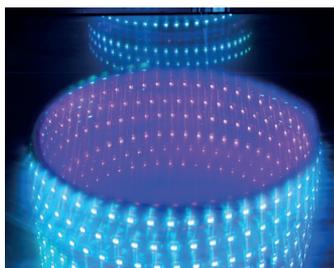
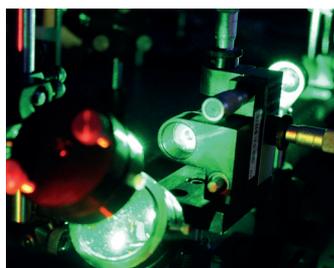


NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

The Mexican Photonics Initiative

The Mexican Academy of Optics, RIAO, and Promexico to launch the *Iniciativa Mexicana de Fotónica*.



All images courtesy of CIO, Leon, Mexico.

Optics and photonics play an increasingly relevant role all around the world, since those are the backbone technologies for the key industrial processes allowing the telecommunications, energy generation, diseases detection and diagnosis, advanced manufacturing for many industries, etc. The United Nations declaration of the International Year of Light and Light-Based Technologies 2015 highlighted this worldwide importance of optics and photonics.

In recent years, some of the main economies in the world, like the US, the UK, Germany and Canada, have recognized optics and photonics as key enabling technologies for their future development. This recognition has fostered the design of national and regional mechanisms devoted to the sustainable exploitation of optics and photonics, such as the National Photonics Initiative of the United States of America, the European Technological Platform Photonics21 of the European Union, and the Photonics Leadership Group of the United Kingdom, among others.

In Mexico, the vice-presidency appointed by the Red Iberoamericana de Óptica to the International Commission for Optics, through the Mexico Territorial Committee for Optics - represented by the Academia Mexicana de Óptica - together with ProMéxico, the Mexico's government agency devoted to promoting the country all around the world for foreign investment, started a joint collaboration in 2014 that led to the *Iniciativa Mexicana de Fotónica* (Mexican Photonics Initiative - MPI), the mechanism allowing Mexico to establish synergies between industry, government, academia and society, in order to develop the optics- and photonics-based industries required by the country to retain its role as one of the most important economies of the world.

The MPI intends to position optics and photonics as priority technologies for Mexico, in a way that an innovation-oriented ecosystem can be created for industries such as telecommunications, energy, health and medicine, and advanced manufacturing. It is expected that this innovation-friendly ecosys-

tem will be successful in attracting the young Mexican talent by involving it at early educational stages into these knowledge fields, to facilitate their latter natural insertion to the several productive activities: qualified manufacturing, technical specialized service supply, new products design, etc. This strategy looks for Mexico to advance in the near future in the global photonics market to reach an important role with innovative companies based in optics and photonics technologies, but with profound roots in a solid scientific base, in which the Mexican optics and photonics community will continue to supply highly qualified talent, as well as with the design and construction of cutting-edge scientific facilities essential for high-level-oriented research and the development of innovative products and services, like photonics certification centres, the *Clúster Mexicano de Fotónica* (Mexican Photonics Cluster), or the ultra-high power laser.

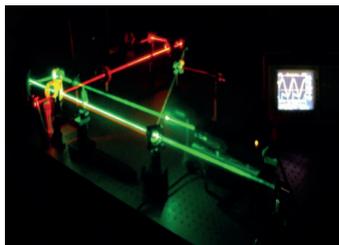
As the initial product of the MPI, currently a control group conformed by outstanding members of the Mexican optics and photonics community, works in the development of a first iteration Mexican Technology Roadmap for Photonics, which is expected to be ready later in 2016, presenting the starting scenario for the development of the Mexican optics- and photonics-based industries, and establishing the milestones that the country will pursue in the coming years to continue sustainable development of the four key industries: telecommunications, energy, health and medicine, and advanced manufacturing.

It is expected that after the launch of this first Mexican Technology Roadmap for Photonics, more stakeholders, industry leaders, government, academia and the Mexican society join the MPI and promote it in their various circles of influence. The end goal is that the results of the MPI translate into public policies on education, science, development technology, innovation, economy, health, poverty alleviation, equality gender, environmental care, etc.

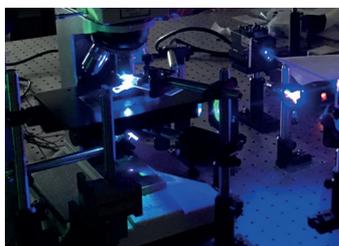
Eric Rosas, ICO appointed vice-president by RIAO, CIO, Leon, Mexico.

Hands-on activities at the ICTP Winter College

The Winter College 2017 will include laboratory activities.



Set-up for thermal lens spectroscopy (Applied Optics Lab, IVIC).



Thermal lens microscopy setup at the IPN (Instituto Politécnico Nacional, Mexico).

The ICO has been an active member of the Trieste System in Optics Sciences and Applications Advisory Group (TSOSA) since its inception in 2003. The TSOSA has recommended that the ICTP includes hands-on activities in the Winter College of Optics whenever possible. Thanks to the commitment of the directors of the Winter College 2017, a new structure will allow students to devote part time to activities in the lab, working on special set-ups prepared for hands-on training. This college structure is reminiscent of the first Laser and Fiber Optics Workshops held at ICTP under the lead of Prof. Abdus Salam.

The Abdus Salam International Centre for Theoretical Physics (ICTP), in collaboration with the International Commission for Optics (ICO), the Optical Society of America (OSA), the International Society for Optics and Photonics (SPIE), the European Optical Society (EOS), Società Italiana di Ottica e Fotonica (SIOF), the International Society on Optics Within Life Sciences (OWLS), will organize a Winter College on Optics. This year the topic is dedicated to Applied Optical Techniques for Bio-imaging, which will be held at ICTP, Trieste, Italy, from 13–24 February 2017.

There are important scientific and pedagogical aspects for choosing these topics: advanced light microscopy has become one of the most useful tools in the life sciences and environmental research and it has been recently awarded through the 2014 Nobel Prize in Chemistry to E Betzig, S W Hell (an ICO prize awardee in 2000) and W E Moerner.

The course will start with the basics of optics of light microscopy, covering the various methods of imaging fluorescent samples, polarization microscopy and image processing, and concludes with some of the latest advances in light microscopy using super-resolution techniques. As a focus on this forthcoming college, in addition to lectures, the courses will also provide laboratory sections, scheduled every day in the afternoon, in which students will have hands-on activities. This is indeed a new focus for the college at the ICTP that will address fundamental and experimental aspects of advanced microscopy, spectroscopy and related techniques in combination with experimental sessions and a design of an experimental project by the participants who qualified for presenting their own scientific projects.

The scope of the course is to promote new theoretical and experimental methods, concepts, instruments, measurement techniques and data analysis routines for both laboratory and industrial applications to train students and scientists, as well as to coordinate international activities and collaboration in this area. By focusing on both theory and applications, the workshop will also provide an interesting intersection of emerging techniques and experimental methods with theoretical advances in the field. The lectures will focus on a variety of topics related to biological applications, environmental research and material characterization.

Relevance to scientists in developing countries

With theoretical and experimental sessions, the interdisciplinary nature of the workshop will target a wide audience of professionals (including students, teachers, science and scientists) dealing with experimental and theoretical work related to the field of microscopy and



Students receiving instruction at the SPIE-ICTP Anchor Research in Optics Program Laboratory.

spectroscopy applications in different fields of life sciences. It is expected that the school will stimulate collaborations among scientific communities for the generation of joint projects and other initiatives, which will enhance the availability of public-domain technical resources especially for research and education in developing countries.

Organizers

The co-directors of the college are: Humberto Cabrera (Venezuelan Institute for Scientific Research, Merida, Venezuela), Maria L Calvo (Universidad Complutense de Madrid, Spain), Alberto Diaspro (Istituto Italiano di Tecnologia, Genoa, Italy), Viktor Lysiuk (V Lashkariov Institute of Semiconductor Physics, Ukraine), Nicoletta Tosa (National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj, Romania), with local organizers: Joseph Niemela, Dan Cojoc and Mitcho Danailov (Trieste, Italy).

The main topics will focus on: introduction to optical microscopy, confocal microscopy, phase contrast microscopy and super-resolution, bio-imaging processing and speckle interferometry, advanced fluorescence microscopy, fluorescence nanoscopy and label-free approaches in microscopy, mobile-phone-based fluorescent microscopy: sensing and diagnostics, STED microscopy, polarization microscopy: biomedical imaging and diagnostics, photothermal spectroscopy and microscopy: related techniques and applications, time-resolved and multispectral spectroscopy, biosensing by surface plasmon resonance, optical properties of thin films, optical lithography, applications of nanostructured porous materials for biomedicine, optical tweezers and applications.

Following the recommendation of the TSOSA Committee, the Winter College will include hands-on activities. The director in



Dr Humberto Cabrera working at the ICTP optics laboratory.

charge is the Professor Humberto Cabrera and the selected experimental sessions are: photothermal microscopy, surface plasmon resonance method for precise detection of low-concentration solutions, optical tweezers: demonstration on manipulation of micron-size particles and discussion with students, multi-spectral spectroscopy analysis, lock-in photothermal shadowgraph method, experiments and computer lab processing, polarization microscopy, biomedical imaging and diagnostics, laser speckle bio-imaging, experiments and computer lab processing: portable mobile-phone microscopes: demonstration with differ-

ent prototypes, spectroscopy: determination of the optical properties in the visible range of thin films influence of the substrate and material, UV-Vis optical fiber assisted spectroscopy in thin films and solutions, hands-on sessions in the computer laboratory.

More information can be found at <http://indico.ictp.it/event/7920>

We invite all young scientists interested in the topic to participate in this forthcoming college.

Humberto Cabrera, Instituto Venezolano de Investigaciones Cientificas and International Centre for Theoretical Physics. Maria L Calvo Universidad Complutense de Madrid.

Optics Symposia in Armenia

Four International Symposia on Optics held since 2011.



2011: Gagik Buniatyan (LT-Pyrkal, Armenia), Narine Gevorgyan (RAU, Armenia), Maria L Calvo (Universidad Complutense de Madrid, Spain), Brian Culshaw (University of Strathclyde, UK), Aram Papoyan (IPR of NAS).



2014: William Rhodes (FAU, USA), Joseph Niemela (ICTP, Trieste), Stefano Bellucci (Frascati National Laboratory INFN, Italy), Armen Nersessian (YSU, Armenia), Narine Gevorgyan (RAU, Armenia), David Blaschke (University of Wroclaw, Poland).

The 4th International Symposium "Optics and its Applications" (Optics-2016) took place in Yerevan and Ashtarak, Armenia, from 25-28 July 2016. The Symposium was organized by the Russian-Armenian University (RAU), the Institute for Physical Research of the National Academy of Sciences (IPR of NAS), the Greek-Armenian industrial company LT-Pyrkal, the Faculty of Physics of Yerevan State University (YSU), and the University of Wroclaw. Furthermore, the Armenian SPIE Student chapter, as well as different OSA and SPIE student chapters were involved in the organization of OPTICS-2016.

The Symposium was dedicated to these three anniversaries: 100 years Optical Society (OSA), 10 years of the Armenian SPIE Student Chapter, and 5 years of the Armenian Territorial Committee of ICO.

OPTICS-2016 hosted 116 scientists and students from 18 countries namely: Armenia, Belarus, Canada, France, Georgia, Germany, India, Iran, Israel, Italy, Latvia, Malaysia, Moldova, Poland, Romania, Russia, Ukraine and the US.

The Symposium was supported by SPIE under the Federation of Optics College and University Students (FOCUS) conference grant, as well as by the OSA, the International Commission for Optics (ICO), the State Committee of Science of the Republic of Armenia, the RAU, the Greek-Armenian industrial company LT-Pyrkal, the IPR of NAS, and the University of Wroclaw.

This series of symposia on "Optics and its Applications" was founded by the member of the Armenian SPIE student chapter, Narine Gevorgyan, and could be realized with the support of Gagik Buniatyan (LT-Pyrkal), Aram Papoyan (IPR of NAS) and Hayk Sarkisyan (RAU). The first symposium took place in 2011, and it was the first scientific event organized in Armenia since this country became a member of the ICO. The 2nd symposium on Optics and its Applications was organized by ICTP (smr2633) in 2014 and was the first official scientific event that was organized by ICTP in Armenia. The 3rd Sympos-



2016: Eugene Arthurs (SPIE, USA), Fedor Mitschke (University of Rostock, Germany), Gerd Häusler (Erlangen-Nurnberg University, Germany).

ium took place in 2015 under the SPIE FOCUS grant and was devoted to the International Year of Light and Light-Based Technologies.

The objective of this series of Symposia is to bring together experienced and young scientists working in various areas of optics, to share their ideas and achievements, present their works and to discuss the most recent developments in their areas. These scientific events provided opportunities for researchers from industrial companies, academic and research institutions to exchange information and to launch collaborations.

The program of the symposia as well as scientific presentations also included career-development lectures, presentations of institutions (CERN, ICTP, JINR, KAUST, Université de Bourgogne, University of Wroclaw) and societies (ICO, OSA, SPIE). During the last two symposia presentations of the OSA and the SPIE, student chapters' activities were also organized. Each day of the symposium took place in a different scientific organization, including the industrial company. This gave the participants the opportunity in a short time to see the main scientific centres of Armenia and to visit their laboratories.

In the closing ceremonies of the symposia, awards were presented for best student oral presentations (only students were awarded). In 2011, the award for the best oral presentation of experimental work was given to Paytsar Mantashyan (Armenia) and the one for best oral presentation of theoretical work to David Dzsotjan (Hungary). In 2014, first place for best oral presentation was



2015: Astghik Chalyan (RAU, Armenia), Tatevik Chalyan (University of Trento, Italy), Sune Svanberg (Lund University, Sweden), Katarina Svanberg (Lund University, Sweden), Angela Guzman (CREOL, USA).

given to Yousef Pourvais (Iran), the second place was shared between Naira Grigoryan from Germany and Irina Dolganova (Fokina) from Russia. In 2015, the first place was shared between Tatevik Chalyan (Italy) and Lukas Nadvornik (Czech Republic); and three certificates were given for second place to Mariam Gevorgyan (Armenia and France), Gleb Katyba (Russia) and Hrach Toneyan (Armenia). This year's first place for the best oral presentation was awarded to Mateusz Szatkowski (Poland), second place went to Astghik Torosyan (Russia), and third place to Matis Laci (Latvia).

The meetings in the "Optics" series are a success story. This conference series has become a brand and attracts leading persons in the field to the developing region where contact with young academics and students is very important

for the future survival of the academic tradition. An important characteristic of these meetings is that the organization is to a major part in the hands of young scientists and students from the SPIE and OSA chapters. They learn to take over responsibilities in the early stage of their scientific life and make contacts that are important for developing their scientific career.

The four symposia were attended by 500 scientists and students representing 41 countries from all continents. Such a broad international community confirmed the important mission of science to be a uniting force between different countries, religions, and nations.

The next symposium will take place in Wrocław, Poland, from 3–7 July 2017.

David Blaschke, University of Wrocław, Poland.

Contacts

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

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e-mail secretariat@e-ico.org;
ico.secretariat@gmail.com

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Forthcoming events with ICO participation

Below is a list of 2016/17 events with ICO participation. For further information, visit the new ICO webpage at <http://e-ico.org/node/103>.

21–25 November 2016

RIA-OPTILAS 2016

Pucon, Chile

Contact: Carlos Saavedra Rubilar

tel: +56 41 2204740

riao.optilas2016@cefop.udec.cl

<http://riaooptilas.cefop.cl/>

26–28 November 2016

International Conference on Light and Light-based Technologies

Tezpur, Assam, India

Contact: Pabitra Nath

tel: +913712-275575

pnath07@gmail.com

<http://luit.tezu.ernet.in/icl2t>

13–24 February 2017

Wintercollege on Optics

Trieste, Italy

Contact: Joe Niemela

tel: +39-040-2240555

niemela@ictp.it

<http://indico.ictp.it/event/7920/>

4–7 April 2017

International Conference on Optical and Photonic Engineering (icOPEN 2017)

Singapore

Contact: Anand Asundi

tel: +65-67905936

d-cole@ntu.edu.sg

www.icopen.com.sg/

8–12 May 2017

International Conference on Applications of Optics and Photonics (AOP 2017)

Faro, Portugal

Contact: Manuel da Costa

tel: +35-1253604070

president@optica.pt

www.optica.pt/aop2017

21–25 August 2017

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

Tokyo, Japan

Contact: Yasuhiko Arakawa

tel: +81-3-5452-6245

arakawa@iis.u-tokyo.ac.jp

<http://ico24.org>

11–15 September 2017

213th International Conference on Correlation Optics "Correlation Optics '17"

Chernivtsi, Ukraine

Contact: Oleg V Angelsky

tel: +380372244730

o.angelsky@chnu.edu.ua

<http://ptcsi.chnu.edu.ua/en/corrupt17>

Responsibility for the correctness of the information on this page rests with ICO, the International Commission for Optics; <http://www.e-ico.org/>. *President:* Prof. Yasuhiko Arakawa, Director, Collaborative Institute for Nano & Quantum Information Electronics, University of Tokyo, Japan, arakawa@iis.u-tokyo.ac.jp. *Associate Secretary:* Prof. Gert von Bally, Centrum für Biomedizinische Optik und Photonik, Universitätsklinikum Münster, Robert-Koch-Straße 45, 48149 Münster, Germany; bally@uni-muenster.de