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TOWARDS ICO-25

EN ROUTE VERS ICO-25

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Headquarters:

Institut d'Optique Graduate School,
Campus Polytechnique
2, avenue Augustin Fresnel
91127 PALAISEAU Cedex - France

Edited in Spain.



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PART I:

ICO PERIODIC REPORT

PERIODIC REPORT OF THE ICO TO IUPAP

Roberta Ramponi, ICO President 2017-2021

Introduction



ICO, being founded in 1947, is now more than 70 years old, and it is composed of 53 territorial committee members and 7 international society members. It is an affiliated Commission of the International Union for Pure and Applied Physics, IUPAP, and an affiliated member of the International Science Council, ISC.

In 2018 in Delft, the Netherlands, we celebrated 70 years since ICO first General Congress, ICO-1, which was also held in Delft, in 1948. Since then, the ICO Congress has been held every three years.

Proved to be an important and prestigious forum of scientific discussion for the Optics and Photonics community, with a wide and growing worldwide participation, it includes many scientists from developing countries. Participation of students and young scientists has been supported, and a careful policy to favor gender diversity has been set in place throughout the years. The last ICO General Congress, ICO-24, was held in Tokyo in 2017, and it has seen the participation of about 1000 delegates from more than 20 countries. The Opening Ceremony was held in the presence of Their Majesties the Emperor and Empress of Japan; six prestigious guests, including the Mayor of Tokyo, and more than 850 registered attendees joined this event.

ICO-25 was supposed to be held in Dresden, Germany, in 2020, together with the 16th Conference of the International Society on Optics Within Life Sciences (OWLS-16), but it had to be postponed due to the pandemic related to COVID-19. Initially rescheduled from 13 to 17 September 2021, considering travel restrictions and difficulties still in place, it is now postponed from 5 to 9 September 2022. However, ICO General Assembly will take place online on 14 and 15 September 2021, together with elections of the Bureau and Executive positions for the next term (2021-2024).

Since its foundation, as our motto says, ICO has been and is “the place where the World of Optics meets”. Actually, it aims more and more to be also the place where Optics meets the World, overcoming social, economic, religious and political barriers in the name of Science. In the past four years, ICO has been facing and still faces a crucial phase.



Some of the participants at the first official meeting of ICO held in 12-17 July 1948 at the Physics Laboratory of the Technische Hogeschool, Delft, Netherlands.

The importance of optics and photonics as key technologies to foster sustainable development and to meet the societal challenges that the World is dealing with, keeps growing, and this gives us tremendous opportunities together with important responsibilities. Despite limited budget, teaming up with our Members, the Territorial Committees and International Societies, and thanks to the continuous support of enthusiastic volunteers, we can make the difference, helping the optics and photonics community all over the World to be a key policy-making player in the present knowledge-based society, fostering the use of scientific and technological capacity to reduce the gap between developing and developed countries, favoring an open science approach, fruitful interactions and people mobility. To meet our mission, we promote instruments to support gender balance and to inspire and support young minds and we foster knowledge and technology transfer for the sake of innovation and human well-being. Along this path, in order to reach out more and more countries, with a special attention to developing ones, we worked and keep working to increase membership. It is not an easy task, however it is a first necessary step for us to be able to give our full support to the local communities of Optics and Photonics.

Among ICO flagship activities I would like to mention our yearly award program, including ICO Prize, ICO Galileo Galilei Medal, IUPAP Young Scientist Prize in Optics, ICO/ICTP Gallieno Denardo Award. Through these awards, we recognize the contribution to optics and photonics of promising young scientists who achieve break-

through results in the early stage of their careers, of inspiring scientists giving outstanding contributions to the field working under comparatively unfavorable circumstances, and of young researchers from developing countries who conduct their research in developing countries. Our Awardees become our ambassadors and bring to the World a positive message of optimism and trust in science. I take the opportunity to deeply thank all nominators who have contributed with excellent proposals throughout the years, and to ICO selection committees for their great work. Indeed, if we go back to the list of our past prize winners, it is easy to find the names of many scientists and stakeholders who made the recent history of optics and photonics. A detailed report on the ICO award program and winners of the past four years can be found in the dedicated chapter of this Green Book.



Photo of members of the current ICO board in front of the same building, where the first ICO bureau took place in 1948. From left to right, in the top row: P. Urbach, J. Harvey, L. Sirko, J. Howell. Middle row: F. Höller, E. Rosas, G. von Bally, Q. Gong, J. Czarske, M. Zghal. Bottom row: C. Londoño, R. Ramponi, Y. Arakawa, H. Michinel, N. Kundikova, S-H. Park.

Another activity we are proud of is the Traveling lecturer program that aims to promote lectures on modern aspects of optics and photonics in interested territories by scientists of international reputation with good lecturing skills. The program is focused specially at developing nations, but is not necessarily restricted to them. Through this program we hope to attract young students and researchers to pursue their future in optics and photonics and to favor closer collaboration between the lecturer and the scientists of the destination territory. The program experienced a stop in 2020 due to the pandemic, however it has shown a good impact and received very positive feedback, both from the lecturers and from the hosting territories.

Last, but not least, every year ICO sponsors conferences and workshops on Optics and Photonics that match our aims and commitment and are organized with the support of our Territorial Committees. Moreover, we are among the founding partners of the biennial International Conference on Education and Training in Optics & Photonics (ETOP) that brings together educators from around the world to share information and novelties about the practice of teaching optics at all levels. Indeed, to ensure that optics and photonics future workforce can meet the growing needs, expectations and challenges of research, science, and industry, and be at the core of today's worldwide technological infrastructure, related teaching must continually be upgraded and renewed. Among our major events of the past four years, I would like to mention the very successful OPTISUD 19 — ICO & IUPAP-C17 Topical Meeting on OPTics and applications to SUsustainable Development, held in Carthage, Tunisia, from 1 to 5 September 2019. It was a great opportunity to bring internationally renowned scientists together with young researchers and students and to foster a wide participation from African countries. Also concerning ICO sponsorship to conferences, the activity dropped during the pandemic. Indeed, although some organizers moved to online events, mainly in the case of large professional organizations, many others decided to cancel or postpone the events.

Following the great success of the International Year of Light 2015, an International Day of Light (IDL) has been established and celebrated every year on May 16th. ICO has given its active participation and contributed speakers, including myself, at some of the official events, and helped promoting activities. This year, the focus of the IDL is the Trust Science Campaign (#LightDay2021 #TrustScience) that ICO signed and promotes. Indeed, the World probably never experienced as hardly and widely as under the current pandemic conditions the need to rely on Science and Technology to win the threats that can arise from everywhere, from natural events and from human misconduct, and to find solutions capable of improving our quality of life. Optics and photonics are one of the keys for a better and sustainable future.

Actions for becoming an ISC full member and ICO Strategic Planning

At the 2017 General Assembly in Tokyo, the decision to follow-up with all actions needed to become an independent Union within the International Council of Science Unions (ICSU) was voted at large majority, motivated by the much wider targets and impact that Optics and Photonics have nowadays, if compared to the past when Optics was primarily seen as a branch of Physics.

Despite the strong relationship with Physics and the excellent cooperation within IUPAP, we believe that being an independent Union will allow us to collaborate more efficiently and fruitfully with all the Scientific and Technological Institutions representing areas where Optics and Photonics may find application and have an impact (e.g. Engineering, Material Science, Life Science, Agrifood, Chemistry, Advanced Manufacturing, Smart Lighting, Energy, Cultural Heritage, Digital Innovation, and Circular Economy).

At the beginning of December 2019, we signed a Memorandum of Understanding with the International Union of Pure and Applied Physics, on our relation and cooperation to prepare a future International Union of Optics and Photonics. Meanwhile, the international frame had changed. Indeed, in 2018 the International Science Council (ISC) was founded, as the result of a merger between ICSU and the International Social Science Council (ISSC). We were immediately recognized as Affiliated Member of ISC, thanks to our status of “international body whose activities are in a field cognate to those of the Council.”

On the contrary, to become a Full Member, we need first to change our status to that of an independent Scientific Union, “being an international scientific organization devoted to the practice and promotion of specific scientific disciplines or areas.” Thus, during the online General Assembly in September 2021, to follow up with the strategic planning approved in 2017, we need to vote a new resolution to become independent of IUPAP, so as to meet the requirement to apply for full membership with ISC.

Conclusions

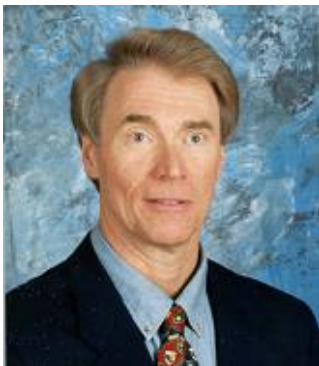
The term 2017-2021 has been a crucial period for ICO. We set the basis for our future as an independent Union and Full Member of ISC. This will open us many opportunities. Indeed, the experience of the International Year of Light 2015 has proven that the influence of Optics and Photonics is not limited to the so-called “hard” Science and Technologies, and goes much beyond, with a strong impact on several fields also in Social Science. We still have a long way to go, however, with the help and support of all our Members, working in conjunction with ISC, I am confident that, through a wise exploitation of Optics and Photonics, we can contribute to shape a better and sustainable World for future generations.

Finally, I would like to express my thanks to the whole Optics and Photonics community that is working so hard for the progress of our society and to all our Members for their commitment and continuous support to ICO activities. My special thanks go to all the ICO Bureau and Execom members who shared with me the past four years, being always proactive and positive. My deepest thought goes to our Associate Secretary, Dr. Frank Höller, who unexpectedly suddenly passed away at the age of 65 on April 4th, 2021. It has been for me a great privilege to meet him and interact with him, he has been both a precious colleague and friend. His enthusiasm, high professionalism and dedication inspired our actions and will remain in our memory in the years to come.

*Roberta Ramponi,
ICO President*

IN MEMORIAM

Remembering Jim Harrington



Dr. James A. Harrington former treasurer of the International Commission for Optics passed away on June 20, 2018. Jim graduated from Grinnell College in Grinnell, Iowa, and Northwestern University, Evanston, Ill., where he received his PhD in physics in 1970. He continued in Germany post-doctoral work for two years at the University of Stuttgart and did one more year of post-doctoral activities at the Naval Research Lab in Washington, D.C. In 1973 Jim moved to the University of Alabama in Huntsville, where he was assistant professor of physics for three years.

In 1976 Jim turned to industry temporarily, spending seven years as senior staff physicist at Hughes Research Laboratories, where he was responsible for developing the application of infrared fibers in CO₂ laser surgery. From 1985-1989 Jim worked for Heraeus LaserSonics in Westlake Village, Calif., as director of infrared fiber operations, being in charge of developing fiber optics for surgical applications. In 1989 Jim restarted his academic career at Rutgers University, where he taught and conducted research for 29 years, attaining the rank of distinguished professor in 1998.

During 2005-2006 Jim moved to Washington, D.C., when he was selected as a Jefferson Science Fellow at the U.S. Department of State, helping to establish international controls for lasers and detectors and serving as a science advisor within the Bureau of Security and Nonproliferation. In 2001 Jim was elected president of SPIE. The society awarded Jim its Director's Award in 2008 and the Gold Medal, its highest honor, in 2014, for 30 years of pioneering research and development in specialty fiber optics and infrared optical materials. Jim also supported the global optics community serving as treasurer of the ICO (International Commission for Optics) from 2008-2017. With over 40 years of research experience in the area of optical properties of solids, Jim worked on all aspects of infrared fibers and was recognized as one of the world's leading experts in hollow fibers for medical applications and infrared transmission in general. Specifically, Jim and his students invented the hollow glass waveguide, one of the most actively licensed technologies within Rutgers. During his career, he published more than 190 articles, authored the book "Infrared Fibers and Their Applications," and was awarded 10 patents on specialty fiber optics and medical devices.

Humberto Michinel
ICO Secretary General

Remembering Frank Höller



The ICO community was shocked by the unexpected sudden death of our friend, Dr. Frank Höller, who passed away in the age of 65 on Easter Sunday April 4th, 2021. As ICO Vice-President (2011- 2017) and later as Associate Secretary, he took an important active role in shaping the ICO. Especially his outstanding commitment in the activities of the EXECOM resulted in important contributions to the stand of ICO in the international network of scientific organizations. The interaction between optical industry and academia was one of his key topics.

His long years of experience in leading positions including that of the Chair of the German Society for Applied Optics (DGaO) allowed him to creatively represent in an ideal way a bridge between science and industry. He was convinced that in order to use the large amount of scientific knowledge in the international optical community for progress in society it is of utmost importance to enable free exchange of knowledge between scientists on a national as well as on an international level. And he saw the ICO as a perfect platform to enable such an exchange with a special emphasis on developing countries. In this sense he used intensively his privileged position as an Associate Secretary of ICO to encourage, organize and support such scientific conferences. We are thankful to Frank Höller that despite his time-consuming and labor-intensive professional commitment for the new company “Scantinel Photonics” he intensively took care as Associate Secretary especially of the support of international conferences of ICO members.

We will sorely miss his experience as well as his balancing advices and creative proposals in the German Territorial Committee and the EXECOM – not to forget his invaluable engagement as co-chair in the preparation of the World Congress on Optics and Photonics ICO25-OWLS16 in Dresden, Germany. In addition, based on his experience as initiator of the “Young Scientist Award” of the DGaO he was predestined to be chair of the committee for the “IUPAP-ICO Young Scientist Prize in Optics” (2014 – 2017). With this work as a whole, he has left a lasting mark on the ICO and far beyond. Yet, besides these outstanding activities for the ICO first and foremost we will miss a supporter and friend. Our thoughts and sympathy go to his family, especially his wife and daughter whom we wish all strength to deal with this dramatic loss.

Gert von Bally
ICO Vice-President appointed by OWLS

Remembering Valentin Vlad



Valentin Vlad, “Galileo Galilei” Prize winner of the International Commission of Optics (2005), died in Bucharest on 24 December 2017. He was 74. Valentin Vlad was the current President of the Romanian Academy (the highest academic forum in Romania), since 2014.

He was also the Head of the “Nonlinear and Information Photonics” group in the Laser Department of the National Institute for Laser, Plasma and Radiation Physics, as well as Professor at the University of Bucharest, Faculty of Physics.

A distinguished scientist honored by several prestigious societies and national and international bodies, with a prodigious publishing activity and international conference organization, he is credited with many milestones and accomplishments as can be read here. In short, he was a Fellow of the OSA, SPIE, IOP, an Honorary member of the Academy of Sciences of the Republic of Moldova and Honoris Causa of several Romanian Universities. He was a leader among those who promoted the Optics in Romania to the level we know today. He has supported dissemination of Optics research as chair of many editions of the Romopto international conference.

On a personal note, I was a student of his in 1973, when he taught us “Optical transmission of information”, as an external lecturer coming from a distinguished research institute. He emanated professionalism and rigor that inspired me in choosing optics as my career. Later on, in 1991, we went together to San Diego to meet the SPIE Board to represent the wishes of the Romanian optics scientists to form the Chapter of SPIE in Romania.

I traversed together with him some memorable moments in the opening of Eastern Europe towards the rest of the world. He manifested both wisdom and delicacy in handling important moments faced by the Romanian Science community due to the challenges that followed. He was a role model, a true leader in the practice and teaching of Science, as well as in its administration. Valentin Vlad will be sorely missed by the Optics Community, by the family of Romanian Physicists. He will be fondly remembered by all who knew him.

Adrian Podoleanu
ICO Vice-President

Remembering Tito Arecchi



Fortunato Tito Arecchi, born in Reggio Calabria, Italy, in 1933, died on 15 February 2021, in Florence. He was Emeritus Professor of Physics of the University of Florence and ICO Vice President 1981-1984. Tito, as was simply named by all of us, went much beyond Optics, joining deep scientific knowledge and insight with a profound humanistic culture. He started his pioneering activity on lasers in 1957 at Centro Informazioni Studi Esperienze in Milan. In 1975 he moved to Florence, where he was President of the “Istituto Nazionale di Ottica” (INO) for 25 years.

He published more than 450 papers and worth of note are the first demonstration of the deterministic chaos in CO₂ laser or generalized multistability. Classification of lasers in A, B and C classes are related to him. He also promoted quantum optics, optical metrology, optoelectronics and applications such as testing laboratories and industry collaborations.

He taught in many international institutions, such as the MIT, Stanford University, or the IBM Research Laboratories in Zurich. Worth mentioning is his founding, in 1980, of the Specialisation School in Optics, a post degree School of the University, unique in Italy, that he directed until 2003. He was one of the five founders of the SIOF (Società Italiana di Ottica e Fotonica), fellow of OSA and honorary member of the SIF (Italian Society of Physics).

In 1995 he received the Max Born Award from the OSA: “For many contributions to photon statistics of lasers, cooperative atomic radiation effects, and laser instability and chaos” and in 2006 he received the Enrico Fermi Award from the Italian Society of Physics (SIF): “For his pioneering contribution to the knowledge of the coherence phenomena in matter and radiation, in particular for the first experimental demonstration of the statistical properties of coherent radiation”.

In words of Prof. Paolo De Natale, remembering the place where INO was located in Florence: “Arcetri was home to ageless, universal scientists like Galileo Galilei, that here spent the last ten years of his life, or Enrico Fermi, who spent a few years teaching at the Physics Department of Florence University. Therefore, it seems natural for me thinking of Tito, working within this peculiar environment, as a multi-faceted man of Italian Renaissance”.

*Prof. Anna Consortini
ICO President (1993-1996)*

ICO NEWSLETTER

The last ICO Newsletter at the time of editing this book is July 2021 (issue128) and its pdf full version is available online at the official website of the International Commission for Optics: <https://e-ico.org/node/21>. By clicking on the image below the full contents of the newsletter will be displayed in a web browser. It is entirely devoted to the ICO Bureau elections that will take place in September 2021. For more information about the ICO Newsletter, please contact the by email the ICO Secretariat at the following address: secretariat@e-ico.org

JULY 2021



NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE · INTERNATIONAL COMMISSION FOR OPTICS

SPECIAL ISSUE: ICO GENERAL MEETING

"In the past four years, ICO has been facing and still faces a crucial phase".



Roberta Ramponi from Politecnico di Milano (Italy) is the current president of the ICO.

In 2018 in Delft, the Netherlands, we celebrated 70 years since ICO first General Congress, ICO-1, which was also held in Delft, in 1948. Since then, the ICO Congress has been held every three years. Proved to be an important and prestigious forum of scientific discussion for the Optics and Photonics community, with a wide and growing worldwide participation, it includes many scientists from developing countries. Participation of students and young scientists has been supported, and a careful policy to favor gender diversity has been set in place throughout the years.

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Participants in the last ICO General Meeting held in Tokyo, Japan, in August 2017, in the presence of the emperors of Japan.

ICO NEWSLETTER

No. 128 JULY 2021

ICO NEWSLETTERS 2019

OCTOBER 2019

NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE - INTERNATIONAL COMMISSION FOR OPTICS

ICO-IUPAP OPTISUD meeting in Tunis

More than 70 scientists, graduate and post-graduate students from several countries attended the recent ICO-IUPAP-ICTP Topical Meeting on Optics and Applications to Sustainable Development (OPTISUD) in Carthage, Tunisia.

Organized by the Optical Society of Tunisia and supported by the ICO, IUPAP, ICTP, OSA, SPIE, the Abdus Salam Centre and several other organizations, the workshop was held from 1 to 7 September 2019. The event was the first joint ICO/IUPAP/ICTP meeting to be held in Tunisia. The workshop was held in a beautiful location, the Abdus Salam Centre, which is a well-known institution for its research in optics, photonics, laser science and related fields. The workshop was held in a beautiful location, the Abdus Salam Centre, which is a well-known institution for its research in optics, photonics, laser science and related fields. The workshop was held in a beautiful location, the Abdus Salam Centre, which is a well-known institution for its research in optics, photonics, laser science and related fields.



Prof. Mohamed El Ghayour (President of the Abdus Salam Centre) University of Carthage and ICTP was present during the meeting.

Prof. Dr. Mohamed El Ghayour (President of the Abdus Salam Centre) University of Carthage and ICTP was present during the meeting.

ICO NEWSLETTER

No. 123 OCTOBER 2019

JULY 2019

NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE - INTERNATIONAL COMMISSION FOR OPTICS

ICTP hosted 2019 IDL flagship event

The title of the main event of the month was "Illuminating Education and the role of photonics in development as well as in developing countries."

In 2017 the UNESCO declared the 10th of July as the International Day of Light. The event was held in the Abdus Salam Centre for Theoretical Physics (ICTP) in Trieste, Italy, on the 10th of July, 2019. The event was held in the Abdus Salam Centre for Theoretical Physics (ICTP) in Trieste, Italy, on the 10th of July, 2019. The event was held in the Abdus Salam Centre for Theoretical Physics (ICTP) in Trieste, Italy, on the 10th of July, 2019.



Prof. Dr. Mohamed El Ghayour (President of the Abdus Salam Centre) University of Carthage and ICTP was present during the meeting.

ICO NEWSLETTER

No. 120 JULY 2019

APRIL 2019

NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE - INTERNATIONAL COMMISSION FOR OPTICS

A STORY FROM RAGS TO RICHES

Dr. Jehan Ashraf could not get funding for establishment of laboratories yet he managed to sustain his struggle in a very difficult environment.

Dr. Jehan Ashraf completed his PhD in Physics in 1987 from University of Pakistan, Pakistan and PhD from the University of Guelph, Canada in 1990. He worked for Prof. Arthur J. Katz and Prof. Arthur J. Katz, Canada. He worked for Prof. Arthur J. Katz and Prof. Arthur J. Katz, Canada. He worked for Prof. Arthur J. Katz and Prof. Arthur J. Katz, Canada.



Dr. Jehan Ashraf is a physicist and a professor at the University of Guelph, Canada. He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP). He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP). He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP).

ICO NEWSLETTER

No. 115 APRIL 2019

JANUARY 2019

NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE - INTERNATIONAL COMMISSION FOR OPTICS

ICO Prize to Topological Photonics

Michael G. Reizenstein has been awarded the 2018 ICO Prize for his pioneering contributions to the field of topological photonics.

Michael G. Reizenstein is a physicist and a professor at the University of Guelph, Canada. He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP). He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP). He is a member of the International Commission for Optics (ICO) and the International Union of Pure and Applied Physics (IUPAP).



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ICO NEWSLETTER

No. 118 JANUARY 2019

ICO NEWSLETTERS 2018

OCTOBER 2018

NEWSLETTER
 COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

Another Nobel Prize for Optics

ICO celebrates 2018 Nobel Prize in Physics awarded to researchers for laser technology, optical tweezers and chirp pulse amplification.



Arthur Ashkin (USA, a member of the 2018 Nobel Prize in Physics) was awarded for his work on laser technology, optical tweezers and chirp pulse amplification.

The Nobel Prize in Physics 2018 has been awarded to scientists belonging to the Chinese and American continents for their groundbreaking research in the field of laser physics. Arthur Ashkin received one half of the prize "for his ground-breaking work and his application of laser technology to optical trapping and manipulation of neutral atoms and molecules". He was awarded for his work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification.



Paul Chu (USA, a member of the 2018 Nobel Prize in Physics) was awarded for his work on laser technology, optical tweezers and chirp pulse amplification.

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G. Mourou and A. Mourou have been awarded for their work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification. The prize was awarded to three scientists for their work on laser technology, optical tweezers and chirp pulse amplification.

ICO Newsletter
No. 117 OCTOBER 2018

JULY 2018 - SPECIAL ISSUE OF THE 70th ANNIVERSARY OF THE FIRST ICO GENERAL CONFERENCE

NEWSLETTER
 COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

Some memories on the ICO Awards



The ICO Awards ceremony is a special event for the members of the Commission Internationale d'Optique (ICO). It is held every year in a different location and is a great opportunity for members to meet and network. The awards are given to members who have made significant contributions to the field of optics. The awards are given to members who have made significant contributions to the field of optics. The awards are given to members who have made significant contributions to the field of optics.

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ICO NEWSLETTER

No. 116 JULY 2018

APRIL 2018

NEWSLETTER
 COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

Querétaro welcomes the Mexican Photonics Cluster:

An innovative ecosystem for the optics and photonics industry established in Mexico.



The Mexican Photonics Cluster building.

The Mexican Photonics Cluster is a new initiative to promote the development of the optics and photonics industry in Mexico. It is a cluster of companies and research institutions working together to advance the field of optics and photonics. The cluster is located in Querétaro, Mexico, and is the first of its kind in the country. The cluster is located in Querétaro, Mexico, and is the first of its kind in the country. The cluster is located in Querétaro, Mexico, and is the first of its kind in the country.

ICO Newsletter
No. 115 APRIL 2018

ICTP Winter College on extreme optics



The ICTP Winter College on extreme optics.

The ICTP Winter College on extreme optics is a program for young scientists and researchers. It is held every year in a different location and is a great opportunity for participants to learn and network. The college is located in Trieste, Italy, and is the first of its kind in the world. The college is located in Trieste, Italy, and is the first of its kind in the world. The college is located in Trieste, Italy, and is the first of its kind in the world.

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JANUARY 2018

NEWSLETTER
 COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

Roberta Ramponi, ICO President (2017-2020)

The new president of ICO.



Roberta Ramponi, ICO President (2017-2020).

Roberta Ramponi is the new president of the Commission Internationale d'Optique (ICO). She was elected to the position in 2017 and will serve until 2020. She is a member of the ICO and has made significant contributions to the field of optics. She is a member of the ICO and has made significant contributions to the field of optics. She is a member of the ICO and has made significant contributions to the field of optics.

Roberta Ramponi is the new president of the Commission Internationale d'Optique (ICO). She was elected to the position in 2017 and will serve until 2020. She is a member of the ICO and has made significant contributions to the field of optics. She is a member of the ICO and has made significant contributions to the field of optics. She is a member of the ICO and has made significant contributions to the field of optics.

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MEMBER CONTRIBUTIONS

Territorial Committees

Sociedad Española de Óptica (SEDOPTICA).

ICO Territorial Committee representing Spain

SEDOPTICA is the Spanish Society of Optics (www.sedoptica.es), a non-profit organization founded in 1968 devoted to the promotion of optics and photonics, from basic research to industrial applications. Currently represents around 400 members, organized in different topical committees (Imaging Techniques, Vision Science, Optoelectronics, Spectroscopy, Quantum & Nonlinear Optics, Color, and Nanophotonics), as well as other transversal committees (Education in Optics, Women in Optics and Photonics Area and Youth Area). Prof. María S. Millan is the current President, after Prof Ignacio Moreno concluded his term in 2020.



Picture of societies at RNO2018. From left to right: M. Yzuel (Past President SPIE and Past President SEDOPTICA), C. Dainty (Past President OSA), J. A. Azcárraga (President RSEF), M. F. Costa (President SPOF), H. Michinel (President Elect EOS and Secretary General ICO), E. Solarte (President RIAO), I. Moreno (President SEDOPTICA), Jesus Lancis (chair of organizing committee), M. Giger (President SPIE), V. Climent (Rector UJI 2010-2018).

Spain was a founding member of ICO in 1948. The Institute of Optics “Daza de Valdés” National Research Council (IO-CSIC) (founded in 1946 by Prof. José Otero Navascués, former Vice President of ICO) was the headquarters of SEDOPTICA and continues to be, now integrated within the Center of Physics. Since 1968 SEDOPTICA holds the representation of the ICO Territorial Committee of Spain, through the Presidency of the SEDOPTICA Committee for Imaging Techniques, currently Prof. Inmaculada Pascual. SEDOPTICA is also a societal member of the European Optical Society (EOS) and Red Iberoamericana de Óptica (RIAO).

In 2018 SEDOPTICA celebrated its 50th Anniversary, and a special ceremony was organized in the framework of the 2018 Spanish Meeting of Optics (Reunión Nacional de Óptica, RNO2018). The RNO Meeting is one of the hallmarks of SEDOPTICA, and it aims to be the meeting point for the different national interlocutors in Optics and Photonics: researchers, technicians, teachers, students. In 2018 the 12th edition of the RNO Meeting was held at Universitat Jaume I de Castellón (UJI), from 3rd to 6th of July, 2018, chaired by Prof. Jesús Lancis, President of the Organizing Committee. The day before included the third edition of the RNOJ Meeting (RNO-Joven), a meeting of the young members of the society typically attached to the RNO.

The SEDOPTICA celebration ceremony was organized on the 6th of July and was announced at the ICO Newsletter (<https://www.e-ico.org/node/400>). ICO was represented by its Secretary General, Prof. Humberto Michinel. Other organizations related to SEDOPTICA also participated, like OSA represented by Prof. Chris Dainty, SPIE represented by Prof. Maryellen Giger, EOS represented by Prof. Humberto Michinel, RIAO represented by Prof. Efrain Solarte, as well as the Royal Spanish Society of Physics, represented by Prof. J. Adolfo de Azcárraga, and the Confederation of Spanish Scientific Societies, represented by Prof. María Y. Yzuel.



Group picture of the first Workshop of Women, Optics and Photonics organized at CSIC, Madrid, the 6th of September 2019.

In addition to the RNO Meeting, SEDOPTICA holds different topical meetings, such as the Spanish Meeting of Optoelectronics (OPTOEL) the National Colour Congress (CNC), or the National Meeting of Spectroscopy (RNE). The OPTOEL Meeting was organized by the Optoelectronics Committee in July 2019 at the University of Zaragoza, chaired by Prof. Javier Mateo, while the CNC Meeting was organized by the Colour Committee in September 2019 at the Polytechnical School of Linares, University of Jaen, chaired by Prof. Ruperto Bermejo. The RNE Meeting was programmed for July 2020 at the University of Malaga, but it was postponed due to the pandemic. SEDOPTICA also organizes webinars, such as the 2nd series of Webinars on Vision and Visual Science (April-May 2020) and others, which can be revisited through the YouTube channel of the Society.

In the 2018 SEDOPTICA General Assembly the creation of the SEDOPTICA Women in Optics and Photonics Area was approved and Dr. Maria Viñas was designated the President of the Committee. Shortly after, the 1st Workshop of Women in Optics and Photonics was organized, the 6th of September of 2019, at the IO-CSIC, Madrid.

Another important activity of SEDOPTICA is the periodic publication of the journal “Óptica Pura y Aplicada” OPA, an open-access peer-review scientific journal for optics and photonics published since 1968, nowadays with four issues per year, accepted for coverage in the Emerging Sources Citation Index. Therefore, papers published in this journal are indexed in the Web of Science. The journal publishes research, educational and review papers in Spanish or in English. The historical archive of the journal, which is fully complete only at the library of the Institute of Optics IO-CSIC, is being made available online from 1989 (vol. 22) through the journal webpage (Sociedad Española de Óptica (sedoptica.es)), now reaching the volume 53 published in 2020.



Left: Organizers and participants of the IDL flagship event in UCM 2008, from left to right: Javier Alda, Maria Luisa Calvo (ICO Past President), Glenn Boreman, María Luisa Lucía (Dean of the UCM Physics Faculty), Ignacio Moreno, Lara Elbaz, Pablo Nacenta, and Carmen Carreras. Right: announcement of the IDL flagship event in Terrassa, 16 May 2020-21.

SEDOPTICA very actively participates in the Spanish Committee of the International Day of Light (IDL) (DÍA INTERNACIONAL DE LA LUZ (diadelaluz.es)) and collaborates in the organization and promotion of related activities in Spain. A flagship IDL event was organized in 2018 at the Complutense University of Madrid, chaired Prof. Maria Luisa Calvo, former President of ICO, and in 2019 at the University of Santiago de Compostela, chaired by Prof. María Teresa Flores-Arias. The 2020 IDL flagship event was programmed to be at the School of Optics of the Polytechnical University of Catalonia, Terrassa, IDL 2021, chaired by prof. Elisabet Pérez, but due to the pandemic was postponed to 2021. The IDL event in 2018 counted with the participation of Prof. Glenn Boreman, from University of North Carolina, Charlotte, USA, who delivered the conference entitled “How Photonics lights the World”, and attended the event partially covered with the support of a grant from the ICO Travelling Lecturer Program.

M. SAGRARIO MILLÁN
President of SEDOPTICA
www.sedoptica.es

International Organization Members

The Optical Society (OSA)



The Optical Society (OSA), www.osa.org, is recognized as the foremost authority in light science and technology by experts in the field. Since 1916, OSA has promoted the generation, application and archiving of knowledge in optics and photonics. Over 22,000 members from more than 100 countries and 432,000 customers engage with OSA annually. The society's core values – Innovation, Integrity, Inclusivity and Impact – underlie our initiatives, meetings, products and services. OSA advances the science of light with a commitment to excellence by addressing the ongoing need for shared knowledge and professional development.



In 2020, the society leveraged technologies enabled by optics to meet the community's needs during the COVID-19 pandemic. OSA transitioned international

conferences and exhibitions into virtual events and launched the "We Are On" initiative, a series of volunteer-driven webinars on important topics. The inclusive, high-quality programs drew more than 90,000 registrants from 119 countries. OSA will continue to offer hybrid conferences to enable participants to access the content regardless of their time zone.

Since 2010, the OSA Foundation (OSAF) has partnered with ICO to manage charitable donations to the commission's "International Programming Fund." The program supports educational, professional development and recognition opportunities in optics. Contributions are made through OSAF as part of a fiscal sponsorship agreement with ICO.

OSA co-sponsors ETOP, the biennial conference on Education and Training in Optics & Photonics. For the 2019 event in Quebec City, Canada, the society provided USD 6,000 in grants and managed the registration process. 2013 OSA President, OSA Fellow and Nobel Laureate Donna Strickland and OSA members Robert Boyd, University of Rochester, USA; Peter Winzer, Bell Labs, USA; and Leslie Rusch, L'Université Laval, Canada participated as plenary speakers.



Leslie Rusch, L'Université Laval, Canada and Nobel Laureate Donna Strickland, University of Waterloo, Canada at ETOP 2019

OSA also assists the ICTP Winter College on Optics with an annual USD 10,000 grant and provides free access to the OSA Publishing Digital Library featuring 384,000 articles. Year-round, OSA participates in ICTP's electronic journals delivery program (eJDS), which gives scientists and researchers in emerging economies access to OSA's distinguished portfolio of journals.

OSA and OSAP manage a broad portfolio of activities linked to the mission of ICO. Examples include:

1. OSA offers resources to a network of over 400 OSA Student Chapters spread across six continents and Local Sections in about a dozen countries. These resources include grants for youth education outreach in their communities and projects to connect the general public to the science of light. Grants also support the International OSA Network of Students (IONS) conference series comprised of eight annual regional student chapter-run conferences.
2. In 2014, OSAP started the annual Siegman International School on Lasers, a week-long program that exposes students to in-depth learning of lasers and their applications from luminaries in the field. The school was established in honor of Anthony E. Siegman, 1999 OSA President and widely known expert on lasers and optics. To date, the school has been held in the United States, Germany, Spain, Mexico and Sweden. In 2020, the Siegman International School pivoted to a virtual All-Stars event. 2017 OSA President Eric Mazur, Harvard University, USA facilitated the event, and Nobel Laureate Steven Chu served as plenary speaker. In total, 184 students, early career professionals and speakers participated.
3. The OSA Ambassador Program, launched during OSA's centennial in 2016, facilitates opportunities for emerging leaders to share their experiences with students and early career professionals. In 2020, as racial justice demonstrations grew worldwide, the ambassadors recognized the under-representation of Black students within our community. They issued a statement calling for systemic change and proposed the OSA Ambassador Equity in Optics and Photonics Scholarship program to support Black scientists and engineers.



In 2018, the Siegman International School on Lasers was hosted at Spirit of Hven Backafallsbyn, Island of Hven, AB, Sweden. EEE Photonics Society Vice President Kent Choquette working with Tech Light Lab.

4. In 2019, OSAF launched the Subsea Optical Fiber Communications School in partnership with Google in Polvijärvi, Finland. In 2020, the school was held as an online “Mini Dive” with 157 participants involved in lectures and group exercises.
5. In 2020, OSAF distributed 75 professional Zoom accounts to student chapters to help them stay connected. More than 2,000 events were hosted, with an estimated 10,500 people impacted. The largest contingent of users came from Russia, India, Mexico, Ukraine and Argentina.
6. In 2020, OSAF launched its first Career Accelerator, designed to acclimate OSA students and early-career members with fundamental business and leadership skills. The inaugural program focused on optical communications with 67 attendees from 19 countries.



Speakers from Google, Facebook, Subcom, Alcatel Submarine Networks, NEC and more participated in the inaugural Subsea Optical Fiber Communications 2019 International Summer School in Polvijärvi, Finland.



Claudio Mazzali, Sr. VP and CTO, Corning Optical Communications Sector and Gloria Höfler, Director, Advanced Development, Infinera were among the speakers at the 2020 OSAF Career Accelerator.

OSA communicates the value of optics and photonics to the general public through several activities, including:



1. In 2017, OSA launched an international public policy program. Experts from industry, academia and government have come together to focus on global health and environmental initiatives to address climate change. The goals are: 1) to advance knowledge of photonics technologies; and 2) advocate for optics and photonics funding.

2. OSA participates in global celebrations of science and technology. As a founding member of the International Year of Light (IYL) in 2015, OSA recognizes the annual International Day of Light (IDL) on 16 May. In 2021, OSA and other societies encouraged the public to sign the Trust Science pledge to affirm confidence in the scientific process. Each year, the society supports International Day of Women and Girls in Science. In 2010, OSA was a founding partner of Laser Fest and, in 2005, championed the World Year of Physics.

3. In 2019, OSA provided USD 5.7 million to the global community through mentorship and career development opportunities for students and early-career professionals, advocacy and special programs.



Contact: John Howell,
OSA Appointed ICO Vice President



OWLS Society - a spin-off from the ICO

International Society on Optics Within Life Sciences

Improvement in the living conditions of man and the protection of nature have become global challenges. Scientific and technological progress yields new opportunities and achievements, but can also result in adverse consequences for the environment when used without social responsibility. Technological developments in optics provide a powerful means for solving problems in medical, biological, environmental, and cultural heritage areas. The application of these new methods requires the collaboration of scientists and engineers in optics and specialists in medicine, biology, environmental sciences, and cultural heritage. A wide range of interactions between universities, research institutes and industry is necessary.

To serve this unique need, the *International Society on Optics Within Life Sciences* (OWLS) was founded during the satellite conference on “Optics in Life Sciences” to the ICO Congress ICO-15 in Garmisch-Partenkirchen, Germany, on August 13, 1990, as a non-profit organization based on individual membership. In 1992 OWLS was officially accredited by the United Nations as non-governmental organization. Since 2002 the International Society OWLS is an international society member of the International Commission for Optics (ICO).

A Vice-President is nominated by OWLS, who represents OWLS in the ICO Bureau. OWLS sends a representative to TSOSA and supports activities like the ICTP Winter Colleges. OWLS cooperates with organizations for developing countries such as:

**African Laser, Atomic, Molecular and
Optical Sciences Network**



The Abdus Salam
**International Centre
for Theoretical Physics**



THE WORLD ACADEMY OF SCIENCES
for the advancement of science in developing countries

OWLS holds regular biannual OWLS Conferences and cosponsors conferences in the field of Optics and Photonics in the Life Sciences of other organizers including those in developing countries. The following are examples for the reporting period:

In 2018 the biannual OWLS conference “OWLS 2018” was held on Rottnest, Perth, Australia, organized by the Conference Chair, Prof. David Simpson, University of Surrey, UK, as a meeting in the Gordon Conference style of morning and evening science with free afternoons. The Conference addressed the intersection of optics and life sciences with a focus on multimodal characterizations of cell/tissue biophysical-biological properties.



In order to motivate and support young scientists the OWLS President, Prof. Subdipta Maiti, Tata Institute of Fundamental Research, Mumbai, India, introduced in 2019 the “OWLS Poster Prize”. It was given for the first time at the Workshop on Fluorescence and Raman Spectroscopy FCS 2019 held in the new campus of the Centre for Interdisciplinary Sciences, Tata Institute of Fundamental Research, Hyderabad, India.

The ICO General Assembly 2017 in Tokyo decided to hold in 2020 the next ICO General Assembly and Congress ICO-25 jointly with the 30 Years Anniversary and International Conference of the International Society on Optics Within Life Sciences OWLS-16 in Dresden, Germany.

Due to the appearance of COVID 19 pandemic and in order to keep a chance for an in-person congress the original sequence had to be changed and the ICO25 – OWLS16 Congress shifted to September 5 – 9, 2022. Therefore, the chairs of the coming ICO-25 - OWLS-16 Congress decided to include a new topical slot on “Optical Technologies Fighting Infectious Diseases”. (see also: “The ICO & OWLS World Congresses in the Times of the Covid-19” by Prof. Alexander Heisterkamp, International Program Committee Chair of OWLS-16 and Secretary General of the International Society OWLS, ICO NEWSLETTER No. 123 APRIL 2020).



*Prof. Gert von Bally,
ICO Vice-President appointed by OWLS*

RIAO

Red Ibero Americana de Óptica (RIAO)

The Red Iberoamericana de Óptica (RIAO – Ibero-American Network for Optics) was founded in 2008 by the Sociedad Red Colombiana de Óptica, the División de Óptica y Espectroscopía de la Sociedad Cubana de Física, the Academia Mexicana de Óptica (AMO), the Sociedad Española de Óptica (SEDOPTICA) and the Comité Venezolano de Óptica; endorsed by their corresponding Territorial Committees for Optics of the International Commission for Optics (ICO). In July 2010, the Sociedade Portuguesa para a Investigacao e Desenvolvimento em Óptica e Fotónica joined RIAO, and in September 2010 the first RIAO Council took office in Lima, Peru, for a three-year term during the VII Iberian American Optics Meeting and X Latin American Meeting on Optics, Lasers and Applications. RIAO became the seventh ICO International Society Member in September 2014 during the 23rd General Congress of ICO, held in Santiago de Compostela, Spain. Since June 2016 and September 2019, respectively, the Sociedad de Óptica y Fotónica del Ecuador and the División Fotónica y Óptica of the Asociación Física Argentina joined RIAO as members.

In July 2018, the University Jaume I de Castellón organized the 12th edition of the Reunión Nacional de Óptica 2018 (RNO2018 – 2018 Spanish Meeting of Optics), the main meeting of SEDOPTICA. During this conference there was a ceremony to celebrate the Fiftieth Anniversary of SEDOPTICA, attended also by Prof. Efraín Solarte in his capacity as the 2016-2019 RIAO President. Collocated with the RNO2018 the third edition of the RNO-Joven Meeting (RNO-J – RNO Youth), a meeting of the young SEDOPTICA members also took place.



Opening ceremony of the 2018 Reunión Nacional de Óptica and Fiftieth Anniversary of SEDOPTICA, with the participation of Dr. Efraín Solarte, RIAO 2016-2019 President.

Following the recommendations stated in the optics and photonics roadmap “Towards a Brighter Mexico”, that was jointly developed by the Mexican Government, the ICO Mexico Territorial Committee for Optics and RIAO, and presented on November 2016 in Mexico City; the Iniciativa Mexicana en Fotónica (IMF -Mexican Photonics Initiative) announced the establishment of the Clúster Mexicano de Fotónica (CMF – Mexican Photonics Cluster) in a ceremony held on November 15-17, 2018, in the city of Toluca de Lerdo. The 2017-2020 ICO President Dr. Roberta Ramponi remotely addressed the audience during the MPC launch act, that was also attended by Dr. Efraín Solarte as RIAO 2016-2019 President, Dr. Ken Rochford as SPIE CEO, Chad Stark as The Optical Society Foundation (OSAF) Director and Dr. Eric Rosas as the CMF President.

In 2019, two other topical meetings were organized by SEDOPTICA: the Spanish Meeting of Optoelectronics, at the Universidad de Zaragoza; and the National Colour Congress, at the Escuela Politécnica de Linares of the Universidad de Jaen. In addition, the first Workshop of Women in Optics and Photonics was organized in September 2019.

From September 23-27, the RIAO-OPTILAS 2019 (X Iberian American Optics Meeting and the XIII Latin American Meeting on Optics, Lasers and Applications) conference took place in Cancun, Mexico. The RIAO-OPTILAS is the RIAO flagship optics and photonics conference and the evolved version of the collocated “Reunión Iberoamericana de Óptica and Encuentro Latinoamericano de Óptica, Láseres y sus Aplicaciones” meetings series.



The Mexican Photonics Cluster launch and Mexican Photonics Initiative adherence ceremony. From left to right: Chad Stark (OSAF Director), Dr. Ken Rochford (SPIE CEO), Dr. Eric Rosas (CMF President) and Dr. Efraín Solarte (RIAO 2016-2019 President).

The RIAO-OPTILAS 2019 was collocated with the Mexican Optics and Photonics Meeting 2019 organized by the AMO and had the participation of highly distinguished plenary speakers, among those: Roberta Ramponi, 2017-2020 ICO President; Philip Rusell, a founding Director of the Max-Planck Institute for the Science of Light; Zeev Zalevsky, 2008 ICO Prize recipient, now Professor at the Bar-Illan University of Israel; John E. Greivenkamp, 2019 SPIE President-Elect; Ursula Gibson, 2019 OSA President; Pramod Rastogi, Professor in the École Polytechnique Federale de Lausanne, Switzerland; and Guillermo H. Kaufmann, who received the 2016 ICO Galileo Galilei Medal Award and diploma during this conference.



Attendants to the RIAO-Optilas 2019 Conference.

The RIAO-OPTILAS-MOPM 2019 also hosted a discussion panel on the participation of women in the field of optics and photonics, with the participation of Roberta Ramponi, María Josefa Yzuel Giménez, an active member of several ICO bureaus and now Professor in the Autonomous University of Barcelona; Krisinda Plenkovich, SPIE Director for Education and Community Services; Ursula Gibson, also Professor in the Norwegian University of Science and Technology; Kari Apter, OSA Senior Director for Research & Program Development, and María Sagrario Millán, President-Elect of the Spanish optical society and Professor in the Universitat Politècnica de Catalunya.

393 papers were submitted for review of the RIAO-OPTILAS-MOM 2019 Scientific Committee. Of those, 205 were selected to be presented in oral sessions (32 as invited talks) and 188 in posters sessions. The attendants came from 31 countries: Argentina (14), Austria (1), Bolivia (1), Brazil (4), Canada (6), Chile (3), China (1), Colombia (63), Cuba (1), El Salvador (1), France (7), Germany (2), Ireland (1), Israel (1), Italy (3), Japan (4), Mexico (221), The Netherlands (4), Norway (1), Peru (2), Poland (1), Portugal (2), Romania (2), Russia (1), Spain (21), Sweden (1), Switzerland (4), United Kingdom (2), United States (14), Uruguay (3), and Venezuela (1). Some of those works will embody a special issue of Applied Optics and Revista Mexicana de Física journals. According to the RIAO bylaws, the RIAO-OPTILAS-MOPM 2019 held the 2016-2019 RIAO Council Assembly as well as the RIAO 2019 General Assembly in which Prof. Manuel F. Costa took office as the RIAO President for the 2019-2022 term, replacing Prof. Efrain Solarte, the 2016-2019 President.



2019-2022 RIAO Council inauguration ceremony. From left to right: Dr. Eric Rosas (2010-2013 RIAO President and 2016-2019 RIAO Council Secretary), Dr. Manuel Costa (2019-2022 RIAO President), Dr. Efraín Solarte (2016-2019 RIAO President) and Dr. Pedro Andrés (2013-2016 President).

Prof. Eric Rosas,
ICO Vice-President appointed by RIAO

SPIE.

The International Society for Optics and Photonics (SPIE)

SPIE partners with researchers, educators, and industry to advance light-based research and technologies for the betterment of the human condition

SPIE is an international, not-for-profit, educational organization helping our members, volunteers, and constituents push the frontiers of optics and photonics technology. We help our community to expand research, development, and applications of optics and photonics to solve problems spanning healthcare, communications, energy, security, astronomy, transportation, manufacturing, and the environment. By working together across disciplines and geographies toward the advancement of light-based science and technology, and by demonstrating a commitment to our global community, SPIE is recognized around the world as one of the leading international professional society in optics and photonics.

Numerous SPIE Fellows and Members participate in activities sponsored by ICO every year, including the ICO Bureau meetings. The society itself, led by the examples and inspiration of these individual members, supports, and participates alongside other International Society Members in wide-ranging programs.



After the last ICO Bureau Meeting in 2019, SPIE's representative to the ICO Bureau Dr. Carmiña Londoño attended the OPTISUD 2019 — ICO & IUPAP-C17 Topical Meeting held in Carthage, Tunisia. Dr. Londoño delivered SPIE's opening remarks for a successful conference during the opening ceremony and participated on a panel discussion on Optics and Photonics for Sustainable Development, where she presented SPIE's contributions to this area. Dr. Londoño also had the opportunity to discuss during last OPTISUD 2019 meeting (see photo) with Tunis University Prof. Zohra ben Lakhdar, SPIE member and founder of the Tunisian Physics Society, possible collaborations through the Active Learning in

Optics and Photonics program. The UNESCO Active Learning in Optics and Photonics (ALOP) program is also supported by SPIE, along with ICTP, the U.S. National Academies, and other sponsors, and provides training for teachers in optics and photonics using locally sustainable materials and instruction materials in several languages for the trainees to share with other colleagues in their regions.



2020 ICTP Winter College Students with SPIE Past President Maria Yzuel.

The biennial Education and Training in Optics and Photonics Conference (ETOP) is organized by local steering committees and permanent sponsors, which include SPIE and the ICO. SPIE publishes the ETOP proceedings in the SPIE Digital Library as open access articles to help expand the impact and reach of the conference.

With the ICO and other societies SPIE supports the work of the International Centre for Theoretical Physics (ICTP), in ways such as sponsoring its annual Winter College on Optics. SPIE Fellow's and Past President's Katarina Svanberg of Lund University Hospital, and Maria Yzuel participate on the Trieste System Optical Sciences and Applications (TSOSA) Advisory Group, established to advise the ICTP in optics. Participants in the Winter College program are eligible to present their work in poster form or as a short oral presentation, with Best Paper prizes awarded by SPIE. In addition, SPIE provides \$30,000 USD annually to support an optics staff position at ICTP for the Anchor Optics Research Program, housed at the Instituto Nazionale di Fisica Nucleare (INFN). As part of SPIE's commitment to fostering the growth of optics and photonics throughout the world, SPIE and the University of Ottawa-National Research Council Joint Centre for Extreme Photonics (JCEP) announced the creation of a SPIE-JCEP Alexander Szabo Fellowship. The Fellowship is for early-career scientists and will be administered in partnership with the ICTP.

In late October SPIE also launched SHARE (SPIE Helping Advance Research Everywhere) with support from Google Scholar. The program provides free access to the SPIE Digital Library to researchers in World Bank-designated low-income countries. Since SHARE launched there have been more than 75,000 downloads from researchers in 103 countries.

Contact: Carmiña Londoño
ICO Vice-President appointed by SPIE



The European Optical Society (EOS)

Coherence for Europe. This EOS slogan summarizes the EOS soul in a few words. EOS was indeed created as a not-for-profit society at the initiative of several learned national societies over Europe. Their aim was to promote photonics, increase the visibility of European photonics and encourage co-operation. EOS is now **an umbrella organization for 18 national learned optical societies** around Europe. Our over 4,000 members extend from Europe to all over the world.



The mission of EOS is thus to bring together and encourage the co-operation of all with an interest in optics, optoelectronics and related scientific fields, to make practical use of research results, and to support the industrial exploitation of optics.

EOS defends the interest of the photonics community at the European level and is **involved in lobbying actions**. E.g. in 2019, EOS fought together with other societies and Nobel laureates for KET Photonics in Europe, by sending a letter to the Commissioner of the Digital Economy and Society in Europe, expressing concerns about the European Commission's funding decisions in order to include KET Photonics

in the nine priority technological intervention areas in Europe within the European research framework program Horizon Europe. EOS is also a member of the Board of Stakeholders of the European Technology Platform Photonics²¹.

One core action of EOS is the organization international conferences. EOSAM, the European Optical Society Annual Meeting, is now organized yearly in co-operation with the national learned optical societies that are EOS members. This is a major international conference covering the main themes of Photonics and where academic and industrial world meet: an exhibition and an industrial program are held together with the scientific sessions. EOSAM is appreciated for its networking events. This series of conferences also acts as sounding boards to disseminate the results of these EU funded or research projects through its special "EU- project session". These meetings also strength links between EOS and learned societies outside Europe.

Presidents of these learned societies are regularly invited to give a plenary talk. Other interactions between learned societies are also regularly set-up. The European Physical Society Prize, the Emmy Noether distinction, was for instance awarded at EOSAM 2020. EOSAM 2021 welcomes an ICO award plenary talk by Manuel Guizar-Sicairos, ICO Prize winner. Such co-operations take many forms. They can be quite occasional such as the EOS Early career Women in Photonics prize that will be awarded during the common award ceremony at the CLEO/Europe-EQEC 2021.



The European Optical Society Annual Meeting (EOSAM) is a major international conference with exhibition and industry program, paired with several networking events.

This prize is a legacy of the International Year of Light actions conducted jointly with institutions in Europe and coordinated by the European Physical Society. EOS also regularly participates to the meetings organized by partner societies: to the panel discussion held in at the occasion of the 30th anniversary of the Optical Society of Korea; to the meetings of the Optical Society of Japan in 2017 and 2019; etc.

These co-operations also run over the long term. EOS members benefit from the collaboration between national European learned societies that is inherent to the EOS constitution. Additionally, EOS continuously establishes new partnerships with other learned societies around the world, like the European Physical Society (EPS), Japan Society of Applied Physics (JSAP), Optical Society of Korea (OSK), Optical Society of Japan (OSJ), Chinese Optical Society, (COS), Taiwan Photonics Society (TPS) and in 2020 the Iberoamerican Optics Network (RIAO).

Coordination of actions in favor of photonics is also established through brain-storming discussions held between multiple learned societies. Firstly, within ICO, but also at the invitation of SPIE and OSA in the « gathering of Optics and Photonics Societies » held in World of Photonics Munich and at Photonics West. EOS considers that such common actions are of first importance to strengthen our worldwide community. EOS participates to the International lecturer program of ICO by providing a travel grant. EOS enthusiastically joined, as the founding signatory, the recent “Trust in Science Pledge” launched for the International Day of Light 2021.



Panel discussion during the Optics and Photonics Congress (OPC) 2019, organized by the Optical Society of Korea (OSK). From left to right: Byoungcho Lee (OSK), Ursula Gibson (OSA), Jim Oschmann (SPIE), Susumu Yamaguchi (OSJ), Gilles Pauliat (EOS) and Malgorzata Kujawinska (PSP) (copyright OSK events).

Contact: Gilles Pauliat,
EOS Appointed ICO Vice President

The International Day of Light (IDL)



International Day of Light

16 May

For over ten years, a global partnership of scientific societies and other organizations has worked with the United Nations Educational and Scientific Organization (UNESCO) to raise public awareness of the importance of science for sustainable development, structured around the particular theme of light science and optical technologies. This partnership led to the proclamation of the year 2015 as the United Nations International Year of Light, and the recognition since 2018 of the UNESCO International Day of Light (IDL), celebrated every year on May 16. ICO has been supporting these initiatives since their first inception, and currently sits as an IDL Endorsing Partner (see www.lightday.org)

A leading motivation for these actions is that the problem-solving potential of science and technology to address sustainable development challenges is poorly appreciated by the public, and insufficiently prioritized by policy-makers. Yet light-based technology in particular has revolutionized medicine, is essential in developing new energy solutions, and has opened up international communication via the internet and video conferencing tools. From an outreach perspective, light is a highly accessible topic, and easily opens doors to broader conversations on the role of science and technology to providing societal benefits. The subject of light also naturally encourages interdisciplinary events combining science with art, allowing interactions between communities that remain far too frequently distinct.

Since its inauguration in 2018, the International Day of Light has been one of the highlights of the international outreach calendar. The IDL inauguration in Paris on 16 May 2018 saw a remarkable opening ceremony that combined artistic light shows with lectures from Nobel laureates, and which also included the participation of ICO President Roberta Ramponi in a UNESCO convened forum on science and policy. Although such high profile events are important for political visibility, local grass-roots events have always been the core of the IDL mission, and the summary statistics for the four observances since 2018 yield more than 1500 events taking place in 80 countries.

The audience reached (physical participation as well as media and social media etc) is estimated as over a million. It is important to stress the enthusiasm of the international IDL grass-roots community: even during the COVID pandemic, the International Days of Light in 2020 and 2021 have seen over 650 events take place, although many of course were online.

A particular feature of IDL celebrations is to build on the association with UNESCO to initiate discussions of broader issues of societal importance. In this regard, the outreach programme for the International Day of Light 2021 was accompanied by a campaign to bring together supporters of science worldwide to affirm their appreciation for science via a public pledge of “Trust in Science.” The aim here was not to encourage blind following of a poorly defined “scientism,” but rather to use the association with UNESCO to discuss and develop effective techniques to explain how science works, and how to improve science communication.

Amongst 4500 signatories worldwide include Nobel and Breakthrough laureates, UNESCO prizewinners, CEOs, representatives from scientific societies and academies, together with scientists and students from nearly 100 countries. The ICO President was a Founding Signatory, and the success of the campaign led the theme of Trust in Science to be included in the official message for the International Day of Light provided by the UNESCO Director General Audrey Azouley. As stated in her message “Trust remains a fundamental condition for science to serve the public interest. This is also the reason why this edition of the International Day of Light is focused on this crucial theme. The situation surrounding vaccines is a striking illustration of this. Without trust and without transparency, scientific progress, however necessary and exceptional, is regarded with suspicion and mistrust and becomes the target of rumour-mongers.” The IDL community can feel justly proud to have been able to contribute positively to this debate on the international stage during 2021.

As the International Day of Light sees its fifth celebration in 2022, there are renewed opportunities for ICO to cement its place in its organization and governance structure. Specifically, whilst ICO’s current status as an IDL Endorsing Partner clearly brings some visibility, there is more potential for ICO to play a greater role as a full member of the IDL Steering Committee. Although IDL Steering Committee membership usually requires an annual financial contribution, discussions with the IDL Chairs suggest that ICO could sit on the Steering Committee via an in-kind contribution which would include for example, acting as a liaison to promote the International Day of Light amongst the ICO member states, with a particular focus on developing countries where other International Day of Light partners have limited reach.

*John Dudley,
Chairman of the IDL Steering Committee*

ICO BUREAU MEETINGS

Minutes of the first 2017 ICO Bureau meeting

Sunday, August 20, 2017. 9:00 AM – 5:00 PM.

Tokyo, Japan

Keio Plaza Hotel, Main Building 42F: Room Mitake.

Participants: Y. Arakawa, D. T. Moore, H. Michinel, R. Ramponi, A. Wagué, A. Podoleanu, J. Harvey, M. Zghal, A. Guzmán, J. Niemela, G. von Bally, M. Yzuel, F. Höller, S-H Park, J. Howell, C. Cisneros.

Apologies: J. Harrington, K. Choquette, J. Zakrzewski, S. Morgan.

1. Welcome and Opening of the Meeting (Yasuhiko Arakawa, Chair)

The Chair called to order, welcomed all participants and noted the apologies.

2. Adoption of the Agenda (Yasuhiko Arakawa, Chair)

The Chair introduced the agenda, asked the Bureau members if there were requests for changes or additions and invited the Bureau to adopt it.

Motion 1: To approve the Agenda. Moved by H. Michinel, seconded by F. Höller, approved unanimously.

3. Minutes of the ICO Bureau Meeting 2016 (Yasuhiko Arakawa, Chair)

The final version of the Minutes of the ICO Bureau Meeting 2016 were sent to the ICO Bureau members and comments and corrections were inserted.

Motion 2: To approve the minutes of the 2016 ICO Bureau Meeting and to note the decisions and actions list. Moved by A. Wagué seconded by G. von Bally. Approved unanimously.

4. ICO President's Report (Yasuhiko Arakawa, Chair)

ICO President reported on his activities in connection with ICO since the last ICO Bureau Meeting. He also reported in the meeting of the Strategic Planning Committee (SPC), highlighting the discussion on the role of ICO as International Union of Optics and Photonics (IUOP) to be created. He will present a summary of the recommendations of the SPC later in the meeting and to the ICO General Assembly.

The ICO Secretariat received comments from Bureau Members, International Society Members and Territorial Committees. Some comments, mostly referring to typos or unclear statements have been already taken in account in the text or are highlighted in yellow in the text for further consideration. Other comments should be considered by the General Assembly, and are transcribed below.

Comments to the ICO Strategic Plan by ICO Bureau members.

María Yzuel (ICO Vice-president appointed by SPIE)

I have read through the latest version of the ICO Strategic Plan (SP) and note that this version includes some welcome changes. SPIE continues to believe that a union for optics and photonics within ICSU is an idea with merit and could benefit our technologies and their many positive impacts. The current plan includes a number of worthy and ambitious aspirations for ICO. It also includes the budget for the last triennium and the approved budget for the current triennium (misabeled and with the incorrect period).

There is no budget proposed for the period of the plan. The budget section also asserts that dues, the major source of income on which ICO relies, will not be raised. Overall, the inclusion of the recent and current budget information suggests that ICO has no scope for expanding its activities, and therefore raises the question on how the proposed additional activities and addition of part time staff will be supported.

It is mentioned in the document that six unions of ICSU have smaller budgets than ICO. Would you please send me the names of those unions so that I can learn more about their finances and the scope of their operations. This might help me better envisage how ICO could successfully operate as a union within ICSU.

SPIE also notes the hope or intent for ICO to attain 501(c)(3) charitable organization status in the U.S. so that ICO would be eligible to receive tax-deductible contributions (from U.S. tax payers) in accordance with U.S. IRS Code section 170. (SPIE has this charitable organization status). This status comes with many restrictions among which are proscriptions against connections with some countries and individuals, and requirements to document the use of funds. To us, this could restrict the freedom of ICO. SPIE has always admired, and envied, the ability of the ICO to operate anywhere in the world. I feel it would be a pity to sacrifice this capability.

Achieving the several admirable goals for the optics and photonics community included in this plan, will require commitment and resources. SPIE does not doubt the commitment. Without the resources there is concern that poor outcomes could reflect badly on our community. Therefore SPIE cannot support this Strategic Plan.

We welcome discussion of the future of ICO. SPIE's Board, in its most recent meet-ing in February, expressed nothing but goodwill for ICO and appreciation for its contributions. I would like to express, on behalf of SPIE, that we are very concerned because the proposed name for the Union: International Union for Optics and Photonics may be in conflict with the name of SPIE-The International Society for Optics and Photonics.

The description of what ICO does is exaggerated because it includes the activities done by the International Societies. The opening paragraph contains some claims that are not as modest as in the Green Books of past years. Those in the Green Books are more realistic.

Membership: The claim to 53 territories is exaggerated.

English language comment: Surely “Application for all categories of membership shall be made to the ICO Secretary and submitted to the next General Meeting for approval.” should be a standalone sentence and not part of a membership type paragraph.

SWOT: Strengths.

Some of the claims are exaggerated. This would be expected for marketing, but not for a useful SWOT exercise where facing the truth is the goal. I include a few observations.

[4] Should be modified to “some of the leading publishers”. [7] “The ICO TCs are official representatives of the Optics and Photonics community in identified geographical territories.” I do not believe there are official representatives of the Optics and Photonics community in most geographies. I already commented on this. [9] I do not see this relationship. [10]. The implication is somewhat offensive to SPIE volunteer leadership, and possibly to that of other societies. [12] And elsewhere. Yet the plan clearly states that the ICO wants to gain 501c3 status in the US with all the restrictions. [13] “The USA National Initiative for Optics and Photonics was born within the ICO Territorial Committee of the USA (USAC/ICO),” I assume that this refers to the NPI (not the name cited or is this something different?). I find this also disingenuous.

SWOT: Weaknesses

“As to procure a major impact, ICO might fill the lack of appeal to industrial sectors as optical engineers and information scientists”. The intent might be good but this is not English. I note the desire to increase communications and marketing but not in any budget.

SWOT: Opportunities

“Science for policy: Help replicate initiatives like Photonics 21 (Europe), the USA Photonics initiative, Horizon 2020, etc., in less developed countries with the aim to help solve local problems and contribute to regional sustainable development. A step in that direction was the Mexican Photonics Initiative.” I find that a confusion of ideas. Replicating the ~80 bn euro Horizon 2020 in a developing country? An ambition to advocate for optics and photonics in the developed and developing world is itself an ambitious but a worthy goal. Replicating this other mixed bag of very different programs sounds unrealistic.

SWOT: Threats

I think blaming IUPAP is a complete misreading of the reality. This whole item seems somewhat strange to me. The other items in this section seem valid to me, and extend way beyond ICO to scientific organizations especially and to a degree to engineering organizations.

Vision: When I got to (v) there seemed the assumption ICO would be a Union. (vi) narrows ICO down to “academic” which seems out of line with the attempts to be more relevant to industry and the economy. (vii) is a very confusing piece, especially after (v) where a union is assumed. This needs to be rewritten to make sense and to include interaction within ICSU with the many other bodies that are not unions but involved with optics and photonics.

Values: What is meant by “Engagement in a wide range of select activities”? Is this stating that ICO values doing a lot of different things?

Goals and Associated Actions: My overall comment here is that this list of mainly wonderful aspirations will require a lot of resources if it is to be in any meaningful way and done properly.

Short Term: Good to use the word health that should be included before. 2. The correct word is “among”, not “between”

Medium Term: The bulleted point seems in an odd place – “In all the previous mentioned activities ICO may count on the determinant support of the International Society members and the local societies of the TC’s”. Does it refer only to the two preceding goals in 1 of the Medium Term section and or all the Goals and Associated actions?. I also have no idea whether this is an implication that the ICO has the “determinant support” (whatever this means), expects support, or what. It will certainly need support but I doubt the International Society members can, or will provide it.

Long Term: Again the seeming dissociation of the SP and the budget section are obvious. And no comment on what is cited as a strength – all volunteer- being ended?

Finally, I noted in the footnote on page 16: “With this structure, ICO has a fair claim to representing the whole field of Optics and Photonics on an international scale.” The implication is that SPIE’s members (and those of the other organizations) are represented by ICO. That is certainly not true.

Comments by Humberto Michinel, ICO elected VP

First of all, I would like to congratulate the authors of the strategic plan for their terrific job. I just wonder if it would be possible to mention in some way the participation of women in the field of Optics and Phonics, which I consider very relevant for Science worldwide.

I am not sure where this issue can be included, but maybe the "Opportunities" section of the SWOT analysis can be a good place, especially in connection with the improvement of the situation of women in developing countries. Other possible sections can be "Vision" or "Values". In any case, I consider important that the word "women" appears somewhere in the final document.

Comments by Miroslav Hrabovsky, Czech Territorial Committee of ICO

It should be desirable to agree on using “of” or “for” in the name of the Optics and Photonics Union. We prefer “for”: International Union for Optics and Photonics.

In the preamble it should be noted that optics played an important role in development of physics. The Michelson experiment was fundamental for the theory of relativity and the Planck law of radiation was the source for the quantum theory. We think that it is

necessary to remark a rapid development of imaging optics after application of the theory of information, holography after application of the laser, communication after the fiber. It should be not off the point to present recent crucial results concerning gravitational waves through application of the Michelson interferometer in LIGO.

We don't know what to serve in this context presented the demographic graphs? It should be better way to describe it by several words. It should be necessary to clarify relations and cooperation or perhaps overlapping with the Commissions IUPAP C15: Atomic, Molecular and Optical Physics and C1 Laser Physics and Photonics. For example simultaneously negotiate on a transfer of the Optical Physics and Photonics from C15 and C17 into IUOP. But the Optical Physics is only another name for the Atomic Physics: there are the optical transitions in the electron shell of the atom (in three items in the Mandate of C15 a reference to Optical Physics does not exist, only names atomic and molecular physics are present). The Photonics, which is understand as a counterpart to electronics, does not have a direct relation to laser physics. Instead quantum electronics is appropriate (in three items in the Mandate of C17 the photonics is not mentioned, only the quantum electronics is mentioned).

We don't understand for what reason the ICO should be maintained as one committee of IUOP? We rather think that it terminates and new specialized committees create. It should be indicated which committees is desirable to create in the new Union, e.g.

- 3D imaging incl. holography
- guided photonics incl. communication fiber photonics
- astronomic optics incl. giant compact and/or compound mirrors - optical computing incl. optical design and production
- biooptics incl. vision compensation
- solar energy and photovoltaics incl. smart glass
- illumination of interior or exterior
- nonlinear effects in photonics

Comments by the OSA, presented by John Howell

Thank you for considering OSA's previous input and for sharing the new version of the ICO Strategic Plan. We appreciate that ICO incorporated changes based on our initial comments.

We would like to emphasis the high regard OSA holds for ICO. Throughout its long history, ICO has served a valuable role, particularly in connecting and supporting the community in emerging regions. Strengthening and continuing this outreach is a role that ICO is uniquely suited to fulfill.

However, our concerns about how the ambitious Goals and Associated Actions will be achieved, with the current organizational and financial model of ICO, remain. We think it is critical that the long-term goal of stabilization for the ICO be accomplished before embarking on the other stated Goals. OSA cannot approve the current version of the ICO Strategic Plan. We look forward to further constructive dialogue with you and the members of the ICO Bureau.

Comments by the IEEE Photonics Society, presented by the secretary

In terms of additional feedback, I would again echo the USAC-ICO's feeling that the strategic plan needs to address some critical issues if we're going to support making ICO a union. To that end, John gave some very clear and constructive feedback in the summation of the meeting. I'd like to see those concerns addressed. In particular, what I thought was really needed was a clear understanding of the level of financial and human support union members would be required to contribute in the future.

The revised Strategic Plan lists 49,000 members under the USAC-ICO. I've never claimed to involve that many people, and we definitely don't have "members". SPIE, OSA and IEEE Photonic Society are all members of ICO in their own right. I don't know whether you are counting all their members. They've also pointed out that many individuals belong to more than one of the societies, so just adding the 3 together is inaccurate. Beyond that, I'm not clear who would qualify as a U.S. "member".

Issues that must be addressed to the ICO General Assembly:

1. The tentative name of the Union: "International Union of Optics and Photonics". Note of the Secretariat: If ICO application is accepted by ICSU, they would suggest appropriate names for the new Union.
2. The change the U.S. taxation status of the ICO from that of a 501(c)4 organization to a 501(c)3 organization in order that donations made to the ICO can be tax deductible. This change could be done when the ICO is upgraded to ICSU Union status.
3. Comment from M. Yzuel: "The description of what ICO does is exaggerated because it includes the activities done by the International Societies." What does it mean to be an International Society Member of ICO?
4. Comment from USAC-ICO (Kathie Bailey-Mathae):

Who are members of a Territorial Committee? ICO Statutes: Territorial Committee Members, that represent identified optics communities in a set of non-overlapping geographical areas.....Each Territorial Committee should receive endorsement of the appropriate authority representing science in its territory, such as an Academy of Science. In addition, it should either (a) be a subcommittee of the body representing the Member in IUPAP, (b) be recognized by the body representing the Member in IUPAP, or (c) if no such body exists be recognized by the council of IUPAP. USAC-ICO has now only 4 voting members: the representatives of three ICO USA-based International Organization members (OSA, SPIE, IEEE PS) and one representative of the USA National Academy of Sciences.

5. Should the ICO be maintained as one committee of IUOP? Which committees should be created in the new Union? Suggestions:

- 3D imaging incl. holography
- guided photonics incl. communication fiber photonics

- astronomic optics incl. giant compact and/or compound mirrors - optical computing incl. optical design and production

- biooptics incl. vision compensation

- solar energy and photovoltaics incl. smart glass

- illumination of interior or exterior - nonlinear effects in photonics

- International affairs

- Education in Optics and Photonics - Historical archiving

6. Clarify relations and cooperation or perhaps overlapping with the Commissions IUPAP C15: Atomic, Molecular and Optical Physics, C1 Laser Physics and Photonics, and C17.

7. In the preamble of the Strategic Plan it should be noted that optics played an important role in development of physics.

8. We don't know what to serve in this context presented the demographic graphs? It should be better way to describe it by several words.

9. Highlight ICO's support to the participation of women in the field of Optics and Photonics, especially in connection with the improvement of the situation of women in developing countries, in "Opportunities", "Vision" or "Values".

10. What is the membership status for the many territories that have not paid dues for years and which certainly did not apply for Associate Member status?

11. How to accomplish the long-term goal of stabilization for the ICO before embarking on the other stated Goals.

Note of the Secretariat: As pointed out by Sir P. Knight, the structure of organizations like ICSU, with two types of members, national members represented by Academies and Union members, allows their own budget to be greatly enhanced by local resources. At this stage, it is hard to preview the opportunities that may arise for the ICO in the international context if it becomes a Union. The International Union of Astronomy, for example, created a network of astronomers in different countries who support with voluntary work and local resources the initiatives of the IUA. It is the largest Union and its only external sources come from agreements with Academies for their traveling lecturer program, similar to the agreement that the ICO has with the IOP for UK lecturers.

Finances: Eight of the 32 ICSU Unions have smaller budgets than does the ICO. ICSU dues for Unions with budgets less than 55,000 euros as of 2015 were 1,202 euros. The ICO currently pays 500 euros, without having the right to vote. Only two of these smaller Unions have staff, all others have a structure similar to that of the ICO. There is no intention to change national member fees for the next period. The GA will in any case be consulted on this issue if and when the ICO becomes a Union.

M. Yzuel presents a proposal for adopting Robert Rules of Order, which are summarized in the website robertsrules.org.

Motion 3: To recommend the General Assembly to approve the definitive version of the Strategic Plan. Moved by H. Michinel seconded by G. von Bally. votes in favour: 16. Votes against: 3. The motion is approved.

Motion 4: To adopt Robert's Rules of Order for the conduct of all ICO meetings. Moved by M. Yzuel, seconded by R. Ramponi, approved unanimously.

5. ICO Secretary's report (Angela Guzmán, ICO Secretary)

In other opportunities, I have listed the long number of duties of the ICO Secretariat. Since I am leaving now this position, I want to refer to highlights of my role as ICO Secretary during this period. It has been a year of arduous work for the extended Executive Committee that prepared not only a Strategic Plan for the period 2017-2023, but the application to ICSU to become a Union.

The legacy of former ICO Secretaries, Pierre Chavel's, Maria Calvo's and my own, has been the continuity of ICO's international stand and the vision of the role of the ICO as part of the worldwide Scientific community. Pierre Chavel applied successfully for the ICO status as ICSU's Scientific Associate. I presented in 2011 to the ICO Bureau the Flagship Program of ICSU, Future Earth, that was by then recently conceived, and published in the ICO Newsletter some articles on the status of ICO within ICSU and IUPAP, the analysis of which had been part of the Strategic Planning exercise led by Duncan Moore. Current ICO President, Yasuhiko Arakawa, welcomed and fostered the idea of applying to ICSU to become an ICSU Union, throughout multiple sceneries. Duncan Moore, now as ICO Past-President, provided operational support to the ICO Executive Committee, extended by the participation of Maria L. Calvo and Pierre Chavel. The operational support included the service of an experienced project developer, Alana Cahoon, and teleconference capabilities, all financed from his own resources.

The USAC/ICO (USA ICO Territorial Committee) requested the elaboration of a Strategic Plan, which was not a requirement for the application to ICSU and whose first draft was elaborated by Maria L. Calvo and I, with the support of Alana Cahoon. Duncan Moore, Yasuhiko Arakawa, Joe Niemela and I, attended the meeting of the USAC/ICO. I presented to them the basic ideas of the Strategic Plan, which found strong opposition from the 3 USA-based International Society members of the ICO, each of whose representatives has one of the four voting seats in the USAC-ICO. The same 3 societies denied their support to the ICO application to ICSU through their VPs in the ICO Bureau. The Strategic Plan was posted in the ICO webpage, open to the commentaries of all ICO members. The issues that were commented appear highlighted in the ICO Green Book and we would like to request guidance of the General Assembly on those issues to agree on a definitive version of the Plan.

One of the main concerns of the ICO Member societies regarding the implementation of the Plan, relates to the budget required for that purpose. ICO, Unions like the IAU, and ICSU, have a privileged structure that allows them to amplify their own budget, when undertaking initiatives with global coverage that result attractive for their National members, who contribute with local resources to the activities related to the initiative. Not very different was the financing of the International Year of Light 2015: the funds provided by the sponsors were largely amplified by local communities and local governments, who held multiple activities without any direct funding from the organizers of the IYL.

I went through the exercise of comparing ICO's budget with that of ICSU Unions, and estimated the fees that ICO would have to pay to ICSU in the case of becoming a Union. The data on budgets and fees for 2015 were available in the ICSU webpage. Fig 1 shows the comparative dues income of the 31 Unions, and what would be the place of ICO with its current budget.

One of my main efforts since I joined the ICO as ICO VP in 2005, was to create the Iberian American Network of Optics, RIAO. Their first bylaws were presented at the ICO General Assembly in Australia. However, internal problems in one of the by then founding members of RIAO, lead to a delay in the official launching of the Network. The official launching was done at the RIAO OPTILAS in Peru in 2010.

It followed their application to become an ICO member, which was tabled in the ICO General Assembly 2011, and finally accepted in 2014. It is then for me an immense pleasure to tell you that in my role as ICO Secretary, I attended the launching of the Mexican Photonics Initiative (IMF) at the Chapultepec Castle in Mexico City, a ceremony organized by ProMexico, the Mexican government agency devoted to promoting Mexico as an ideal destination for foreign investment. ProMexico published a report entitled "Towards a brighter Mexico: optics and photonics roadmap", where the Mexican Government highlights the economic importance of light-based technologies for its own country.

The IMF is the result of the joint effort of the Mexican ICO Territory, represented by the Mexican Academy of Optics, and RIAO, the Iberian American network of Optics, with the institutional support of the ICO. In the launching ceremony of the IMF, the director of ProMexico stated to me that ProMexico supported this initiative because of the possibilities of collaboration with European researchers that the ICO as the international organization availing the initiative could facilitate. Prof. Rosas, the ICO VP, has apologized for not being able to attend the ICO Bureau Meeting because the Mexican government is already putting the basis for the initiative, by providing the infrastructure for a huge scientific and technology compound that will include education institutions, research labs, and industry incubators. He expects to have the support of the International community to make of this Mexican effort a successful history.

I was very glad of attending the celebration of the centenary of the OSA. Next October I will be attending the celebration of the centenary of the Institut d'Optique, the ICO's host institution and official address since ICO's birth. And after ICO 24 I will attend the celebration of the 30th Anniversary of the Mexican Academy of Optics. For these milestone celebrations, the ICO prepared a congratulation trophy to be presented to the

dignitaries of the organizations, and in the case of the Institut d'Optique, to the Institute's director. I also attended the International Conference in Optics and Applications in Faro, Portugal, a conference that has been growing in size, and has acquired a well definite character with strong emphasis in applications.

I do not want to omit my role as Chair of the TSOSA Committee at ICTP in Italy, an honorific position that I have occupied since 2008. TSOSA is another legacy of former ICO Secretary Pierre Chavel, who was its first Chair. Last year we achieved a long-wished goal: the realization of experimental activities within the ICTP College. I was present when ICTP's director Fernando Quevedo visited the labs, with a similar attitude of the one I remember from Abdus Salam: he wanted to see how people from developing countries could contribute to scientific knowledge, even in the absence of large financial resources. The ICO Secretariat continues elaborating the Minutes of the TSOSA Meeting and publishes them in the ICO Green Book.

The edition of the ICO Green Book was a continued effort of several months. It was printed in Japan, thanks to Prof. Arakawa and the cost for ICO was then lowered, not only due to lower printing costs but for avoiding mailing services. A printed copy will be given to each of the delegations to the ICO General Assembly, and the electronic version has been posted in the ICO webpage.

The Optical Engineering Society Taipei China has been renamed as Taiwan Photonics Society. They sent a formal letter to ask for the change of their society's name and the contact information. Regarding the dues, I was informed by its former President that they do not have sufficient funds to pay for the membership fee right now. Therefore, they would like to choose the option to be the "delegate without right to vote". In view of the problem of two Chinese members of ICO, the Committee of International Affairs will contact for advice and coordination the ISC Board, UNESCO, IUPAP and ICO International Society Members (EOS, OSA, OWLS, SPIE) to look for proposals both sides may be able to accept.

Motion 5: To make the list of motions proposed by the ICO Bureau to the General Assembly. Moved by M. Yzuel, seconded by R. Ramponi, approved unanimously.

Motion 6: To define strategy for contacting individual ICSU National Members. Moved by A. Wagué, seconded by F. Höller, approved unanimously.

6. ICO Treasurer's report (presented by the Secretary)

As of July 25, 2017, the ICO has a cash balance of \$150,400 in our treasury. This amount is held in US dollars (\$107,164) at the US Bank of America and in Euros (37,092 €) in the Caisse D'Epargne in Paris. This may be compared to the cash balance of \$169,286 as of October 1, 2016. The primary source of income that the ICO receives is derived from membership dues contributed by the Territorial Committees (TCs). The money that the ICO expends is used mostly to support conferences, ICO prizes, and travelling lecture awards.

A persistent problem this year as in past years is the collection of dues and dues in arrears. This is a problem which has existed for some time and it is an issue that we continue to address. So far in 2017, only 18 out of 43 territories in good standing have paid their dues. That is 42% have paid their dues through July, 2017. The dues collected so far in 2017 are \$24,174 against total dues owed for 2017 of \$53,815. I should add that the dues paid this year are generally behind the dues collected at this point in past years. This is a result of my not sending out all of the invoices as early as I have in the past. I fully expect that we will collect dues from more TCs as the year progresses. This year I have also invoiced an additional \$8,500 to some of our TCs who owe money from earlier years. Yet there are still non-paying TCs but the number of delinquent TCs is much less than in previous years.

As a reminder those TCs in arrears for more than 5 years face demotion to Associate status. According to a motion approved by the Bureau in 2010, "Territorial Committees which are in arrears on their dues for more than 5 years will have their membership status demoted to Associate status. This means no shares, no votes, no officer on the Bureau, and no ability to ask for financial support. "

One of the problems associated with ICO membership is that some TCs have difficulty determining which optical organization is currently responsible for paying the TC's ICO dues. In some cases we are working with these TCs to restructure their dues schedule and to arrive at an equitable settlement for their back dues.

The OSA Foundation (OSAF) continues to accept monetary gifts from US donors for the use of the ICO. The reason that we decided to make this arrangement is that the ICO is a 501(c)4 organization which means that monies donated by US citizens to the ICO do not exempt the donor from paying US taxes on their gift. In contrast the OSAF is a 501(c)3 organization (as is the OSA itself) and thus the OSAF can accept donations without the donor paying US tax on their donation. To date we have received only one gift of \$25,000. This money is in the OSAF account for our use but so far we have only used \$5,000 of this money to fund our IYL activities in 2016. The current balance in the OSAF/ICO account is about \$25,000 and this balance is not included in the balance sheet given in the Appendix.

A somewhat longer term issue is a re-examination of the shares that we assess each TC as a means of determining their dues. The current dues rate is based on \$235/share. The number of shares for any territory varies from 1 to 27 units. The Green Book gives a formula for calculating the number of shares that are now being assigned to each TC. The new shares more accurately reflect the economic status of the TCs and, therefore, this provides a more equitable way to determine the dues for each TC. The first budget shown below 1 is the performance budget of our society for the past three years. The first column is the actual revenue and expenses to date compared to the 3-year budget approved at ICO-23 in Santiago for the 2014-2017 triennium. Note that none of the budget data presented in this and the other appendix includes money held in the OSA Foundation for ICO activities.

A persistent problem this year as in past years is the collection of dues and dues in arrears. This is a problem which has existed for some time and it is an issue that we continue to address. So far in 2014, only 25 out of 44 territories or 57% have paid their dues through June 2014.

These 25 TCs account for 72% of the total (\$48,175) 2014 dues that are owed. This is close to the percentages normally collected at this point in any year. I anticipate that more TCs will pay their 2014 dues prior to the general assembly in Santiago this summer. Yet there are still non-paying TCs but the number of delinquent TCs is much less than in previous years. As a reminder those TCs in arrears for more than 5 years face demotion to Associate status. According to a motion approved by the Bureau in 2010: “Territorial Committees which are in arrears on their dues for more than 5 years will have their membership status demoted to Associate status. This means no shares, no votes, no officer on the Bureau, and no ability to ask for financial support”.

One of the problems associated with ICO membership is that some TCs have difficulty determining which optical organization is currently responsible for paying the TC’s ICO dues. In some cases, we are working with these TCs to restructure their dues schedule and to arrive at an equitable settlement for their back dues. The biggest expense of the ICO outside of the money given to support conferences, travel, and prizes is for publication and mailing of the newsletter and green books. So far in 2011-2014 these publishing and mailing costs come to \$15,200. This is less than the budgeted amount of \$20,000 and less than these costs in prior years. One reason for the decrease in publishing costs is the switch from IOP Publishing (UK) to Gemini West (UK) and the reduced cost of editing the newsletters. One way to further reduce printing and mailing costs would be to consider sending CDs of the green book instead of a printed copy and to transition to an electronic version of the newsletter.

Since the last General Assembly in Puebla we have been fortunate to make an agreement with the Optical Society of America Foundation (OSAF) for the acceptance of monetary gifts by US donors for the support of ICO activities. The reason for this is that the ICO is a 501(c)4 organization. This means that monies donated by US citizens directly to the ICO do not exempt the donor from paying US taxes on their gift. In contrast, the OSAF is a 501(c)3 organization (as is the OSA itself) and thus the OSAF can accept donations from US tax payers and their donation will be tax deductible. The Memorandum of Understanding (MOU) is now in place between the OSAF and the ICO so we may now solicit donations which will come through the OSAF to the ICO for the activities that we normally support. Those interested may go to the OSAF website (<http://www.osa-foundation.org/news/pressreleases/ico>) for more information and an application for making donations. To date the ICO has received one donation of \$25,000.

A somewhat longer-term issue is a re-examination of the units that we assess each TC as a means of determining their dues. The current dues rate is based on \$235/unit. The number of units for any TC varies from 1 to 18. The units that each TC is assigned are based on information from the World Bank on the economic status of the various countries. The ICO established the numbers of units many years ago but we feel that it is now time to re-evaluate the units assigned to each territory considering economic changes since the units were established. We want to be certain that the units are assigned equably. While several proposals for readjusting the units have been discussed, there has been no reallocation of units to date. Now, we do not envision an increase in the \$235/unit dues in the foreseeable future.

The first budget shown below is the performance budget of our society for the past three years. The last column compares the estimated 3-year totals to the budget approved at ICO-22 in Puebla for the 2011-2014 triennium. Note that none of the budget data presented in this and the other appendices includes the \$25,000 held in the OSA Foundation for ICO activities. Furthermore, none of this donation has been spent to date. Detailed information on the balance and expenses can be seen below.

Motion 7: To approve the financial report presented by the ICO Treasurer. Moved by F. Höller, seconded by Seung-Han Park. Approved unanimously.

Motion 8: To approve the proposed budget. Moved by H. Michinel, seconded by R. Ramponi. Approved unanimously.

Performance Budget*		
2014 through 2017 Tokyo, Japan, August, 2017		
Revenue	Actual* 2014-2017	Approved 2014-2017
Dues	\$160,000	\$163,560
Less not collected	\$49,140	\$14,000
Net dues	\$110,900	\$149,560
Royalties	\$1,880	\$300
Total Revenue	\$112,790	\$149,860
Expenses		
Secretariat	\$21,360	\$22,000
Editing, printing, mailing newsletters	\$11,680	\$16,000
Printing & distribution - Green Book estimated	\$4,000	\$4,000
ICO prizes + travel	\$9,000	\$20,000
Conference support	\$33,500	\$32,000
ICTP school support	\$17,170	\$15,000
ICO Congress	\$7,500	\$8,000
Traveling lecture awards	\$3,000	\$5,000
ICSU dues	\$1,670	\$2,100
Total Expenses	\$108,880	\$124,100
Surplus/(Deficit) for 3 year period	\$3,910	\$25,760

*Estimated through July, 2017. More dues will be collected in 2017

Balance Sheet*
October 1, 2016 through June 24, 2017
General Assembly Tokyo, Japan 8/2017

Assets

Checking/Saving			
	Bank of America - checking	\$4,608	
	Bank of America - money market	\$102,556	
	French account-checking (1 Euro= 1.165 dollars)	\$21,646	
	French account-savings (1 Euro = 1.165 dollars)	\$21,573	
Total checking/money market			\$150,383
Accounts receivable			
	Current year dues collected	\$24,174	
	Dues still owed in 2017	\$29,641	
	Dues in arrears to be collected	\$8,500	
	Book royalties	\$584	
	Transfer OSAF to ICO for IYL activities	\$5,000	
Total accounts receivable			\$62,315
Total assets*			\$212,698

Liabilities and equity

Conference support	\$17,000	
ICO-24	\$7,500	
ICTP Winter College – Trieste 2017	\$6,170	
Secretariat - A. Guzman	\$10,000	
ICO Prizes/awards/travel	\$3,000	
Printing and mailing newsletters	\$3,860	
ICSU dues for 2017	\$582	
Traveling lecture award	\$1,000	
IYL-CUBA	\$1,000	
Miscellaneous-(SPIE book royalty)	\$584	
Bad debt-fraudulent money transfer	\$5,500	
Total liability		\$56,196
Equity		
Retained earnings		\$156,502
Total liabilities and equity		\$212,698

* Does not include \$25,500 in the OSA Foundation

7. Report of the Nomination Committee (D. T. Moore)

According to established procedures in the ICO Rules and Code of Practice, elections for members of the ICO Bureau occur every three years and will take place this year at the ICO-24 Congress. The procedures and protocols for the election are as described in the ICO Rules and Codes of Practice. For the upcoming elections, the Nominating Committee consists, according to the tradition is chaired by the ICO past president (Duncan T. Moore, USA).

According to ICO rules letters have been sent to the Territorial Committees (TCs) in October 2015 and November 2016 for nominations to be received by March 15, 2017. As of this date, 26 May 2017, the following nominations have been received and/or established by protocol:

Candidate for		TC
President	Prof Ángel Guzmán	Colombia
Secretary	Prof Humberto Michinel	Spain
Assoc. Secretary	Dr. Frank Höller	Germany
Treasurer	Prof Joe Niemela	USA

Candidates for Vice President (those in industry are marked with an asterisk*):

Prof Manuel F. Costa	Portugal
Dr Gilles Pauliat	France
Prof John Harvey*	New Zealand
Prof Seung-Han Park	South Korea
Dr. Sara Otero*	Spain
Prof Jürgen Czarske	Germany
Prof Lesek Sirko	Poland
Prof Qihuang Gong	China
Prof. Adrian Podoleanu	United Kingdom
Prof. Tero Setälä	Finland
Prof. Luca Poletto	Italy

Present Vice Presidents eligible for a second term are:

Prof Seung-Han Park	Korea
Prof Mourad Zghal	Tunis

Past President: The position of Past President for the term 2014-2017 will be automatically assumed by the current President, Yasuhiko Arakawa (Japan). Added to these in the Bureau composition will be individuals appointed as Vice President by the Member societies. However, it should be remembered that nominations for all positions/officer's close 24 hours before the second business meeting of the International Commission for Optics General Assembly Tokyo.

The election activities will take place as indicated during the ICO General Assembly-first session scheduled for 5:00 PM - 7:00 PM hours, August 22, 2017 while the second and final ICO General Assembly is scheduled for 4:30 PM-7:30 PM hours, August 24, 2017. Additionally, during the immediate future the Nominating Committee will collect endorsements of Candidates from the various Territorial Committees and CVs.

The work was coordinated with the ICO Secretariat and the report was published in the last ICO Newsletter. The VPS from Societies must be appointed before the General Assembly. The IUPAP EXEC delegate is C. Cisneros.

8. Committees reports, except nomination & prizes & awards

Committee for the Regional Development of Optics (CREDO) (Prepared and presented by John Harvey, Chair)

Introduction

This committee is concerned with regional development in Optics. Developments in this area will only be supported by governments which understand the contribution that Optics can make to the wider community. Educational and industrial outreach from researchers and other specialists is therefore a crucial part of this effort.

The Asia-Pacific region is here defined as including the Asian countries on the western Pacific Rim, Australia and Aotearoa New Zealand, and other Asian countries as far west as the Indian subcontinent. This grouping also reflects the contributing regions for the CLEO/PACRIM conference run by the Optical Society of America. In order to promote the contribution which Optics can make to regional development, it is helpful to consider first the historical interactions in the region.

Previous interactions and collaborations in the Region

The Australian Optical Society (AOS) has around 300 members and was established in 1983 with the support and encouragement of the ICO (see <http://www.optics.org.au/History>). The Society has long-standing agreements with the OSA and the SPIE, including joint member benefits and coordination of international conferences. In 2013 the AOS signed a Memorandum of Understanding with the Optical Society of India offering joint membership benefits.

There have also been a substantial number of optics related conferences in the region in recent years. These include not only the OSA and SPIE organized meetings, but also other large meetings organized by different agencies such as Photonics Global in Singapore, the Photonics Conference in India, and ACP in China, most of which gain ICO support. At all of these meetings, coordination in promotion and timing is important, and this is an area where the ICO could potentially play a helpful, neutral, coordinating role.

In addition to the more formal interactions such as conferences, there have been a number of other collaborative initiatives in the region, some funded by local research Centers and others by local research agencies. These activities have involved educational initiatives, traveling lecturer programs, and the promotion of small startups in the photonics area. The ICO could well promote these visits and help to coordinate them, while perhaps provide some additional support in worthy cases.

The centenary of the birth of Aleksander Prokhorov, who was one of the co-winners of the 1964 Nobel Prize in Physics for the invention of the laser was celebrated in Australia in 2016. Although he was born in the Atherton Tablelands region of far north Queensland, this is largely unknown, even in Australia, and the AOS helped to arrange a ceremony in this remote region of the country to acknowledge this significant event.

The Optical Society of Korea (OSK), founded in 1989, is a leading society in the field of optics and photonics in Korea. At present, OSK has over 5000 members from universities, research institutes, and industries and publishes two peer-reviewed journals: Current Optics and Photonics (listed in SCI) and Korean Journal of Optics and Photonics (Hankook Kwanghak Hoeji).

Since its founding, international activities of OSK have been expanding by exchanging MOUs with professional optical societies in the world such as SPIE -The International Society for Optics and Photonics, Optical Society of America (OSA), Chinese Optical Society (COS), Optical Society of Japan (OSJ), Taiwan Photonics Society (TPS), Optical Society of Europe (EOS), etc. and OSK has successfully hosted numerous international conferences in the past three decades.

Outreach in the Region.

The hugely successful International Year of Light (IYL) in 2015 has been instrumental in raising the profile of Optics around the world, not only within educational institutions but also politically. The future the growth of optics, its funding within Schools, Universities, and Research Institutions, will only be enabled by governments that can appreciate the impact that it can have. The key impact catching the attention of government is of course related to economic growth, but increasingly the issues of sustainability and environmental conservation are becoming important, and photonic technologies have a big role to play in these areas.

In order to survey the region defined in the introduction, it was useful to take advantage of the resources developed by the International Year of Light organizers who have assembled a list of contacts in the photonics sector within each participating country. These contacts will be maintained and updated in the future, as UNESCO has now agreed to the formation of an International Day of Light to be formally declared in November this year. This will ensure the maintenance of this invaluable database, which can be of significant value to future ICO bureau members.

During the preparation of this report I have contacted a number of representatives from countries in the Asia-Pacific region, concerning education and industry outreach from the research and academic communities, and the results are summarized below.

Industry Outreach

Indonesia has initiated a research project on highway lighting using LEDs, involving the Institute of Road Safety and Engineering, the Indonesian Luminaire Association, Universities, and High Schools. The Indonesian Optical Society (<http://inos.indonesianoptics.org/>) supports the development of science and technology in optics within the country.

Taiwan has long been recognized as a powerhouse for the development of Photonic technologies and even has its own Photonics Industry Development Association (PIDA) which runs an annual Photonics Festival (see <http://www.pida.org.tw/ExhibitionSeminar/>). As an indication of the importance of Optics to their economy it is interesting to note that their stock-market has a section labeled "Photonics"!

Australia has a programme of “Linkage Projects” which Research Institutes and Universities can take advantage of to fund a postdoctoral fellowship, provided an associated company commits sufficient resources to enable the application (see <http://www.arc.gov.au/linkage-projects>). Whilst this is across all sectors, in common with most other countries, it has enabled more funding to flow to Photonics related research projects.

New Zealand has a funding system which requires industry involvement for much of the research funding that is provided for Research Institutes and Universities. The Dodd-Walls Centre of Research Excellence linking most of the Universities in the country, also runs the Lighthouse Platform which fosters industry outreach in Photonics and Optics from the six participating Universities across the country (see <http://www.lighthouseplatform.org.nz/>).

Singapore has the LUX consortium (see <http://luxphotonicsconsortium-sg.org/>) which has as its mission the conversion of research in photonics into diverse applications in industry. It is a joint initiative from the two leading Universities in Singapore.

In Korea, KAPID (Korea Association for Photonics Industry Development); was established in 2000 (<http://www.kapid.org/english>) to promote the competitiveness of Korean photonics industry and to provide information on the statistical analysis of photonics industries, markets, and technical trends. In addition, KOPHIA (Korea Photonics Industry Association; see www.kophia.or.kr), established in 1988, holds annual ‘Photonics Seoul’ exhibition, to strengthen the research and development activities of Korean photonics.

Education Outreach.

Indonesia has funded The Center for Young Scientists (see <http://www.cys.or.id/>). This Centre is preparing workshops for physics secondary school teacher in optics and photonics as the follow ups of ALOP (Active Learning in Optics and Photonics) with the ICTP and UNESCO. The workshops will be running in several provinces within the country. The center is also conducting educational research on the impact of this learning upon students' learning in physics.

The Australian organization Questacon (see <https://www.questacon.edu.au/>) fosters generic awareness of Science and Technology through a number of programmes, some of which were geared towards Optics during the IYL in 2015.

In New Zealand the Lighthouse Platform fosters educational outreach in Photonics and Optics from the Universities (see <http://www.lighthouseplatform.org.nz/>). In Korea, various programs, such as summer/winter camps, tutorial programs, and science festivals, are provided for young scientists by the OSK and the Korean Physical Society (KPS). The National Research Foundation of Korea (NRF), also supports young researchers to attend international conferences and workshops through the BK21+ programs. Several students Chapters of SPIE and OSA have also been established.

Update on Africa

Whilst this report concentrates on the Asia-Pacific region, it is appropriate to include an update on developments in Africa, since this region has not been examined in detail by recent CREDO committees.

The promotion of optics and photonics in Africa has been greatly strengthened by the International Year of Light 2015. IYL events have been organized in 26 countries, and included conferences, workshops, exhibitions, outreach, and festivals. Information disseminating activities about light and light-based technologies have also been led in primary schools, high schools, universities, NGOs and cultural centers, and were mainly focused on four different aspects:

(i) Impact of photonics on African economy: the most widespread photonics technology in Africa is related to optical fiber networks and telecommunications. It should be noted that the telecommunications sector amounts to at least 5% of the wealth of the continent, and indirectly impacts up to 20% of its economy. In this continent with 1.1 billion inhabitants, more than 75% of adults own a mobile phone. Africa is the 2nd largest mobile phone market in the world, and also the fastest growing (projected 500 million smartphones in use by 2021). IYL was therefore a perfect initiative to help Africans understand that photonics already plays a major role in their daily life, and already has a significant impact in the economy of their country.

(ii) Solar energy: It is notable that African development is slowed by a chronic deficit in electric energy production. As an example, 70% of the population has no access to electricity in sub-Saharan African. Solar energy can contribute to solving this problem, with a production that is increasing by 60% per year (approximately 500 MW in 2016).

(iii) Healthcare: The opportunities provided by photonics have been widely discussed, for example for water purification, or for healthcare imaging systems (X-Ray, MRI, tomography, etc.). The International Year of Light also provided the perfect opportunity to address the issue of affordable eye glasses, which are needed by more than 100 million people in Africa.

(iv) The final and perhaps most important impact of the IYL was related to training opportunities for young professionals, which are strongly needed in order to exploit the full potential of photonics for science and technology applications in Africa. The support from the main international photonics societies (IEEE Photonics Society, OSA, and SPIE) has already enabled the creation of several student chapters in different universities across the continent, and they are strongly committed to supporting graduates in Africa in the forthcoming years.

As a full year event supported by UNESCO, the international Year of Light in Africa has been an ideal platform to connect with policy-makers and communication media, and to encourage them to include photonics in their planning and publicity. We have already noted in the last two years (2016 and 2017) that there is clearly a higher awareness in the public with regards to the benefits of photonics in science, technology and economy. Our objective for future years is to capitalize on this asset and most importantly, translate the benefit towards the creation of a photonics technology network in Africa.

Future CREDO interactions in the region

The newly promulgated International Day of Light (IDL) on May 16th, will provide an ideal platform for promoting Photonics and Optics initiatives in the future. The ICO is in a prime position to take a lead role in organizing IDL functions, and leveraging the UNESCO endorsed IDL symbol to promote sustainable development worldwide, as well as in the region.

In order to enhance the interactions, the ICO should make every effort to find the regional contact people and leaders throughout the world. We should identify, make connections, and maintain an open dialog with these regional key leaders and organizations. In addition, we should continue to provide appropriate support to improve communication between ICO and the regional leaders, and provide the information and resources on optics and photonics that they need for creating a better global society.

It is worth noting that the ‘Asian Science Dean’s Forum (ASDF)’ has been recently established, after several consecutive meetings of ‘Asian Science Dean’s Summit’ in Seoul, Korea (2015), Kuala Lumpur, Malaysia (2016), and Bali, Indonesia (2017). The first ASDF meeting is planned for Thailand, 2018, next year. The ICO could obtain information from ASDF on how to increase interactions with Asian countries.

In the case of economically under developed countries, the ICO could provide assistance along the lines of the initiatives already underway in Africa and other regions. The Asia-Pacific region has a large number of small island communities, who could benefit immeasurably from both educational resources, and photonic technologies such as those highlighted in the recent International Year of Light, and in the African report above, for bringing power and lighting to off grid communities.

Whilst funding for this latter idea remains a challenge, the experience of the ICO Bureau staff can be very valuable in suggesting ways to implement such assistance.

9. Reports of liaisons with Member Societies & ICTP

9a) International Societies (ICO Bureau members)

SPIE: Referred to its report available in the ICO24 Green Book.

RIAO: Referred to its report available in the ICO24 Green Book.

EOS: Referred to its report available in the ICO24 Green Book.

OSA: Referred to its report available in the ICO24 Green Book. Reaffirmed that the ICO provides great means for contacting with other societies.

OWLS: On 10-12th June 2014, the OWLS conference was held at the University of Nottingham, Ningbo, China Campus and was chaired by Profs Stephen Morgan, Mike Somekh and Paul O’Shea. This was the 13th OWLS conference, having previously been held in Germany, Japan, Greece, Australia, Canada, Switzerland, Taiwan, Singapore and Italy. This was the first time the conference was been held in China and brought 70 delegates from China, UK, Japan, Australia, USA, Germany, Russia, and Singapore to Ningbo. Sponsorship was generously provided by the ICO, IEEE Photonics Society,

The Institute of Physics (UK), the Ningbo Association for Science and Technology and numerous Optics companies.

ICO sponsorship was used to ICO grant was used to provide travel support for one student from Singapore and 4 from the local region and 3 poster prizes.

Plenary/invited speakers included Lihong Wang, Washington University (USA), Min Gu, Swinburne University (Australia), Tony Wilson, University of Oxford (UK), Xu Liu, Zhejiang University (China), Arthur Chiou, National Yang-Ming University (Taiwan), Steve Matcher, University of Sheffield (UK), David Sampson, The University of Western Australia, Ling Fu, Huazhong University of Science and Technology (China), Valery Tuchin, Saratov State University (Russia), Michelle Peckham, University of Leeds (UK), Nanguang Chen, National University of Singapore, Aaron Ho, The Chinese University of Hong Kong, Seung-Woo Lee, The University of Kitakyushu (Japan), Zhihong Zhang, Huazhong University of Science and Technology (China), Gert von Bally, University of Muenster (Germany).

On 16th - 19th March 2016, the OWLS conference was held at the Tata Institute of Fundamental Research, Mumbai, India and was Chaired by Profs Sudipta Maiti, Jyotishman Dasgupta, A. S. R. Koti and Ravindra Venkatramani. This was the first time that OWLS was held in India and there were 2 parallel sessions, 100 oral presentations and 2 poster sessions with speakers from India, UK, France, USA, Israel, Germany, Netherlands, Australia, Singapore, Japan. OWLS 2018 will be held in Perth, Western Australia, and will be hosted by David and Danka Sampson.

9b) TSOSA Advisory Group (Angela Guzman, ICO Representative and Chair of TSOSA)

Already presented as part of the ICO Secretary report.

10. ICO Prize and Awards Committees

10a) ICO Prize Committee (Roberta Ramponi, Chair)

The ICO Prize Committee for the term 1 October 2014 to 30 September 2017 has been chaired by Professor Roberta Ramponi, ICO Vice President, from the Department of Physics, Politecnico di Milano and the Institute of Photonics and Nanotechnologies of CNR, piazza Leonardo da Vinci 32, 20133 Milano, Italy. Other members of the Committee are six ICO Vice Presidents, two of which from the previous Committee, Yujie Ding, John Harvey, John Howell, Seug-Han Park, Eric Rosas, Maria J. Yzuel, and two non ICO Bureau members from the previous Committee Zohra Ben Lakhdar, and Zhou Bingkun.

2014 ICO Prize: Martin James Booth, UK.

The 2014 ICO Prize was awarded to Martin James Booth, University of Oxford, UK. Dr. Booth was awarded for his innovative and pioneering research on dynamic optical methods and new approaches to adaptive optics. Indeed, Dr. Both has made a series of outstanding contributions to the field of optics. He has been responsible for several significant developments in dynamic optical methods that have led to many advances in optical microscopy and other areas of photonics and also in interdisciplinary fields. His work has ranged from optical theory, particularly on the effects of aberrations in

high numerical aperture focussing systems, through pioneering experimental work, implementing adaptive optics in numerous microscopes, to industrial innovation and commercialization of technology. These advances have had notable impact in other areas: for example, adaptive aberration correction is opening new applications for microscopy, including the use of super-resolution methods in thick tissue; dynamic optical methods for laser machining are being applied. Prof. Booth will receive the prize at the ICO 24th Congress where he will give an invited presentation.

2015 ICO Prize: Aydogan Ozcan, USA.

The 2015 ICO Prize was awarded to Dr. Aydogan Ozcan, University of California at Los Angeles, USA for his seminal contributions to bio-photonics technologies impacting computational microscopy and digital holography for telemedicine and global health applications. Indeed, he is one of the most innovative researchers in bio-photonics and in particular, together with his group, he pioneered the area of lensless high-throughput cytometry and on-chip microscopy platforms. Another unique landmark result that Dr. Ozcan pioneered is wide-field lensfree on-chip imaging technique. This high-throughput imaging platform demonstrated more than an order of magnitude larger imaging volume compared to other microscopy tools. Furthermore, these computational imaging and microscopy techniques of Dr. Ozcan are also miniaturized to the volume of a regular “cell-phone” and thus show significant promise especially for medical point-of-care diagnostic applications relevant to global health problems in resource limited setting.

2016 ICO Prize: Andrea Alù, USA.

The 2016 ICO Prize was awarded to Andrea Alù, University of Texas at Austin, Department of Electrical and Computer Engineering. Dr. Alù was awarded for his groundbreaking work on metatronics for ultrafast electronics and the localization of optical radiation in structured materials. Indeed, he has made fundamental and groundbreaking discoveries in plasmonics and metamaterials that have significantly advanced the field. Among these, his studies on the design of optical circuit components and metatronics where the novel possibilities of optical conductors and insulators are exploited for ultrafast electronics. Another example of his groundbreaking discoveries is the collection of studies of basic and canonical geometrical shapes of plasmonic particles and the localization of optical radiation into particular regions of structured materials. Dr. Alù received the prize at the 23rd ICO meeting where he gave an invited presentation. The 2017 prize is under discussion.

10b) Galileo Galilei Medal Award Committee (María Yzuel, Chair)

Committee members (2015-2017):

Maria Yzuel (Chair, ICO VP)

Anna Consortini (Past ICO President)

Nataliya Kundikova (Former winner of the ICO Galileo Galilei Medal Award)

Fernando Mendoza (Former ICO bureau member)

Joseph Niemela (ICO VP)

Nominees:

Ravindra Sinha (2010, 2011, 2012) Self nomination in 2015 and 2016.

Eva Campo (2015) (Nominator James Grote).

Sarun Sumriddetchkajorn (2015) (Nominator Nabeel Riza).

Alexander Nosich (2016) (Nominator Joseph ZYSS, France).

Sameen Ahmed Khan (2017), (Nominator Azher Majid Siddiqui, India).

Evaluation: Alexander Nosich is unanimously voted in the first position.

Final decision: The Committee decided to propose to the ICO Bureau Alexander Nosich, from the Ukraine Academy of Sciences, as the recipient for the Award for 2017, *"for his contribution from fundamental mathematical physics studies to the modeling of actual devices for photonics and optoelectronics under comparatively difficult circumstances"*.

10c) ICO IUPAP Young Scientist Prize in Optics

The Price Committee chaired by Dr. Frank Höller (Germany) consists of Prof. Carmen Cisneros (Mexico), Prof. Cornelia Denz (Germany), Prof. Humberto Michinel (Spain), Prof. Joe Niemela (Italy), Dr. Moshe Oron (Israel), Prof. Seung Han Park (Korea), Prof. Paul Urbach (Netherlands), Prof. Mourad Zghal (Tunisia).

The committee recommends to award the IUPAP Young Scientist Price 2017 to Giulia Grancini from EPFL Lausanne *"for her deep knowledge on photophysical properties and ultrafast light-induced dynamical processes"*.

Motion 9: To approve the nomination of Alexander Nosich to the Galileo Galilei Medal Award 2017 *"for his contribution from fundamental mathematical physics studies to the modeling of actual devices for photonics and optoelectronics under comparatively difficult circumstances"*. Moved by M. Yzuel, seconded by F. Höller, approved unanimously.

Motion 10: To approve the nomination of Giulia Grancini to the ICO IUPAP Young Scientist Prize in Optics 2017 *"for her deep knowledge on photophysical properties and ultrafast light-induced dynamical processes"*. Moved by F. Höller, seconded by H. Michinel, approved unanimously.

11. ICO participation in meetings and schools

The full report on Meetings during the period 2014-2017 appeared in the ICO 24 Green Book. Recent applications need approval of the Bureau. The ICO usually holds Topical Meetings in the years in between ICO General Congresses. The ICO Bureau usually has its annual meeting at the ICO Topical Meeting. For 2017, none of the proposed meetings qualifies as Topical Meeting. Below is shown a table with recent meetings with ICO participation.

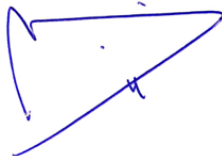
1 Oct 2016 - 30 Sept 2017 (Period 3)	date	requested by applicants	decision by ICO	ICO representative
RIAO-OPTILAS 2016 Pucon, Chile	21-25 November 2016	US\$ 5,000	US\$ 2,000	Eric Rosas
International Conference on Light and Light-based Technologies Tezpur, Assam, India	26-28 November 2016	US\$ 3,000	US\$ 1,500	
Wintercollege on Optics Trieste, Italy	13-24 Feb.2017		different budget	Angela Guzman
OASIS 6 Tel Aviv, Israel	27-28 Feb.2017	US\$ 5,000	US\$ 2,000	
International Conference on Optical and Photonic Engineering (icOPEN 2017) Singapore	4 -7 April 2017	US\$ 5,000	US\$ 1,500	Anan Asundi
International Conference on Applications of Optics and Photonics (AOP 2017) Faro, Portugal	8-12 May 2017	US\$ 2,500	US\$ 2,000	Angela Guzman
ETOP Hanzhou, China	29-31 May		different budget	Jim Harrington
24th Congress of the International Commission for Optics (ICO-24) Tokyo, Japan	21-25 August 2017		different budget	Angela Guzman
13th International Conference on Correlation Optics "Correlation Optics'17" Chernivtsi, Ukraine	11-15 September 2017	US\$ 2,000	US\$ 1,500	Serguey Odoulov

12. Other business (All)

No other business.

Meeting Adjourned at 18:00PM.

Minutes approved by the ICO Bureau, October 7th, 2018




Minutes of the 2017 joint meeting of the old and new Bureaus

Tokyo, Japan

Friday, August 25, 2017. 2:00 PM – 3:30 PM. Hotel Keio Plaza-

Participants: Y. Arakawa, H. Michinel, R. Ramponi, A. Wagué, A. Podoleanu, J. Harvey, K. Choquette, J. Czarske (as invited guest), M. Zghal, A. Guzmán, J. Niemela, G. von Bally, C. Londoño, M. Yzuel, N. Kundikova, L. Sirko, J. Harvey, F. Höller, S-H Park.

Apologies for absence have been received from D. Moore, Qihuang Gong, P. Urbach, E. Rosas, J. Howell, J. Harrington, S. Otero, J. Zakrzewski, S. Morgan, C. Cisneros.

1. Call to order, introduction (Y. Arakawa)

Y. Arakawa thanks the ICO Bureau members for their contribution to the ICO 24 conference and congratulates the new President and Vice Presidents. C. Londoño asks for introductions. All participants in the meeting introduce themselves.

Y. Arakawa hands over to Roberta Ramponi, elected President.

2. Operation of the ICO Bureau 2014-2017 (R. Ramponi)

The ICO Bureau will take the Strategic Plan and build on that. She wants to keep a balance between keeping memory of what has been done and going ahead. The past president will be involved in the Long-Range Planning Committee for the future. They will start by evaluating the key characteristic value of what has been done. One of the major problems is to follow up with members. She sees the need of strengthening the links, which should be a role of the ICO treasurer. She wants that the members feel very much involved in ICO activities. She is concerned that ICO has been losing members since they do not see a reason to pay the fee. ICO should find ways to be important for them. Another issue is that in some countries where a person that has been very active leaves, the contact is lost. The ICO needs to work with the scientists, which is easier in places where there are optical societies, but when there is a different kind of organization is trickier to keep contact.

R. Ramponi will go with H. Michinel about critical situations. Nowadays are many instruments for electronic connections to facilitate working together. They will set up instruments to get connected, so that the Bureau members will stay in contact and work more constantly. She will of course need to play with the time zones. The rule is that the Bureau meets once a year, but nothing prevents the Bureau from meeting more often by electronic means. The Committee chairs should work together. Past committee Chairs are expected to pass all information to new committee members. She asks those who are interested on working on a specific committee to propose themselves. This is especially true for the representatives of the societies, since they know what the societies are interested in.

The Nominating Committee is chaired Ex officio by the Past president. The traveling lecturer award committee will continue being chaired by the treasurer. The Long-Range Planning Committee will be chaired by ICO's President. All other Committee Chairs are to be defined. Either the ICO Secretary or the Associate Secretary should be ex-officio members of all the Committees. She then asks the ICO Bureau members to volunteer for the different committees.

J. Harvey volunteers to continue chairing CREDO. He might want to change some operational issues in the committee to make it more effective. Some members of the previous committee were reelected.

R. Ramponi states that the Chairs should feel free about deciding the number of members in their committee. It is also possible to Committee members that are not within the ICO Bureau, if the Committee Chair considers that they can be strong contributors to the committee. A. Wagué and M. Zghal volunteered to be members of CREDO.

R. Ramponi mentions that the Education Committee was very active when Chaired by Z. Ben Lakhdar. Since China is one of the countries strongly investing in education, she would like to ask Qihuang Hong (not present) to chair it. The new Chair of the ICO Prize Committee will be Seung-Han Park. She recommends to him to avoid superposition of candidates with the IUPAP Young Scientist Award in Optics, and to work on establishing a clear distinction between the two awards. She also recommends having a representative of the industry as a member.

H. Michinel volunteered to contact Sara Otero and ask her if she will be willing to be member of the ICO Prize Committee. R. Ramponi ask N. Kundikova to Chair the ICO Galileo Galilei Medal Award, remarking that she is a past recipient of the award. She also asks M. Zghal to continue chairing the ICO-ICTP Gallieno Denardo Award, and L. Sirko to chair the IUPAP Young Scientist Award Committee, since he is a member of the Marie Curie Network. She recommends him to award it to really young students.

Ad hoc committees: The ICO ad hoc committee on International affairs has been chaired by Gert von Bally. He will be willing to continue. He explained why the committee was established, and commented that currently the committee is discussing how to solve a problem with the name of the Taiwan Optical Society and China.

The ad hoc Committee for the IYL 2015 should continue to organize now activities related to the annual day of light. ICO wants to follow promoting activities and there is in the budget some money allocated for projects that could be used for the activities on the day of light. The IYL committee was chaired by Duncan Moore, and then R. Ramponi expects Y. Arakawa to be the next Chair. As a possible external member of the committee she proposed John Dudley. J. Niemela supported this idea.

R. Ramponi thanks A. Guzmán And J. Harrington for their service to ICO, and thanked Y. Arakawa for the conference and the warm hospitality offered to the ICO community. The Chair of the next ICO 25 conference will be invited to attend the ICO Bureau Meetings. ICO representation to the TSOSA Committee will be decided later.

3. ICO Participation in Meetings and Schools

G. von Bally reports. He comments on an application from Pakistan. He recalls that nonmembers are not co-sponsored by ICO, and he suggests to J. Niemela to discuss with the organizers of the event the possibility of Pakistan becoming an ICO member.

4. ICO Topical Meetings 2018 and 2019

G. von Bally mentions that there is nothing planned until the date. In 2019 there should be the next event of the series Correlation Optics in Ukraine, and the Optics and Photonics Meeting in Singapore.

5. Date and Place of the next ICO Bureau Meeting – proposals

Y. Arakawa states that the next meeting could be held at any ICO International Scientific conference. J. Niemela proposes to hold the Bureau Meeting at ICTP, probably during the ICTP Winter College. R. Ramponi asks if there is any anniversary to celebrate and proposes to hold a topical meeting in the Netherlands. She is aware that the Netherlands is currently not an ICO Territory, but the EOS might decide to hold their annual meeting at Delft. The topical Meeting on energy chaired by M. Calvo was held in partnership with EOS. J. Dudley has contacts in the Netherlands, H. Michinel will become EOS President, and P. Urbach is EOS representative. G. von Bally mentions that the ICO has worked on attracting the Netherlands for 15 years.

H. Michinel is going to talk with them. J. Czarke mentions that the EOS meeting will be held on 8-12 October in the Netherlands. Gert remarked that the topical meeting should be supported by an ICO local committee. J. Harvey mentions that he can provide a mapping of photonics resources near Eindhoven. J. Niemela asks if the groups from Eindhoven and Delft are different. G. von Bally explains that there are three different organizations in the Netherlands that have to agree. J. Harvey and F. Höller will initiate conversations with locals. Y. Arakawa is in favor of having a topical meeting in Delft and hold there the ICO Bureau. F. Höller mentions that in between there could be new applications for International conferences. M. Yzuel says it is better to look in advance.

6. The ICO application to become and ICSU Union

Y. Arakawa reports that following the directives of the ICO 23 General Assembly, in Santiago de Compostela, the ICO Bureau prepared the application to ICSU to become a Union. The Bureau also prepared an Strategic Plan 2017-2023 that has been approved by the General Assembly. The ICSU General Assembly will be held in Taipei in October 2017. He hopes that some ICO Bureau Members are going to Taipei, and he considers that the new ICO President should go to Taipei. R. Ramponi answers that she thinks that the persons who have been working in the application should go. G. von Bally answers that the deadline for registration is September 15. And there will be the need to nominate an ICO delegate. He considers very important that a good number of ICO Bureau members attend as well as some people that have some background on the application. The current EXECOM was involved in the whole application process. He recommends the new members of the ICO Bureau to get involved.

R. Ramponi answers that the issue is not in her Agenda, and for her to go to Taipei so soon is hard. Furthermore, she feels that she has no arguments to contribute to the issue. She would need to study. Y. Arakawa comments that ICO Past President, D. Moore is going.

7. Message of the outgoing ICO Secretary, A. Guzmán:

“I want to thank the members of ICO for making it possible for me to serve ICO these past nine years as Secretary, the highest position that a person from a developing country has held within ICO. And I wish the incoming Bureau success in taking ICO to the level of a Union within ICSU. Many of us, including former ICO Secretaries and the outgoing ICO President, are of the conviction that this is the right step to take, indeed a step critical to ICO’s future growth and ability to serve humanity effectively. The outgoing Bureau has been accused, of chasing dreams, of setting goals in its strategic plan that are not attainable without financial resources much greater than those currently available. I think it is far better to have lofty goals and look to continual improvement of the ICO than to resign to a lesser role for it on the world stage. I thank Prof. Arakawa for his strong commitment to the cause of becoming a Union and for his inspiring vision. He has provided the ICO with critically needed leadership in this regard. The road ahead will likely be demanding and require a strong commitment from all Bureau members.

I strongly urge ICO President Yasuhiko Arakawa, President-elect Roberta Ramponi, Humberto Michinel, Quihuang Gong, Gert von Bally, John Harvey, and Adrian Podoleanu to request ASAP that their ICSU national members, who supported the ICO application to become an ICSU Union, demand an explanation from the ICSU Secretary-General David Black for not having included our application in the Agenda of the upcoming ICSU General Assembly, which meets in October in Taipei. And I urge all Territorial members to ask for the support of their ICSU National members for our initiative and, in the case that they are not able to attend that meeting, to delegate their votes to the German representative to the ICSU General Assembly. I am confident that the Bureau will receive excellent support in its activities from my successor, Prof. Humberto Michinel. He will be the acting Secretary as of October 1st, 2017. In the month ahead, I will do my best to facilitate a smooth transition of the ICO Secretariat. It has been a privilege to work with you. Farewell my dear friends.”

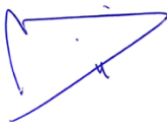
The ICO Secretary asked permission to leave the meeting since it is already 4pm. H. Michinel, Secretary Elect, continues as relator.

8. Other Business

No other business are presented.

Meeting Adjourned at 3:30PM

Minutes Approved, by the ICO Bureau, October 7th, 2018.




Humberto Michinel, ICO Secretary

Minutes of the 2018 ICO Bureau Meeting

Sunday, October 7th, 2018. 9:00 AM – 7:00 PM.

Westcord Hotel, Delft, The Netherlands

Participants: R. Ramponi, Y. Arakawa, H. Michinel, F. Höller, J. Niemela (online, partially), J. Harvey, Qihuang Gong, P. Urbach, E. Rosas, J. Howell, J. Czarske (as invited guest), M. Zghal (partially), G. von Bally, C. Londoño, N. Kundikova, L. Sirko, S-H Park.

Apologies from: A. Wagué, A. Podoleanu, K. Choquette, S. Otero, C. Cisneros.

1. Call to order, introduction (R. Ramponi, Chair)

R. Ramponi thanks the ICO Bureau members for their attendance to the meeting and a minute of silence in memoriam of James Harrington, former ICO treasurer who passed away last June. After the moment of silence, all participants in the meeting introduce themselves.

2. Approval of the agenda and minutes of the previous bureau

The secretary indicates minor changes in the agenda: the commemorative photo will be taken at 12:00 in front of the historic building of TU Delft university where the first ICO meeting was held in 1948. This moves the agenda 1 hour after 12:00. The changes are approved unanimously as well as the minutes of the previous ICO bureau meetings after voting a motion moved by Gert von Bally seconded by Frank Höller.

Motion 1. To approve the agenda with the changes proposed. Moved by **R. Ramponi**, seconded by **F. Höller**, approved unanimously.

Motion 2. To approve the minutes of the 2017 ICO Bureau Meetings celebrated in Tokyo. Moved by **G. von Bally**, seconded by **F. Höller**. Approved unanimously.

3. Report from the president

R. Ramponi presents the report of her activity since the last bureau, starting with her participation in the following events:

February 13th, 2018: Trieste, TSOSA meeting:

Since the TSOSA Committee was founded, ICO has the pleasure and honor to chair it. The annual meeting takes place during the Winter College and is followed by the ICO-ICTP Gallieno Denardo Award ceremony.

April 3rd-4th, 2018: Singapore, C&CC IUPAP meeting:

The participation to the C&CC IUPAP meeting was an excellent occasion to explain to several IUPAP colleagues the reasons for supporting our request to establish a Union.

Very fruitful discussion took place with the chair of C17, Tsuneyuki Ozaki, and we decided to propose a common workshop in 2019.

May 16th, 2018: Paris, International Day of Light:

Lunch meeting with Heide Hackmann, at that time ICSU CEO, now ISC CEO; meeting with SPIE new DG; meeting with representatives of CIE, the International Commission for Illumination.

July 3rd- 4th, 2018: Paris, ISC Foundation General Assembly:

The participation to the meeting was an excellent occasion to support our application to become a Union

November 1st-2nd, 2018: Vilnius, C&CC IUPAP meeting:

The decision on our application to become an independent Union should be known. The meeting will be useful to start negotiation with IUPAP on how to collaborate in the future, depending on the result of the application.

Events of interest for ICO: Mexican Photonics cluster kick-off, November 16th, 2018, Queretaro (Mexico)

After the president's report, M. Zghal comments that the next ICO topical meeting will be held in Tunisia, as approved previously by the bureau in an online vote. J. Howell asked about IUPAP support and M. Zghal answers that the meeting is co-organized with C17 IUPAP commission.

4. Secretariat's report

H. Michinel presents the report of the ICO secretariat, focused on the following activities developed since the last ICO bureau:

1. Coordination of logistics for ICO EXEC & Bureau.
2. Agendas & Minutes.
3. Advertising & Coordinating ICO Prizes and Awards.
4. Website management.
5. ICO Newsletter.
6. Events sponsorship.
7. Liaison with TCs & other societies.
8. Others.

After the report, M. Zghal comments on the new journal "African Physics Newsletter" and that he will be on the editorial board. H. Michinel responds that it can be announced in the ICO newsletter.

5. Treasurer's report (J. Niemela)

After the secretary report, there is a coffee-break and after it, an online conference is held with J. Niemela for presenting the treasurer's report. In summary:

CURRENT TOTAL COMBINED ASSETS: \$181,473.2 (+\$14,113.47 increase)

- Combined Balance Checking (August 31 2018): \$45,867.08
- Combined Balance Savings (August 31, 2018): \$135,606.12

(CONVERSION by October 1 2018 was: 1 EUR = 1.15145 USD)

Motion 3. To approve the treasurer's report. Moved by **R. Ramponi**, seconded by **E. Rosas**, approved unanimously.

Issue 10 of the agenda (new territory applications) is discussed at this moment, as there is an application from Pakistan, which is well-known by J. Niemela. After a short debate, the application is rejected, and J. Niemela will ask the applicant for a proper application letter, which will reflect that the applicants represent significantly the optical community in Pakistan.

H. Michinel asks on the possibility of using the travelling lecture (chaired by the treasurer) program to promote ICO in territories wishing to belong to ICO, as he has an invitation from Equatorial Guinea.

6. Report's from the ICO Committees (Committees' chairs)

The reports of the ICO committees are presented in order of reception of the documentation.

6.1. The report of the regional development in optics committee is presented by its chair, J. Harvey. The main idea is that in the region of Oceania there are a number of isolated communities (not just island communities) who can benefit immensely from improved access to power (PV based), and lighting (LED based) systems. The extent of this problem and the potential benefits could be quantified in the planned Photonics road mapping exercise, and if extended in this way, the survey would potentially be of interest (and could be sponsored by) other government agencies apart from those concerned with research and technological development.

J. Harvey proposes to explore this idea, since it could potentially be a pilot for surveys in other regions. I would suggest that if it was thought valuable, then this might be something that the ICO could sponsor, as it falls under the mandate of the CREDO committee quoted above (assisting engineers in Developing Nations). G. von Bally indicates that it would be good to coordinate this action with the committee of international affairs that he chairs. R. Ramponi says that all the committees should have concrete tasks to do, as it is the case of the ICO prizes committees. H. Michinel proposes an ICO prize for regional development.

J. Howard is asked to prepare a report before the end of the year on how this prize could be awarded. J. Howell comments that this action can be coordinated with student chapter of other organizations like OSA or SPIE.

6.2 The report of the education committee is presented by its chair: Q. Gong. He says that, in the beginning year, there still was some time left to develop relevant work comprehensively. Even through, a series of work concerning optics education in China territory were developed:

- 1) The 14th Conference on Education and Training in Optics and Photonics (ETOP'17) was hosted firstly in China. The conference attracted more than 280 scholars and educators from 28 counties and areas. As the only international conference focusing on education and training in optics and photonics, ETOP is a biennial conference, co-hosted by the ICO, SPIE, OSA and IEEE.
- 2) National Excellent Doctoral Dissertation Award activity was held, choosing 4 prize-winning dissertations and 6 excellent nominated dissertations.
- 3) The 14th University Students' Wang Daheng's Optical Prize Appraisal Activity was hosted, choosing 21 prize winners from 21 universities.
- 4) Carrying the theme of "The Light of Exploration", The 6th National University Students' Opt-Sci-Tech Competition was held in Beijing Institute of Technology. More than 1200 students attended.

6.3 The report on the ICO prize is presented by the chair of its committee, S-H. Park. The final results show that the 1st and the 2nd rank candidates for the ICO Prize 2018 are Mikael Rechtsman (4.68/5.0)^(SEP) and Nick Vamivakas (4.21/5.0). Na Liu was the 3rd rank candidate with the average score of 3.69/5.0, given by the 8 committee members.

There were comments without the scores from the 3 committee members that she received the IUPAP prize in 2016 and the nomination letter submitted to ICO is the same as for the IUPAP prize. After a brief discussion on the superposition of ICO and IUPAP prizes, F. Höller asks if it is possible to change the regulation of the ICO prize and says that the prize is not a question of money, but prestige. R. Ramponi tells that it is better to wait for the decision on ICO-IUPAP relationship that will be taken soon.

The members of the bureau are encouraged to help the chairs of the committees to look for good candidates for the prizes. The following motion is thus presented:

Motion 4. To recommend Mikael Rechtsman as a recipient of the ICO Prize 2018 in this coming Oct. 7, 2018. Moved by G. von Bally, seconded by F. Höller, approved unanimously.

6.4 Report on the ICO-IUPAP Young Scientist Prize in Optics 2018: in the absence of its chair, the report is presented by the ICO secretary. After the committee's discussion the following motion is presented:

Motion 5. To recommend Dr. Can Bayram as a recipient of the ICO-IUPAP Young Scientist Prize in Optics 2018 for revolutionizing the way graphene has been employed in photonics and major contributions to III-V photonic devices. Moved by Q. Gong and seconded by R. Ramponi, approved unanimously.

6.5. The ICO-ICTP Gallieno Denardo award decision is presented by M. Zghal, the committee chair. The ICO/ICTP Gallieno Denardo Award 2018 has been given to Dr Urbasi Sinha, Raman Research Institute, Bangalore, India, for her pioneering research in photonic quantum technologies, contributions to cutting-edge experimental research in quantum optics, and extensive and multifaceted outreach activities towards popularizing experimental optical science in India. The application is open for 2019. F. Höller comments on the possibility of have a larger representation of developing countries in the prize committee.

6.6. The report on the Galileo Galilei Medal is presented by the chair of the committee, N. Kundikova: The Committee decided to propose Dr. Debabrata Goswami from Indian Institute of Technology, India, as the recipient for the Award for 2018 “for extensive contributions to the frontiers of interdisciplinary research that involved both theoretical and experimental developments in the fundamental aspects of femtosecond laser-matter interactions under comparatively difficult circumstances”. The president of the committee is encouraged to coordinate with other committees and the TCs to increase the number of applications for the prize. After the committee’s discussion the following motion is presented:

Motion 6. To recommend Dr. Debabrata Goswami from Indian Institute of Technology, India, as the recipient for the Galileo Galilei Medal 2018 “for extensive contributions to the frontiers of interdisciplinary research that involved both theoretical and experimental developments in the fundamental aspects of femtosecond laser-matter interactions under comparatively difficult circumstances. Moved by S-H. Park and seconded by J. Harvey, approved unanimously.

6.7. The report of the ad-hoc committee for international affairs is presented by G. von Bally. He says that in order to use the potential of the global activities, contacts and experience of ICO International Society Members and to act in a coordinated and structured manner, actually the ad hoc Committee evaluates the possibility for an emergency information line and network of (permanent or at least longer lasting) specific contact points for information exchange among International Society Members. In addition, the Committee intends to establish close contacts to ISC as soon as the corresponding ISC committees and its chairs and members are appointed, especially since the Committee was already asked to inform ISC on the status and development of “best practice procedures” of ICO for such cases. Furthermore, the Committee received advices and proposals from the German Representative of UNESCO, experienced in such matters. At the ICO General Assembly 2017 in Tokyo the Committee was asked to look into the problem of a new name of Taiwan as ICO Member Territory.

The Committee decided first to contact for advice and coordination the new ISC Board. Actually, answers are envisaged after establishing the corresponding ISC committees and their chairs and members. E. Rosas asks about the possibility of dropping “ad-hoc” from the name of the committee in order to make it permanent and G. Bally agrees. E. Rosas asks if it would be possible to include other situations in the committee like discrimination or harassment. C. Londoño says that in US new policies on harassment in the scientific context are being studied at the moment.

After the presentation of all the committees R. Ramponi asks If ICO should keep the committee for the international year of light 2015. Y. Arakawa (current chair) asks that the committee should be kept in connection with the International day of light (IDL) that will be celebrated each year. R. Ramponi asks if ICO should be part of the steering committee of the IDL. F. Höller says that there are too many “international days” but R. Ramponi replies that if there is a IDL, the ICO must be involved. The following motion is presented:

Motion 5. ICO be part of the steering committee of the International Day of Light. Moved by **E. Rosas** and seconded by **Q. Gong**, approved with the only abstention of **F. Höller**.

After the presentation of all the committees, there is a break for going to the historic building where the first ICO meeting was held in Delft in 1948 and lunch. After lunch. M. Zghal excuses his attendance for the rest of the meeting. Then, the affiliated societies OWLS, RIAO, SPIE and OSA present reports about their activities, after the OWLS report, J. Czarske is invited to present the progress on the preparation of next ICO general meeting that will be in Dresden, Germany the first week of September, 2020. Due to the time remaining, it is approved to discuss now the last two items of the agenda: ICO participation in events and date and place of the next ICO bureau.

The ICO Associate Secretary, F. Höller, presents the table below with the previously online-voting approved ICO sponsored events. He explains that the meeting in India was rejected because of the deadline and some defects on the application. The meeting in Spain was finally withdrawn by the organizers, as they considered it non-international. The funding given is shown in the table below:

Event	Location	Requested	Approved	Budget 2018	Budget 2019	Budget 2020	Status
11th International Conference on Optics-photonics Design & Fabrication	Hiroshima	0	0	0	0	0	approved
OWLS 2018	Perth	3000	2000	2000	0	0	approved
EOSAM 2018	Delft	1175	1175	1175	0	0	approved
ISPHOA 2018	Surabaya	2500	1500	1500	0	0	approved
OPTISUD 2019	Carthage	5000	3500	0	3500	0	approved
BIOAM 2018	Palaiseau	2300	1000	1000	0	0	approved
Correlation Optics 2019	Chernivtsy	2000	1500	0	1500	0	approved
RNO 2018	Castellon	1848	0	0	0	0	withdrawn
AOP	Lisbon	2500	1250	0	1250	0	approved
Photonics 2018	Dehli	3000	0	0	0	0	rejected
ICO GA	Dresden	0	0	0	0	0	in preparation
				5675	6250	0	11925

After that, it is voted if the next ICO bureau will take place in coordination with the ICO topical meeting that will be celebrated in Tunis, the first week of September, 2019.

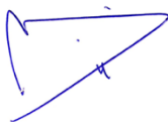
Motion 8. To celebrate the next ICO bureau in Carthage, in coordination with OPTISUD, the first week of September 2019. Moved by **R. Ramponi** and seconded by **F. Höller**, approved unanimously.

The final issue to be discussed is the situation after the application of ICO to ISC to become a scientific union. R. Ramponi tells the bureau that this issue will be discussed in the next ISC bureau meeting in Paris, next Wednesday 10th October. It will be an online discussion of this issue after she knows the final decision.

A debate is opened about the possible overlapping with other unions or organizations. More concretely, CIE (Comité Internationale de L'Eclariage) which is devoted to lighting. R. Ramponi says that she has explained the representatives of CIE that ICO will not interfere destructively with their activities, as ICO has a complementary view of the field of lighting.

7. Other issues (all)

No other issues were raised and the meeting adjourned at 18:40.



Minutes approved by the ICO Bureau on Tuesday 3rd September 2019.

Humberto Michinel, ICO Secretary General

Minutes of the 2019 ICO Bureau Meeting

**Tuesday, September 3rd, 2019. 9:00 AM – 7:00 PM (Tunisian Time).
Ramada Hotel, Carthage, Tunisia.**

Participants: R. Ramponi (Chair), Y. Arakawa, H. Michinel, F. Höller, A. Podoleanu, A. Wagué, J. Harvey, E. Rosas, J. Howell, M. Zghal, G. von Bally, C. Londoño, N. Kundikova, L. Sirko, S-H Park, J. Niemela (online, partially), J. Czarske (as ICO-25 chairman), A. Assundi (online, partially, as candidate for ICO-26 chairman), G. Pauliat (online, partially, as candidate for ICO-26 chairman).

Apologies from: S-H Park. It is authorized that the ICO treasurer J. Niemela attend online, partially due to a health problem.

1. Call to order, introduction (R. Ramponi, Chair)

R. Ramponi thanks the ICO Bureau members for their attendance to the meeting all participants in the meeting introduce themselves. An apology from S-H for not attending the meeting is presented by the Secretary. It is authorized that A. Assundi attends online, partially, as candidate for ICO-26 chairman as well as G. Pauliat as candidate for ICO-26 co-chairman.

2. Adoption of the agenda and minutes of the previous Bureau (Chair)

The agenda is presented with the only issue that, due to different time zones, an online video-conference will be held at 9:15AM with A. Assundi in Singapore, who is candidate for chairing ICO-25 in Singapore. The president will present the Strategic Plan status within her report. The following motions are moved:

Motion 1. To approve the proposed changes in the agenda. Moved by **C. Londoño**, seconded by **E. Rosas**, approved unanimously.

Motion 2. To approve the minutes of the previous bureau celebrated in Delft on October 7th, 2018. Moved by F. Höller, seconded by R. Ramponi, approved unanimously.

Therefore, A. Assundi starts at 9:15 his presentation of Singapore's candidacy to organize ICO-26. The bureau members already have the documents and can ask questions. A. Wagué asks about funding available for developing countries' attendants. A. Assundi says that there will be grants available. J. Harvey offers the cooperation of the Australian National Society. After the presentation, the meeting follows at 9:30

3. ICO President's report (Y. Arakawa, ICO President)

R. Ramponi presents the report of her activity since the last bureau, as well as the strategic plan committee report that she chairs. She starts with her participation in some events:

2018 Winter College was on “Applications of Optics and Photonics in Food Science”. The aim of the Winter College is to offer Ph.D. students and other emerging researchers broad training in the innovative applications of optics and photonics in food and agriculture. Deriving impact through research, development and entrepreneurship in this sector will be explored.

2018 International Day of Light official UNESCO event was celebrated at ICTP in Trieste. ICO was involved in the opening session for a welcome given by Roberta Ramponi as ICO President.

2019 Winter College will be on “Quantum Optics”. Directors and details to be confirmed.

With respect to the strategic plan, R. Ramponi says that the activity of the committee has been mainly devoted to contacts with the governance of ISC (in particular Heide Hackmann, Daya Reddy, and Charles Erkelens) and with that of IUPAP (in particular Kennedy Reed, Michel Spiro, and Bruce McKellar) to move forward on our process to become a Union, and thus a full Member of ISC (with voting rights).

ISC is not favorable to create a somehow new status (associate Unions) as it had been proposed by IUPAP at the meeting in Vilnius so as to regulate our relationship with IUPAP. They seem to be favorable to ICO’s request, however they will not make any step without the agreement of IUPAP. ICO proposed to IUPAP to write a memorandum of understanding (MoU) to fix the basic principles of our future cooperation. In summary, we will cooperate on actions related to the physical aspects of optics and photonics (e.g. event organization, outreach activities, actions to promote gender balance, etc.) and we are open to maintain the present IUPAP prize in Optics. ICO sent a first draft of a MoU and are waiting for feedback. We will take the chance of the joint meeting with IUPAP C17 in Carthage to seek their support. Hopefully, some progress could be achieved during the C&CC IUPAP meeting in London next October 2nd-3rd.

In parallel, discussion on the future configuration of ICO as Union should be started internally. Preliminary contacts were established with the International Commission on Illumination (CIE) and we were invited to their annual symposium. Carmina Londoño represented us at the round table. We should probably define a list of main topics so as to create the basis for future commissions that will constitute the structure of our Union. They can address both general scientific and technical topics (e.g. Physics, Engineering, Material Science) and application oriented topics (e.g. Life science, Cultural Heritage, Lighting, Environment, Industrial production).

After the presidents report, H. Michinel notes that other issues related with the ICO President’s activity will be described in the reports from the ICO secretary, ICO associated secretary and ICO treasurer. Separate documents contain information about the president activities regarding specific issues like ICO-IUPAP MOU. J. Howell asks if a telecom board meeting will be held during the year and R. Ramponi asks that probably just after TSOSA meeting in Trieste. A. Podoleanu asks if it will be an implication of companies in the future Union. R. Ramponi says that this is highly desirable. It follows a coffee-break from 10:15 till 10:30.

4. Secretariat's report

H. Michinel presents the report of the ICO secretariat, focused on the following activities developed since the last ICO bureau:

1. Coordination of logistics for ICO EXEC & Bureau.
2. Agendas & Minutes.
3. Advertising & Coordinating ICO Prizes and Awards.
4. Website management.
5. ICO Newsletter.
6. Events sponsorship.
7. Liaison with TCs & other societies.
8. Others.

H. Michinel acknowledges the help from the associate secretary, Dr. Frank Höller. After the secretary's report, E. Rosas asks about the possibility of preparing a repository with ICO online material. H. Michinel says that it will be accessible online at ICO's website. G. v Bally comments on the possibility of increasing the number of African members through collaboration ICTP. J. Harvey points to look for more members in South America and Philippines.

5. Treasurer's report (J. Niemela)

After the secretary report, J Niemela presents online at 11:00 the treasurer's report. In summary:

Period Covered: September 1, 2018 to July 31, 2019.

Current total combined assets: **\$201,330.53** (+\$19, 857.33 increase from 31/08/2018).

Conversion (August 27, 2019): 1 EUR = 1.11 USD.

The details of the report are in the documents delivered to the bureau. J. Niemela also comments that only two lecture grants have been awarded in the last year: to Zeev Zalesky and Federico Rosell. He encourages to apply to this program. After his presentation, R. Ramponi comments that Pakistan's territorial committee has already paid a fee although their ICO's membership has not been approved by the General Assembly (GA), as mandatory. It is suggested that we a delegation from Pakistan will be invited to ICO-26 in Dresden and that the first point of the agenda in the next GA will be the incorporation of new territories, so their representatives can attend the rest of the GA as full members. H. Michinel says that he will prepare the agenda of the next GA in this way. M. Zghal thanks J. Niemela and P. Chavel for their help with the organization of OPTISUD.

A. Podoleanu asks about the general economic health of ICO and J. Niemela considers it pretty good. He says that ICO can increase the travelling lecture program grants to make them more attractive. The following motions are moved:

Motion 3. To approve the treasurer's report. Moved by **Roberta Ramponi**, seconded by **F. Höller**, approved unanimously.

Motion 4. To increase the amount of ICO travelling lecture grants to 1.500USD. Moved by **M. Zghal**, seconded by **C. Londoño**, approved unanimously.

6. Reports from the ICO Committees

The reports of the ICO committees are presented at 11:30 in the following order:

6.1. Report of the ICO Nominations committee by its chair Y. Arakawa.

Prof. Arakawa informs that next year the ICO Bureau will be reconstituted through elections by territorial member participation. As Past President of ICO, he assumes the chairmanship of the Nominating Committee to oversee the nomination process and the election at the ICO-25, Triennial Congress of the International Commission for Optics in Dresden, Germany, 31st August to 4th September 2020. Candidates are now sought for the offices of president, secretary, associate secretary, treasurer, and eight elected vice-presidents, of which two must, according to the bylaws, represent industry. There are in addition several vice-presidents appointed by large optics-related societies and professional organizations that are associate members of the ICO Bureau.

A letter has been sent requesting nominations has already been sent to the Territorial Committees with election procedures. A list of candidates must be in place by February 28, 2020, at which time all members will receive information as to the nominated candidates so that they can identify those that they wish to support for any specific office. It should be remembered that nominations for all positions/officers close only twenty-four (24) hours before the second business meeting of the International Commission for Optics General Assembly in Dresden

6.2. Report of the Committee for Regional Development of Optics (CREDO) by its chair J. Harvey

Prof. Harvey quotes the mandate of the committee: *“The purpose of the Committee for the Regional Development of Optics is to find and implement actions whereby ICO can promote the transfer of optical knowledge and provide practical help to optical scientists and engineers in Developing Nations and in general, geographical areas where optics is not well developed”*.

The current committee is particularly concerned with the Asia-Pacific region defined as including the Asian countries on the western Pacific Rim, Australia and Aotearoa New Zealand, and other Asian countries as far west as the Indian subcontinent. This grouping also reflects the contributing regions for the CLEO/PACRIM conference run by the Optical Society of America.

As discussed at the previous meeting in Delft, the interactions in the region are strongly conditioned by the conferences run by the national and internationally focused Optical Societies, such as SPIE, OSA and IEEE. These larger organizations both collaborate and compete in the running of international conferences around the world. The International Day of Light (IDL) on May 16th, provides an ideal platform for promoting Photonics and Optics initiatives in the future. The ICO is in a prime position to take a lead role in organizing IDL functions. In the case of economically under developed countries, the ICO could provide assistance along the lines of the initiatives already underway in Africa and other regions. The Asia-Pacific region has a large number of small island communities, who could benefit immeasurably from both educational resources, and photonic technologies.

6.3 The report of the ICO prize in absence of its chair is presented by the Secretary.

All of the ICO Prize Committee Members have made the votes, ranging from 5 (excellent) down to 1 (poor) with the decimal digits for the candidates. The final results shows that the 1st, the 2nd, and the 3rd rank candidates for the ICO Prize 2019 are:

- Manuel Guizar-Sicairos (4.67/5.0)
- Wojciech Wasilewski (4.25/5.0)
- Pasquale Memmolo (3.42/5.0)

After hearing the results of the report, the following motion is thus presented:

Motion 5. To recommend Manuel Guizar-Sicairos as a recipient of the ICO Prize 2019 “*due to his seminal contributions to method and algorithm development, and application of coherent lensless imaging, ptychography, x-ray nanotomography, and scanning small-angle x-ray scattering*”. Moved by **C. Londoño**, seconded by **E. Rosas**, approved unanimously.

It is also mentioned that there was a superposition between recent or present nominations for the ICO & IUPAP prizes in related topics and the double award is not desirable because there is a strong correlation between ICO and IUPAP.

6.4 Report on the ICO-IUPAP Young Scientist Prize in Optics 2019 presented by its chair, A. Podoleanu. After hearing the results of the committee, the following motion is presented:

Motion 6. To recommend Dr. Chao-Yang Lu as a recipient of the ICO-IUPAP Young Scientist Prize in Optics 2019 “*for significant contributions to optical quantum sciences*”. Moved by **R. Ramponi** and seconded by **J. Harvey**, approved unanimously.

6.5 The ICO-ICTP Gallieno Denardo award 2019 decision is presented by M. Zghal, the committee chair. The ICO/ICTP Gallieno Denardo Award 2019 was already delivered during the winter school in Trieste in February 2019 to Muhammad Faryad of Lahore University of Management Sciences (LUMS) in Pakistan, and Christian Tomas Schmiegelow of the Universidad de Buenos Aires in Argentina.

The award for Faryad cites *“his contributions to the understanding of light interaction with nanostructured materials, and applications in the area of optical surface waves, solar cells, optical metamaterials and the modelling of wave propagation in the nanostructured mediums.”*

Schmiegelow received the ICO/ICTP Prize for *“his contributions to the field of quantum optics and light-matter interaction, and in particular the demonstration of transfer of optical orbital momentum to bound electrons and studies on interaction of twisted light with trapped ions.”*

The application is open for 2020.

6.6. The report on the Galileo Galilei Medal is presented by the chair of the committee, N. Kundikova and the following motion is presented:

Motion 7. To recommend Prof. Malik Maaza, as the recipient for the Galileo Galilei Medal 2018 “for extensive contributions to the frontiers of interdisciplinary research that involved both theoretical and experimental developments in the fundamental aspects of femtosecond laser-matter interactions under comparatively difficult circumstances. Moved by **S-H. Park** and seconded by **J. Harvey**, approved unanimously.

6.7 The report of the committee for the international day of light (IDL) is presented by its chair, Y. Arakawa. The secretary informs that the ICO execom recommends to close this committee, being the secretary the new contact person with the IDL steering committee. The following motion is moved:

Motion 8. To close the IDL committee and to designate the ICO Secretary as contact person with the IDL steering committee. Moved by **Y. Arakawa** and seconded by **R. Ramponi**, approved unanimously.

6.8. The report of the ad-hoc committee for international affairs is presented by its chair, G. von Bally. The following motion is presented:

Motion 9. The chair of the International advisory committee will be permanent advisor on this issues of the ICO executive committee. Moved by **H. Michinel** and seconded by **F. Höller**. Approved unanimously.

After the presentation of all the committees, there is a lunch break. At 16:00 G. von Bally presents the report of OWLS which is followed by the presentation of the celebration of its 30th anniversary. This anniversary coincides with the celebration in Dresden of the 25th ICO general congress. Therefore, the presentation of OWLS activities is followed by a presentation by J. Czarke about the preparation of ICO-25 in Dresden. After the presentation of ICO-25, the following reports of the activities of international societies are presented: SPIE, OSA, RIAO and EOS. IEEE and IUPAP did not send any report. LAN will report will be presented later by A. Wagué when introducing the application of Senegal TC for organizing ICO-26.

At 17:00 R. Ramponi presents the MoU sent to IUPAP in order to start an International Union of Optics and Photonics. After that, the associated secretary F. Höller presents a repost with respect to the issue of ICO supporting military meetings. The following motion is moved:

Motion 10: To bring the following text to the ICO GA: *“Being the global scientific umbrella organization for Optics and Photonics for good reasons ICO has always avoided to create the image of support of or close relations to military institutions. Therefore meetings and conferences will usually not be supported by ICO if the meeting or conference is organized in close cooperation with or significantly funded by military institutions or the scientific content of the meeting or conference covers a significant amount of topics with military background”*. Moved by **H. Michinel** and seconded by **F. Höller**. Approved unanimously.

At 17:45 R. Ramponi asks C. Londoño about SPIE policies on female harassment on meetings. C. Londoño says that SPIE will be happy to collaborate with ICO to establish a common framework to deal with this issue. J. Howell comments that OSA is aligned in this direction too.

18:00 A. Wagué presents the application of Senegal’s territorial committee to organize ICO-26 in Dakar. G. Pauliat from SFO connects from Paris to explain the collaboration of SFO in this initiative. M. Zghal asks about how the coordination between SFO and the local committee in Senegal will work. G. Pauliat explains that SFO will prepare the budget and will assume the potential economic risk. The following motion is moved:

Motion 11: To recommend to the GA Senegal’s candidacy to organize ICO-26 in Dakar. Moved by **M. Zghal** and seconded by **R. Ramponi**, approved unanimously.

18:30 Two new members applications are presented by the secretary: the territorial committees of Pakistan and Equatorial Guinea. The following motion is moved:

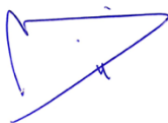
Motion 12: To recommend the GA the incorporation to ICO of the territorial committees of Pakistan and Equatorial Guinea. Moved by **R. Ramponi** and seconded by **A. Wagué**, approved unanimously.

18:45 Breakthrough prize proposal by L. Sirko is suggested to be converted into fellowships.

7. Other issues (all)

The next ICO bureau online meeting will take place just after TSOSA in Trieste.

No other issues were raised and the meeting adjourned at 19:00.



*Minutes approved by the ICO Bureau on Wednesday 18th March 2020.
Humberto Michinel, ICO Secretary General*

Minutes of the 1st and 2nd part of the extraordinary 2020 ICO Bureau Meeting

**1st Part: Wednesday, March 18th, 2020. 13:00 – 14:00 (CET).
Online meeting using zoom.us platform.**

Participants: R. Ramponi (Chair), Y. Arakawa, H. Michinel, F. Höller, A. Podoleanu, A. Wagué, J. Harvey, E. Rosas, J. Howell, G. von Bally, C. Londoño, N. Kundikova, S-H Park, J. Niemela, Q. Gong, J. Czarske (as ICO-25 chairman).

Apologies from: P. Urbach, S. Otero and C. Cisneros.

1. Call to order, introduction (R. Ramponi, Chair)

R. Ramponi thanks the ICO Bureau members for their attendance to the meeting all participants in this new online format as agreed in the last bureau meeting in Tunisia, September 3rd 2019.

2. Approval of the agenda and minutes of the previous bureau (Chair).

The agenda is presented with the issue that, due to different time zones, the time will be limited to one hour. Due to the situation of the coronavirus crisis and the time limitation, the president asks to focus the discussion on the impact of the pandemics on the ICO-25 and OWLS congresses and discuss other issues only briefly.

Motion 1: To approve the proposed changes in the agenda. Moved by **F. Höller**, seconded by **G. von Bally**, approved unanimously.

Motion 2: To approve the minutes of the previous bureau celebrated in Tunisia in 2019. Moved by **R. Ramponi**, seconded by **F. Höller**, approved unanimously.

3. Report from the president (R. Ramponi, Chair)

R. Ramponi presents the report from the president, starting with the last Winter College was on “Quantum Photonics and information”. She points that other members of the ICO bureau (H. Michinel and J. Niemela) attended the meeting. They discussed there on the situation of the application of ICO to become an international union within ISC. R. Ramponi says that contacts are kept with IUPAP (in particular Kennedy Reed, Michel Spiro, and Bruce McKellar) and ISC (Heide Hackmann, Daya Reddy, and Charles Erkelens) to move forward on the process to become a Union, and thus a full Member of ISC with voting rights.

After this brief introduction, R. Ramponi talks on her concerns about the coronavirus crisis. Specially in Italy the situation is quite serious and confinement has been also in other European countries like Spain. She asks to devote this session to analyze the consequences of the pandemics on the celebration of ICO25 and OWLS congresses in Dresden, Germany. Due to the time limitation, it is unanimously approved that the discussion focuses on this topic.

4. Secretariat's report (H. Michinel)

After the president's report, the secretary informs the bureau that it is available a copy of his report with information on:

1. Coordination of logistics for ICO EXEC & Bureau.
2. Agendas & Minutes.
3. Advertising & Coordinating ICO Prizes and Awards.
4. Website management.
5. ICO Newsletter.
6. Events sponsorship.
7. Liaison with TCs & other societies.
8. Others.

H. Michinel acknowledges the help from the associate secretary, Dr. Frank Höller.

5. Treasurer's report (J. Niemela)

After the secretary report, the treasurer informs that there are no important economic issues after his last report presented in Tunisia last September and that his annual report will be presented during ICO-25.

6. Discussion on the situation of ICO-25 due to the coronavirus crisis

Due to the situation in some European countries, it is clear that there is a risk of suspending scientific meetings all over the world. H. Michinel says that the European Optical Society is facing the same problem with their annual meeting to be celebrated in Porto the week before ICO-25. No decision has been made yet. J. Czarske informs that there will be costs associated with the potential postponement of ICO-25, mainly due to hotel reservations and the work of the agency selected. This costs cannot be avoided unless laws in Germany forbidden the celebration of scientific meetings.

A discussion is started on the pros and cons of keeping the dates or postponing the congress with several interventions. In the end, it becomes clear that, due to the importance of the decision and the lack of information about the evolution of the situation, the meeting will be postponed some time and thus, the meeting will have a second part to take a final decision. This part of the meeting ends at 14:00 CET.

2nd Part: Friday, May 15th, 2020. 13:00 – 14:00 (CET).

Online meeting using zoo.us platform.

Participants: R. Ramponi (Chair), Y. Arakawa, H. Michinel, F. Höller, A. Podoleanu, A. Wagué, , E. Rosas, J. Howell, G. von Bally, C. Londoño, N. Kundikova, S-H Park, J. Niemela, Q. Gong, J. Czarske (as ICO-25 chairman).

The second part of the meeting starts 15th May 13:00h CEST with the aim on making a decision in one hour on the celebration of ICO-25 and OWLS congresses, due to the coronavirus crisis. J. Harvey excuses his attendance to this second part.

R. Ramponi, starts by saying that now it is quite clear that the pandemics is now retiring from Europe but hitting the Americas. Due to the worldwide configuration of ICO it is evident that the congress cannot be celebrated in a face-to-face format next September and therefore there are two options, make the congress online or postpone it.

H. Michinel says that the European Optical Society (EOS) where he is the current president, will keep the same dates for their annual meeting, but it will be celebrated online. R. Ramponi says that an online ICO congress will have many problems, for instance with the celebration of the General Assembly. After a brief discussion, a consensus was reached that the meeting cannot take place online and thus, the only option is to postpone it.

J. Czarske says that it is not clear the law that Germany will apply for the celebration of scientific meetings in Dresden. At the moment, meetings until August are forbidden, but the ICO meeting has a part in September. Moreover, the work of the agency for one more year has also to be paid. G. von Bally says that the situation also is affecting OWLS congress and a brief discussion on the economic consequences follows with several interventions. In the end, is not clear the amount of the penalty that may be imposed for the postponement. F. Höller says that ICO money that has not been spent in sponsoring cancelled meeting can be used to help cover some extra expenses related with the postponement of the ICO-25 and OWLS congresses.

Due to the time consumed in the discussion and that in some parts of the world is very late, R. Ramponi asks to make a decision. A text must be approved including also the situation of the General Assembly and the election of the bureau members. After a brief discussion, the following motion is presented:

Motion 3: The congress ICO-25 will be postponed one year and celebrated 13th-17th September 2021 in Dresden (Germany) together with the next ICO General Assembly, that will be postponed the same period of one year. The ICO Bureau and Execom will therefore remain in charge for one more year. Due to the exceptional circumstances that we are facing, the financial support that is normally given to the annual topical meeting will be added to the support already fixed for ICO-25, since there will be no other ICO topical meeting in 2021.

The ICO Secretary will send a copy of the motion to all the ICO territories. No more issues are raised and the meeting adjourned at 14:00PM May, 15th 2020.

Minutes approved by the ICO Bureau on Thursday 10th September 2020.



Humberto Michinel, ICO Secretary General

Minutes of the ordinary 2020 ICO Bureau Meeting

Thursday, September 10th, 2020. 13:00 – 15:00 (CET).

Online meeting using zoom.us platform.

Participants: R. Ramponi (Chair), Y. Arakawa, H. Michinel, A. Podoleanu, J. Howell, E. Rosas, G. von Bally, C. Londoño, N. Kundikova, S-H Park, S. Otero, K. Choquette, J. Czarske (as ICO-25 chairman).

Apologies from: Joe Niemela (video and presentation with his report was sent in advance), Frank Höller, Ahmadou Wagué.

1. Call to order, introduction (R. Ramponi, Chair)

R. Ramponi thanks the ICO Bureau members for their attendance to the meeting all participants and the Secretary informs that a new online voting system provided by zoom.us will be used. The meeting starts at 13:05PM.

2. Approval of the agenda and minutes of the previous bureau (Chair).

The secretary informs that, as agreed by the ICO Executive Committee, all the reports have been sent a week in advance to the bureau members. Due to the timezone limitations, only questions previously sent to the secretariat by email will be discussed.

The agenda is presented with the issue that items 8 (ISC Union application status) and 9 (Situation of ICO-25) are interchanged as J. Czarske has another meeting at 14:15. The change is approved as well as the minutes of the last bureau meeting, after moving the following motions.

Motion 1: To approve the proposed changes in the agenda. Moved by **E. Rosas**, seconded by **R. Ramponi**, approved with 12 votes in favor and 1 abstention.

Motion 2: To approve the minutes of the previous bureau celebrated online, starting March 18th at 13:00h (CEST). Moved by **C. Londoño**, seconded by **E. Rosas**, approved with 11 votes in favor and 2 abstentions.

3. Report from the president (R. Ramponi)

No questions have been sent to the ICO Secretariat and therefore the ICO President's report is not discussed. It is added to the minutes as appendix I.

4. Report from the Secretary (H. Michinel)

The secretary informs the bureau that it is available a copy of his report with information on:

1. Coordination of logistics for ICO EXEC & Bureau.
2. Agendas & Minutes.

3. Advertising & Coordinating ICO Prizes and Awards.

4. Website management.

5. ICO Newsletter.

6. Events sponsorship.

7. Liaison with TCs & other societies.

8. Others.

H. Michinel acknowledges the help from the associate secretary, Dr. Frank Höller.

5. Report from the treasurer (R. Ramponi, Chair)

After showing the video on the ICO Treasurer's report, indicating that the current total combined assets are \$200,768.45 the following motion is approved:

Motion 3: To approve the ICO Treasurer's report. Moved by **R. Ramponi**, seconded by **G. von Bally**, approved with 12 votes in favor and 1 abstention.

6. Report from the Committees:

No questions have been sent to the ICO Secretariat to the reports of the ICO committees, previously sent to the bureau members. The following motions are approved:

Motion 4: To award the ICO Prize 2020 to **Wojciech Wasilewski** "*for his seminal contributions to experimental work in the field of multi-mode quantum memories, demonstrating systems with both outstanding storage capacity and remarkably extensive range of operations*". Moved by **S.H. Park**, seconded by **E. Rosas**, approved with 12 votes in favor and 1 abstention.

Motion 5: To award the ICO-IUPAP Medal 2020 to **Bhavin Shastri** "*for his pioneering contributions to Neuromorphic Photonics*". Moved by **A. Podoleanu**, seconded by **R. Ramponi**, approved with 12 votes in favor and 1 abstention.

Motion 6: To award the Galileo Galilei Medal 2020 to: **Jorge Ojeda-Castañeda** "*for his elegant insightful contributions in the development of phase-space analysis, self-imaging and diffractionless beams, pioneering groundwork for computational imaging, for discovering class of functions providing extended depth-of-field, and for designing nonconventional devices employing varifocal lenses under significantly unfavorable circumstances*". Moved by **N. Kundikova**, seconded by **C. Londoño**, approved with 12 votes in favor and 1 abstention.

7. Liaisons with international societies:

The following international societies have sent their reports to the ICO Secretariat: SPIE, OSA, IEEE, RIAO, EOS, OWLS, LAM.

8. ICO-25 and OWLS-16 situation

Due to the situation in some European countries, it is clear that there is a risk of suspending scientific meetings all over the world. H. Michinel says that the European Optical Society has moved their annual meeting (EOSAM2020) to online.

J. Czarzys says that although the situation is not clear, he is optimistic to a 90% that the ICO-25 will take place in person in Dresden on September 2021. In the end, the penalty amount has been severely reduced.

G von Bally says that in case of being necessary to organize a hybrid meeting, extra costs for this option should be covered by ICO as the organizational and financial risks caused by the uncertainty in COVID19 development create an extremely difficult situation for the organizer of ICO25-OWLS16.

After a brief discussion, the following motion is presented:

Motion 7: ICO will offer a “Risk Money” contract according to the regulations in the ICO Rules and Code of Practice if requested. Moved by **G. von Bally**, seconded by **C. Londoño**. Approved with 11 votes in favor and 2 abstentions.

C. Londoño indicates that a hybrid model could be very interesting for the expansion of the ICO and should be discussed for future ICO events beyond ICO-25.

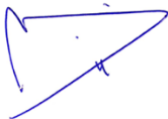
9. Liaisons to ISC and IUPAP:

R. Ramponi and G. von Bally report contacts with ISC representatives, but the situation of the ICO application presented 4 years ago to the former ICSU to become a Union is not clear. R. Ramponi notices that it is not possible to continue with informal communication with ISC and thus the following motion is presented:

Motion 8: The ICO President will send an official letter to ISC to clarify the status of the ICO application to become a Union. Moved by **R. Ramponi**, seconded by **Y. Arakawa**. Approved unanimously.

10. Other issues:

H. Michinel reports that the ICO website is not correctly listed in google searches. An SSL certificate has been purchased to avoid security problems. No more issues are raised and the meeting adjourned at 15:00 (CET) September, 10th 2020.



*Minutes approved by the ICO Bureau on Thursday, January 14th January 2021.
Humberto Michinel, ICO Secretary General*

APPENDIX I: President's report 2020

ICTP Winter College

2020 Winter College was on “Optics: Quantum Photonics and Information” from 10 to 21 February, with the preparatory school from 4 to 8 February. The aim of the Winter College was to offer Ph.D. students and early career researchers training in quantum optics and quantum information. The College will also offer insight in the new quantum technologies involving the generation and manipulation of photonic and matter-like states.

Quantum Optics, which studies how individual quanta of light interact with atoms and molecules, has been one of the most active research fields in the last years. Such endeavors have led to a deep understanding of the fundamental properties of light-matter interaction and its use to control and engineer quantum systems.

Currently, taking advantage from properties like entanglement, nonlocality and coherence, photons and atoms are the key elements for quantum technologies applications. In particular, quantum information science has flourished everywhere in the world, including developing countries. Theoretical and experimental research is thriving, and leading the way to new technological developments. The Winter College will present the basic concepts as well as the most up-to-date research in Quantum Optics.

Directors: V. AHUFINGER, Universitat Autònoma de Barcelona, Spain, A. BASSI, University of Trieste, Italy, M. PATERNOSTRO, Queen's University Belfast, UK; Local Organiser: J. NIEMELA.

On February 18, there was the ceremony for the presentation of the ICO-ICTP Gallieno Denardo Award, which was assigned to Dr. Kok Sing Lim, Photonics Research Centre, University of Malaya, Malaysia, for his achievements in the field of optical fibre sensing and optical communications, and his substantial contributions to sustainable development in Malaysia through promoting the use of optics-based technologies in the industrial sector. The prize Committee is chaired by Mourad Zghal.

2021 Winter College will not be run in the usual February slot due to possible travel restrictions for lecturers and participants. A request was submitted to ICTP for a slot in autumn, however it is unlikely that it is given high priority since we were among the few to be able to run the 2020 activity. I suggested Joe Niemela to have the TSOSA committee meeting on a virtual basis to keep continuity and plan for the future. Also the ICO-ICTP Gallieno Denardo award could be appointed, with some flexibility for the presentation and the ceremony.

ICO Strategic Planning Committee 2019-2020 Activity report*Members:*

- Roberta Ramponi, chair
- Humberto Michinel
- Yasuhiko Arakawa
- Frank Höller
- Joe Niemela
- Gert von Bally

External consultants:

- Maria Luisa Calvo
- Duncan Moore
- Pierre Chavel

Following the C&CC IUPAP meeting in London October 2nd-3rd 2019, a Memorandum of Understanding was signed between ICO and IUPAP in view of our future status. The MoU was shared with the governance of ISC (in particular Heide Hackmann, Daya Reddy, and Charles Erkelens) at the end of 2019 and we are waiting for an official feedback. Unfortunately, due to the coronavirus sanitary emergency, the situation did not progress. We will solicit an answer on possible next steps.

Minutes of the first 2021 ICO Bureau Meeting

Thursday, January 14th, 2021. 13:00 – 15:00 (CET).

Online meeting using zoom.us platform.

Participants: R. Ramponi (Chair), Y. Arakawa, H. Michinel (Secretary), A. Wagué, A. Podoleanu, J. Howell, E. Rosas, G. von Bally, C. Londoño, S-H Park, S. Otero, K. Choquette, J. Czarske (as ICO-25 chairman). Invited: Lars Büttner, John Cathleen.

Apologies from: M. Zghal, J. Harvey, N. Kundikova, C. Cisneros.

1. Call to order, introduction (R. Ramponi, Chair)

R. Ramponi thanks the ICO Bureau members for their attendance to the meeting all participants. The meeting starts at 13:05PM CET.

2. Approval of the agenda and minutes of the previous bureau

The agenda is presented with the only issue of discussing the postponement of ICO25 to 2022 and the possibility of celebrating an honorary activity in 2021 and elections of the new bureau, as proposed by the ICO Execom. The following motions are moved and voted:

Motion 1: To approve the proposed agenda. Moved by **F. Höller**, seconded by **E. Rosas**, approved unanimously.

Motion 2: To approve the minutes of the previous bureau celebrated online, starting September 10th 2020 at 13:00h (CEST). Moved by **G. von Bally**, seconded by **A. Wagué**, approved unanimously.

Roberta Ramponi says that due to the uncertainties of covid19 pandemics, the ICO Execom recommends to postpone ICO25 to 2022. However, as the elections of the ICO bureau cannot be postponed anymore and the urgency of delivering some of the ICO award ceremony.

H. Michinel says that it is mandatory to have bureau elections in 2021 and there is an opportunity to celebrate the online elections in combination with an online award ceremony that will allow to deliver pending ICO prizes. Frank Höller comments that most conferences will be kept online during 2021.

J. Czarske displays a short presentation with pros (+) and cons (-) of different alternatives for celebrating ICO25 in 2021 or 2022:

ICO25 **ONLINE**, September 2021

+	-
GA and elections in 2021	High financial risk (high costs, no registration fees, however available support)
No risk for participants' health	Low number of participants anticipated/no buzz, no energy (similar to a list of papers)
	Drawback for a world congress: time zones, ~2...4 h/day (high efforts, hybrid only for few time zones suitable)
	No exhibition/less company presentations

ICO25 in **PRESENCE**, March 2022

+	-
Smaller risk for corona impact	GA and elections in 2022 (3 months in 2022) (problem with terms, usually 3 years)
High number of participants anticipated	Risk is not zero
High probability to be a world congress	Additional effort as most abstracts will be new
Financial risk is reduced	

ICO25 in **PRESENCE**, September 2022

+	-
Low risk for corona impact	GA and elections in 2022 (9 months in 2022)
Highest number of participants anticipated (a first step to normality)	Risk is not zero
Highest probability to be a real world congress: 5 A: Africa, Asia, Australia, America and Amazing Europe)	Abstracts will be new
Financial risk is strongly reduced	

J. Czarske finally comments: “the virtual format will lead to disappointment. From our point of view, we have our virtual engagement at conferences severely cut back, as not effective. To hold a proper face-to-face optics meeting in Dresden is crucial that people can come and see Dresden, TU Dresden and make impact, meet people, see hardware/exhibits and enjoy. I have attended a few online optical events and they are not good: no energy, no buzz. People in any case report good impact work in journals so that continues these days. It is not like they are waiting for online conferences like ICO online to be held. Presenting the work online is no big deal and creates no buzz. I'd rather have the meeting in Dresden in 2022 when things have calmed down versus having hybrid and all-online events”.

As a result of the arguments given, the conclusion is that celebrating ICO25 in 2022 is the best option, as it is indicated in the following table:

	In presence 2021	In presence 2022	Video 2021
Risk for corona impact	High	Low#	No
Financial Risk	High	Low	Medium*
Anticipated Success of ICO25 (number of participants, WORLD congress)	Medium	Highest	Low**

Gert von Bally, as chair of OWLS-16 to be celebrated in parallel with ICO-25 says that he agrees with any of the dates proposed by 2022 and that the OWLS-16 General Assembly will be celebrated during the congress. After the discussion and the arguments presented the following motions are presented and voted:

Motion 3: To approve moving ICO25 to 12-16 September 2022. Moved by **C. Londoño**, seconded by **A. Wagué**, approved unanimously.

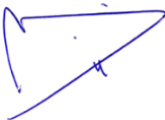
Motion 4: To celebrate an extraordinary online ICO General Meeting September 2021 with the purpose of voting the new ICO bureau moved **E. Rosas** second by **F. Höller**, approved unanimously.

Concerning the celebration of an online award ceremony during the ICO online meeting, Jhon Howell says that probably for the awardees is not the best option in terms of impact. Several members of the bureau agree that it would be better to have the award ceremonies in person in Dresden. Roberta Ramponi suggest to have an special award session in Dresden with all the awards and talks about 20min.

Motion 5: To celebrate the ICO awards ceremony in a specific day in Dresden during ICO 25, moved by **R. Ramponi** second by **F. Höller**, approved unanimously.

3. Other issues

No more issues are raised and the meeting adjourned at 15:00PM January, 14th 2021.



*Minutes approved by the ICO Bureau on Thursday, Wednesday 24th March 2021.
Humberto Michinel, ICO Secretary General.*

Draft minutes of the second 2021 ICO Bureau Meeting

Wednesday, March 24th, 2021. 13:00 – 14:20 (CET).

Online meeting using zoom.us platform.

Participants: R. Ramponi (Chair, AKA R.R.), Y. Arakawa, H. Michinel (Secretary), J. Niemela, L. Sirko, F. Höller, A. Wagué, A. Podoleanu, J. Howell, E. Rosas, S. Otero, G. von Bally, S-H Park, N. Kundikova, K. Choquette, Q. Gong, J. Czarske (invited).

Apologies from: M. Zghal, J. Harvey, C. Londoño, C. Cisneros.

1. Call to order, introduction (R. Ramponi, Chair)

R.R. thanks the ICO Bureau members for their attendance to the meeting all participants. The meeting starts at 13:05PM CET.

2. Approval of the agenda and minutes of the previous bureau (Chair).

The agenda is presented with a main point to be discussed: the situation of ICO application to become full ISC member. The following motions are moved and voted:

Motion 1: To approve the proposed changes in the agenda. Moved by **F. Höller**, seconded by **G. von Bally**, approved unanimously.

Motion 2: To approve the minutes of the previous bureau celebrated online, starting January 14th 2021 at 13:00h (CEST). Moved by **F. Höller**, seconded by **R. Ramponi**, approved unanimously.

3. ICO application to become ISC full member (R. Ramponi)

R.R. explains that due the new situation with the ICO application to become ISC full member. In the previous framework, with ICSU, it was approved in Tokyo that ICO will apply to be promoted to International Union from affiliated commission belonging to IUPAP. With the new situation that appear with ISC foundation, ICO must apply to be promoted to become full member of ISC from its current status of affiliated member. Therefore it will be necessary to vote this issue in the next ICO GA.

K. Choquette asks about the situation with IUPAP and RR says that it is fine now. L. Sirko asks about the financial support of IUPAP. RR says that when ICO will be independent the only support will be for events that are co-organized by both organizations and not for ICO activities alone. After a brief debate and detailed explanations, the following motion is moved:

Motion 1: To present a motion to be voted in the next ICO General Assembly with the following text: *“Do you agree that the International Commission for Optics be no longer an affiliated commission of the International Union of Pure and Applied Physics and applies to become a "category 1" full member of the International Science Council?”*. Moved by R. Ramponi, seconded by A. Wagué, approved unanimously.

4. Other issues

R.Ramponi explains some minor issues concerning the next GA. In first place it will be voted the acceptance of new members, so they can participate in the rest of the GA. Then, it will be voted the motion previously approved about ICO becoming a full member of ISC. After voting this issue, the election of the next ICO board can take place.

H. Michinel suggest to use an online commercial platform for the voting. In the next days he will run some tests. To the contrary of face-to-face GA, the candidacies will be presented maximum one week in advance not 24h as it is traditional.

R.Ramponi encourages the board members to find candidates for the elections of the governing board of the ISC.

No more issues are raised and the meeting adjourned at 14:20PM March, 24th 2021.

Minutes pending approval by the ICO Bureau at the time of publishing this book.

FINANCES

ICO Treasurer's report (2017-2020)

As of December 31, 2020, the ICO has a cash balance of \$205,889 in our treasury. This amount is held in US dollars (\$152,019) at the US Bank of America and in Euros (104,279 €) in the Caisse D'Epargne in Paris. The primary source of income that the ICO receives is derived from membership dues contributed by the Territorial Committees (TCs). The money that the ICO expends is used mostly to support conferences, ICO prizes, and travelling lecture awards.

The Covid-19 pandemic has certainly had an effect on ICO finances, with some delays in paying dues as well as difficulty in spending our funds. While we went forward with selection of the ICO-ICTP Gallieno Denardo award, for instance, the cash award has been postponed to the next in-person meeting which we assumed would be in 2022. But the postponement of ICO-25 means that we have at present somewhat more funds than would have been the case under normal circumstances. All things taken together, it is less instructive to look at these past 3 years as indicative of spending goals for the next period.

Within the US, the ICO is designated as a 501(c)4 organization, which means that it is exempt from paying federal taxes, but cannot provide tax-exempt receipts for donations within the US as can 501(c)3 organizations. Its physical address for tax purposes is in the state of New Jersey. The number of shares for any territory varies from 1 to 27 units, and the amount per share has remained fixed at \$235 USD. In the appendices are the records of balances and expenditures.



Joe Niemela

ICO Treasurer

Appendix I – Summary of Assets

Summary of Assets

2017-2018:	\$181,473	(August 31, 2018)
2018-2019:	\$201,331	(July 31, 2019)
2019-2020:	\$205,889	(December 31, 2020)

Summary of Major Expenses:

2017-2018

Secretariat (total):	\$9067
Service fees (total):	\$1,589
Activities (total):	\$9,837
Traveling Lecturer:	\$390
Awards/Prizes:	\$5,116
ICSU dues:	\$576
Total:	\$26,185

2018-2019

Secretariat (total):	\$12,347
Service fees (total):	\$454
Activities (total):	\$7073
Traveling Lecturer:	\$990
Awards/Prizes:	\$1000
ICSU dues:	\$566
Total:	\$22,430

2019-2020

Secretariat (total):	\$14,406 (includes \$3064 for ICO Congress)
Service fees (total):	\$611
Activities (total):	\$25,686 (includes ICO Bureau in Tunisia)
Traveling Lecturer:	\$1,017
Awards/Prizes:	\$1,000
ISC dues:	\$578
Total:	\$43,298

3-year totals by category:

Secretariat (total):	\$35,820
Service fees (total):	\$2,654
Activities (total):	\$42,596 (Not including ICO Congress est. ~ +\$14,500)
Traveling Lecturer:	\$2,397
Awards/Prizes:	\$7,116
ISC dues:	\$1,720

Appendix II-Year 2017-2018

(covering October 1, 2017 – August 31, 2018)

FINAL TOTAL COMBINED ASSETS: \$181,473.2

(CONVERSION USED: 1 EUR = 1.15145 USD)

BANK OF AMERICA (USA)

Starting balances October 1, 2017

Checking: \$14,001.03

Savings: \$102,563.97

Ending Balances August 31, 2018

Checking: \$23,802.21 (+\$9,801.18)

Savings: \$102,592.19 (+\$28.22 in interest)

CAISSE D'EPARGNE BANK (France)

Starting balances October 1, 2017

Checking: €15 593,62

Savings: €28 513,70

Ending Balances August 31, 2018

Checking: €19,162.74 (+€ 3569.12)

Savings: €28,671.30 (+€ 157.6)

Total Expenses (USD)

Secretariat (total): \$8,088

Service fees (total): \$1,557.94

Activities (total): \$10,837

Traveling Lecturer: \$390.00

Awards/Prizes: \$4,115.93

ICSU dues: \$575.73

Appendix III-Year 2018-2019

(September 1, 2018- July 31 2019)

FINAL TOTAL COMBINED ASSETS: \$201,330.53

(CONVERSION USED: 1 EUR = 1.11 USD)

BANK OF AMERICA (USA)

Starting balances September 1, 2018

Checking: \$23,802.21
Savings: \$102,592.19
Combined: \$126,394.40

Ending Balance July 31, 2019

COMBINED (Checking): \$139,354.06

(Note: Bank of America Savings account closed and combined with Checking)

CAISSE D'EPARGNE BANK (France)

Starting balances September 1, 2018

Checking: €19,162.74
Savings: €28,671.30
Total: €47,834.04

Ending balances July 31 2019:

Checking: €26,948.33
Savings: €28,886.33
Total: €55,834.66

Total Expenses (USD)

Secretariat (total): \$12,347
Service fees (total): \$454
Activities (total): \$7073
Traveling Lecturer: \$990
Awards/Prizes: \$1000
ICSU dues: \$566

Appendix IV-Year 2019-2020

(August 1, 2019- December 31 2020)

FINAL TOTAL COMBINED ASSETS: \$205888.99

CONVERSION (XE/ March 15 2020): 1 EURO = 1.112 USD

BANK OF AMERICA (USA)

Starting balance (August 1, 2019): \$139,354.06

Ending Balance (December 31, 2020):\$152,018.72

**

CAISSE D'EPARGNE BANK (France)

Starting balances (August 1, 2019)

Checking: €26,948.33

Savings: € 28,886.33

Total: €55,834.66

Ending balances (December 31 2020):

Checking: €16424.02

Savings: € 32020.47

Total: €48,444.49

**

Total Expenses (USD)

Secretariat (total): \$14,406 (includes \$3064 for ICO Congress secretariat expenses)

Service fees (total): \$611

Activities (total): \$25,686 (includes ICO Bureau in Tunisia)

Traveling Lecturer: \$1,017

Awards/Prizes: \$1,000

ISC dues: \$578

COMMITTEE REPORTS AND AWARDS

ICO Nominating Committee for 2021 elections

Yasuhiko Arakawa, chairman of the ICO Nominating Committee



According to established procedures in the ICO Rules and Codes of Practice, elections for members of the ICO Bureau take place every three years. However, due to the coronavirus crisis during 2020, the ICO General Assembly will take place virtually in 2021, as already announced by the newsletter. There will be two sessions. At the first session on Monday September 13th, from 13:00h to 15:00 (CET), the candidates for the election of the new ICO Bureau will present their statements and the electronic voting procedure will be explained. Then, the system is open for the delegates to start electronic voting until Tuesday 14th 13:00.

The procedures and protocols for the election described in the ICO Rules and Codes of Practice will undergo some changes:

Traditionally, a 24h-notice for candidacies for the new ICO Bureau was accepted. However, due to the exceptional circumstances of the virtual format, for this election, the candidates must apply before 14:00h CET August 31st 2021, so that the electronic voting system can be ready on time for the election.

At the second session of the ICO General Meeting on Thursday, 15th September 2021 from 13:00 till 15:00 (CET), the voting results will be announced. Depending on the results, a second-round voting may take place. Details of the electronic voting procedure will be informed separately. It is important to understand that the above mentioned procedure of the election may be subject to change depending on the situation, as the virtual election of this year is different from the traditional procedure of election that took place in person.

As the first step, delegates will be asked to register before June 15th for voting by accessing a website and introducing the same number of official delegates as that of votes. If no registration is made by the corresponding Territorial Committee (TC), the TC is regarded to abstain the voting. The number of votes for each TC/International organization is available in the ICO website.

The second session of the ICO General Meeting will be devoted essentially to the presentation of the results of the election of the new ICO Bureau and it will take place on Thursday, 15th September 2021 from 13:00 till 15:00 (CET).

COUNTRY	SHARES	VOTES	COUNTRY	SHARES	VOTES
Argentina	3	2	Korea	4	3
Armenia	1	1	Latvia	1	1
Australia	6	3	Lithuania	1	A
Belarus	2	A	Mexico	3	2
Belgium	4	A	Moldova	1	A
Brazil	5	3	Morocco	0	A
Canada	8	4	Netherlands	4	A
China	11	5	N. Zealand	3	2
Colombia	2	2	Norway	4	3
Cuba	1	1	Poland	4	3
Czech Rep.	2	2	Portugal	2	2
Denmark	4	3	Romania	1	1
Ecuador	0	A	Russia	18	6
Estonia	1	1	Singapore	3	2
Finland	4	3	Slovak Rep.	2	2
France	15	5	Spain	6	3
Germany	15	5	Sudan	1	1
W. Africa	1	A	Sweden	8	4
Greece	3	2	Switzerland	6	3
Hungary	3	A	Taipei	3	A
India	4	3	Tunisia	1	1
Indonesia	1	1	Turkey	1	A
Ireland	3	2	Ukraine	2	2
Iran	1	A	U.K.	12	5
Israel	4	3	USA	27	6
Italy	12	5	Venezuela	2	2
Japan	15	5	LAM*	1	1
OSA*	5	3	OWLS*	1	1
SPIE*	5	3	EOS*	1	1
IEEE*	2	2	RIAO*	1	1

(*) = International Societies

Nominations for ICO Bureau Elections 2021

Position	Candidate	Affiliation	Nominating Territory
President	John Howell	Hebrew Univ. of Jerusalem, Israel	USA
President	Eric Rosas	Mexican Photonics Cluster, Mexico	Mexico
Secretary	Humberto Michinel	University of Vigo, Spain	Spain
Assoc. Secr.	Adrian Podoleanu	University of Kent, UK	UK
Assoc. Secr.	Victor Zadkov	Russian Acad. of Sciences, Russia	Russia
Treasurer	Joe Niemela	The Abdus Salam ICTP, Italy	USA
ICO VP	Nathalie Westbrook	University Paris –Sud, France	France
ICO VP	Juergen Czarke	Technical Univ. of Dresden, Germany	Germany
ICO VP	Leszek Sirko	Polish Acad. of Sciences., Poland	Poland
ICO VP	Adrian Podoleanu	University of Kent, UK	UK
ICO VP	Kaoru Minoshima	Univ. of Electro-Communications, Japan	Japan
ICO VP	Natalian Kundikova	Russian Acad. Sc. (Ural Branch), Russia	Russia
ICO VP	Qihuang Ging	Beijing University, China	China
ICO VP (Ind.)	Sara Otero	Radiantis, Spain	Spain
ICO VP (Ind.)	Pietro Ferraro	TaiGeek Technology Ltd., Italy	Italy

SCHEDULE OF THE ONLINE ICO GENERAL ASSEMBLY (CET)

ACTIVITY	STARTS	ENDS	SYSTEM	PARTICIPANTS
Voting Registration	15/06/21 (00:00)	01/08/21 (00:00)	GOOGLE FORM	ICO DELEGATES
Nominations	15/06/21 (00:00)	31/08/21 (14:00)	Mail	TERRITORIAL COMMITTEES
Endorsements	15/06/21 (00:00)	08/09/21 (14:00)	Mail	TERRITORIAL COMMITTEES
1 st Gen. Assembly	13/09/21 (13:00)	13/09/21 (15:00)	zoom.us	ICO DELEGATES
1 st Online Vote	13/09/21 (15:00)	15/09/21 (10:00)	polyas.com	ICO DELEGATES
2 nd Gen. Assembly	15/09/21 (14:00)	15/09/21 (15:00)	zoom.us	ICO DELEGATES
2 nd Online Vote	15/09/21 (15:00)	17/09/21 (10:00)	polyas.com	ICO DELEGATES
3 rd Gen. Assembly	17/09/21 (14:00)	17/09/21 (15:00)	zoom.us	ICO DELEGATES

ICO Traveling Lecturer Award

The ICO Traveling Lecturer Committee is chaired by the ICO treasurer, Prof. Joe Niemela and other members of the committee are Roberta Ramponi and Humberto Michinel.

The ICO travelling lecture award is designed to provide financial assistance to those scientists and engineers of international reputation who wish to travel to give a series of lectures on modern aspects of optics and photonics. Each awardee is given a grant of \$1,000 to help defray travel expenses.

Often, the awards are given for those travelling to developing countries. The awards are not designed to support travel to attend or present a paper at a scientific conference. According to the information on the ICO website:

"The (Travelling Lecture Award) program is aimed specially at developing nations, but is not necessarily restricted to them. It is hoped that visits will lead to closer collaboration between the lecturer and the scientists of the destination territory. Generally, these grants will not be awarded simply to support international conference attendance."

In 2018, two traveling lecturers were funded: Glenn Boreman (SPIE) to Universidad Complutense de Madrid and University Miguel Hernandez of Elche (Alicante). Hosts were Maria Calvo and Ignacio Moreno Soriano. Zeev Zalevsky from Bar-Ilan University, Ramat-Gan, Israel travelled to Pontifical Catholic University of Peru, Lima, Peru, hosted by Prof. Guillermo Baldwin.

In 2019, Federico Rosei traveled to Carthage, Tunisia and participated in OPTISUD, hosted by Prof. Mourad Zghal.

In 2020, due to the pandemic there were no traveling lectureships awarded in 2020.

As a reminder, we welcome new applicants for our travelling lecture awards. The approximate total allocation for these awards was \$5,000 for the three-year period, 2017– 2020.

Joseph Niemela

Chair of the ICO Travelling

Lecture Award Committee

Report of the ICO Prize Committee

ICO established the ICO Prize in 1982, to be given each year to an individual who has made a noteworthy contribution to optics, published or submitted for publication before he or she has reached the age of 40. (Specifically, the Prize winner must not have reached the age of forty years before December 31 of the year for which the Prize is awarded).

The character of the work of successive Prize recipients should preferably alternate between predominantly experimental or technological and predominantly theoretical. The "noteworthy" contribution in optics is mainly measured by its impact (past or possibly future) on the field of optics generally, opening a subfield or significantly expanding an established subfield in research or technology.

The Prize includes:

- a citation,
- a cash award of an amount established in the triennial budget of ICO, and the invitation to present an invited paper and receive the award at the next ICO Congress or another ICO meeting mutually agreed to by the bureau and the award winner.



Ernst Abbe Medal donated by the Carl Zeiss Foundation.

Every year, the ICO Prize Committee issues a call for nominations that is published in the ICO Newsletter, receives the nominations and selects the recipients for approval by the Bureau at its next meeting. The award needs not be made each year if the Prize Committee so chooses.

The Prize is preferably given to an individual, but it can be shared by two persons. Eligibility for the Prize is not excluded by previous prizes awarded to the individual. The selected Prize winner is then announced in the ICO Newsletter and, as appropriate, in one or more optics journals.

Every year, the ICO Prize Committee issues a call for nominations that is published in the ICO Newsletter, receives the nominations, and selects the recipients for approval by the Bureau at its next meeting. The award needs not be made each year if the Prize Committee so chooses.

The Prize is preferably given to an individual, but it can be shared by two persons. Eligibility for the Prize is not excluded by previous prizes awarded to the individual. The selected Prize winner is then announced in the ICO Newsletter and, as appropriate, in one or more optics journals.

The prize will be presented at the next appropriate major ICO meeting and the Prize winner will be expected to deliver an invited talk at that Meeting. Posters of the Prize are also available under request to ICO Secretariat. The prize will be presented at the next appropriate major ICO meeting and the Prize winner will be expected to deliver an invited talk at that Meeting. Posters of the Prize are also available under request to ICO Secretariat. The rules of the Prize are here: <http://e-ico.org/activities/awards#nom>. The award winners to this date are:

- 1982 Antoine Labeyrie, France
- 1983 James R. Fienup, USA
- 1984 J. Christopher Dainty, U.K.
- 1985 Sergei I. Stepanov, USSR
- 1986 Kensuke Ikeda, Japan
- 1987 Alain Aspect, France
- 1988 no prize bore the number of the year 1988.
- 1989 Demetri Psaltis, USA
- 1990 Rosario Martinez-Herrero, Spain
- 1991 David A.B. Miller, U.K. and USA
- 1992 Wolfgang Peter Schleich, Germany
- 1993 Aleksander K. Rebane, Estonia
- 1994 Emmanuel Desurvire, France
- 1995 Tony F. Heinz, USA
- 1996 Vladimir Buzek, Slovakia
- 1997 Andrew M. Weiner, USA
- 1998 David Mendlovic, Israel and Haldun Ozaktas, Turkey
- 1999 Hugo Thienpont, Belgium
- 2000 Stefan W. Hell, Germany
- 2001 Nabeel A. Riza, Pakistan and USA
- 2002 Prize not accorded
- 2003 Benjamin J. Eggleton, Australia
- 2004 Ashok V. Krishnamoorthy, India
- 2005 Immanuel Bloch, Germany
- 2006 Hideyuki Sotobayashi, Japan
- 2007 Susana Marcos, Spain
- 2008 Zeev Zalevsky, Israel
- 2009 Rajesh Menon, USA
- 2010 Reinhard Kienberger, Germany
- 2011 Xuanlai (Nick) Fang, USA
- 2012 Romain Quidant, Spain
- 2013 Tobias J. Kippenberg, Switzerland
- 2014 Martin Booth, UK
- 2015 Aydogan Ozcan, USA
- 2016 Andrea Alù, USA
- 2017 Francesca Calegari, Germany
- 2018 Mikael Rechtsman, USA
- 2019 Manuel Guizar-Sicairos, Switzerland
- 2020 Wojciech Wasilewski, Poland



Laser engraved sculpture donated by the Carl Zeiss Foundation.

The ICO Prize Committee for the term 1 October 2017 to 30 September 2021 has been chaired by Professor Seung-Han Park, ICO Vice President, (shpark@yonsei.ac.kr) from the Department of Physics, College of Science, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea.

Other members of the Committee 2017-2021 are Maria J. Yzuel (Spain, Former ICO Vice President), John Harvey (New Zealand, ICO Vice President), Leszek Sirko (Poland, ICO Vice President), Yasuhiko Arakawa (Japan, Past ICO President), Eric Rosas (Mexico, ICO Vice President), Gert von Bally (Germany, ICO Vice President), Joseph Niemela (Italy, ICO Treasurer), Carmina Londoño (U.S.A., ICO Vice President), Paul Urbach (Netherlands, ICO Vice President), and Sara Otero (Spain, ICO Vice President). Since 2011, the Carl Zeiss Foundation donates a laser engraved glass trophy for the ICO Prize winner. The committee is in the process of selecting the 2021 ICO prize.

2017 ICO Prize: Francesca Calegari, Germany



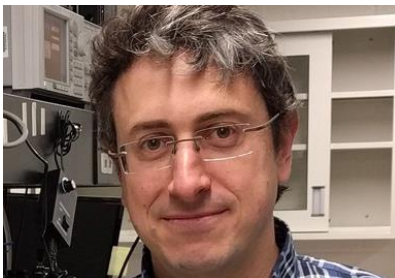
The 2017 ICO Prize was awarded to Francesca Calegari, University of Hamburg, Germany. Dr. Calegari was awarded “*for her innovative and pioneering research on the generation of isolated XUV attosecond pulses at the nJ-energy level and their application to the study of the electron dynamics in complex molecules.*” Dr. Calegari received her Ph.D. in Physics in 2009. From 2011 till 2016, she was researcher at IFN- CNR, Milan.

From 2013 till 2016 she was a professor of Physics at Politecnico di Milano in Milan, Italy. Since August 2016, she is a Full Professor of Physics at the University of Hamburg and a Leading Scientist at DESY, Hamburg, Germany.

Her main achievements are: a new experimental approach for the generation of isolated attosecond pulses at the nJ-energy level for the realization of XUV sources with high photon flux at the kHz repetition rate; the application of this XUV technology to track the electron dynamics in large systems (e.g., the first experimental evidence of sub-4 fs charge migration occurring in the amino acid phenylalanine); the demonstration of the possibility to track in real-time the scattering behavior of electrons propagating in a dielectric material after the interaction with high-energy photons. The outstanding contributions of Dr. Calegari have been proven to be the first step in the direction of controlling the electron dynamics in complex molecules for a future “atto-chemistry.” An extended article on her achievements and research areas of interest was published in the [ICO Newsletter 114](#).

2018 ICO Prize: Mikael Rechtsman, USA

The 2018 ICO Prize was awarded to Mikael C. Rechtsman, Pennsylvania State University, USA, “for his pioneering contributions to the field of topological photonics.” Dr. Rechtsman received his S.B. from the MIT and Ph.D. from Princeton University and is a recipient of the Sloan Fellowship, the Packard Fellowship, and the Office of Naval Research Young Investigator award.



He is the Downsborough Early Career Development Professor in the Dept. of Physics at Pennsylvania State University. Dr. Rechtsman was recognized for his first realization of a topological insulator for light. He showed that the incredible robustness of electron transport to disorder, as observed in the quantum Hall effect, could be carried over to photons propagating in complex photonic structures. It opened the door to the field of “topological photonics,” i.e., using the ideas of topological physics as tools to engineer new and disorder-immune photonic materials and devices.

In addition, he has demonstrated the first realization of Weyl points in optics, the first realization of the valley Hall effect, and a “higher-order topological insulator,” a demonstration of four-dimensional quantum Hall physics via dimensional reduction, and the first Weyl exceptional ring. His theoretical and experimental research spans the fields of condensed matter physics, nonlinear optics, quantum optics, photonic crystals, aperiodic and disordered materials, soft matter physics, and topological photonics. Further information on his research is available in the [ICO Newsletter 118](#).

2019 ICO Prize: Manuel Guizar-Sicairos, Switzerland



The 2017 ICO Prize was awarded to Manuel Guizar-Sicairos, Paul Scherrer Institute, Switzerland. Dr. Guizar-Sicairos was awarded “for his seminal contributions to the method and algorithm development, and application of coherent lensless imaging, ptychography, x-ray nanotomography, and scanning small-angle x-ray scattering.” He received his B.Sc. and M.Sc. from the Tecnológico de Monterrey, Mexico, and his Ph.D. from the University of Rochester in 2010.

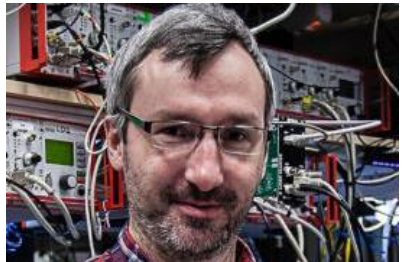
He is currently a beamline scientist at the cSAXS beamline, Swiss Light Source, Paul Scherrer Institute.

Dr. Guizar-Sicairos's research has focused on the development, advancement, and application of coherent X-ray imaging techniques, in particular on innovations in novel imaging methods and image reconstruction algorithms. He co-developed the basic principles and experimental demonstration for generalizing off-axis holography (termed HERALDO), an approach based on differential holographic encoding that allows a much larger class of extended references to be used for high-resolution X-ray lensless imaging.

The added flexibility in holographic-reference design enables superior resolution over X-ray Fourier transform holography, eases sample fabrication, and allows for 3D imaging, all while maintaining the signal-to-noise ratio and algorithmic simplicity. His remarkable contributions enable very high-resolution 3D imaging with quantitative contrast, and are increasingly used or planned in synchrotron X-ray sources around the world. Further details on his work can be found in the [ICO Newsletter 122](#).

2020 ICO Prize: Wojciech Wasilewski, Poland

The 2017 ICO Prize was awarded to Wojciech Wasilewski, University of Warsaw, Poland, "for his pioneering experimental work in the field of multi-mode quantum memories, demonstrating systems with both outstanding storage capacity and remarkably extensive range of operations." He received his M.Sc. from the University of Warsaw and Ph.D. from Nicolaus Copernicus University, Torun.



He works at the Faculty of Physics at the University of Warsaw and is the head of the Quantum Memories Laboratory. His research focuses on multimode quantum information processing, including quantum memories, single-photon characterization, and quantum enhanced measurements. His main accomplishment is to achieve massive multimode operation of such systems in the spatial degree of freedom and to develop programmable interference transformations on stored excitations.

Related to this line of research was the development of a fast single-photon camera system that is a critical ingredient in quantum memory experiments, facilitated many original imaging experiments in the quantum domain, including holography of a single photon and beating the Rayleigh limit using two-photon interference. His experimental achievements are expected to contribute to advances in quantum communication and precision measurement. Further details on his work can be found in the [ICO Newsletter 125](#).

Prof. Seung-Han Park
Chair of the ICO Prize Committee

Report of the IUPAP Young Scientist Prize in Optics

In 2005 the International Union of Pure and Applied Physics (IUPAP) created the Young Scientist Prizes for its commissions. The international Commission of Optics (ICO), as an Affiliated Commission of IUPAP, decided in 2008 to adopt the IUPAP Young Scientist Prize in Optics. The IUPAP prize in optics is awarded annually through ICO to a scientist who has made noteworthy contributions to applied optics and photonics during a maximum of 8 years of research experience after having earned a PhD degree.



The Prize is awarded at a major ICO meeting and it includes the IUPAP Young Scientist Medal with the name and discipline (optics) of the awardee engraved on the back, a citation and a 1000€.

The IUPAP Prize Committee, is chaired (for the term October 1, 2017 - September 30, 2021) by Prof. Dr. Adrian Podoleanu, Head of the Applied Optics Group, University of Kent, Canterbury, UK.

The award winners to this date are:

2009: Eleftherios Goulielmakis, Germany.

2010: Shuang Zhang, United Kingdom.

2011: Goëry Genty, Finland.

2012: Nirit Dudovich, Israel.

2013: Andrea Alù, USA.

2014: Albert Schliesser, Denmark

2015: Frank Koppens, Netherlands

2016: Laura Na Liu, Germany.

2017: Giulia Grancini, Switzerland.

2018: Can Bayram, USA.

2019: Chao-Yang Lu, China.

2020: Bhavin Shastri, Canada.

IUPAP Young Scientist Prize in Optics 2017: Giulia Grancini, Switzerland



Giulia Grancini was awarded the IUPAP Young Scientist Prize in Optics 2017 for her “deep knowledge on photophysical properties and ultrafast light-induced dynamical processes”.

More information on her discoveries can be found in the [ICO Newsletter 113](#).

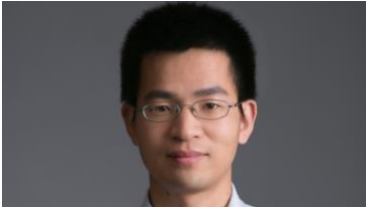
IUPAP Young Scientist Prize in Optics 2018: Can Bayram, USA

Dr Prof. Can Bayram demonstrated direct epitaxy of GaN on Graphene for the first time, revolutionizing the way graphene has been employed in optics and photonics”.

Details on his research and areas of interest can be found in the [ICO Newsletter 118](#).



IUPAP Young Scientist Prize in Optics 2019: Chao-Yang Lu, China



Dr. Chao-Yang Lu from Univ. of Science & Technology of China received the ICO-IUPAP Young Scientist Prize in optics 2019 “for significant contributions to optical quantum sciences”.

More information on his discoveries can be found in the [ICO Newsletter 121](#).

IUPAP Young Scientist Prize in Optics 2020: Bhavin Shastri, Canada

Dr. Bhavin J. Shastri from Queen's University in Canada received the ICO-IUPAP Young Scientist Prize in optics 2020 “for his pioneering contributions to Neuromorphic Photonics”.

Details on his research and areas of interest can be found in the [ICO Newsletter 126](#).



Adrian Podoleanu

Chair of the IUPAP Young Scientist Prize in Optics

Report of the ICO Galileo Galilei Committee

Oct 1, 2014-Sept 30, 2017

The ICO Galileo Galilei Medal Award contributes to one of the essential missions of the International Commission for Optics: recognize the promotion of Optics under difficult circumstances. The award was established by the 1993 General Assembly of ICO and has been awarded annually since 1994.

Rules applicable to the Award:

- 1 The Galileo Galilei medal of ICO is awarded for outstanding contributions to the field of optics, which are achieved under comparatively unfavorable circumstances.
- 2 The outstanding contributions in the field of optics should refer to: fundamental scientific questions or problems, or research or development of optical methods or devices, or scientific or technical leadership in the establishment of regional optical centers.



Photograph of the Galileo Galilei medal, donated by the Società Italiana di Ottica e Fotonica.

- 2.1 "Comparatively unfavorable circumstances" refers to difficult economic or social conditions or lack of access to scientific or technical facilities or sources of information.
- 2.2 The outstanding contributions must be documented, if applicable, by internationally acknowledged publications. Exceptionally, reports can be considered, provided that they are made available to the Award Committee.
- 3 The award is normally given to one person. Exceptionally, however, if a collective contribution is judged to be worthy of the award a team of several persons may be selected.
- 4 Every year, the ICO Committee for the Regional Development of Optics issues a call for nominations that is published in the ICO Newsletter, receives the nominations and selects the winner for approval by the Bureau at its next meeting. The award need not be given every year if the Bureau so chooses.
- 5- The award consists of:
 - a) the Galileo Galilei Medal, a silver medal with the portrait of Galileo Galilei donated by the Italian Society of Optics and Photonics, SIOF (Società Italiana di Ottica e Fotonica).
 - b) assistance in travel to present an invited paper and receive the award at the next ICO Congress or another ICO meeting mutually agreed to with the award winner,
 - c) a cash donation.
 - d) special attention and appropriate measures of ICO to support the future activities of the award winner.

In the period Oct. 1, 2014-Sept. 30, 2017 the ICO Galileo Galilei Medal Award Committee was chaired by Prof. Natalya Kundikova, ICO Vice-president.

The award winners from 1994 to 2020 are:

1994: Ion N. Mihailescu, Romania
1995: Rajpal S. Sirohi, India
1996: Daniel Malacara, Mexico
1997: Natalya D. Kundikova, Russia
1998: Ajoy K. Ghatak, India
1999: Mario Garavaglia, Argentina
2000: Vladimir P. Lukin, Russia
2001: Kehar Singh, India
2002: Rashid A. Ganeev, Uzbekistan
2003: Cid B. de Araujo, Brazil
2004: Milivoj Belic, Serbia and Montenegro and Caesar Saloma, Philippines, ex-aequo
2005: Valentin Vlad, Romania
2006: Mohammed M. Shabat, Gaza, Palestine
2007: Oleg V. Angelsy, Ukraine
2008: Joewono Widjaja, Thailand
2009: Marat S. Soskin, Ukraine and Dumitru Mihalache, Romania, ex-aequo
2010: Mohammad Taghi Tavassoly, Iran
2011: Jan Peřina, Czech Republic
2012: Mikhail V. Fedorov, Russia
2013: Kazimierz Rzażewski, Poland
2014: Chandra Shaker, India
2015: Aram Papoyan, Armenia
2016: Guillermo H. Kaufmann, Argentina.
2017: Alexander Nosich, Ukraine.
2018: Debabrata Goswami, India.
2019: Malik Maaza, South Africa.
2020: Jorge Ojeda-Castañeda, México.

ICO Galileo Galilei Medal Award 2017: Alexander Nosich, Ukraine



Prof. Nosich was awarded the Galileo Galilei Medal Award 2017 “for his contribution from fundamental mathematical physics studies to the modeling of actual devices for photonics and optoelectronics under comparatively difficult circumstances”.

More information on her discoveries can be found in the [ICO Newsletter 113](#).

ICO Galileo Galilei Medal Award 2018: Debabrata Goswami, India

Prof. Goswami was awarded the Galileo Galilei Medal Award 2018 “for his contribution the use of coherent control with femtosecond pulse shaping for spatiotemporal control under comparatively difficult circumstances”.

Details on his research and areas of interest can be found in the [ICO Newsletter 118](#).

**ICO Galileo Galilei Medal Award 2019: Malik Maaza, South Africa**

Prof. Malik Maaza was awarded the Galileo Galilei Medal Award 2019 “for extensive contributions to the frontiers of interdisciplinary research that involved both theoretical and experimental developments in the fundamental aspects of fs laser-matter interactions under comparatively difficult circumstances”.

More information on her discoveries can be found in the [ICO Newsletter 121](#).

ICO Galileo Galilei Medal Award 2020: Jorge Ojeda-Castañeda, Mexico

Prof. Jorge Ojeda-Castañeda from Universidad de Guanajuato in Mexico, was awarded the Galileo Galilei Medal Award 2019 “for his elegant insightful contributions in the development of phase-space analysis, self-imaging and diffractionless beams, pioneering groundwork for computational imaging, for discovering class of functions providing extended depth-of-field, and for designing nonconventional devices employing varifocal lenses under significantly unfavorable circumstances”. [ICO Newsletter 125](#).



Prof. Nataliya Kundikova

Chair of the ICO Galileo Galilei Medal Award

Report of the ICO/ICTP Gallieno Denardo Award

ICO, the International Commission for Optics, and ICTP, the Abdus Salam International Centre for Theoretical Physics, Trieste, agreed to establish since 2000 a joint prize, called the ICO/ICTP Award. In September 2007, the ICTP and ICO agreed to rename the ICO/ICTP Award as ICO/ICTP Gallieno Denardo Award to honor the memory and legacy of the late Prof Gallieno Denardo.

Due to the Corona-virus-19 pandemic, the 2020 General Assembly was postponed to 2021, and therefore there are winners of four years, because the ICO/ICTP Gallieno Denardo award is delivered in February, during the Winter College of the corresponding year. Although the 2021 Winter College did not take place, the award was assigned. It will be delivered during the next College, hopefully, in 2022.

Award winners to this date are:

- 2000: Arbab Ali Khan (Pakistan)
- 2001: Arashmid Nahal (Iran) and Fernando Pérez Quintián (Argentina)
- 2002: Alphan Sennaroglu (Turkey)
- 2003: Robert Szpöcs (Hungary)
- 2004: Imrana Ashraf Zahid (Pakistan) and Revati Nitin Kulkarni (India)
- 2005: Sarun Sumriddetchkajorn (Thailand)
- 2006: Héctor Manuel Moya Cessa (México)
- 2007: Svetlana Boriskina (Ukraine)
- 2008: Mourad Zghal (Tunisia)
- 2009: Saifollah Raoul (Iran)
- 2010: Cleber Mendonça (Brazil)
- 2011: Iván Moreno (Mexico) and Ryan Balili (Philippines)
- 2012: Selçuk Akturk (Turkey)
- 2013: Mohammad D. Al-Amri (Saudi Arabia)
- 2014: María F. Pascual-Winter (Argentina) and J. Fredy Barrera Ramírez (Colombia)
- 2015: Rim Cherif (Tunisia) and Rajan Jha (India)
- 2016: Jehan Akbar (Pakistan) and Mati Horprathum (Thailand)
- 2017: Goutam K Samanta (India)
- 2018: Urbasi Sinha (India)
- 2019: M. Faryad (Pakistan) and Christian T. Schmiegelow (Argentina) ex-aequo
- 2020: Kok Sing Lim (Malaysia)
- 2021: David Hayrapetyan (Armenia)

Members of the ICO/ICTP Award Committee 2017-2020 are Mourad Zghal (Chair and ICO VP), Ahmadou Wagué (ICO VP), Joseph Niemela (ICO VP), Anna Consortini (ICO former President) and Mitcho Danailov. In 2020 the term of the Committee was extended to 2021 due to the Pandemic.

The award is reserved for young researchers from developing countries (as defined by the United Nations), who conduct their research in a developing country.

It will be given to scientists less than 40 years old (on December 31 of the year for which the award is given), who are active in research in Optics and have contributed to the promotion of research activities in Optics in their own or another developing country. The award consists of the following:

1. The ICO gives a cash amount of US\$1000 and a diploma.
2. The ICTP invites the winner to attend a three-week-long College at Trieste at the next appropriate opportunity, and to give a seminar on his/her work when appropriate. ICTP will pay for travel and living expenses.

The award is presented to the winner at the ICTP in Trieste in the presence of representatives of ICO and ICTP. The winner is selected based on nominations received by the Award Committee in response to a call published by both ICO and ICTP. The nominations must be documented with a complete curriculum vitae including a list of publications and selected reprints (no more than three) as well as a complete employment history and a description of the nominee's achievements. The nomination form is available at: <http://e-ico.org/activities/awards>

ICO/ICTP Gallieno Denardo Award 2018: Urbasi Sinha, India



Dr. Urbasi Sinha, currently Associate Professor II at the Raman Research Institute (RRI), Bangalore, India, where now she heads the Quantum Information and Computing Laboratory, was awarded "for her pioneering research in photonic quantum technologies, contributions to cutting-edge experimental research in quantum optics, and extensive and multifaceted outreach activities towards popularizing experimental optical science in India".

Dr. Sinha was born on April 1979. In the period 1997-2002 she obtained B.A. and M.A. in the Jadavpur, University, Kolkata, India, and in Cambridge University, UK. In 2006 she received the PhD in Physics and Material Science in the same Cambridge University, UK. She also obtained two Postdoctoral fellows: Cavendish Lab, UK, July 2006-August 2007; Institute of Quantum Computing Ottawa, Canada, September 2007-February 2012.

In 2012, in spite of many possibilities to work abroad she came back to India, in the Raman Research Institute in Bangalore, where she founded the Quantum Information and Computing Laboratory. In few years, by overcoming many problems arising in a developing country, she was been able to set up the first Quantum Optics Laboratory in India dedicated to research in Quantum Information, Communication and Computation, where a pioneering role was developed in the techniques of producing single and entangled photons as well exploring their applications.

The most significant research achievements of Urbasi and her group in recent years is in the area of optics-based quantum information and computation as well as fundamental tests of quantum mechanics using optics-based tools. Of particular importance are her work on the superposition principle in interference experiments. Another remarkable contribution is in quantum computation where Urbasi and her group have come up with a novel, robust and scalable scheme of encoding information in highly entangled spatial-bin qutrits pairs. This paves the way for completely ingenious and alternative approach to photonic quantum computation which is not being pursued by any other laboratory in the world.

Another subject concerns preservation of entanglement for its effective use as a resource for applications in quantum communication and quantum computation, for which she recently proposed a novel procedure for controlling the degradation of entanglement that is being implemented using an all optical experimental setup in her laboratory. To be noted Urbasi's activity in promotion and outreaching: She is deeply involved in the promotion of research in optics through extensive outreach activities. She is visiting educational and research institutions all over India, where she delivers popular level lectures on her work to different levels of students and researchers, thereby contributing significantly towards promoting awareness about the research developments in the field of optics. More information on her discoveries can be found in the [ICO Newsletter 113](#).

ICO/ICTP Gallieno Denardo Award 2019:

Dr. Muhammad Faryad and Dr Christian T. Schmiegelow (ex-aequo)

Dr. Muhammad Faryad, currently Associate Professor in the Lahore University of Managements Science (LUMS), Pakistan, was awarded “for his contributions to the understanding of light interaction with nanostructured materials, and applications in the area of optical surface waves, solar cells, optical metamaterials and the modelling of wave propagation in the nanostructured mediums”.



Dr. Muhammad Faryad was born in March 1982. He obtained his BSc in physics and mathematics from the Punjab University, Pakistan, in 2002, and his MSc and MPhil, both in electronics, from the Quaid-i- Azam University, Pakistan, in 2006 and 2008, respectively. He obtained his PhD in engineering science and mechanics from the Pennsylvania State University, USA, in 2012 while working under the supervision of Prof. Akhlesh Lakhtakia. Dr. Faryad basic preparation is theoretical, but recently he also moved to experiments and established an optical laboratory to investigate metamaterials.

He has significantly contributed to the optics of cylindrical reflectors, surface plasmonics with nano-engineered thin films, plasmonic and nanostructured solar cells, Tamm and Dyakonov-Tamm surface waves, plasmonic optical sensors, design and properties of zero-index mediums, optics of one-dimensional dielectric-magnetic photonic crystals, and a book on dyadic Green functions for bi-anisotropic mediums.

One of the major contributions of Dr. Faryad in surface plasmonics is the work on multiple surface-plasmon-polariton (SPP) waves periodically supported by non-homogeneous materials that show that multiple SPP waves of the same frequency but different polarization states, degrees of localization to the interface, and phase speeds can exist. The applications of these multiple SPP waves in optical sensors have opened up the possibility of more reliable sensors that sense with multiple SPP waves instead of only one. Dr. Faryad is also an active member of the optics community.

He is a section editor of a respected archival journal, *Optik-International Journal of Light and Electron Optics*, for the last three years. He has recently been elevated to the senior membership of SPIE. He has conducted several workshops on optics in Pakistani universities for graduate students on plasmonic solar cells, optics of anisotropic media, and optical sensors. Details on his research can be found in the [ICO Newsletter 118](#).



Dr. Christian Tomas Schmiegelow, currently professor at the University of Buenos Aires, Argentina, where he heads the "Laboratory of Cold Ions and Atoms" was awarded "for his contribution to the field of quantum optics and light-matter interaction, and in particular the demonstration of the transfer of optical orbital momentum to bound electrons and studies on interaction of twisted light". Dr. Christian Tomas Schmiegelow was born on November 1981.

He obtained the Bachelor in Science, St. Andrews School, Buenos Aires, Argentina in 1999 and the Master in Physics from the Universidad Nacional de La Plata in 2006, and the Doctorate in Physics from the "Universidad de Buenos Aires" in 2011. After a Post Doc position in Argentina, in 2013 he was Post-doctoral Scholar in the Johannes Gutenberg Universität Mainz and subsequently Post-doctoral Researcher until 2015. He then returned to Argentina, Universidad de Buenos Aires, with a Humboldt return Scholar and a Bunge-and-Born Post-doctoral position.

In 2017 he obtained his current position of Adjoint Professor in the "Departamento de Física", where he heads the "Laboratory of Cold Ions and Atoms". He also is a researcher at the Argentinian National Research Council (CONICET). Dr. Schmiegelow's activity is mainly devoted to experimental quantum optics: on single quantum systems such as a single photon or single atoms to the purpose of understanding new physics and realizing applications. Both single photons and trapped atoms are platforms on which quantum computing and quantum information transmission are being developed. These tasks require control of quantum systems and a detailed understanding of the way light and matter interact. Dr. Schmiegelow and his colleagues demonstrated that special kinds of structured light beams interact with matter in a very particular way.

The beams, called twisted beams or also chiral beams are beams with orbital angular momentum. These beams, whose intensity profile looks like a donut, can carry arbitrarily large amounts of angular momentum. The angular momentum of each photon is not just given by the circularity of the polarization, but is now also determined by the spatial structure of the beam.

Schmiegelow first predicted [Eur. Phys. J. D 66, 1–9 (2012)] and then demonstrated experimentally [Nat. Comm.7, 12998 (2016)] that the extra angular momentum on the photon can be transferred to a single trapped ion. More precisely to the internal motion of the electron around the nucleus. In other words, the extra angular momentum modifies the conventional transition-selection rules, which now have to account for this extra twist.

ICO/ICTP Gallieno Denardo Award 2020: Dr Kok-Sing LIM, Malaysia



Dr. Kok Sing Lim from the Photonics Research Centre, University of Malaya in Malaysia, was awarded "for his achievements in the field of optical fiber sensing and optical communications, and his substantial contributions to sustainable development in Malaysia through promoting the use of optics-based technologies in the industrial sector." Dr. Kok-Sing Lim was born in 1984. He received the B. Eng. from the Electrical Dept. of the University of Malaya, Malaysia, in 2008.

On March 2012 he received the PhD. in Applied Physics (Photonics/Optics). Photonic Research Centre, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia. Dr Lim activity is based on fibers: in optical fiber sensor technology, optical measurement and medical laser devices, and, mostly in fibers for telecommunications. He works in the field of mode division multiplexing (MDM) technology specifically in the development of an optical system for efficient mode excitation and management in few-mode fibre (FMF). The orthogonality of various linearly polarized (LP) modes in the FMF is the key enabler for a greater transmission capacity per fiber. It is a solution to the transmission bottleneck in single mode fibers.

There is a pressing need for developing the basic FMF-compatible components that serve similar purposes of their SMF-counterparts such as coupler, isolator, fiber Bragg grating and etc. Dr Lim and his group members focus on the development of few-mode fiber Bragg grating (FM-FBG) for spatial mode filtering and mode conversion. The presence of multiple LP modes in the fiber gives rise to the excitation of multiple Bragg resonant wavelengths, the results of self-mode coupling and cross-mode coupling among the LP modes in the FM-FBG. The self-mode coupling resonant wavelengths can be used as selective mode-pass/stop filters with good rejection ratios (90-99%) whereas the cross-mode coupling resonant wavelengths can be used for mode conversion between two different LP modes. He exploited these properties for higher-level systems such as optical delay lines. Besides MDM technology. In addition to his activity with directing Master and PhD. Theses, he is actively involved in industrial projects in fiber-optic sensing and non-destructive test in other engineering sectors and industry in the country.

ICO/ICTP Gallieno Denardo Award 2021: Dr David Hayrapetyan, Armenia

Dr David Hayrapetyan, born on August 1982 is currently Associate Professor in the Russian-Armenian University, where he heads the Department of General Physics and Quantum Structures at the Institute of Engineering and Physics, was awarded for "his breakthrough contributions to the theory of semiconductor nanosystems, as well as his promotion of optics and photonics in Armenia under difficult circumstances".



Dr. Hayrapetyan obtained his BSc and MSc in physics from Yerevan State University, Armenia, in 2004 and 2006, respectively. He obtained his PhD in semiconductor physics in 2009 from the same university. After a number of activities including, Research scientist, Heliotechnic Problem Laboratory, National Polytechnic University of Armenia 2009 – 2015, in 2014 he became Associate professor, Department of General Physics and Quantum Nanostructures, Institute of Mathematics and High Technologies, Russian-Armenian University, Yerevan, Armenia, where he is actually the head of the Department of General Physics and Quantum Nanostructures at the Institute of Engineering and Physics. Since 2017 he is also Adjunct professor, Dep. of Semiconductor Physics and Nanoelectronics, Institute of Physics, Nanotechnologies and Telecommunications, Peter the Great St. Petersburg Polytechnic University, Russia.

His works address theoretical investigation of electronic, excitonic and impurity states, optical, magnetic and thermodynamical properties of semiconductor nanosystems with different types and geometries. He developed the analytical theory for the description of the states in quantum dots with non-trivial geometries and generalized Kohn's theorem for these structures subsequently experimentally demonstrated. The exact analytical description of quantum nano-structures developed by Davit has importance in the design of optoelectronic devices of new generation.

As a consequence of his research, his University opened a Wolfram laboratory, jointly with Wolfram Research, to set a bridge between the department and industry. He also organized a master program of Alternative energy with Solar Group Inc. In 2019 Hayrapetyan won the prestigious EC Horizon- 2020 grant "Nano QIQO" within the Twinning Program of the European Commission for research into smart Nanomaterials for Quantum Information and Quantum Optics, bringing much-needed research funding into Armenia. Details on his research can be found in the [ICO Newsletter 126](#).

Anna Consortini
Former ICO President

Report of the ad hoc Committee on International Affairs

Proposed by the Bureau and agreed by the General Assembly the ICO Committee on International Affairs was established 2014 at the ICO-23 in Santiago de Compostela, Spain, in order to advice ICO authorities in international affairs matters and territorial member issues. The Chair participates in the EXECOM and Bureau activities in an advisory capacity.

International Emergency Network

One of the first activities of this Committee was the creation of an International Emergency Network. Based on actual cases the task of the Committee was defined as to analyze and prepare a procedure for the ICO whom to contact and how to act in order to give support to colleagues, who are personally endangered in their human rights in particular for professional or political reasons.

As a result of several discussions the following procedure was evaluated for the ICO EXECOM and Bureau:

- Any hint to any contact point of ICO (Territorial Members, International Society Members, ICO Committee Members etc.) in such a case as described above shall initiate an immediate distribution of information to ICO EXECOM, Bureau and the Committee.
- Based on the (fast) initial assessment of these ICO authorities the President or the General Secretary informs ISC and IUPAP.
- For further evaluation of the situation and possible actions the Committee contacts:
 - ISC and IUPAP authorities;
 - United Nations Human Rights Bodies (<http://www.ohchr.org/EN/HRBodies/Pages/>
 - HumanRightsBodies.aspx) especially the “Special Rapporteur System”;
 - appropriate NGOs and national Ministries of Foreign Affairs.
- Based on the collected information the Committee prepares -if necessary in an ongoing process - proposals for further actions to the EXECOM and the Bureau.

By such a procedure ICO was able to successfully contribute to the support actions of the global science community to a prominent case of an Iranian colleague, which finally lead to his release from prison.

Currently, the ad hoc Committee evaluates the possibility for a network of (permanent or at least longer lasting) specific contact points for information exchange among ICO Territorial and International Society Members and the influence on ICO Rules and Codes of Practice.

In order to use the potential of the global activities, contacts and experience of ICO International Society Members and to act in a coordinated and structured manner, actually the Committee evaluates the possibility for an emergency information line and network of (permanent or at least longer lasting) specific contact points for information exchange among International Society Members.

The US NAS and all International Society Members through their ICO Representatives nominated such specific contact points. Furthermore, the Committee received advices and proposals from the German Representative of UNESCO, experienced in such matters.

On invitation by the Committee Joe Niemela, member of the ICO EXECOM, agreed to act as contact point to UNESCO and TSOSA. Furthermore, Humberto Michinel, member of the ICO EXECOM, accepted the invitation to act as contact point to the ICO Secretariat.

Personal contacts during meetings within the frame of the process of evaluating future cooperation with IUPAP will be used to propose corresponding joint activities of ICO and IUPAP within the International Emergency Network.

ICO Territorial Member Issues

At the ICO General Assembly 2017 in Tokyo the Committee was asked to look into the problem of a new name of Taiwan as ICO Member Territory after renaming the Optical Engineering Society of the Republic of China into Taiwan Photonics Society.

In view of the problem of two Chinese members of ICO the Committee contacted for advice and coordination the ISC Board, UNESCO, IUPAP and ICO International Society Members (EOS, OSA, OWLS, SPIE). In most cases the old names were kept and corresponding agreements prolonged. Currently, the Committee is working on proposals both sides may be able to accept.

Gert von Bally

Chairman of the Committee

for International Affairs

MEETINGS WITH ICO SPONSORING 2018-2019(*)

Conference	Date	Location	Funding [\$]
ODF 2017	nov-17	Hiroshima	
ISPHOA	ago-18	Surabaya	1500
BIOAM	oct-18	Paris	1000
EOSAM	oct-18	Delft	1175
ODF 2018	nov-18	Tokyo	
OWLS 2018	nov-18	Perth	2000
ETOP 2019	may-19	Quebec	2500
AOP 2019	jun-19	Lisboa	1000
RIAO Optilas	sept-19	Cancun Mex	1500
Optisud	sept-19	Carthage	3500
Correlation Optics	sept-19	Chernivtsi Ua	1500
Optics 2019	sept-19	Yerevan	1000
ICOL 2019	oct-19	Dehradun	1500
Total			18175

(*)Due to the coronavirus crisis, no meetings have been sponsored since 2020

*Frank Höller, ICO Associate Secretary
(In Memoriam)*

The ICO-24 General Congress

The opening ceremony was attended by the Emperor and Empress of Japan



Members of the ICO bureau in the ICO-24 General Congress

The first Congress of the ICO (ICO-1) was held in Delft, the Netherlands, in July 1948 with the aim of providing a forum to discuss progress in optics and photonics. Since then, the ICO Congress has been held every three years, and gained participation from all over the world including developing countries. The 24th Congress of the International Commission for Optics (ICO-24) took place at the Keio Plaza Hotel in Shinjuku, Tokyo, Japan from 21–25 August 2017. ICO-24 is the second to be held in Japan, 34 years since ICO-13 was held in Sapporo. It is a great honor for the ICO territorial committee of Japan to have hosted the ICO Congress in its country again. Tokyo Metropolitan is the capital of Japan with a population of 13 million. Shinjuku is one of the busiest areas, having a big terminal station with the most passengers and many department stores. The Keio Plaza Hotel is located close to the Shinjuku railway station.

ICO-24 was jointly sponsored by the ICO and the Science Council of Japan (SCJ) and co-sponsored by the Japan Society of Applied Physics (JSAP) and the Optical Society of Japan (OSJ). ICO-24 was also technically co-sponsored by many scientific societies including the Chinese Optical Society (COS), the Chinese Society for Optical Engineering (CSOE), the European Optical Society (EOS), the Foundation for Promotion of Electrical, Electronic and Information Engineering, the IEEE Photonics Society, the Institute of Electronics, Information and Communication Engineers (IEICE), the International Society for Optics and Photonics (SPIE), the Laser Society of Japan (LSJ), the Optical Society (OSA), the Optical Society of Korea (OSK), the Physical Society of Japan (JPS), and the Taiwan Photonics Society (TPS).

The main theme of ICO-24 was “Light for Society”, emphasizing the role of optics and photonics in the further development and innovation of optical networks and optical information technologies for advanced information technology and artificial intelligence, as well as their great potential to contribute to solving issues on global energy and the environment and to provide advanced tools for medicine.

The total number of participants in ICO-24 was 1003, from more than 40 countries. The Congress programme of ICO-24 consisted of the opening ceremony, plenary sessions, technical sessions, the conference reception, the Congress banquet, and the closing session. The most important event for the ICO, its triennial General Assembly also took place during ICO-24.

The most commemorative highlight of ICO-24 was the opening ceremony that was held immediately after the first Plenary Session in the afternoon of 21 August. It is our great honor that the opening ceremony was attended by their Majesties the Emperor and Empress of Japan. I believe that ICO-24 has been the only ICO congress ever attended by a royal family. The Japanese Emperor and Empress attend only one international scientific conference a year. ICO-24 was greatly honored when selected as the international conference in 2017 to be honored with their presence. A deep understanding of the fact that optics and photonics will play an important role in a wide range of scientific and engineering fields enabled the presence of the Emperor and Empress.



Prof. Yasuhiko Arakawa chaired ICO-24

With the presence of the Emperor and Empress, I, as the ICO president, delivered the opening speech, which was followed by the speeches of Prof. Takashi Ohnishi, the SCJ president, and Dr Kennedy Reed, the IUPAP president-designate. The ceremony was also attended by special guests, Masashi Matsuyama, the Minister of State for Science and Technology Policy, Yuriko Koike, the Governor of Tokyo Metropolitan, and Makoto Gonokami, president of The University of Tokyo. The message from Shinzo Abe, the Prime Minister was introduced by Prof. Yukari Matsuo, the ceremony chair. Everything was prepared under strict security for the opening ceremony, which gave extremely fascinating and significant impact to all the participants to the ICO-24.

For organizing and steering the opening ceremony, the full cooperation and support by the Keio Plaza Hotel was indispensable. The news of the opening ceremony was immediately broadcasted by Japan's major TV channels. As a result, I think that the name of ICO was well recognized throughout Japan.

Technical presentations

Two plenary sessions were held, in the afternoon of Monday 21 August and in the morning of Wednesday 23 August. At the first plenary session, a Nobel laureate, Prof. Hiroshi Amano, Nagoya University, Prof. Anne L'Huillier, Lund University, and another Nobel laureate, Prof. Takaaki Kajita, The University of Tokyo delivered plenary speeches on “New era of LEDs”, “From extreme nonlinear optics to ultrafast atomic physics”, and “30 years of neutrino researches in Kamioka”, respectively. At the second plenary session, Prof. Christopher Dainty, University College London, and Prof. James G Fujimoto, Massachusetts Institute of Technology talked about “Fundamental limits of mobile phone cameras” and “Optical coherence tomography and biomedical imaging”.

683 papers, including 18 keynote papers and about 100 invited papers, were presented at oral or poster sessions. At ICO-24, 18 research areas were categorized and the contribution of technical papers was solicited in these areas. More than 650 papers were submitted, and those papers were carefully reviewed and selected by the programme subcommittees of the 18 areas. As a result, 13 countries presented more than 10 papers. The 13 countries are Japan, China, Taiwan, Mexico, USA, Germany, Korea, Spain, Russia, UK, France and India. About 10 parallel sessions were always running. Every session room was crowded with a large number of audiences with active presentations and debates. The 18 areas categorized were the following:

- 1: optical design, optical materials, and photo lithography;
- 2: vision, colour, display and lighting;
- 3: optical metrology;
- 4: optical imaging and optical information processing;
- 5: advanced microscopy and spectroscopy;
- 6: biomedical optics/photonics;
- 7: nonlinear optics;
- 8: ultrafast phenomena and ultrafast optics;
- 9: high-power lasers and applications;
- 10: X-ray and high-energy optics;
- 11: micro- wave/millimeter-wave/THz photonics;
- 12: near-field optics, plasmonics, and metamaterials;
- 13: photonic crystal, nano structures and functions;
- 14: optoelectronics and photonic devices;
- 15: optical MEMS and micro-optics;
- 16: quantum optics and atom optics;
- 17: fibre optics;
- 18: optical communications and photonic network.

Award presentations and support to participation

The ICO-24 planned to support travelling and accommodation expenses to the presenters or Bureau members from developing countries. 12 participants received the support from ICO-24 with the registration fee waived. In addition, OSA provided support for travel expenses for 3 people.

The OSA/SPIE student awards were given to 18 students who presented excellent papers at the ICO-24 technical sessions. The recipients were selected from each category by the ICO technical programme committee members. The awards were sponsored by OSA, SPIE, as well as by the ICO. The winners, who received certificates at each technical session, were also invited to the banquet. At the awards ceremony, which took place on 23 August, just before the Congress banquet, the ICO Prize 2014 was presented to Prof. Martin Booth, UK, and the ICO Galileo Galilei Medal Award 2015 was presented to Prof. Aram Papoyan, Armenia. Both gave technical presentations on their achievements on the awards.

General Assembly

The General Assembly was organized in two sessions during ICO-24. Session 1 was held on Tuesday 22 August, 2.00–5.00 p.m., and Session 2 was on Thursday 24 August, 5.00–7.00 p.m. About 65 delegates from about 29 countries and 7 international societies participated in the General Assembly. At the first session, the ICO president for 2014–2017 presented his report, including the ICO application to become an ICSU Union and the ICO Strategic Plan 2017–2023.

The General Assembly debated and approved the ICO Strategic Plan. The preliminary list of nominees for the ICO bureau election was presented by the ICO past-president and chair of the ICO Nomination Committee, Prof. Duncan Moore, who also explained the process of late nominations. At the second session, the main agenda of the meeting was the election of ICO Bureau Members for the term 2017–2020. Prof. Juergen Czarске, Dresden Technical University Dresden, Dresden, Germany, presented Germany's bid to host ICO-25, which was very well received and unanimously approved by the General Assembly.

Congress Banquet

The Congress banquet was held at Keio Plaza on the evening of 24 August. Participants entered the banquet room with the welcome of eight Japanese Geisha, who danced and sang for 15 minutes. After the cultural performance, I gave a welcome speech as the ICO-24 Organizing Committee Chair, and Prof. Maria L Calvo delivered a celebration speech as former ICO president. The meal was started with a toast by Prof. Junpei Tsujiuchi, former ICO president. Meanwhile, eight winners of the OSA/SPIE student awards were invited to the stage and introduced.

I am convinced that such an introduction became a very honorable memory for the young award winners. After this introduction, the Geisha played a traditional Japanese game together with the participants, who thoroughly enjoyed it. Closing remarks were given by Prof. Juergen Czarске, on behalf of the organizers, announcing that ICO-25 will be held in Dresden, Germany, encouraging all the attendees to participate in ICO-25.



Eight Japanese Geisha performed during the Congress banquet.

2017–2020 ICO Bureau members

Position	Name	ICO member
President	Prof. Roberto Ramponi	Italy
Past-president	Prof. Yasuhiko Arakawa	Japan
Secretary	Prof. Dr Humberto Michinel	Spain
Associate secretary	Dr Frank Höller	Germany
Treasurer	Prof. Joseph Niemela	USA
Elected Vice-presidents Those in industry are marked with *	Prof. Qihuang Gong	China
	Prof. Seung-Han Park	Korea
	Prof. John Harvey*	New Zealand
	Prof. Leszek Sirko	Poland
	Prof. Nataliya Kundikova	Russia
	Dr Sara Otero*	Spain
	Prof. Mourad Zghal	Tunisia
	Prof. Adrian Podoleanu	UK
Appointed Vice-presidents	Prof. Dr Paul Urbach	EOS
	Prof. Kent Choquette	IEEE
	Prof. Ahmadou Wagué	LAM Network
	Prof. John Howell	OSA
	Prof. Gert von Bally	OWLS
	Prof. Eric Rosas	RIAO
	Dr Carmiña Londoño	SPIE
IUPAP Exec. Council delegate	Prof. Carmen Cisneros	

Conclusion

We are pleased to have successfully held ICO-24 in Tokyo, thanks to the strong support by the ICO Bureau members and each territorial committee, as well as international societies. I believe that ICO-24 has become one of the most commemorative ICO Congress in the whole history of the ICO. Finally, I would like to express my thanks to all Japanese colleagues and committee members who contributed to organization, preparation, and execution of ICO-24 in Tokyo.

Report on the ICAOP-2017

At ICAOP there were 260 invited papers out of which 83 were oral presentations and 177 poster.

A four-day International Conference on Advances in Optics and Photonics (XLI Conference of Optical Society of India) was held on November 2017 at CRS auditorium organized by the Department of Physics, Guru Jambheshwar University of Science & Technology, Hisar, Haryana. The chief guest on this occasion was Shri Benjamin Lionel, Director of IRDE, Deharadhun. The Guest of Honor was Shri Satish Kumar, Director of the National Institute of Technology, Kurukshetra. Prof. Kehar Singh was the technical chair of ICAOP-2017.

The conference was attended by over 400 delegates from India and abroad. It was sponsored by the Defense Research and Development Organization, the Department of Science and Technology-SERB, the Department of Atomic Energy-BRNS, the International Commission of Optics, the Optical Society of America, Bharat Electronics Ltd. and supported by manufactures/dealers. A souvenir was also released on the occasion of the inauguration emphasizing the completion and celebration of the 50th anniversary of Haryana. Prof. Kehar Singh, Technical Chair-IIT Delhi briefed the audience about the conference. It is the goal of this international conference to bring together leading optics and photonics educators from all levels and orientations to discuss, demonstrate and learn about new teaching methodologies.

ETOP' 2015 covered the following topics: Tools for photonics education (kits, laboratory training materials...), digital technologies in education (software, computer assisted learning), 3D virtual reality in optics and photonics, curriculum development driven by industry, training and continuing education, education and training for multidisciplinary education, international cooperation and co-development in education and training, metric and evaluation of education and training.

The Vice Chancellor of Guru Jambheshwar University of Science and Technology, Prof. Tankeshwar Kumar, gave a message at the inauguration of ICAOP: "Advanced optics based next generation devices are likely to influence our lives in so many ways that we could never have imagined a few decades ago. And we move ahead in 21st century with Photonics that will play even more significant role in new modalities in the practice of medicine, more efficient national defense, sensor technology based on nano-materials."

The Director of IRDE, Shri Benjamin Lionel, emphasized that battlefield strategy evolves with the technological innovations. Dr. A. K. Gupta, president of the Optical Society of India (OSI) briefed about the society goals and activities towards promotion of optics in the country. Prof. Satish Mishra, a rebound scientist of country better-known integrated missile technology development and currently director of the National Institute of Technology stressed on the development of indigenous developed technologies in this field of optics.

Also, Prof. Devendra Mohan Convener told that the ‘International Conference on Advances in Optics and Photonics’ being organized under the umbrella of the prestigious ‘Optical Society of India’ would nurture various fields on current advancements from communications to manufacturing, diagnostics to aerospace particularly with design of novel nanophotonic structures, quantum computing and imaging techniques.

Other activities during the ICAOP

There were four Plenary lectures and two Special Lecture/tutorial, these by Virendra Mahajan (USA) and Padamshree Rajpal S. Sirohi (IIT Delhi). There were also thirty seven invited talks from all over the world, 260 invited papers (83 was oral presentations and 177 poster presentations) organized in 26 parallel sessions on different themes. OSI meeting was held the first day of ICAOP. The technical session started with a plenary lecture by Zeev Zalevsky (Israel), on Remote photonic diseases sensing. He gave a glimpse of how photonics is going to detect some fatal diseases at earlier stage enabling better prevention and cure. The second half of the day started with the talk “Multi-controllable Metasurfaces” by the plenary lecture Akhlesh Lakhtakia (USA) who stressed out how the concept of multicontrollable metasurfaces is inspired by biological multicontrollability.

The 2nd day started with a highly informative plenary lecture by Prof. Daniele Faccio (UK). During his mesmerizing talk where he started with history of photography where the first photograph took days of exposure to modern day image capture targeting event control within nanoseconds, he emphasized on recent developments in CMOS technology. The 3rd day started with a plenary lecture by Prof. Pablo Artal (Spain). He explained about applications of adaptive optics in eye related health issue. On the last day of the conference there were two talks on silicon Photonics and Erbium doped fiber amplifiers by K Das and Vipul Rastogi.

OSI best paper awards were announced by the organizers; one for Optical Society of America (OSA) and six for OSI along with four ICAOP Awards. J. Banerjee got the award for best oral presentation. Namitha C. V., Parimal Sah, and Kavita Yadav got the Ist, IInd, and IIIRD awards for best oral presentation.

Sushanta Kumar Pal, Hauz Khas, and Ramesh Kumar got the Ist, IInd, and IIIRD Optical Society of India Awards for best poster presentation. Soumadri Samanta and Anil Kumar Chauhan got the Ist and IInd ICAOP-Young Scientist Awards for oral presentation. Jogender Singh and Atul Kumar Dubey got the Ist and IInd ICAOP-Young Scientist Awards for Poster presentation.



***Shri Benjamin Lionel**
Chairman of ICAOP-2017*

THE ICTP WINTER COLLEGE (2018-2020*)

ICO continued its involvement on ICTP activities collaborating with the ICTP Winter College, event where ICO holds an annual Award Ceremony for the ICO-ICTP Gallieno Denardo Prize Awardee, and a reception for the participants. The Winter College is preceded by an ICTP Preparatory School whose purpose is to provide basic elements of theoretical optics relevant to the College Lectures, enabling the students to be better prepared for the College. Prof Joseph Niemela is responsible for the activities in Optics at ICTP and has been the local organizer of the Winter College since 2009. Dr. M. Danailov, the director of the Laser laboratory at Elettra has also acted as local organizer for most Colleges.

The ICTP Winter College on OPTICS 2018

The ICTP Winter College was held in February 2018 in Trieste, Italy. This year the ICTP Winter college was mainly dedicated to extreme nonlinear optics, attosecond science and high-field physics. The aim of the Winter College was to offer PhD students a broad training on extreme light science, from ultra-short and ultra-intense laser pulse generation, to attosecond and Free Electron Laser (FEL) technology, focusing on applications of attosecond pulse generation in atomic and molecular physics, photo-chemistry and nanoscience, and the application of extreme light sources to matter-radiation interactions in general. The attendants had the opportunity to participate on tutorials and on hands-on laboratory sessions. More information can be found at <http://indi-co.ictp.it/event/8295/>.



The ICTP Winter College on OPTICS 2019

The aim of the Winter College 2019 was to offer Ph.D. students and other emerging researchers broad training in the innovative applications of optics and photonics in food and agriculture. Deriving impact through research, development and entrepreneurship in this sector will be explored.

(*) Due to the coronavirus crisis 2020 was the last in-person winter college.

Improving food, from production to processing, is one of the most important and successful contributions of modern optical and photonic innovations. Optical sensing and spectroscopy discoveries have provided huge advances in all areas, from identifying nutritional components, to uncovering contamination by adulterants and pathogens. Tailored light and light-based technologies also are used to better grow plants, purify water, kill pathogens, hatch eggs, and sort sperm and oocytes for herd control. The keen interest in photonics for food and agriculture is global and rapidly growing – a future with smart optics and photonics will succeed in feeding the world's people sustainably. More information is available at <http://indico.ictp.it/event/8643/>

The ICTP Winter College on OPTICS 2020

The aim of the Winter College was to offer Ph.D. students and early career researchers training in quantum optics and quantum information. The College will also offer insight in the new quantum technologies involving the generation and manipulation of photonic and matter-like states.

Quantum Optics, which studies how individual quanta of light interact with atoms and molecules, has been one of the most active research fields in the last years. Such endeavors have led to a deep understanding of the fundamental properties of light-matter interaction and its use to control and engineer quantum systems. Currently, taking advantage from properties like entanglement, nonlocality and coherence, photons and atoms are the key elements for quantum technologies applications. In particular, quantum information science has flourished everywhere in the world, including developing countries. Theoretical and experimental research is thriving, and leading the way to new technological developments. The Winter College will present the basic concepts as well as the most up-to-date research in Quantum Optics. More information at: <http://indico.ictp.it/event/9021/>



Akinwumi Akimpelu , receives an award at ICTP Winter College 2020
from Anthony M. Johnson, former OSA President).

TSOSA ADVISORY GROUP

Terms of reference

Terms of reference for the establishment of a body to advise on the coordination of activities in Optics and Photonics related to the Trieste System. Working name: TSOSA Advisory Group (Trieste System Optical Sciences and Applications Advisory Group).

The TSOSA Advisory Group is established with the purpose to offer advice on the development and coordination of activities on Optics and Photonics carried out or planned by the Trieste System. It is initially established by the following Organizations:

ICO, OSA, SPIE, OWLS, IAEA, UNESCO and Institutions of the Trieste System i.e. ICTP, ICS, TWAS, ICGEB, Elettra Synchrotron Light Facility and the Laser laboratory at Elettra. Participation of other Organizations and Institutions is open and welcome.

The TSOSA Advisory group is assumed to be aware of the activities and Programs of its members that promote the advancement of Optics and Photonics for the benefit of Developing Countries and that are related to the Trieste System Programs. Developing Countries are defined as per the U.N. rules.

The mandate of the TSOSA Advisory Group is as follows.

1. To stimulate the consistency of the activities of the member Organizations to maximize the outcome.
2. Suggest new activities and topics for the Workshops, Courses, Conferences held by the Trieste System.
3. Make sure that Optics and Photonics activities of the Trieste System are adequately publicized by the organizing bodies of the TSOSA Advisory Group including the activities held at ICTP and at the ICTP Affiliated Centers.
4. To propose new schemes that can improve the activities on Optics and Photonics of the Trieste System.
5. To stimulate nominations from Developing Countries for fellowships, grants and awards of the respective Societies and Organizations keeping their full autonomy of the final decisions or selections.
6. Issue an annual progress report to its member organization governing bodies.

Each member organization, including each member body of the Trieste System, will appoint one representative in the body, with a specified term of office, and may appoint a substitute in addition.

The TSOSA Advisory Group has a chairperson, elected annually by the members at its meeting. It meets annually in Trieste during the Winter College on Optics and otherwise operates by email. The ICTP provides the secretariat for the TSOSA Advisory Group.

The chairperson may invite individuals to attend meetings in a non-voting capacity as appropriate.

Amendment 1 (February 14th, 2012): The TSOSA Committee approved the admission of the US-NAS and the LAM-Network as member organizations of TSOSA, with one representative in the body.

Minutes of the TSOSA Advisory Committee (2018-2020)

Minutes of the 2018 TSOSA Advisory Committee

13 February 2018, Lunqvist Lecture Hall, ICTP, Trieste, Italy

Participants: Miltcho Danailov (Sincrotrone Trieste), Vasudevan Lakshminarayanan (University of Waterloo), Krisinda Plenkovich (SPIE), Roberta Ramponi (Politecnico di Milano), Katerina Svanberg (Lund University), Andrea Vacchi (Istituto Nazionale di Fisica Nucleare), Gert Von Bally (University of Muenster), Ahmadou Wague (Universite Cheikh Anta Diop), Maria Yzuel (Universdad Autonoma de Barcelona), Anna Consortini (Universita degli Studi di Firenze), Kari Apter (OSA) and Joe Niemela (ICTP)

1. Introduction and welcoming remarks

The meeting was opened at 9am by J. Niemela who welcomed the committee and introductions were made. Point of order, Johnson was unexpectedly unable to attend due to passport issues. Apter will vote for the OSA in his place.

Niemela said that Guzman was not able to attend. He nominated Ramponi as TSOSA chair for 2018 and 2019. Svanberg seconded the nomination and Ramponi left the room. Niemela clarified that Ramponi was being nominated as an individual not as an organization. He proposed that moving forward the chair serve for a two year term with an option to serve a second two year term. Yzuel spoke in favor of the proposal. No other candidates were nominated.

RESOLVED: The committee approved Ramponi as Chair for 2018 and 2019. Motion passed unanimously.

2. Approval of the minutes of the previous TSOSA meeting

Niemela said that the Secretary had not provided minutes from the previous meeting. He provided abbreviated minutes for committee review and approval. Ramponi said that minutes would be approved following the coffee break. Lakshminarayanan moved to approve the abbreviated minutes as presented and it was seconded by Von Bally.

RESOLVED: Minutes were unanimously approved as presented.

3. Briefing on Winter College

Niemela said that the 2017 Winter College on Optics included experiments for the first time. He reported that there were 89 participants which was not optimal. A smaller number of students would be better for experiments. The largest number of students was from Iran. Lakshminarayanan noted that there were no Chinese students in 2017. Niemela said that there had been participation in the past from China but it had dropped off. He said that there was a Chinese Director this year and that there were some Chinese students participating for 2018. Svanberg said that she had been promoting Winter College at student talks in China. There was discussion about the challenges of participating for students without strong English skills. Niemela reported that there was 42% female participants and that the faculty was 21% female. He said that the faculty gender balance was an area for improvement.

The 2018 college has 68 participants and 16 are from China; 43% of the participants and 26% of the faculty are female. He said that there were more issues with visas this year than in past years. He said that labs were offered again this year and they were well attended. There was discussion about the affiliation of the Winter College Director from China and clarification was requested.

4. Briefing on other activities

Niemela reported on other related ICTP activities. He said that Komlan GADEDJISSO-TOSSOU from Togo had set up a QCL in the SPIE Anchor Lab and that they have used a number of programs to bring students from developing countries to work with Humberto Cabrera in the lab. Jehan Akbar from Pakistan collaborated with Cabrera on a proposal for a lab development project in Pakistan that received funding and was a direct outcome of the work on the ICTP campus. He highlighted it as a nice development. He also reported on the Training for Research in Italian Labs (TRIL) program which has a longer term study programme. He said that John Freddy, past ICTP/ICO prize winner, will be coming to ICTP for a few months to work in the lab under the Associates Programme which is a good way to develop researchers and to give them skills that they can bring back to their home labs.

Danailov said that they developed a small experiment for the students related to attosecond sciences and also provided some simulations. He said that the subject was not easy but it went well. Wague agreed and said that the students enjoyed the experiment. Niemela said that the experiments didn't have to exactly match the college topic but that was the ideal situation. Consortini said that the students were very active and that they all attended the afternoon experiments. Danailov reported that his fiber laser work would be published and that he had hosted associate visits.

Niemela said that Dan Cojoc was also working on an optical tweezer project which had produced a PhD from Senegal and had been used by many associates. The optical tweezers provide a biophysics tool for student use. There was discussion about the possibility of sending the tweezer equipment to a lab in Senegal. Niemela said that the applied physics unit had a 3D printing fablab that could be geared toward photonics for interesting projects. He said that spectrometers could be produced in the fablab.

4. ICTP Awards

Niemela announced that Urbasi Sinha from India was the ICTP/ICO Prize winner and he read the citation. Consortini said that she would like to have more nominations for ICO/ICTP prize. Ramponi said that this was a common problem for older prizes and that it was happening in many areas. She said that Photonics21 was ending the student innovation award because it was difficult to get nominations. She added that Zghal did a good job promoting the award and sent the nomination information to the ICO territorial committees. Wague suggested starting promoting earlier and possibly refereed self-nomination. Yzuel spoke against self-nomination. The prize is one of few prizes for younger people from developing countries. She said that we need to promote it make it more visible in developing countries. She said that scientific society student chapters could help promote the award by sending information to Chapter advisors. **ACTION:** Apter and Plenkovich with take this suggestion to their committees. Mourad will send them information for distribution.

Apter said that OSA has an award for young researchers and recently redefined young to someone within 10 years of receiving a terminal degree and the number of applications increased significantly. Wague said that he could post the announcement on the LAM website. Ramponi also said that there was no poster for the prize.

ACTION: Mourad will explore producing a poster.

5. International Projects

Niemela said that he would be working with Lila Punawalla Foundation for women's education in India. They are planning a science education outreach project for girls in India in April. They also did a min-ALOP in Mumbai last year and have an active volunteer in the area. Cabrera led an outreach activity Fatima University with Imrana Ashraf for girls in India.

SPiE Anchor Research: QCL project – Andrea Vacchi reported on the work in high precision spectroscopy in muonic hydrogen. The core of the project is the development of a laser system based on nonlinear optics. The project is a small collaboration that includes a Polish group, Japanese group at RIKEN and many local collaborators. He provided highlights of 2017 activities and an overview of an experimental activity at Rutherford Lab in the UK. The initial QCL that was developed is at the ICTP lab and being used for experiments during the Winter College

6. 2019 Winter School

The 2019 Winter School proposal for Advanced Optics and Photonics to Feed the Plant Planet Sustainably was reviewed. Ramponi said that new proposals were needed for 2020. She said that quantum optics was suggested as well as high precision spectroscopy for physics which could be broadened to metrology at large with one week dedicated to fundamental physics and one week dedicated to applications. She requested to get new proposals at least one month in advance of the next TSOSA meeting. Niemela reviewed the 2019 proposal which included as directors Cather Simpson and Anna Mignani as well as Sarun Sumriddetchkajorn from Thailand. Hands on activities are proposed. He said that some of the pieces for the spectrometer activity could be produced by the students in the ICTP fablab using 3D printers.

Ramponi said that laser surface fracturing for antibacterial packaging in foods could be an interesting topic to be introduced. She said that there were portable machines that could be brought to ICTP for the college. Svanberg said that safety pack was a related project at Lund University that that could also be included. Wague suggested contacting Bagnato in Brazil who is working in this area. Danailov suggested bringing Michael Sorenson and Sune Svanberg's LED microscope.

ACTION: Niemela will contact Sorenson about being involved in the college. Lakshminarayanan sent Niemela a suggestion for a holographic grating section related to work being done at Waterloo University.

ACTION: Svanberg and Ramponi will send contacts for the project to Niemela. Niemela will make these suggestions to the Directors.

There was discussion about modifying the title. The title was modified to "Optics and photonics in food science: applications for safe and sustainable nutrition." Consortini suggested more integration with ICTP staff and organizers and said that collaborating with Danailov worked well this year. There was a suggestion for an experiment on basic spectroscopy for the preparatory school. It would be useful to know who the instructors will be for the preparatory school in advance.

7. Discussion on Phablab4.0 / Photonics Explorer

Integration into general optics programs at ICTP. Ramponi said that idea was to use the fablab that is in Trieste for the ICTP. Fablabs is European initiative to enhance fablabs to support making photonics and use of photonics materials and optical components. There is a large group of scientific partners and workshops – like maker fairs. They are targeting three levels 11-13 year old, high school students and young professionals.

She presented the activity for each age group and highlighted challenge projects for students and young professionals. They have a competition for high school students to develop a table top educational game. There were 426 students who developed 28 games in 16 cities. They have launched a 2017-2018 edition and developed a quantum race game.

The Photonics Explorer Kit was developed within a European project with Hugo Thienpont's group in Brussels. The kits have been updated and modified. The focus is on educating the teachers. They have Local Associated Partners (LAPs) that can purchase kits, distribute them locally and provide teacher training. One kit costs 150 euros which includes the training and 10 people can use it at one time.

Yzuel said that it was a good project and that we should consider how to extend use to developing countries. Niemela said that ICTP purchased ten of the kits for use at the Winter College and after the College he provided them to a group in Pakistan for use. The possibility of hosting a training at ICTP was suggested.

Niemela said that he had funding to purchase five kits and that it could be combined with a Winter College. Wague said that there was interest in using the kit in Senegal. Training is half of a day.

ACTION: Share information on how to purchase kits with TSOSA Members. Ramponi said that the people involved in this activity can cooperate with ICTP.

8. Support of the ICTP programs and the International Day of Light.

Apter presented an overview of OSA collaborations with ICTP. She said that 55% of OSA member reside outside of the US and 40% are students. She provided highlights of IONS conferences that are organized by students. They run 8-10 IONS student conferences per year. They also run an annual Siegmund School. Iam Wamesly and Liz Rogan will be in Paris for the inaugural IDL event and they will be celebrating at CLEO also.

Svanberg provided an overview of SPIE direct support for ICTP including the Winter College, ALOP and the anchor research lab. She reviewed other SPIE resources for outreach including materials for educators, students and women. She provided a list of resources that SPIE produced for the community to help celebrate the International Day of Light and highlighted the SPIE Photonics for a Better World blog and the INASP program for free journal access in developing nations.

Von Bally provided an overview of OWLS programs. Owls initiated an early Biophotonics College in 2003. Stephen Hell was a presenter and past prize winner. The regular OWLS conference is regularly held in developing countries. In 2016 it was held in Mumbai India. He provided a list of conferences that they cosponsor and said that they try to support participants from developing countries to participate. OWLS 2018 will be held in Australia and it will be the 15th annual conference, David Sampson will organize. The ICO's 25th conference will be held 31 Aug -4 Sept in Dresden Germany.

Wague said that LAM was established in 1991 in Senegal and includes 20 African countries. They organize a conference every other year. They held an event in 2015 for the International Year of Light and they are planning an activity for the International Day of Light. They are working to develop a network for science clubs in West Africa. He expressed an interest in bringing in optics Kits for this group. Niemela suggested hosting an ALOP in Senegal.

Roberta said that EOS was not represented at the meeting. She suggested that we work to involve them more in TSOSA. They are planning some events with Students. They are international but primarily focused on Europe.

ACTION: Ramponi will contacts.

ACTION: Plenkovich will contact IPS. Vengu suggested contacting Barry Shoop.

Ramponi suggested reaching out to RIAO/OPTIALS group in South America. There was discussion about reaching out the Chinese Optical Society also. Wague said that there is group focused on science education in CESEME in Africa that could also be engaged. He said that LAM had a new web address which is LAMOPTINET.org.

9. Other Business No new business was introduced.

The meeting was adjourned at 12:30. The group went to the multi-disciplinary lab on the ICTP campus for lunch and a tour.

Draft prepared by Krisinda Plenkovich. Approved by the TSOSA Advisory Committee on February 19th, 2019.

Minutes of the 2019 TSOSA Advisory Committee

19th February 2019, Lunqvist Lecture Hall, ICTP, Trieste, Italy

Participants: A. Johnson, A Consortini, M. Danilov, M. Yzuel, K. Rochford, A Vacchi, H. Ghalila, V. Lakshminarayanan, K. Apter, G. Von Bally, H. Michinel, A. Wague, K. Svanberg, K Plenkovich, and J. Niemela.

1. Introduction and welcoming remarks

Niemela made opening remarks. Minutes from the previous meeting were reviewed. Yzuel requested that the title of the college be added to the minutes. Under item number nine, ICO 23, she recommended adding the year as 2020. Von Bally said that the OWLs conferences are partially held in developing countries and that the ICO 25 conference would be held jointly with OWLS 16. Niemela/Lakshminarayanan moved that the minutes were approved as amended.

2. Briefing on activities

Niemela provided an update on the 2018 winter college on Extreme Non- linear Optics, Attosecond Science and High-field Physics. The data on gender and nation of origin was reviewed. He reported that there were 64 participants and that 45% were female, additionally, 25% of the faculty were female. He said that the average percentage of female participants at the ICTP was 24% but that all applicants are ranked independent of nationality and gender. Niemela said that most students were not familiar with the food and farm topic so they invited additional students to participate in the preparatory school. Hands on activities were included in the program as recommended by TSOSA. He said that the committee would tour the new laboratory space and see the work being completed by a student from Togo later in the day.

Lakshminarayanan suggested moving from costly software like Matlab to open access software in the future and added that some people were moving to Scilab. He suggested that we talk with ZMAX about participation. Niemela suggested that Lakshminarayanan could help identify different software for use in future winter colleges. Niemela said that numerical simulations had been well received by the students and that Jean luc Dumont provided professional development training on making scientific presentations which was funded by NAS and the USAC-ICO. He said that the students made three minute presentations on their work. He suggested the proposal writing could be a good future topic.

This year's college add topic, Applications of Optics and Photonics in Food Science was well received by UNESCO. Food production and food security are important issues. One of the directors, Cather Simpson, runs a lab in New Zealand that increased the gross national product 0.2%. The other directors were Sarun Sumriddetchkajorn, Ana Mignani. All three directors are entrepreneurial and that message was communicated to the students. There were 58 participants and 52% are female which is a new all-time high. The faculty are 33% female. Niemela added that total attendance that attendance was lower than in recent years. He was only able to offer limited travel support and there were a number of students who were not able to get visas.

The ICTP has a good relationship with the foreign ministry and assists students in getting visas. He said that this college was run like a school than previous programs which were more lecture based which is the direction that TSOA was encouraging. Niemela said that additional guidance in the instruction for directors will help keep the college focused. He said that he would take an action to work more closely with the directors next year to coordinate program so that it continues to be run more like a school than a conference.

Demographics were discussed. There was a high number of students from Iran. Niemela said that they received a high number of application from Iran and that if you normalized by number of applications the number of students was appropriate. There was discussion about the fact that there were no students from China. There was a Chinese director last year and he encouraged students from China to participate but there is very little to no participation from China. There was discussion about adding representation from the Chinese Optical Society to TSOSA.

Niemela introduced the Sandwich and TRIL programs which are collaborations with the IAEA . Training and Research in Italian Laboratories (TRIL) supplements the SPIE-funded Anchor Research Lab program. TRILL can be used at other Italian labs outside of ICPT also. ICTP Fellow, Humberto Cabrera from Cuba, has been running trainings in the lab on weekends focused on low cost activities. ICTP Fellow Colman from Togo has been working with A. Vacchi and received funding from TWAS to set up equipment in his lab in Togo. He said that ICTP Associate Jehan Akbar had received the ICO prize. He applied for a grant from TWAS and received 30,000 euros for equipment in the KPK region of Pakistan. The program goal is to identify the brightest of the young people, bring them into ICTP and help them develop skills and learn to write proposal so that they can get funding.

Ramponi suggested utilizing the fablab in the Fermi building for a future college. Niemela said that they had intended to use it this year but it did not materialize but that they would like to use it for a future school. A. Vacchi and Ramponi will work with Niemela to develop a proposal for a future winter college. A. Vacchi suggested developing a project that would be shared more broadly as an outreach resource.

3. Activities at the Fermilab.

M. Danilvo said that they had supported three visits from students associated with the TRILL program including Mbaye Diouf from Senegal who was working on a low cost digital micron mirror project with Jose Suarez Vargas from Venezuela. For the first time, they prepared an experiment for the winter college and they have also been working with high school students from Italy who were very enthusiastic about the project. This is something that could be part of a kit. There are just 3-4 components and it could be set up in the new lab space. The papers on their work have been published are listed in the TSOSA background material. This was the 25th anniversary of the synchrotron and they are received 100 million euro for a facility upgrade to generation 3.5. The first part of the funding will be delivered this year and the project should be completed by 2025, with some of the major upgrades completed by 2023.

Niemela said that ICTP and the Elettra synchrotron maintain a close relationship.

ICTP has used the Elettra facility for training for the SESAME project. There was a suggestion for a future TSOSA visit to Elettra. Niemela said that next year Trieste would be the EU city of science.

4. ICTP Awards

Niemela said that the ICO/ICTP prize had been renamed in honor of Galliano Denardo. Past prize winners were reviewed. Urbasi Sinha from India was the winner last year. She works in quantum optics and is proposed as a possible director for a future winter college on quantum optics.

The 2019 winners, Muhannad Faryard from Pakistan and Christian Tomas Schmiegelow from Argentina, will both will present 30 minute talks later today. They were both ranked similarly and a decision was made to award both the ICO/ICTP prize. There were 6-7 nominations this year which is a good number. Niemela said that he solicited nominations to help increase the pool.

5. FAMU Experiment

Vacchi presented and update on the FAMU experiment on measuring the ground-state hyperfine splitting in muonic hydrogen. He said that they built special muonic atoms for spectroscopy and are publishing the results of this experiment this year. They collaborate with ICTP and Elettra, without their help their experiment would not be possible. They have approximately 50 people working on the experiment. There have been a significant number of publications this year. He provided an overview of the laser lab facilities and said that SESAME was a partner organization. He provided an overview of the SESAME detector system target which is ambitious.

6. Proposals for 2020 and beyond

Niemela said that two proposals were received, one on quantum information and optics and one on LIDAR for environmental sensing. He said that it would be good to have a less application focused topic than in 2019. Svanberg said that the LIDAR and sensing were important areas with environmental optics, physics, health and medicine. A. Johnson recommended Halina Dunlop as a possible director and Sir Peter Knight as a lecturer for a quantum school. Ramponi suggested increasing the focus on applied aspects including integrated quantum optics and quantum sensing. She said that LIDAR was a good topic also.

Lakshminarayanan suggested including something on the realization of quantum applications and adding lectures from industry. Von Bally said that that he was impressed by the strong representation of women and that he had additional names to suggest. He said that in the future we should consider reflecting the social impacts of the science being presented. Niemela said that professional development and ethics were topics that need to be included. Consortini supported a rotation between a focus on application every other year. There was agreement that quantum should be the topics for the 2019 school. Johnson/Yzuel moved and the motion was approved unanimously.

7. IDL and initiatives of partner societies.

Plenkovich said that 2020 IDL activities were being discussed and highlights of the upcoming 2019 IDL Flagship event at the ICTP were shared.

Niemela said that the poster was being prepared and that help was needed from this group to promote the event and to encourage participation. Ramponi added that there would be a school with a focus on skills taking place the week prior to the IDL event. She suggested a speaker) for the IDL event in Trieste who would be teaching at the school. Wague suggested an initiative to fight light poverty.

Ramopni said that the IOP had launched a new journal physics in photonics and there will be a special issue on High Power Lasers. She proposed that LAMP and the IUPAP Africa project submit a paper to the new journal to get more visibility. She will contact the chair and make the suggestion.

Svanberg presented on the activities of SPIE in support of IDL and the ICPT. She said that the SPIE Educator Prize had been renamed in honor of Maria Yzuel. She provided an overview of SPIE support programs with ICTP said that SPIE provided resources for educators, and students including scholarships. She talked about Women in Optics programs and IDL activities Niemela said teacher training and inquiry based learning was a topic of interest at UNESCO. There were questions about who should lead science education. The Science division or the education division.

VonBally provided an update on Optics within Life Sciences (OWLS) activities. He said that November 25- 28 was the 15th annual meeting in Australia. He provided an overview of upcoming OWLS conferences and said that OWLS would be heavily involved in the ICO 25 and OWLS 16 event in Dresden Germany 31 Aug-4 Sept.

Johnson said that he visited the ICTP for the first time in 1988 for the first Edward Bouchet International conference on physics and technology which was a blend of African and Africa American researchers. He said that OSA has been a financial sponsor of the winter college since 2000 and that they provide \$10k in support and that they were an IDL partner. He provided highlights about OSA membership and a history of OSA members in developing nations. He thanked Niemela for his work to continue the TSOSA and said that continued collaboration across the societies was important.

Wague shared a photo of the lunar eclipse from Senegal and said that related activities were developed and that school children were invited to participate. He said part of the duties of the LAM Network were to share science with the general population and to explain that an eclipse was a science phenomena and did not indicate a future disaster. He said that they also distributed 100 solar lamps. They are planning a LAM workshop and they are making an effort to revive the African Physical Society and that they would host a meeting on photonics for sustain able development in 2020. The African spectral imaging network is organizing a workshop in Ghana. Niemela said that Fatu from Senegal was at the ICTP working to apply for TWAS funding to set up a lab in Africa.

Ghalila said that they were preparing an IDL activity in Tunisia that would be held in the city of science, Tunis. They are also preparing an ALOP teacher training together with Zohra to take place in July. He said that Mourad Zghal is preparing a conference activity in September called Optisud 4-7 sept jointly with ICO and IUPAPs Zghal is now the editor in chief of the new African Physics Newsletter which will be shared through the ICO network.

Michinel said that the EOS website had information on the next biannual meeting which would be in Portugal in 2020. Ramponi said that ICO had a number of prizes including the ICO/ICTP and a joint prize with IUPAP. She said that nominations for the Galileo Galilei medal should be submitted by 5 April and asked TSOSA to send her nominations. She highlighted upcoming events with ICO participation and said that they took part in the launch event for the new Mexican Optical Cluster. Michinel requested information for the ICO newsletter like events, awards and activities. They produce the newsletter quarterly. ICO will cooperate with IUPAP for the centenary celebration in 2022. ICO is discussing with IUPAP about the future and how to achieve the goal of representing optics at a global level. They expect 2022 to be the international year of basic science in the developing world.

Consortini said that SIOF was involved in a number of conferences and that they were involved in second annual bioscience conference.

8. Other Business No new business was introduced.

The meeting was adjourned at 12:40. Niemela said that lunch would be at the Galileo Guest House and that there would be demonstrations and a lab tour.

Draft prepared by Krisinda Plenkovich. Approved by the TSOSA Advisory Committee on February 18th, 2020.

Minutes of the 2020 TSOSA Advisory Committee

18 February 2020, Lunqvist Lecture Hall, ICTP, Trieste, Italy

Participants: C. Roll, M. Bertolotti, A. Consortini, M. Danailov, A. Johnson, V. Lakshminarayanan, H. Michinel, J. Niemela, K. Plenkovich, R. Ramponi, K. Rochford, K. Svanberg, A. Vacchi, G. Von Bally (remote), A. Wague, M.J. Yzuel

1. Introductions and Welcome

The TSOSA Chair, Roberta Ramponi, welcomed the board and introductions were made. Niemela said that a new ICTP Director, Atish Dabhokar, was appointed in November 2019. He said that Dabhokar is interested in scientific excellence as a priority and that he was on travel and would not be able to join the meeting.

2. Approval of Minutes

The minutes from the previous meeting were presented by Plenkovich and approved.

3. Briefing on 2019 activities

a. Laser Lab at Elettra: M. Danailov provided an overview of activities and reviewed the unique features of the FERMI FEL. He said the from both a scientific and facility perspective it was a positive year. Funding and approval was received for a facility upgrade as part of the ELETTRA 2.0 project with a project completion by 2022.

He presented information about attosecond pulse shaping using a seeded free-electron laser research and related publications.

b. ICTP Winter College and Preparatory School: J. Niemela reported on the 2019 ICTP Winter College and Preparatory School on Applications of Optics and Photonics in Food Science. He said that the STEP, TRIL and Associate programmes were closely integrated with TSOSA activities. He said that the Winter College topic was application-focused in 2019 and theoretical-focused in 2020. The 2019 attendances was slightly lower than recent years with 58 students; 52% were female. The entrepreneurial and lab components were well received. There was a goal to involve the 3D printing lab that was not realized but it would be considered for future colleges.

He said that the preparatory school for the 2020 Winter College on quantum photonics and information was well connected to the college programme content. There was discussion about varying student participant skill levels. Niemela said that the TSOSA Board should consider how to better connect the preparatory school with the programme. V. Lakshminarayanan said that computer labs with Zemax simulations would be a useful addition. K. Plenkovich reported that she had researched the Zemax Global Academic programme and that it might be a fit but students and local organizers would need to apply for the programme. A. Consortini said that a student told her that this week was her first time in a lab. There was discussion about increasing awareness of the programme in sub-Saharan and encouraging instructors to write recommendation letters.

ACTION: The TSOSA board will work with A. Wague to develop ideas to increase awareness of the programme in Africa. A. Wague will provide contact information for outreach. R. Ramponi suggested promoting this activity through partner society student chapters.

ACTION: J. Niemela will send a message to partner societies with college details and deadlines to be distribute to their student groups. There was discussion about using past ICTP Fellows and students to increase programme awareness.

c. International Day of Light (IDL) Flagship Event: J. Niemela provided highlights from the IDL Flagship event that was hosted at the ICTP on 16 May 2019. He said the theme was illuminating education and he reviewed a list of key speakers. He said that there were 123 participants including 27 from Italy and 62% were females. M. Yzuel said that the ceremony was excellent because the programme was very diverse and there were many young people in the audience. J. Niemela said that for 2020 there were no flagship activities planned but grassroots activities would be increased. K. Plenkovich said that a flyer was distributed to the groups with statistics from the 2019 effort and that the target for 2020 was 1,000 grassroots activities. R. Ramponi said that the IDL needed to be a bottom up activity and that level of activity that was expended for the International Day of Light could not be maintained. It was agreed that student chapters should be encouraged to register their events.

d. SPIE Anchor Research activities at ICTP: J. Niemela said that the SPIE Anchor Research lab activities are an important training tool at the ICTP. He said that Humberto Cabrera was driving the effort to take full advantage of the programme and that there had been some publications and a patent that resulted from the work done in the lab.

A summary on Active Learning in Optics and Photonics (ALOP) activities in the meeting materials and that trainings were held in Peru, Indonesia and India. R. Ramponi said that there was an interest in developing a Fablab in Tunisia and that they were to host an ALOP training. J. Niemela said that the EPS Young Minds programme had supported a group of students to build their own equipment and take it back with them to Morocco and Palestine to support water quality projects. He said that developing a kit model for use in the College that would allow for more individual hands-on activity was a goal.

e. Muon Project – SPIE Anchor Research: A. Vacchi presented information about the experiment for the muon project as part of the SPIE Anchor Research programme and said that a report was included in the meeting packet. Last year they were able to prove that the process that they were using was effective and they have approved projects scheduled for March and July in conjunction with Oxford University. They have been acquiring progressively positive results and working with a growing group of collaborators. They hope to get the first significant results this year. There are two competing projects, one in Japan and one from a Swiss-German group. They are using different crystals and wavelengths. There are possible uses in medical applications, specifically for brain surgeons. A long lasting activity to develop a specialized detector for the SESAME facility was also completed this year after five years of development work.

4. The ICO/ICTP Gallieno Denardo Award 2020

J. Niemela announced the Kok-Sing Kim from the University of Malaysia received the ICO/ICTP prize. He said that he works with the building industry in Malaysia on the development of sensors. M. Zghal was the chair and there were 5 good quality candidates nominated.

5. Discussion on proposals for 2021 and beyond

K. Svanberg said that a proposal for a Winter College on LIDAR for remote sensing and robotics had been submitted. She said that the topic was appropriate for this type of school and that there were applications in many areas including in malaria prevention. She said that a list of potential instructors was included in the proposal but that it could be expanded to include additional names. V. Lakshminarayanan said that the LIDAR proposal was consistent with the plan to rotate between theoretical and application focused topics. Potential additional instructors were discussed. Pollution was added as a topic area. R. Ramponi said that industrial applications should be included and she suggested inviting someone from Italy to reduce travel. The list of potential directors was reviewed. It was agreed the Papalardo, Brydegaard, Gasmi, and Shaw should be proposed as directors.

ACTION: K. Plenkovich will update the proposal and send a final draft to Niemela by 28 February.

A. Consortini suggested a future college on the optics of terahertz. M. Danailov supported the proposal and said that there were possibilities to collaborate with Elettra. M. Bertolotti suggested thermowaves as a future subject. Danailov suggested looking for the relationship to optics.

7. Initiatives in international organizations

In support of the ICTP Mission and Programmes and the International Day of Light:

a. K. Svanberg presented on behalf of SPIE and shared the society mission. She provided an overview of SPIE and ICTP collaborations including free journals, Winter College travel support, Anchor Research Programme, ALOP and the new TRIL Fellow Collaboration. SPIE and OSA are supporting TRIL Fellows for the first time in 2020. She said that SPIE provided \$5.6 million in community support in 2019 and highlighted joint programmes including the new See the Light Campaign and the celebration of the 60th anniversary of the laser.

b. A. Johnson presented on behalf of the OSA and introduced the new OSA Director in Europe, Claus Roll. Roll introduced himself and said that his role was to be an ambassador for OSA. A. Johnson presented information about OSA's goals to focus on integrity, innovation, impact and inclusivity. He said that the OSA Board of Directors was over 50% female and that 59% of their 23,000 members are outside of the USA. They have 402 student chapter and 22 local sections. The International OSA Network of Students will hold events in seven countries and they are each eligible for grants of up to \$7,000 + 2 Visiting Lecturers. He said that the OSA Foundation provided training, mentoring, scholarships and travel support programmes. The Siegman summer school on lasers will be held at the University of Warsaw in July 2020 and they will support participation of 100 graduate students.

c. G. Von Bally joined the meeting by Skype and presented an update on Optics Within Life Sciences (OWLS) activity and said that Sudipta Maiti was the current OWLS president. He said that OWLS supported the India Biophotonics Physics meeting and the FCS national workshop on fluorescence where student prizes were presented. In 2020, OWLS will collaborate on a joint conference with the ICO; the 16th OWLS international conference will be held together with the 25th ICO conference in Dresden, Germany 31 Aug-4 Sept. Conference topics were highlighted. He said that 20 February was the deadline for poster and paper submissions. There will be plenary presentations from three Nobel Laureates, including an opening talk from Stephan Hell. TSOSA Board members were invited to join the event.

d. H. Michinel presented a list of the EOS affiliated societies and branches and shared their Mission statement. He said that there will be annual meetings of the EOS beginning in 2020, the next meeting will be 7-11 Sept on Porto, Portugal organized by Manuel Costa and they will have an open access journal published by Springer. He said that they would like to be more involved with the ICO in the future.

e. A. Wague said that the LAM Network had organized 11 international workshops and that the ICTP was a supporter. He said that they were trying to revive the African Physical Society and that he was serving as the President. They are preparing a presentation ICO general assembly to host an ICO meeting in Dakar, Senegal. It will be presented at the bureau meeting in Dresden. R. Ramponi supported the proposal and said that it would be cost effective and allow for larger participation from developing nations.

8. New Business

A. Johnson requested TSOSA develop a plan for maintain the programme when Niemela retires. J. Niemela said that the new ICTP director supported TSOSA activities that the Winter College in Optics would not be reduced if budgets remained stable. He suggested Marco Zennaro, Nadia Bingley or Maria Liz as possible future local organizers. M. Liz is a member of the ICTP professional staff and runs the activities for Elettra. He suggested involving her in the 2021 programme. Action: J. Niemela will mentor potential replacement staff and increase his/her involvement in the Optics Winter College. NOTE: Nadia Binggeli has accepted the role of local organizer for 2021 and moving forward and the ICTP Officer in Charge, Sandro Scandolo has agreed.

J. Niemela suggested greater involvement from the IOP. He said that K. Plenkovich had discussed with the Chinese Optical Society about joining TSOSA and that they were interested in participating. The Tunisian Optical Society has always been an active member of TSOSA and R. Ramponi reported that they are willing to contribute also in the future. M. Yzuel suggested contacting IPS. There was agreement that the Indian Optical Society should also be contacted as well as getting IEEE Photonics back on board. Action: J. Niemela will contact additional societies about becoming TSOSA Board members.

9. TWAS Physics Grant opportunities

J. Niemela said that TWAS offers physics grants to support lab equipment for the least developed countries but they don't have good connections to the physics community and need additional good proposals. Average award amounts are 10,000-15,000 euros and the application deadline is 31 March. Action: Niemela will draft a TWAS Physics Grant social media announcement for the Societies to share.

10. Other issues

No other issues are raised and the meeting was adjourned at 15:30.

PART II:

MEETINGS PROCEDURES

ICO CONGRESSES AND OTHER MAJOR ICO EVENTS

Topical Meetings, Regional Meetings, Schools

Information and Guidelines

Application deadlines are April 15 and October 15 of each year. The applications must be submitted to the ICO Associate Secretary by a deadline that is at least 12 months prior to the event and before the first announcement.

- [Application for ICO General Meetings](#) (Word Doc)

A - General conditions:

1 - "Event" in this document refers to a scientific meeting, college, or school. As opposed to other events with ICO participation, ICO Congresses and other major ICO events are generated from the very beginning by ICO or in close relation with ICO. A companion document to this one gives the information and guidelines for ICO Cosponsorship and Endorsement of Conferences and Schools, where ICO is not the primary organizer.

2 - The following rules apply in all cases to ICO General Meetings and other major ICO events

- the event should be international - typically, at least 30 % of the expected attendance and at least 50 % of the Program Committee should be from outside the host territory;
- the ICO Bureau should perceive clearly that the meeting will be of a good scientific quality and that the timing and venue are appropriate;
- the ICO Territorial Committee of the territory where the event is to be held should approve the project;
- in agreement with the organizers, the ICO Secretariat applies for the formal sponsorship of the ICO General, Regional, and Topical Meetings by IUPAP;
- the organizers should confirm compliance with the general principle of "free movement of scientists" as defined by the International Council for Science ([ISC](#)) in the booklet "Advice to Organizers of International Scientific Conferences". The International Union of Pure and Applied Physics ([IUPAP](#)), in which ICO is Affiliated Commission 1, adheres to the declarations of ISC. In essence, the host territory must guarantee that a *bona fide* scientist or engineer of **any** nationality or citizenship may attend. It is not sufficient to make such a guarantee only for persons from territories recognized by the host territory. Any failure to honor a guarantee is reported by ICO to ISC through IUPAP.

Following a decision by IUPAP, the organizers are requested to publish the following sentence in any circular, announcement, and in the Proceedings of the conference: "To secure IUPAP sponsorship, the organizers have provided assurance that (Conference name) will be conducted in accordance with IUPAP principles as stated in the ISC Document "Universality of Science" (sixth edition, 1989) regarding the free circulation of scientists for international purposes. In particular, no bona fide scientist will be excluded from participation on the grounds of national origin, nationality, or political considerations unrelated to science."

- the registration fees for meetings should follow [IUPAP's policy on conference fees](#). The ICO Bureau recommends to have substantially discounted fees for full-time students;
- ICO should approve the composition of the Program Committee and be in a position to appoint part of it. The ICO Associate Secretary in charge of meetings should be ex officio a member of the Organizing Committee;
- the ICO logo should be used in all documents related to the meeting that are made public;
- the event should be publicized in the ICO Newsletter. The texts are usually prepared in cooperation by the local Organizers and the ICO Secretary;
- the announcements, calls for communications and registration forms should be distributed, among others, through the channel of the ICO Territorial Committees;
- the organizers should accept to send free proceedings of the conference to countries where optics development requires special support; a list of addresses appropriate for this purpose selected by ICO will be provided by ICO. At present, the number of copies required is of the order of 20. In addition, conferences endorsed by IUPAP should participate in the IUPAP Proceedings Donation Program.

3 - ICO encourages meetings in all new areas of optics and meetings designed to fill specific needs, including regional development of optics. At the same time, ICO would like to avoid the unnecessary proliferation of conferences; section 6 of the Questionnaire should therefore be answered carefully, explaining why this particular conference should be held.

4 - Industrial participation in the Program Committee and in the Organizing Committee is usually required.

5 - There may be ICO financial participation in ICO Events, in the form of a grant, a loan, or a participation in the risks. ICO participation is an ICO Bureau decision. There is usually no ICO financial participation in ICO Endorsed Events.

Notes:

- participation in the financial risks means an immediate loan that can be converted in part or in totality into a grant if the event runs a deficit. ICO accepts to take the first risk. In case of a surplus, however, ICO receives a share of the surplus (for details, see ICO Green Book: Rules and Codes of Practice).
- A typical amount of an ICO grant for a major ICO event is US\$ 1500-7000, and for an ICO Cosponsored event about US\$ 1000-3000. ICO grant are mostly awarded for the purpose of help support young scientists and scientists from low-income and lower-middle-income countries as defined by the most recent [list of the World Bank](#).

B - Special conditions for ICO Congresses

6 - ICO Congresses are held every three years; they include the General Business Meeting as requested by the statutes and a Scientific Meeting that should cover most of optics.

7 - For Congresses, calls for bids are issued by the ICO Associate Secretary with a deadline typically 4 years before the Meeting. The ICO Bureau in that year examines the bids and issues a proposition that is then submitted to the ICO Congress the following year. The ICO Congress makes the final decision. Advance notice is always appreciated. Bids should be sent to the ICO Associate Secretary in charge of meetings and schools.

8 - The vast majority of the recent Congresses were held in the last days of August or early in September.

9 - The budget should provide for some financial help for invited speakers, the usual minimum being free registration. Special support is requested for invited speakers from countries where the development of optics is comparatively difficult. In recent ICO Congresses, the number of invited speakers has ranged between 30 and 40. Recent winners of the ICO Prize, the IUPAP Young Scientist Prize in Optics and the Galileo Galilei Medal Award are usually invited speakers at the Immediate next ICO Congress.

10 – The 2022 Congress, ICO-25, will be held in Dresden, Germany in September 2022. Previous [ICO Congresses](#) were held in the following countries:

ICO-24, 2017, Japan
 ICO-23, 2014, Spain
 ICO-22, 2011, Mexico
 ICO -21, 2008, Australia
 ICO-20, 2005, China
 ICO-19, 2002, Italy
 ICO-18, 1999, USA
 ICO-17, 1996, Korea
 ICO-16, 1993, Hungary
 ICO-15, 1990, F.R. Germany
 ICO-14, 1987, Canada
 ICO-13, 1984, Japan
 ICO-12, 1981, Austria

ICO-11, 1978, Spain
 ICO-10, 1975, Czechoslovakia
 ICO-9, 1972, USA
 ICO-8, 1969, the United Kingdom
 ICO-7, 1966, France
 ICO-6, 1962, F.R. Germany
 ICO-5, 1959, Sweden
 ICO-4, 1956, USA
 ICO-3, 1953, Spain
 ICO-2, 1950, the United Kingdom
 ICO-1, 1948, the Netherlands
 (Preliminary meetings had been held in Czechoslovakia and France



In green, current ICO territories.

C - Other major ICO events:

11 - ICO usually organizes Schools, [Topical Meetings, and Regional Meetings](#) between the Congresses.

12 - ICO Meetings should correspond to a clear need in a given sub-field of optics or in a given geographical area.

13 - It is possible to have more than one ICO major meeting in a given year or to have one in the same year as a Congress.

14 - Bids for all major ICO events other than the ICO Congress that are to be held prior to December of a given calendar year should be sent to the ICO Secretariat by April of that year.

15 - Opportunities to organize schools are welcome. ICO Schools should normally be specialized to some area of optics and should last between one and three weeks. Schools in geographical areas with special needs for the development of optics are particularly welcome. During the period 2000-2020, the list of other ICO major events is as follows:

- February 2000 ICTP/ICO/OSA Winter College on Optics and Photonics, Trieste (Italy)
- April 2000, ICO Topical Meeting on Optical Science and Applications for Sustainable Development, Dakar (Senegal)
- (August 2001, ICO Topical Meeting on Information Optics, Caesarea (Israel), postponed)
- February 2002, ICTP/ICO/OSA Winter College on Ultrafast Nonlinear Optics, Trieste (Italy)
- February 2003, ICTP/ICO/OSA/OWLS/SPIE, Winter College on Biophotonics, Trieste (Italy)
- July 2003, ICO Topical Meeting on Polarization Optics, Joensuu (Finland)
- ICTP/ICO/OSA/OWLS/SPIE, Winter College on Interferometry and Applications in Modern Physics, Feb. 2004, Trieste (Italy)
- July 2004, Meeting on Optics and Photonics in Technology Frontiers, Chiba, Japan
- February 2005, ICTP/ICO/OSA/OWLS/SPIE, Winter College on Optics and Photonics in Nanoscience and Nanotechnology, Trieste (Italy)
- January/February 2006, ICTP/ICO/OSA/OWLS/SPIE/CEI, Winter College on Quantum and Classical Aspects of Information Optics, Trieste (Italy)
- September 2006, ICO Topical Meeting on Optoinformatics 2006/Information Photonics 2006, Saint Petersburg (Russia)
- February 2007, ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI, Winter College on Fibre Optics, Fibre Lasers and Sensors, Trieste (Italy)
- November 2007, ICO Topical Meeting 2007 on Optics and Laser Applications in Medicine and Environmental Monitoring for Sustainable Development, Ghana
- February 2008, ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI, Winter College on Micro and Nano Photonics for Life Sciences Trieste (Italy)
- February 2009, ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI, Winter College on Optics in Environmental Science. Trieste (Italy)
- October 2009, ICO Topical meeting on “Emerging Trends and Novel Materials in Photonics”, Delphi, Greece
- 2010 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI, Winter College on Optics and Energy. Trieste (Italy)
- October 2010, ICO Topical meeting on Optics and Energy, Paris, France.
- 2011 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI, Winter College on Optics in Imaging Science.
- 2012 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: Advances in Nano-Optics and Plasmonics. Trieste (Italy).
- FIRST ICO/ICTP/TWAS Central American Workshop in Lasers, Laser Applications and Laser Safety Regulations, April-May 2012, (Costa Rica)

- ICO Topical Meeting: 6th International Conference on Nanophotonics (ICNP 2012), May 2012, Beijing (China).
- ICO Topical Meeting: 12th Conference of the International Society on Optics Within Life Sciences "OWLS 12", July 2012, Genoa (Italy).
- 2013 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: Trends in Laser Development and Multidisciplinary Applications, Trieste (Italy)
- 18th Microoptics Conference (MOC'13). October 2013, Tokyo (Japan).
- 2014 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: "Fundamentals of Photonics Theory, Devices & Applications." Trieste, Italy.
- ICTP-ICO-MCTP College on Optics and Energy, April-May 2014, Tuxtla Gutiérrez, Mexico.
- 2015 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: "Light: A Bridge between Earth and Space", Trieste, Italy, Feb. 2015.
- Education and Training in Optics and Photonics (ETOP 2015) Bordeaux, France, 29 June – 2 July 2015.
- 2016 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: "Optical Frequency Combs - from multispecies gas sensing to high precision interrogation of atomic and molecular targets", Trieste, Italy. 15- 16 Feb 2016.
- ICO Topical Meeting: International Conference on Applied Optics and Photonics 2016, Hanover, Germany, 17 - 21 May 2016.
- 2017 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: "Applied Optical Techniques for Bio-imaging", Trieste, Italy, 13-24 Feb. 2017.
- ETOP 2017: The 14th Int. Conference on Education and Training in Optics and Photonics, Zijingang Campus, Zhejiang University. China, 29-31 May 2017
- ODF'18, 11th International Conference on Optics-photonics Design, Hiroshima, Japan, November 28th-30th, 2018.
- ISPHOA, 3rd International Seminar on Photonics, Optics, and its Applications, August 1st, 2018 in Bumi Surabaya City Resort, Indonesia.
- BIOAM 2nd International Workshop on Biophotonics and Optical Angular Momentum, Paris, October 2018.
- EOSAM-2018. Annual Meeting of the European Optical Society. Delft, The Netherlands, October 2018.
- OWLS 2018, 15th Optics Within Life Sciences will take place in Perth, Australia, 25-28 November 2018.
- ETOP 2019 Education and Training in Optics and Photonics, Québec City, Canada May 21-24, 2019
- AOP 2019 International Meeting on Applications in Optics and Photonics June, 2019, Lisbon, Portugal.
- RIAO-Optilas Meeting of the Iberoamerican Optics Network, Cancún, Sept-2019
- Optisud: Optics for sustainable development, Cartaghe, Tunis, Sept-2019
- Correlation Optics, Chernivtsi Ukraine, September 2019
- 7th Int. Symposium "Optics & its applications" Yerevan, Armenia Sep. 2019

ICO Co-sponsorship of Conferences and Schools

Information and Guidelines

Application deadlines are April 15 and October 15 of each year. The applications must be submitted to the ICO Associate Secretary by a deadline that is at least 12 months for Congresses and other major events and 6 months for cosponsored events prior to the event and before the first announcement:

Dr. Frank Höller
Center for Biomedical Optics and Photonics (CeBOP)
University of Muenster
Robert-Koch-Str. 45
D-48149 Muenster Germany
Phone: + 49 175 2069916
e-mail: bally@uni-muenster.de

[ICO Co-Sponsorship Form](#) (PDF Document)

A - General conditions

1 - ICO provides cosponsorship to international conferences and schools - typically, those with at least 30 % of the attendees and at least 50 % of the Program Committee from outside the host territory. "Event" in the forthcoming refers to conference or school. A companion document to this one gives the information and guidelines for events directly generated by ICO or in particularly close cooperation with ICO (i.e., ICO Congresses, ICO Topical Meetings, ICO Regional Meetings, ICO Schools).

2 - ICO participation implies in all cases that the ICO Bureau perceives that the meeting will be of a good scientific quality and that the timing and venue are appropriate; the ICO Territorial Committee of the territory where the event is to be held approves the project; the organizers should confirm compliance with the general principle of "free movement of scientists" as defined by the International Science Council (ISC) in the booklet "Advice to Organizers of International Scientific Conferences". The International Union of Pure and Applied Physics (IUPAP), in which ICO is Affiliated Commission 1, adheres to the declarations of ISC. In essence, the host territory must guarantee that a bona fide scientist or engineer of any nationality or citizenship may attend. It is not sufficient to make such a guarantee only for persons from territories recognized by the host territory. Any failure to honor a guarantee is reported by ICO to ISC through IUPAP.

3 - ICO encourages meetings in all new areas of optics and meetings designed to fill specific needs, including regional development of optics. At the same time, ICO would like to avoid the unnecessary proliferation of conferences; section 6 of the Questionnaire should therefore be answered carefully, explaining why this particular conference should be held.

4 - Industrial participation in the Program Committee and in the Organizing Committee is usually required.

B - Special conditions for ICO Cosponsored events

5 - ICO Cosponsored conferences must follow IUPAP's policy on conference fees.

For conferences held in 2013 the maximum registration fee is 550 Euros. This includes abstracts, preprints and/or proceedings, but does not include meals and/or accommodation. If proceedings are not included, the fee shall be substantially lower. For ICO Endorsed events, exceptions to that rule may be made.

6 - In ICO Cosponsored events, the ICO Associate Secretary (in charge of meetings) is ex officio a member of the Organizing Committee and should be kept regularly informed of the progress of the organization.

7 - In ICO Cosponsored events, the ICO Bureau designates one member to represent it in the Program Committee.

8 - For ICO Cosponsored events, the organizers are always welcome to use the channel of the ICO Territorial Committee mailing list to distribute information.

9 - For ICO Cosponsored events, the organizers are requested to send free proceedings of the conference in email form to countries where optics development requires special support; a list of addresses appropriate for this purpose selected by ICO will be provided by ICO. The number of copies requested is of the order of 20.

10 - All ICO Cosponsored events are listed in the section "Forthcoming events with ICO participation" on the ICO website and in the ICO Newsletter. In addition, organizers of ICO Cosponsored events are welcome to provide the ICO Secretariat with a 1000 to 2000 words article, if possible with an illustration, for further publicity in the

ICO Newsletter. Since the responsibility for the publication rests on it, ICO has the liberty to slightly edit the text to adapt it to the general style and to the space available.

11 - The use of the ICO logo in documents concerning ICO Cosponsored events is desired.

12 - There may be ICO financial participation in ICO Cosponsored events in the form of a grant (for Congresses and other major events additionally in form of a loan, or a participation in the risks). ICO participation is an ICO Bureau decision.

Notes: participation in the financial risks means an immediate loan that can be converted in part or in totality into a grant if the event runs a deficit. ICO accepts to take the first risk. In case of a surplus, however, ICO receives a share of the surplus (for details, see ICO Green Book: Rules and Codes of Practice). A typical amount of an ICO grant for a major ICO event is US\$ 1500-7000, and for an ICO Cosponsored event about US\$ 1000-3000. In most of the recent cases, the ICO grant was specifically awarded for the purpose of helping identified registrants from less favored countries.

Steering Committees

ICO is involved with OSA, SPIE, and other organizations such as its International Organization Members, and EOS in two international meeting series: Education and Training in Optics and Photonics (ETOP), and Optics and Computing, later designated as Information Photonics.

Information about the ETOP series, including the Long-Range Guidance, Sponsorship, and Management of ETOP series and instructions for hosting ETOP meetings, can be found from the ICO home pages <http://e-ico.org/> under Activities (meeting series).

PART III:

THE ORGANIZATION OF ICO



ICO STATUTES

New statutes have been adopted in 1999; the motivation was to obtain a good representation of the whole optical community within ICO through the addition of the new membership category "International Organization Member". The European Optical Society, the Institute of Electrical and Electronic Engineer's Laser and Electro-Optic Society, the Optical Society of America, and SPIE – the International Society for Optical Engineering have been accepted for membership in the new category as early as 1999.

Original statutes adopted at Delft, 1948. Amended at Cambridge - 1956, Santa Monica - 1972, Sapporo - 1984, Garmisch Partenkirchen - 1990, Taejon- 1996.

New version adopted by ICO General Meeting, San Francisco, August 2, 1999. Approved by IUPAP, October 1999. Amended by the ICO-21 General Assembly, Sidney, Australia, July 2008. Amended by the ICO General Assembly, Santiago de Compostela, Spain, August 2014.

Article 1 Objective

The objective of the International Commission for Optics (ICO) is to contribute, on an international basis, to the progress of the science of optics and photonics and their applications. It emphasizes the unity of the cross disciplinary field of optics.

Optics and photonics are defined as the fields of science and engineering encompassing the physical phenomena and technologies associated with the generation, transmission, manipulation, detection, and utilization of light. It extends on both sides of the visible part of the electromagnetic spectrum as far as the same concepts apply.

In particular, the ICO promotes international cooperation and facilitates the rapid exchange of information, by encouraging and furthering the organization, on an international basis, of scientific meetings and summer schools. It emphasizes actions for the education and training in optics and photonics internationally. It undertakes special actions for the development of optics and photonics in regions where particular support is needed. It strives to improve the recognition of optics and photonics as fields

of science with a significant impact on economy. It works also for the promotion of international agreements on nomenclature, units, symbols and standards.

Article 2 Affiliation

The International Commission for Optics is an Affiliated Commission of the Union for Pure and Applied Physics (IUPAP) and a Scientific Associate of the International Science Council (ISC).

Article 3 Membership

The Commission has three categories of Members.

3a) Territorial Committee Members, that represent identified optics communities in a set of non-overlapping geographical areas. A Territorial Committee Member should be listed under a name that avoids any misunderstanding about the area represented. The word "territory" does not imply any political position on the part of the Commission, which seeks to assist scientists in optics everywhere in the world to cooperate on an international level. Each Territorial Committee should receive endorsement of the appropriate authority representing science in its territory, such as an Academy of Science. In addition, it should either (a) be a subcommittee of the body representing the Member in IUPAP, (b) be recognized by the body representing the Member in IUPAP, or (c) if no such body exists be recognized by the council of IUPAP.

3b) International Organization members. Such members are membership organizations active in the field of Optics on an international level.

3c) The Commission may also accept organizations active in optics as Associate Members. Associate Members pay no dues and have no voting privileges.

Application for all categories of membership shall be made to the Secretary of the Commission and submitted to the next General Meeting for approval. Applications in the Territorial Committee Member and Associate Member categories may be approved by the Bureau, subject to ratification at the next General Meeting of the Commission.

Article 4 Shares and votes

Each member of ICO has a specified number of shares, which determines its financial contribution as well as its number of votes at the General Meeting.

4a) Each Territorial Committee member whose territory is also a member of IUPAP has the same number of shares, N_{s1} , in ICO as it has in IUPAP. The number of votes N_{v1} , which is also the maximum number of voting delegates of the Territorial Committee Member, is determined according to the IUPAP scale, which presently reads as follows:

Category	number of shares	number of official delegates and votes
I	1	1
II	2 or 3	2
III	4 to 6	3
IV	7 to 9	4
V	10 to 15	5
VI	Over 15	6

4b) The number of shares N_{s2} of an International Organization Member is determined in agreement with ICO during the Membership admission procedure; it may be changed following the same procedures as for membership admission. The International Organization Members are represented by one voting representative carrying a number of votes N_{v2} proportional to the number of shares N_{s2} of the member determined in such a way that the total number of votes of all International Organization Members cannot exceed that of all Territorial Committee Members. The exact method for determining N_{v2} is included in the Rules and Codes of Practice.

Article 5 The Bureau

The Bureau of ICO consists of the following.

- the Executive Committee, consisting of the President, the immediate Past-President, the Secretary, the Associate Secretary and the Treasurer. All members of the Executive Committee, except for the Immediate Past-President, are elected by ICO at the General Meeting.
- The IUPAP representative appointed by the Executive Council of IUPAP under Article 7b of the statutes of the Union, and any Associate Members from IUPAP Commissions.
- The other Bureau members, who are traditionally known as Vice-Presidents. Eight Vice-Presidents (at least two of whom are from industry) are elected at the General Meeting by the Territorial Committee Members; in addition, also at the General Meeting, every International Organization Member appoints one Vice-President up to the limit of eight; if there are more than eight International Organization Members, eight Vice-Presidents are elected at the General Meeting by the International Organization Members.

The Bureau is responsible for the conduct of the Commission's business between General Meetings. The term of office of the Bureau is three years from October 1st in the year of the election.

The President will be elected for a term of 3 years, normally after having served 3 years as a Bureau Member. In the event the President is unable to continue his/her duties for the elected term, the Past-President (or in case he/she is unable, the Secretary) will act as interim President, or, with the concurrence of the majority of the Bureau, will appoint one of the Bureau Members as interim President.

The Secretary, Associate Secretary and Treasurer will be elected for a term of three years and will be eligible for a second and usually final term of three more years. If either is unable to continue his/her duties for the elected term, the President will, with the concurrence of the majority of the Bureau, appoint a substitute from among the current Bureau Members.

Other Bureau Members will be elected for 3 years and will be eligible for not more than one further term of three years, except as described in the above two paragraphs.

The Bureau may fill vacancies occurring in its membership during the interval period between General Meetings, except for the position of Immediate Past President.

Article 6 Finance

In addition to money that may be granted by IUPAP, the International Commission for Optics may possess funds of its own consisting of subscriptions from the Members and special donations or grants. Each member pays a number of shares. Dues are payable on the first day of each year. Certain specific projects may be financed independently of the general resources of the Commission. The unit subscription per share is decided by the General Meeting.

Article 7 Withdrawal and Resignation

A member whose subscription is more than six years in arrears is to be regarded as having withdrawn. Any Member which has resigned is liable for the unpaid subscriptions up to the end of the year of resignation. Any Member ceasing to belong to the Commission forfeits its rights to ICO assets.

Article 8 General Meeting

The ICO is governed by its General Meeting, which consists of the Bureau (non voting) and the official delegates appointed by the Members.

The General Meeting of ICO is held every third year. The following business will be carried out at each of these General Meetings:

- (a) election of the Bureau;
- (b) examination of a Financial Statement presented by the Bureau;
- (c) agreement on a provisional budget for future years;
- (d) discussion of questions submitted by the ICO Members, the Bureau or the Executive Council of IUPAP.

Any Member, including Associate Members, as well as the ICO President can invite delegates at the General Meeting with no restriction of number. The number of voting delegates is restricted as per article 4.

The President may, with the approval of the Bureau, convene an Extraordinary General Meeting, and shall call such Meetings upon the request of one-third of all ICO Members.

The Draft Agenda for the General Meeting is circulated by the Secretary at least three months before the opening of the General Meeting. Subjects not on the Draft Agenda may be added at the Meeting with the consent of a single majority of the votes of Members represented at the Meeting.

A Member who is unable to send a delegate at a given General Meeting but wishes to vote on appropriate matters appearing on the Agenda may send its vote in writing to the President.

Alternately, it may give a proxy to another member of the same category. To be valid, votes made in writing and proxies must be received prior to the General Meeting.

Article 9 Other Meetings

The International Commission for Optics may sponsor or co-sponsor international conferences and give financial support (grants or guarantees), as a grant to organizing committees or as a travelling grant directly to participants.

Article 10 Relation with the International Union of Pure and Applied Physics

(See also Articles 2 and 3)

The Commission will report concerning its work and its financial position to each General Assembly of the International Union for Pure and Applied Physics and will receive directives from that Assembly. Affiliation of the Commission to the Union can be terminated only by the Union at its General Assembly. In the event of disaffiliation, the special funds of the Commission are to remain its own property, but any unexpected balance of money received from IUPAP shall be returned to that body.

Article 11 Duration of the Commission

The life of the International Commission for Optics is not limited. The dissolution of the Commission may be decided by a majority of two-thirds of the votes of the Members voting at a General Meeting. In this event, the assets of ICO will be allocated by the General Meeting to one or more not-profit organizations of closely similar purposes serving the optical sciences.

Article 12 Alterations to the Statutes

Alterations in the Statutes may be proposed by the Bureau of the Commission, by one of the members, or by IUPAP. Such proposals must be received by the Secretary of the Commission at least three months before the date of the General Meeting.

Amendments or modifications may be adopted only at a General Meeting by a two-thirds majority of the Members taking part in the vote. Alterations of Statutes must be approved by IUPAP, which shall also constitute the final authority in regard to interpretation of Statutes.

Article 13 Rules and Codes of Practice

Rules for the conduct of business determine procedures for dealing with matters not specifically laid down in these Statutes. They are meant to give guidance in general terms to the Bureau and to the Members in matters such as, for example, the provision of grants from the funds of the International Commission for Optics for Symposia and Schools.

The rules and codes of practice may not contravene the Statutes of the ICO. They are proposed by the Bureau. The adoption, modification, or abolition of any rule or code of practice shall require either a majority of two-thirds of the members voting at a General Meeting of the Commission, or alternatively a majority of two-thirds of the total number of votes of all Members in a postal vote on a proposal unanimously approved by the Bureau.

RULES AND CODE OF PRACTICE OF THE INTERNATIONAL COMMISSION FOR OPTICS

Adopted by the ICO–16 General Meeting, Budapest, August 1993. Modified by the ICO–17 General Meeting, Taejon, August 1996.

Modified by the ICO–18 General Meeting, San Francisco, August 1999.

Modified by the ICO General Meeting, Florence, August 2002.

Modified by the ICO-20 General Meeting, Changchun, August 2005.

Modified by the ICO-21 General Meeting, Sidney, July 2008. Modified by the ICO-22 General Meeting, Puebla, August 2011.

Modified by the ICO-23 General Meeting, Santiago de Compostela, August 2014

Article 13 of the statutes of the International Commission for Optics mentions the possibility of establishing rules and codes of practice for ICO. In its meeting in Garmisch Partenkirchen on August 5, 1990, the ICO Bureau decided to setup such rules. These rules replace those adopted earlier and published in previous ICO Green Books such as "Towards ICO-XII", May 1982, pp 69-70.

Article 13 of the ICO statutes: "Rules and Codes of Practice".

"Rules for the conduct of business determine procedures for dealing with matters not specifically laid down in these Statutes. They are meant to give guidance in general terms to the Bureau and to the Members in matters such as, for example, the provision of grants from the funds of the International Commission for Optics for Symposia and Schools.

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Changes and additions decided by the Bureau, but not yet submitted to the General Assembly for approval, are italicized.

1 - Free Circulation of Scientists:

ICO adheres to the principles established by the International Science Council (ISC) concerning the free circulation of scientists. In particular, organizers of ICO meetings and of meetings cosponsored by ICO are requested to follow the "advice to organizers of international scientific meetings" issued by the ISC Standing Committee on the free circulation of scientists.

*International Science Council,
5 Rue Auguste Vacquerie,
75116 Paris, France
T: +33 1 45 25 03 29
F: +33 1 42 88 94 31*

2 - Membership:

Application

This section complements article 3 of the statutes.

The following are normally provided by a Territorial Committee applying for full membership:

- a) if the Territory is represented in IUPAP, a statement from the president of the body representing the Territory in IUPAP, that the Territorial Committee is authorized by that body to represent optical scientists and engineers of that Territory within ICO; if it is not, a motion to the same effect from a local scientific authority (Ministry, Academy, Council of Research);
- b) a letter of application signed by the chair person or representative of the applicant Territorial Committee, including a statement of adherence of the Territorial Committee to the ICO Statutes;
- c) a description of the organization of the Territorial Committee, including the number of members, their designation procedure, their term of office, and the procedures that are set up to ensure a good representation of the optics community within the territory. If the Territory is not a member of IUPAP, the Territorial Committee and the ICO Secretary or Associate Secretary shall jointly take the necessary steps to request approval of the Territorial Committee by the council of IUPAP.

The application of a Territory for Associate Membership in ICO shall be made to the Secretary. It may be considered and approved by the Bureau. At the next General Meeting, the decision shall be made

- * either, subject to the desire of the applicant, to transform the associate membership into regular membership,
- * or to extend the associate membership until the next General Meeting,
- * or to terminate the associate membership.

In the case of a Territorial Committee applying for Associate Membership, item a) is required if the Territory is represented in IUPAP; item b) is always required.

The following are normally provided by an International Organization Member applying for membership (whether as full member or as associate member, except for the number of shares, that applies only to full members):

- a) a letter of application signed by the President or its duly appointed representative, mentioning approval by the appropriate bodies in the Organization, expressing adherence to the ICO Statutes, and including a proposition for the number of shares;
- b) a description of the operation of the Organization, as provided for example by its bylaws, statutes, rules and codes of practice, and showing indication of its international character. This includes the requirement that at least 20% of the members are from outside the most represented country. The advice of the Territorial Committee (if any) in the most represented country will be considered.

Organization and duties of Territorial Committees

The Territorial Committees normally have members elected or designated by some agreed procedure, with a well-defined term of office; it is usually convenient for them to have a bureau or at least a chairperson; their organization secures in all cases:

- a fair representation of the optics community in the Territory;
- approval and support of the scientific authorities of the Territory (Ministry, Academy, council of Research).

The ICO Bureau may at any time request information from the Territorial Committees about their organization as described above.

Territorial committees maintain mailing lists of at least an extensive representative subset of the optics community in the territory. They will include in the mailing list any bona fide scientist with an address in their Territory and requesting to be included. They distribute at no charge to ICO any document sent to them in an appropriate quantity either by the ICO bureau or on its behalf. This applies in particular to the ICO Newsletter and to the Meetings and Schools with ICO participation.

Number of votes of International Organization Members:

The number of votes N_{v2} of an International Organization Member is determined according to its number of shares N_{s2} according to the following formula, rounded to the nearest integer but with a minimum of 1:

$$N_{v2} = N_{s2} \frac{\sum N_{v1}}{\max(\sum N_{s1}; \sum N_{s2})}$$

[Explanation note: e.g., assume the Territorial Committee members together have 200 shares and 100 votes (as is approximately the case in 1999). If the International Organization Members (IOMs) together have 100 shares, they will have 50 votes (apart from round off errors). If the IOM have 200 shares, they will have 100 votes. If the IOM have 250 shares, they will still have 100 votes and no more. In fact, this is unlikely to happen in the near future, but this rule has been established in response to the concern about the Territorial Committee Members being dominated by the International Organization Members and losing control of the ICO.]

3 - General Meetings, votes and elections:

This section complements articles 4 and 8 of the statutes that provide for a General Meeting of ICO every three years. ICO holds a Congress every three years. The ICO Congress consists of a business part, known as the ICO General Meeting, and an International Scientific Conference part.

Sessions:

Tradition holds that General Meetings are held in two sessions with more than 24 hours between the end of the first session and the beginning of the second session.

Attendance in the General Meeting

During any session of the General Meeting, the Secretary circulates a list of attendance. Each attendant signs the attendance list, indicating

- * their capacity of ICO Bureau member, official delegate an ICO Territorial Committee, representative of an associate member, member of an ICO Committee, or observer (more than one category may apply);

- * their country or ICO territory.

According to article 4 of the statutes, the number of official delegates of ICO Territorial Committees is equal to their respective numbers of votes. The number of official delegates may in no case exceed the number of votes, but if the actual number of official delegates at a General Meeting is smaller than the number of votes, the Territorial Committee still keeps the same number of votes.

Voting Procedure

Except as indicated in articles 8 (agenda of the General Meeting), 11 (duration of the commission), 12 (alterations to statutes) and 13 (alterations of the Rules and Codes of Practice) of the statutes, decisions of the General Meeting, including elections, are by a majority of the votes of the members present and taking part.

Except for the ICO Bureau election, where secret ballot is the rule, the ICO President decides whether votes need to be made by secret ballot. A member having N votes is provided with N ballot forms; this applies to both the Territorial Committee members

and the International Organization members. The member may decide to cast identical ballots or not.

Nomination procedure:

Candidates for the ICO Bureau may be nominated by the ICO nominating Committee (see section 6 below) and/or by the Territorial Committees. No other nomination may be received. The Nominating Committee writes to the Territorial Committees at least one year before the election to request nominations for all positions in the ICO Bureau.

Endorsement of all candidates by their respective Territorial Committees is requested in all cases. In addition, Territorial Committees may endorse candidates from any Territory. At the time of the General Meeting, the delegation of the Territorial Committee to the General Assembly makes endorsements in its name.

Endorsement means that the person is considered by the endorsing Territorial Committee as a good person to stand for an ICO election and is to be understood as an intention, not an obligation, to support this candidate at the election, given the list of candidates at the time the endorsement is made.

The Nominating Committee establishes a first list of candidates that is sent to the territorial Committees along with the agenda of the General Meeting.

Nominations may be received until 24 hours before the election. After the closure of nominations, the Nominating Committee establishes a final list of candidates. In addition, each candidate provides the Nominating Committee with a short curriculum vitae and a statement on his/her policy if elected for distribution to the General Meeting.

Except as provided in this and in the next subsection, there is no official campaign for the ICO Bureau.

Elections for the ICO Bureau:

Bureau Elections are by secret ballot in all cases.

Tradition holds that:

- * during the first session of the General Meeting, the Nominating Committee presents its report and indicates the current list of candidates for the ICO Bureau offices;
- * elections are held during the second session of the General Meeting;
- * for the offices of President, Treasurer, Secretary and Associate Secretary, each candidate is given, immediately before the vote, a short-prescribed time (typically between 5 and 10 minutes) to present himself and his/her policy to the General Meeting. If there is only one candidate, that procedure is optional.

The elections are conducted by the chairperson of the Nominating Committee. After each vote, the Nominating Committee counts the votes and during that time, the General Meeting may treat agenda items other than the elections.

In the case of a tie for any vote, the elder candidate is declared elected.

For any vote, if the number of candidates is equal to the number of seats, the Nominating Committee Chairperson may decide that there is no vote and declare the candidate(s) elected.

Concerning the Vice-Presidents, the idea is that eight Vice-Presidents represent the Territorial Committee Members and are elected only by the Territorial Committee Members, while a number of Vice-Presidents represent the International Organization Members and are elected only by the International Organization Members. Since it is not advisable to have too many members on the Bureau, the number of Vice-Presidents representing Territorial Committee Members has been set to eight, and the maximum number of Vice-Presidents representing International Organization Members has also been set to eight.³

The votes are held in the following order:

Executive Committee (elected by all members):

- * one vote for the President;
- * one vote for the Treasurer;
- * one vote for the Secretary;
- * one vote for the Associate Secretary.

Vice-Presidents elected by Territorial Committee Members (only the Territorial Committee Members vote):

- in a first vote, members vote on four (4) names; all candidates are eligible, whether they come from industry or not; if, among the first four (4) candidates ranked by number of votes, no one is from industry, the first three (3) are declared elected; if at least one is from industry, the first four (4) are declared elected;
- if the first vote did not lead to the election of two (2) candidates from industry, a second vote is made, where only candidates from industry are eligible; as a result

³ The whole point of having an International Organization Member category is to give them close contact with the ICO and therefore they are well represented in the Bureau. Nevertheless, their representation in the Bureau cannot exceed that of the Territorial Committee Members. Just like it is impossible for all Territorial Committee Members to have someone on the Bureau, it will also be impossible for all International Organization Members to have someone on the Bureau if their number exceeds eight. While this is a fair rule, it may generate difficulties and frustration if the number of International Organization Members happens to be just slightly larger than eight. If that happens, one option open to the ICO President will be to invite those International Organization Members that have no Vice-President to attend part or all of the Bureau meetings as observers.

of this vote, the number of candidates from industry elected is brought to two (2); in that vote, members vote on one (1) or two (2) names, depending on how many candidates should be elected;

- in a last vote, all candidates are eligible, whether they come from industry or not, and the total number of Vice-Presidents is brought to eight; in that vote, members vote on three (3) to four (4) names, depending on how many candidates should be elected.

In every vote, the ballots forms given to the voting members should indicate the number of seats to be assigned by this vote; nevertheless, ballots with a smaller number of votes are valid. On one given ballot form, no name should be written more than once and the ballot form must be explicit about that rule. If nevertheless one name is duplicated, it is counted only once. Ballots containing a number of different names larger than the number of seats to be assigned are not valid.

Tradition holds that for ICO elections, the details of votes are not made public but is kept by the Nominating Committee Chairperson. Consequently, it is not sensible to repeat votes in order to reach an absolute majority and the applicable majority rule is always the relative majority, i.e. the candidates that have more votes are elected, whether they have reached the absolute majority or not.

***Vice-Presidents representing International Organization Members (IOM):**

For the Vice-Presidents appointed by the International Organization Members (IOM), prior to the General Meeting, every IOM appoints one representative. If the representative is elected on the Executive Committee or as one of the eight elected Vice-Presidents, the IOM appoints another representative at its earliest convenience *but no later than September 30th*.

- If there are less than eight IOM, their representatives automatically become Vice-Presidents.
- If there are more than eight IOM, unless a consensus agreement is found among the IOM, the election of their eight Vice-Presidents takes place last and the candidates are automatically the appointed representatives of the IOM.

The Nominating Committee contacts the IOM at least six months before the GA to request the appointments.

4 - Classification for the participation of ICO in Meetings and Schools:

There are four categories for ICO participation in meetings and in summer (or fall, or winter, or spring) schools:

1- ICO General Meetings.

2- Other major ICO events "; whenever appropriate, these events may receive the designation "ICO Special Meeting", "ICO Topical Meeting", "ICO School", "ICO Regional Meeting".

3- ICO Cosponsored Meetings and Schools.

4- ICO Endorsed Meetings and Schools.

The applicable rules are given in the table on the next page.

Keys: SR: strictly required, UR: usually required, NR: not required, PO: possible, NO: usually not.

Any meeting with ICO participation, classified in category 2, 3 or 4 may be given by the Bureau the name of ICO Satellite Meetings if it is scheduled to take place within 15 days of an ICO General Meeting or other major ICO event.

Note on registration fees:

As a rule, ICO adheres to the IUPAP upper limit on registration fees. Even though the participation of scientists from disadvantaged areas usually requires special measures independently of the cost of registration, high registration fees tends to limit participation, in particular from students and to be a form of discrimination between scientists.

Specifically, ICO conferences submitted to IUPAP sponsorship must necessarily to follow the IUPAP limit in all cases. These are the General Meetings, Topical Meetings and other major ICO events — usually one per year. For the other events with ICO participation, registration fees higher than the limit can occasionally be accepted provided that an option exists for any scientist to request, at least six weeks in advance, application of the IUPAP limit and still be fully registered, perhaps with the exception of some social events. That option must be known to registrants.

Decision procedure:

The ICO Bureau approves all forms of ICO participation in international conferences, and authorizes the related grants:

- * the meeting and school applications are processed twice annually, with the deadlines of applications on April 15 and October 15 of each year
- * the applications must be received by ICO Secretariat by a deadline that is at least 12 months prior to the event and before the first announcement
- * when the applications are received, the ICO President, Treasurer, and Secretary or Associate Secretary get in touch by some fast procedure and issue a memo including the background information relevant to the meeting. The memo may include a proposition concerning the category of ICO meeting applicable, the opportunity to grant the sponsorship requested, and the opportunity to grant financial support
- * reply form is sent to the Bureau members; it includes the proposition

- * in any event, if the approval by the relevant Territorial Committee is not clear from the application form, the Territorial Committee is contacted at the same time as the Bureau members and it has a right of veto for 45 days after the letter has been sent; the default is that there is no veto
- * no later than one month after application deadline, the decisions are made on the basis of the replies obtained so far from the Bureau members. Only the votes received are counted, the votes not received are not considered as approvals of the proposition of the subcommittee.

REQUIREMENTS	TYPE OF CONGRESS		
	1-ICO General 2-Other major ICO events	3-ICO Co-sponsored	4-ICO Endorsed
a) ISC rules: free movement of scientists	SR	SR	SR
b) good scientific quality as perceived by the ICO Bureau	SR	SR	SR
c) international character (> 30% participants and > 50% program Committee members from outside territory)	SR	SR	SR
d) industrial participation in Committees	UR	UR	UR
e) registration fee to follow IUPAP rules	SR	UR (see text)	UR (see text)
f) timeliness very clear, novelty	SR	UR	UR
g) participation in the ICO Proceedings Donation Program	UR	UR	NR
h) approval by Territorial Committee (if there is one)	SR	SR	SR
ICO PARTICIPATION			
h) ICO Secretary or Associate Secretary in Organizing Committee	SR	UR	NR
i) ICO designates one member of Pro-gram Committee	SR	SR	UR
j) ICO associated from the beginning (usually at least 18 months in advance)	SR	SR	NR
k) use of ICO logo	SR	UR	PO
l) grant	PO	PO	NO

m) loan (reimbursable whether deficit or benefit)	PO	PO	NO
n) participation in budget, risk and benefits	PO	PO	NO
o) support for participation of scientists from regions of the world requiring special support	PO	PO	PO
p) announcements in Newsletter	SR	SR	PO
q) distribution of documents through ICO channels	SR	PO	NO

Financial participation of ICO:

ICO may offer financial support as part of its agreement to cosponsor a conference or school. However, it does not normally sign a cooperation agreement implying mutual commitments between itself and event organizing bodies

According to the table above, ICO may give a grant or a loan to meetings and schools of categories 1, 2 and 3. A special form of a grant, that can apply to all categories, is the financial support for the participation of scientists from regions of the world requiring special support. In that case, the amount is usually sent to the organizers with the instruction that they should spend it on financial support to identified scientists from such regions, inform the recipients of the support from ICO and send the list of recipients to ICO; whenever possible, the organizers should be requested to complement the ICO grant, for example by waiving the registration fees for the recipients.

Alternatively, ICO may also wish to take part where practicable in the risks or benefits of meetings and schools of categories 1, 2 and 3. That is possible, if the local law permits, in the following conditions:

- * ICO accepts a financial responsibility up to an amount of X;
- * the amount X is paid by ICO to the meeting organizers in the form of a treasury advance; it is made available to the organizers by the ICO Treasurer as soon as they request it;
- * at the closing of the account and in no case later than one year after the meeting is finished,

if there is a deficit:

- if the deficit is smaller than X, ICO will cover it in its entirety, i.e. the organizers will only have to reimburse ICO the difference;
- if the deficit is larger than X, then ICO will cover it for an amount X, i.e. no money will be reimbursed to ICO;

if there is a surplus:

- if the surplus is smaller than 4X, ICO will receive 25 % of the surplus, i.e. the organizers will reimburse ICO the amount X plus a quarter of the surplus;

- if the surplus is larger than 4X, the organizers will reimburse ICO two times X.

Depending on circumstances, slight modifications to this scheme may be made by the Bureau.

Any given Bureau may approve meeting support up to the triennial Meeting Support budget for the triennium of its term, augmented with any return from previously granted participation in risk. Loans are not counted and are limited only by the approval of the Treasurer based on the account balance. There is continuity in the ICO Bureau, therefore the Bureau may approve meetings to be held after the next Bureau elections.

5 - Relations with IUPAP:

IUPAP, at each of its General Meetings designates one Representative to ICO. The IUPAP Representative takes part in the ICO General Meeting.

ICO will normally request sponsorship by IUPAP of its General and Topical Meetings.

ICO will normally request to have associate members in some IUPAP Commissions, as appropriate to maintain close relations.

6 - ICO Committees:

List of ICO Committees:

In order to assist the General Meeting and the Bureau in their activities, ICO has established the following committees:

- * Nominating Committee
- * Long Range Planning Committee
- * Committee for the Regional Development of Optics
- * Education Committee
- * Travelling Lecturer Committee
- * ICO Prize Committee
- * ICO Galileo Galilei Medal Award Committee
- * ICO/ICTP Gallieno Denardo Award Committee
- * IUPAP Young Scientist Prize in Optics Committee

Duties of the committees:

The specific purpose of each committee is indicated below. Committees report on their activity at each General Meeting and, as appropriate, at each meeting of the Bureau.

- * The purpose of the Nominating Committee is to coordinate the elections of the Bureau.
- * The purpose of the Long-Range Planning Committee is to propose suitable new actions for ICO, with suitable attention for the inclusion of industrial optics in ICO's activities.
- * The purpose of the Committee for the Regional Development of Optics is to find and implement actions whereby ICO can promote the transfer of optical knowledge and provide practical help to optical scientists and engineers in Developing Nations and in general, geographical areas where optics is not well developed.
- * The purpose of the Education Committee is to promote education in Optics worldwide.
- * The purpose of the Travelling Lecturer Program Committee is indicated in section 7 below.
- * The purpose of the Standards Committee is to serve as a channel of communication for work on standards in optics, in relation with ISO.
- * The purpose of the ICO Prize Committee is indicated in section 9 below.
- * The purpose of the ICO Galileo Galilei Medal Award Committee is indicated in section 10 below.
- * The purpose of the ICO/ICTP Gallieno Denardo Award Committee is indicated in section 11 below.
- * The purpose of the IUPAP Young Scientist Prize in Optics Committee is indicated in section 12 below.

Membership of the Committees:

Each committee has a chairperson and members. The following rules apply:

- a) The chairperson of all ICO committees is always a member of the ICO Bureau.
- b) The ICO past-President is ex officio the chairperson of the Nominating Committee and the members are appointed by the chairperson.
- c) The ICO President is ex officio the chairperson of the long-range planning Committee and the members are appointed by the chairperson.
- d) The ICO Treasurer is ex officio the chairperson of the Travelling Lecturer Committee.
- e) The ICO Secretary or Associate Secretary is ex officio member of all Committees except the Nominating Committee, the Long-Range Planning Committee and the ICO Prize Committee.
- f) Except for the cases of rules b, c, and e above, the members are proposed by the chairperson and appointed by the Bureau. To avoid delays in the operation of Committees, the appointment of members by the Bureau can be made by mail.

7 - ICO Travelling Lecturer Program:

ICO has established in 1988 a Travelling Lecturer Program to promote lectures on modern aspects of optics in interested territories by scientists of international reputation with good lecturing skills. The program is aimed specially at developing nations, but is not necessarily restricted to them. As a rule, it is expected that the lecturer's local expenses will be met by the host institution and that ICO's contribution will be towards the travel costs. Scientists or host groups interested in participating in this program should write to the Treasurer of ICO with details of the proposed lecture program and ICO support requested.

Within the financial limits of the budget, an ICO Committee, with the ICO Treasurer as chairperson, decides for the ICO Travelling Lecturer grants. This Committee in principle does not meet, but works by mail and telecommunication facilities to secure the fastest response compatible with good operation

8

- ICO Book:

ICO has established in 1990 a series of books: the title "International Trends in Optics" has been chosen for the series. There is one volume every three years. The ICO President, the ICO past-President, or one of the ICO former Presidents, acts as the editor.

The books are intended to provide an authoritative overview of research that is underway in the field of optics throughout the world. The articles should be suitable for the specialist and non-specialist alike and should provide general, readable overviews of many different aspects of optical science and engineering. They should tend to be less formal than the standard technical reviews found in journals. In addition to examining their designated topics, the authors should also discuss unsolved research problems and speculate on future directions in their fields.

The royalties typically paid to the editor and the authors are instead paid to ICO.

9

- ICO Prize:

ICO established in 1982 the ICO Prize, to be given each year to an individual who has made a noteworthy contribution to optics, published or submitted for publication before he or she has reached the age of 40. (Specifically, the Prize winner must not have reached the age of 40 before December 31 of the year for which the Prize is awarded). The character of the work of successive Prize recipients should preferably alternate between predominantly experimental or technological and predominantly theoretical. The "noteworthy" contribution in optics is measured chiefly by its impact (past or possibly future) on the field of optics generally, opening a new subfield or significantly expanding an established subfield in research or technology.

The ICO Prize involves:

- a citation,

- a cash award of an amount established in the triennial budget of the ICO and indicated every year in the call for nominations
- travel support to attend said meeting to an amount to be determined by the Bureau⁴,
- waiver of registration fees at said meeting
- and the invitation to present an invited paper and receive the award at the next ICO Congress or another ICO meeting mutually agreed to by the Bureau and the award winner.⁵

Every year, the ICO Prize Committee issues a call for nominations that is published in the ICO Newsletter, receives the nominations and selects the recipients for approval by the Bureau at its next meeting. The award needs not be made each year if the Prize Committee so chooses. The Prize is preferably given to an individual, but it can be shared by two persons. Eligibility for the Prize is not excluded by previous prizes awarded to the individual. The selected Prize winner is then announced in the ICO Newsletter and, if possible, in one or more optics journals. The prizes are presented at each ICO General Meeting.

10 - ICO Galileo Galilei Medal:

10.1 - The Galileo Galilei medal of ICO is awarded for outstanding contributions to the field of optics which are achieved under comparatively unfavorable circumstances.

10.2.1 - The outstanding contributions in the field of optics should refer to:

- fundamental scientific questions or problems, or
- research or development of optical methods or devices, or
- scientific or technical leadership in the establishment of regional optical centers.

10.2.2 - "Comparatively unfavorable circumstances" refers to difficult economic or social conditions or lack of access to scientific or technical facilities or sources of information.

10.2.3 - The outstanding contributions must be documented, if applicable, by internationally acknowledged publications. Exceptionally, reports can be considered, provided that they are made available to the Award Committee.

⁴For 2008-2017, these amounts are a cash award of US\$2000 and up to US\$1000 towards travel expenses.

⁵The Carl Zeiss Foundation generously agreed to donate an Ernst Abbe medal up until 2010 and thereafter a laser engraved glass trophy.

- 10.3 - The award is normally given to one person. Exceptionally, however, if a collective contribution is judged to be worthy of the award a team of several persons may be selected.
- 10.4 - Every year, the ICO Galileo Galilei Medal Award Committee issues a call for nominations that is published in the ICO Newsletter, receives the nominations and selects the winner for approval by the Bureau at its next meeting. The award need not be given every year if the Bureau so chooses.
- 10.5 - The award consists of:
- a) the Galileo Galilei Medal offered by the Italian Society for Optics and Photonics
 - b) a cash award of an amount determined by the Bureau
 - c) assistance in travel as determined by the Bureau⁶ to present an invited paper and receive the award at the next ICO Congress or another ICO meeting mutually agreed to by the Bureau and the award winner⁷,
 - d) waiver of registration fees at said meeting.
 - e) Special attention and appropriate measures of ICO to support the future activities of the award winner.

11 - ICO/ICTP Gallieno Denardo Award for Young Researchers from Developing Countries:

Approved by ICTP, August 1999. New agreement approved by ICO and ICTP, November 2007.

ICO, the International Commission for Optics, and ICTP, the Abdus Salam International Centre for Theoretical Physics, Trieste, have agreed to establish a joint prize, called the ICO/ICTP Award. It is reserved for young researchers from developing countries⁸, who conduct their research in a developing country.

The award will be given to scientists less than 40 years old⁹ who are active in research in Optics and have contributed to the promotion of research activities in Optics in their own or another developing country.

⁶For 2017-2021, these amounts were: a cash award of US\$1000 and up to US\$1000 towards travel expenses.

⁷The Società Italiana di Ottica e Fotonica (SIOF) has generously agreed to donate the Medal.

⁸Developing Countries are defined by the list of Developing Countries of the United Nations Organization.

⁹Specifically, the winner must not have reached the age of 40 on December 31st of the year for which the award is given.

The award consists of the following:

- 1) the ICO gives a cash amount¹⁰ and a diploma.
- 2) The ICTP invites the winner to attend a three weeks College¹¹ at Trieste at the next appropriate opportunity, and to give a seminar on his/her work when appropriate. ICTP will pay for travel and living expenses.

The award will be delivered to the winner at Trieste in the presence of representatives of ICO and ICTP.

The award is given to one person every year. The winner is selected on the basis of nominations received by the Award Committee in response to a call published by both ICO and ICTP. The Award Committee consists of four members, of which two are appointed by ICO and two by ICTP for a period of three years. Among the four members, ICO appoints the Committee Chair.

The nominations must be documented by a complete curriculum vitae including a list of publications and selected reprints (no more than three) as well as a complete employment history and a description of the nominee's achievements for the promotion of research activity in developing countries.

Since February 2008 the award has the new definitions as ICO/ICTP Gallieno Denardo Award honoring the memory of the late Prof Gallieno Denardo.

12 - IUPAP Young Scientist Prize in Optics:

The IUPAP Young Scientist Prize in Optics is an achievement prize established in 2009. It is an IUPAP prize administered by the ICO in a similar manner as the ICO's own prizes and awards.

General rules

The IUPAP Young Scientist Prize in Optics will be awarded annually to a scientist who has made an outstanding contribution to the field of applied optics and photonics and who by the end of the year in which the prize is given has a maximum of eight years of research experience (excluding any career interruptions) after obtaining the doctoral degree. The contribution, which is measured by its scientific impact, must be clearly documented. The IUPAP Prize is strictly an achievement award for an individual in early career. The Prize will be awarded at an ICO conference that is endorsed by the IUPAP.

¹⁰ For 2008-2021, the amount is US\$1000.

¹¹ The ICTP in Trieste organizes a Winter College on Optics, or Laser Physics, or Photonics, or Quantum Optics once a year, normally three weeks in February. The Winter Colleges are currently organized in cooperation with the ICO, OSA (Optical Society of America), SPIE and OWLS.

The IUPAP Prize involves

- a) An IUPAP Young Scientist Medal, with the name and discipline (Optics) of the recipient engraved on the back. The medal is prepared by the IUPAP and its front side is the same for all Commissions and Affiliated Commissions
- b) A certificate containing the citation (with a maximum of 100 words).
- c) A cash award determined by the IUPAP.¹²

The recipient is expected to deliver an invited presentation at a major ICO conference and it is recommended that the registration fee for the awardee be waived. Additional travel support can be obtained from other sources but it cannot be used to increase the amount of the cash award.

Nomination and selection procedure

For each triennial period, the ICO appoints an IUPAP Prize Committee. Every year the ICO issues and distributes a call for nominations with a nomination deadline. The nominations are to be made in accordance with the general instructions as published on the ICO website. The Prize Committee evaluates the nominations and recommends a winner for the approval of the ICO Bureau. The Prize need not be given every year if the Prize Committee or the Bureau so decide.

Eligibility for the IUPAP Prize is not excluded by previous prizes that may have been awarded to the individual. Provided the time limitations are satisfied, unsuccessful nominations are considered for two subsequent years after the initial nomination, but the Nomination Committee may ask for updates of the nomination documents. After three years, a re-nomination can be made if the eight-year time limit is met. The nomination and selection procedure must overall be fair and open.

13 - Fiscal sponsorship grant agreement between the OSA Foundation and the International Commission for Optics

On 27 October 2010, the OSA Foundation (Grantor) decided that financial support of the project described in the grant proposal application accompanying this Agreement will further Grantor's tax-exempt purposes. Therefore, Grantor has created a restricted fund designated for such project, and has decided to grant all amounts that it may deposit to that fund, less any administrative charge as set forth below, to the International Commission for Optics (Grantee), subject to the following terms and conditions:

WHEREAS,

¹² During the period 2009-2017, the amount was € 1,000.

Grantee is an exempt organization under Section 501(c)(4) of the Internal Revenue Code, and may apply for exemption from federal income tax under Section 501(c)(3) of the Internal Revenue Code at some point in the future

The purpose of Grantee is the following: to contribute, on an international basis, to the progress and diffusion of knowledge in the field of optics.

Grantor is exempt under Section 501(c)(3) of the Internal Revenue Code and is not a private foundation under Section 509(a)(1) of the Internal Revenue Code. Grantor would like to support certain activities of Grantee and is willing to act as a fiscal sponsor for Grantee. Grantor will accept contributions for the benefit of ICO by those contributors who wish to support Grantee prior to Grantee's obtaining federal tax-exempt status (the "Fiscal Sponsorship").

Grantor anticipates terminating the Fiscal Sponsorship should the Grantor receive an advance ruling that it is exempt under Section 501(c)(3) of the Internal Revenue Code.

Grantor and Grantee have a shared mission, and Grantor has determined that the purposes and activities of ICO are charitable under Internal Revenue Code Section 501(c)(3). The success of ICO will benefit the mission of the Fiscal Sponsor.

NOW, THEREFORE, in consideration of the foregoing recitals and the promises contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties, intending to be legally bound, agree as follows:

Term. This Agreement shall be effective starting [INSERT DATE] and shall remain in force until Grantee receives its designation from the Internal Revenue Service as a 501(c)(3) tax-exempt organization, or it is terminated in accordance with the terms of this Agreement, whichever is sooner.

Grantee shall provide Grantor with its governing documents, a completed and filed IRS Form SS-4 or other documentation satisfactory to Grantor, showing Grantee's separate existence as an organization.

Use of Funds. Grantee shall use the grant solely for the project described in the accompanying grant proposal application, and Grantee shall repay to Grantor any portion of the amount granted which is not used for that project. Any changes in the purposes for which grant funds are spent must be approved in writing by Grantor before implementation. Grantor retains the right, if Grantee breaches this Agreement, or if Grantee's conduct of the project jeopardizes Grantor's legal or tax status, to withhold, withdraw, or demand immediate return of grant funds, and to spend such funds so as to accomplish the purposes of the project as nearly as possible within Grantor's sole judgment. Any tangible or intangible property, including copyrights, obtained or created by Grantee as part of this project shall remain the property of Grantee.

Fundraising. Grantee may solicit gifts, contributions and grants to Grantor, earmarked for Grantor's restricted fund for this project. Grantee's choice of funding sources to be

approached and the text of Grantee's fundraising materials are subject to Grantor's prior written approval. All grant agreements, pledges, or other commitments with funding sources to support this project via Grantor's restricted fund shall be executed by Grantor.

Nothing in this Agreement shall constitute the naming of Grantee as an agent or legal representative of Grantor for any purpose whatsoever except as specifically and to the extent set forth herein. This Agreement shall not be deemed to create any relationship of agency, partnership, or joint venture between the parties hereto, and Grantee shall make no such representation to anyone.

Reporting Requirement. Grantee shall submit a full and complete report to Grantor sixty (60) days after the completion of the grant program. Periodic program updates may be requested for programs lasting more than three months. The report shall describe the charitable programs conducted by the Grantee with the aid of this grant and the expenditures made with grant funds, and shall report on the Grantee's compliance with the terms of this grant.

Termination. Either party may terminate this Agreement by giving sixty (60) days' written notice to the other party.

This grant is not to be used in any attempt to influence legislation within the meaning of Internal Revenue Code (IRC) Section 501(c)(3).

Grantee shall not use any portion of the funds granted herein to participate or intervene in any political campaign on behalf of or in opposition to any candidate for public office, to induce or encourage violations of law or public policy, to cause any private inurement or improper private benefit to occur, nor to take any other action inconsistent with IRC Section 501(c)(3).

Grantee shall notify Grantor immediately of any change in:

- (a) Grantee's legal or tax status, and
- (b) Grantee's executive or key staff responsible for achieving the grant purposes.

Grantee hereby irrevocably and unconditionally agrees, to the fullest extent permitted by law, to defend, indemnify and hold harmless Grantor, its officers, directors, trustees, employees and agents, from and against any and all claims, liabilities, losses and expenses (including reasonable attorneys' fees) directly, indirectly, wholly or partially arising from or in connection with any act or omission of Grantee, its employees or agents, in applying for or accepting the grant, in expending or applying the funds furnished pursuant to the grant or in carrying out the program or project to be funded or financed by the grant, except to the extent that such claims, liabilities, losses or expenses arise from or in connection with any act or omission of Grantor, its officers, directors, trustees, employees or agents.

Notices. All notices, demands, amendments, waivers, consents, approvals, and other communications required or permitted under this Agreement must be in writing and expressly reference this Agreement.

Amendments; Waivers. All parties must approve any amendment to this Agreement, however, any waiver of any right or remedy requires only the consent of the party waiving it. Every amendment or waiver must be in writing and designated as an amendment or waiver, as appropriate. No failure by any party to insist on the strict performance of any provision of this Agreement, or to exercise any right or remedy, will be deemed a waiver of such performance, right or remedy, or of any other provision of this Agreement.

Severability. If any provision of this Agreement, or the application thereof, becomes or is declared by a court of competent jurisdiction to be illegal, void or unenforceable, the remainder of this Agreement will continue in full force and effect and the application of such provision to other persons or circumstances will be interpreted so as reasonably to effect the intent of the parties hereto. The parties further agree to replace such void or unenforceable provision of this Agreement with a valid and enforceable provision that will achieve, to the extent possible, the economic, business and other purposes of such void or unenforceable provision.

Entire Agreement. This Agreement shall supersede any prior oral or written understandings or communications between the parties and constitutes the entire agreement of the parties with respect to the subject matter hereof. This Agreement may not be amended or modified, except in a writing signed by both parties hereto.

Counterparts. This Agreement may be executed in one or more counterparts, all of which are considered one and the same agreement and will become effective when one or more counterparts have been signed by each of the parties and delivered to the other parties, it being understood that all parties need not sign the same counterpart. A facsimile signature page will be deemed an original.

Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of New York applicable to agreements made and to be performed entirely within such State.

IN WITNESS WHEREOF, the parties have executed this Grant Agreement effective on the 1st day of December, 2010.

OSA FOUNDATION

By: E. Rogan (in original)
Print Name: Elizabeth Rogan
Date: 15 Nov. 2010
Title: OSA Foundation Executive Director

INTERNATIONAL COMMISSION
FOR OPTICS

By: María L. Calvo (in original)
Print Name: Maria L. Calvo
Date: 11 Nov. 2010
Title: ICO President

14 - ICO Proceedings Donation Program:

Territorial Committees and scientists from countries that are preparing for ICO membership may request to receive copies of the Proceedings volumes issued on the occasion of meetings participating in the ICO Proceedings Donation Program. At least all ICO General, Topical, Regional and Cosponsored Meetings participate in the Program. These proceedings will be kept in a scientific library open to all researchers and engineers working in optics. The cost of printing and shipping will be borne by the organizers of the meetings. The ICO Secretariat will keep the mailing list and send the appropriate mailing labels in due time to the meeting organizers. In view of the expenses involved, there will be a limit of one address per ICO Member Territory and one address per country preparing for ICO membership. In addition, it is expected that Member Territories and countries where the access to scientific literature is relatively satisfactory will refrain from requesting to benefit from the Program.

15

- ICO Bureau Meetings:

The ICO Bureau meets typically one time per year in the years without a General Meeting, and in addition once immediately before and once immediately after every General Meeting.

If events arise that require action from the Bureau between its regular meetings, the Bureau may meet by teleconference or by such electronic or other means of correspondence as it may decide. In such cases, the Executive Committee shall submit a clear description of the issue at hand, with a deadline for reactions. Decisions are made on the basis of the replies obtained from the Bureau Members. Only the votes received are counted, the votes not received are not considered as approvals of the proposition. If the Executive Committee proposes a specific decision on the issue, the decision shall be considered as approved if more Bureau Members vote in favor compared to votes against and abstentions by the specified deadline. In case of a delay in communication, or if the available information is considered insufficient for a decision, the deadline shall be extended or the decision deferred until a later meeting at the request of at least 4 members of the Bureau.

THE ICO TERRITORIAL COMMITTEES

ICO Membership List, July 1, 2017

Argentina

Units: 3, votes: 2, member since 1981



Dra. Silvia Ledesma

Lab. de Procesado de
Imágenes Cdad. Univ.,
Pabellón 1 Intendente
Güiraldes 2160.
C1428EHA Bs. As.,
Argentina

Tel: +54-221-471-5249

E-mail: ledesma@df.uba.ar

Asociación Física Argentina

Armenia

Units: 1, votes: 1, member since 2011



Prof. Aram Papoyan

Laboratory of Optics
Institute for Physical
Research,

[National Academy of Sciences of
Armenia](http://National Academy of Sciences of Armenia)

Ashtarak-2, 0203, Armenia

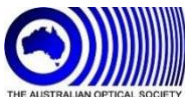
Tel: (+374 10) 288150

Fax: (+374 232) 31172

E-mail: papoyan@ipr.sci.am

Australia

Units: 6, votes: 3, member since 1959



Prof. John Holdsworth

University of Newcastle
Fac. of Science & Inform. Tech.
School of Mathematical and Physical
Sciences, Room P104 Physics Building
Callaghan, NSW 2308 Australia
Tel: +61 2 4921 5436

Fax: +61 2 4921 6898, E-mail:

John.Holdsworth@newcastle.edu.au

The Australian Optical Society

Belgium

Units: 4, votes: 3, member since 1948

Associate Member since 2013

Dr. Yvon Renotte

CBO/BCO, President
c/o Hololab Université de Liège,
Institut de Physique, B5 Sart Tilman,
B-4000 LIEGE, Belgium
Tel: 41.66.37.72,
Fax: 41.66.23.55,

E-mail: y.renotte@ulg.ac.be

Belorussia

Units: 2, votes: 2, member since 1993

Associate member since 2013

Prof. Andrey M. Goncharenko

Optical Territorial Committee
Republic of Belarus,
B.I.Stepanov Institute of Physics of the
NAS of Belarus, Chief Researcher.
68 Independence Avenue, Minsk BY-
220072, Republic of Belarus
Tel: +375 (17) 264-37-50.

E-mail: office@optoinform.bas-net.by

Brazil

Units: 5, votes: 3, member since 1984

Prof. Jaime Frejlich

DFMC/IFGW-UNICAMP
rua Sergio Buarque de Holanda, 777
13083-859 Campinas-SP, Brazil
Tel: +55-19-3521.2450
Fax: +55-19-3521.0308
E-mail: frejlich@ifi.unicamp.br

Canada

Units: 8, votes: 4, member since 1956

Tigran GALSTIAN

Ph.D., Eng. Professeur Titulaire.
Universite Laval

Departement de physique, de genie
physique et d'optique
Centre d'optique, photonique et laser
Pavillon d'Optique-Photonique,
2375 Rue de la Terrasse,
Quebec, Canada G1V 0A6
Tel: (418) 656-2025
Fax: (418) 656-2623
E-mail: galstian@phy.ulaval.ca

Chinese Optical Society

Units: 11, votes: 5, member since 1987



Prof. Gong Qihuang
COS International
Working Committee
South Xueyuan Road,
Haidian District,
Beijing, China.

e-mail: qhong@pku.edu.cn
[Chinese Optical Society](http://www.cos-optics.org)

Colombia

Units: 2, votes: 2, member since 1990



Prof. Edgar Rueda

Institute of Physics, University of
Antioquia, Cl. Barranquilla #53-108,
Medellín, Colombia
Tel: +574 42195630,
E-mail: edgar.rueda@udea.edu.co
[Sociedad Red Colombiana de Optica](http://www.sociedadredcolombiana.deoptica.org)

Cuba

Units: 1, votes: 1, member since 1993

Prof. Tit. Juan Gualberto Darías González

Grupo de Metrología y Calidad.
Centro de Aplicaciones Tecnológicas y
Desarrollo Nuclear (CEADEN).
Calle 30 #502 esq. 5ta Ave. Miramar,

Playa, C. Habana, Cuba. CP 11300.
Tel/Fax: (+53) 7 202 1518
E-mail: darias@ceaden.edu.cu

Czech Republic

Units: 2, votes: 2, member since 1948

Dr. Miroslav Hrabovsky

[Territorial Committee of ICO](http://www.slo-up.cz), secretary
SLO UP and FZU AV CR
17. Listopadu 50
772 07 Olomouc, Czech Republic
Tel: 420 68 522 3936,
Fax: 420 68 522 4047,
E-mail: hrovsky@sloup.upol.cz
Alternate phone: 42 2 84 3741 Fax0609
Web: <http://www.cko-ico.cz/>

Denmark

Units: 3, votes: 2, member since 1987



Anders Clausen

DTU Fotonik Technical University of
Denmark, Ørsted's Plads, Building
343, Room 122, 2800 Kgs. Lyngby,
Denmark
Tel: +45 45253779
E-mail: ancl@fotonik.dtu.dk
[The Danish Optical Society](http://www.danishopticalsociety.org)

Ecuador

Associate member since 2005

Ph. D. Dr. Nikolai Espinosa

Optical Committee of Ecuador,
President
CICTE - E.S.P.E.
Centro de Investigaciones Científicas
Escuela Politécnica del Ejercito
P.O. Box 17-07-9661
Quito, Ecuador
Tel: 593-9-7072532
Fax: 593-2-2534395
E-mail: ndespinosa@espe.edu.ec

Estonia*Units: 1, votes: 1, member since 2002***Prof Peeter Saari**

Estonian Committee for Optics

Institute of Physics

Faculty of Science and Technology

University of Tartu

142 Riia Str., Tartu

51014 Estonia

Tel: +372 7 383 016

Fax: +372 5109018

E-mail: psaari@fi.tartu.ee[Estonian Physical Society](http://www.physic.ut.ee/efs/)Web: <http://www.physic.ut.ee/efs/>**Finland***Units: 4, votes: 3, member since 1978***Prof. Jyrki Saarinen**

Intitute of Photonics

University of Eastern Finland

Vice President, Photonics Finland

E-mail jyrki.saarinen@uef.fi[Photonics Finland](http://www.photonicsfinland.fi)**France***Units: 15, votes: 5, member since 1948***Prof. Benoît****BOULANGER**

President Société

Française d'Optique

benoit.boulanger@grenoble.cnrs.fr**Catherine Hercé**

Secrétaire Générale

Société Française d'Optique

2 avenue Augustin Fresnel

91127 PALAISEAU CEDEX

Tel: +33 (0)1 64 53 31 83

Fax : + 33 (0)1 64 53 31 84

catherine.herce@institutoptique.fr[Société Française d'Optique](http://www.institutoptique.fr)**Germany***Units: 15, votes: 5, member since 1953***Prof. Gert Von Bally**

Center for Biomedical Optics and

Photonics (CeBOP)

University of Münster

Robert-Koch-Str. 45

D-48149 Münster Germany

Phone: + 49 251 8356888 or 8356862

Fax: + 49 251 8358536,

e-mail: bally@uni-muenster.de**Ghana / West Africa***Units: 1, votes: 1, member since 1993**Associate member since 2013***Dr. Paul Buah-Bassuah**

Ghana/West Africa Territorial

Committee, Secretary General

Ghana Committee for Optics

Laser and Fibre Optics Centre

Dept of Physics, Univ. of Cape Coast,

Cape Coast, Ghana

Tel: +233 42 33773,

Fax: +233 42 32446

E-mail: buahbass@hotmail.com**Prof. Ahmadou Wagué**

Ghana/West Africa Territorial

Committee, Senegal contact,

Département de Physique

Université Cheikh Anta Diop, Fac des

Sciences et Techniques, DAKAR,

Sénégal

Tel: +221-8.25.69.80

Fax: +221-8.25.69.80

E-mail: wague@refer.sn**Prof. Kedro Sidiki Diomandé**

Ghana/West Africa Territorial

Committee, Ivory Coast contact

Université Nationale de Côte d'Ivoire

Département de Physique, Faculté

Sciences B.P. 582, 22 ABIDJAN,

Côte d'Ivoire E-mail: cnra@avisoci.cior diomkap@yahoo.fr

Greece*Units: 3, votes: 2, member since 2005***Prof. Nikos Vainos**

Engineered Photonic Media Lab.
 NHRF-The National Hellenic Research
 Foundation , TPCI
 48, Vas. Constantinou Ave., Athens
 11635, Greece
 Tel: +30 10 7273887, 10 7273792
 Fax +30 10 7273794
 E-mail vainos@eie.gr

Hungary*Units: 3, votes: 2, member since 1963*
Associate member since 2013**Dr. Ákos Antal**

Sci. Soc. Optics,
 Acoustics & Filmtech.

OPAKFI, Fo u. 68, 1027 BUDAPEST,
 Hungary

Tel: +36 1 202 0452

Fax: +36 1 202 0452

E-mail: akos1@mail.matav.hu

OPAKFI: Sci. Soc. Optics, Acoustics
 & Filmtech

India*Units: 4, votes: 3, member since 1990***Prof. L. N. Hazra**

Department of Applied
 Optics and Photonics,
 University of Calcutta

Acharya Prafulla Chandra Siksha
 Prangan

JD-2 Sector-III Salt Lake

Kolkata 700098 India

Tel : (Off) 91-33-23352411

Cell: (+91)9433162114

Email: lnhaphy@caluniv.ac.in;LNHazra@yahoo.com;lakshminarayanhazra@gmail.com[Optical Society of India](http://www.opticalsoc.org)**Indonesia***Units: 1, votes: 1, member since 1987*

Himpunan Optika Indonesia
 Indonesian Optical Society

Dr Husin Alatas

Head of the Theoretical Physics
 Division

Department of Physics, Bogor
 Agricultural University (IPB)
 Jl. Meranti, Kampus IPB Darmaga,
 Bogor 16680

West Java, Indonesia

Tel/Fax: +62 251-862-5728

Cell: +62 888-166-8471

E-mail: alatas@ipb.ac.id ors.h.alatas@gmail.com[The Indonesian Optical Society \(InOS\)](http://www.theindonesianopticalsociety.org)**Ireland***Units: 3, votes: 2, member since 1984***Karen Sheeran**

Policy Officer

Institute of Physics in Ireland

c/o School of Physical Sciences

Dublin City University

Dublin 9

Ireland

Tel: +353 1 7007789

Fax: +353 1 7005384

E-mail Karen.Sheeran@iop.org<http://www.iopireland.org/>**Islamic Republic of Iran***Units: 1, votes: 1, member since 1993**Associate member since 2013***Prof. M.T. Tavassoli**

Department of Physics,

University of Tehran,

Kargar shomally Avenue,

Tehran 14399-66951, Iran.

E-mail: tavasoli@iasbs.ac.ir

Israel*Units: 4, votes: 3, member since 1972***Professor Abraham Katzir**

Territorial Committee for Optics
 Faculty of Exact Sciences
 School of Physics and Astronomy
 Tel-Aviv University
 P.O. Box 39040
 Tel Aviv 69978
 Israel
 Tel: +972-(0)3-640-8301/ 8068
 Fax: +972-(0)3-641-5850,
 E-mail: katzir@post.tau.ac.il

Italy*Units: 12, votes: 5, member since 1948*

Delegate

Dr. Paolo DE NATALE

CNR - Istituto Nazionale di Ottica
 Largo Enrico Fermi, 6
 50125 Firenze
 E-mail: paolo.denatale@ino.it

Alternate Delegate

Dr. Piero Ferraro

Director CNR- ISASI
 Institute of Applied Science and
 Intelligent Systems
 Via Campi Flegrei, 34
 80078 Pozzuoli NA
 E-mail: pietro.ferraro@ino.it
[Italian National Council for
 Research](http://www.italian-national-council-for-research.it) (CNR).

Japan*Units: 15, votes: 5, member since 1953*

Prof. Yasuhiko Arakawa
 Member,
[Science Council of Japan](http://www.science-council.jp)

Professor, The University of Tokyo
 6-1 Komaba, Meguro-ku,
 Tokyo 153-8505 Japan
 Tel: +81-3-5452-5130 or 6245
 Fax: +81-3-5452-6246
 E-mail: arakawa@iis.u-tokyo.ac.jp
[Optical Society of Japan](http://www.osj.or.jp)

Korea (Republic of)*Units: 4, votes: 3, member since 1975***Dr. Byoung Yoon Kim**

811 Korea Science Technology Center
 635-4 Yeoksam-dong, Gangam-gu
 Seoul 135-703, Korea
 Tel: +82 2 3452 6560
 Fax: +82 2 3452 6561
 E-mail: osk@osk.or.kr
[Optical Society of Korea](http://www.osk.or.kr)

Latvia*Units: 1, votes: 1, member since 2002***Prof. Janis Spigulis**

Latvian Committee for Optics
 University of Latvia, Physics
 Department and IAPS,
 Raina Blvd. 19, Riga, LV-1586, Latvia
 Tel/Fax: +371 7228249
 E-mail: janispi@latnet.lv

Lithuania*Unit: 1, votes: 1, member since 2003**Associate member since 2013***Prof. Juozas Vidmantis Vaitkus**

Director of Institute of Materials
 Science and Applied Research
 Department of Semiconductor Physics
 Vilnius University
 Sauletekio Ave,
 2054 Vilnius, Lithuania
 Phone: + 827 36 60 71
 Fax: + 822
 E-mail: juozas.vaitkus@ff.vu.lt

Mexico*Units: 3, votes: 2, member since 1972*ACADEMIA MEXICANA
DE ÓPTICA. A.C.**Dr. Josué Álvarez Borrego**

Coordinación de
 Óptica Instituto
 Nacional de Astro-
 física, Óptica y
 Electrónica

Luis Enrique Erro #1
Sta Ma Tonantzintla,
Pue Mexico 72840
Tel: + 52-222-2663100 ext 1213
Fax: + 52-222-24729409
E-mail: presidencia@amo-ac.mx
[Mexican Academy of Optics](#)

Dra. Amalia Martínez García
(2014-2016)

Metrología Óptica
Centro de Investigaciones en Óptica
A.C. Loma del Bosque No. 115
Colonia Lomas del Campestre
León, Gto. 37150, México
Tel: + 52-477-441 4200
Fax: + 52-477-4414209
e-mail: amalia@cio.mx

Moldova

Units: 1, votes: 1, member since 2005

Associate member since 2013

Prof. Andrei Andries

Director of Center of Optoelectronics
Institute of Applied Physics
Academy of Sciences of Moldova.
Academiei Street, 1.
20028 Chisinau, Moldova.
Tel/Fax: +373 22 739805
E-mail: andries@asm.md
[Academy of Sciences of Moldova](#)

Morocco

Associate member since 2002

Professeur Mustapha Haddad

Université Moulay Ismaïl
Faculté de Sciences Meknès
BP 4010 Beni M'hamed
Meknès, Morocco
Tel.: +212 555 388 70
Fax: +212 555 368 08
e-mail: mhaddad22@yahoo.fr

Professeur

Mohammed Semlali

Faculté des Sciences
Université Mohammed V $\rightarrow$ Agdal
B.P.: 8811 Rabat-Agdal, Morocco
Tel: 212 66 30 06 51
Fax: 212 37 77 74 70
E-mail: medsemlali@hotmail.com

Netherlands

Units: 4, votes: 3, member since 1948

Associate member since 2013

Dr. J. J. H. B. Schleipen

Philips Group Innovation,
Research Optics Group,
High Tech Campus 34
5656 AE Eindhoven, The Netherlands
Tel: +31-40-27 47665
Fax: +31-40-27 46321,
E-mail: jean.schleipen@philips.com
[PhotonicsNL](#)

New Zealand

Units: 3, votes: 2, member since 1974

Prof. John Harvey

International Contracts
Coordinator. Royal
Society of N. Zealand
11 Turnbull Street,
Thorndon | PO Box 598,
Wellington 6140,



New Zealand

Tel: +64 4 470 5780

Fax: +64 4 473 1841, E-mail:

International.Unions@royalsociety.org.nz

[Royal Society of New Zealand](#)

Norway**Units: 4, votes: 3, member since 1981****Dr Jakob J. Stamnes**

Physics Department, University of
Bergen, Allegaten 55, N 5007 Bergen
Norway

Tel: +47 55 58 28 18

Fax: +47 55 58 94 40

E-mail: Jakob.Stamnes@ift.uib.no**Optical Engineering Society Taipei
China (Taiwan Photonics Society)****Units: 3, votes: 2, member since 1981***Associate member since 2013***Gong-Ru Lin**

President of Taiwan Photonics Society
Graduate Institute of Photonics and
Optoelectronics National Taiwan
University (NTU), Taiwan, 1 Sec. 4,
Roosevelt Rd. Taipei 10617

Tel: +886 2-3366-3700 ext. 6519

E-mail: grlin.ntu@gmail.com**Dr. Yung S. Liu**

Industrial Technology Institute
Bldg. 78, 195 Sec.4, Chung-Hsing Rd.,
Chutung 310, Hsinchu, Taiwan, R.O.C.

Tel: +886-3-13525

Fax: +886-3-5913525

E-mail: liuys@ipt.nthu.edu.twliuys@mx.nthu.edu.tw[Taiwan Photonics Society](#)**Poland****Units: 4, votes: 3, member since 1948****Prof. Leszek Sirko (2017)**

Polish Territorial Committee of ICO
Institute of Physics, Polish Academy of
Sciences, Republic of Poland

Tel: +48 (22) 843 09 26

Fax: +48 (22) 116 33 85

E-mail: sirko@ifpan.edu.pl**Prof. Jakub Zakrzewski (2014-2017)**

Polish Territorial Committee of ICO
Zaklad Optyki Atomowej Instytut
Fizyki im. Mariana Smoluchowskiego,
and Mark Kac Complex Systems
Research Center (QuantLab)

Uniwersytet Jagiellonski
Reymonta 4, PL-30-059 Krakow,
PL-30-059 Krakow, Poland

Tel: +48 (12) 663 5555

Fax: +48 (12) 633 8494

E-mail: kuba@if.uj.edu.pl**Portugal****SPOF** *Units:2, votes:2
member since 2011***Prof. Manuel Filipe Pereira
da Cunha Martins Costa**

Universidade do Minho
Departamento de Física
Campus de Gualtar 4710-057
Braga, Portugal

Tel: +351 253 60 4070/4320

Fax: +351253 60 4061

E-mail: mfcosta@fisica.uminho.ptpresident@spidof.ptpresident@hsci.info

[Sociedade Portuguesa de Óptica e
Fotónica](#)

Romania**Units: 1, votes: 1, member since 1993****Prof. Dumitru Mihalache**

Nat. Inst. of Laser, Plasma &
Radiation Physics
Romanian Center of Excellence
in Photonics, Bucharest, Romania

Tel: +40 21 4574467

Fax +401 423 1791

E-mail: mihalake@theory.nipne.ro

Russia*Units: 18, votes: 6, member since 1981***Prof. Sergei N. Bagayev**

Director, Institute of Laser Physics
Siberian Branch of the RAS, 13/3
Prospekt Lavrentyev, Novosibirsk,
630090, Russia

Tel: +7 3832 332489

Fax: +7 3832 332067

E-mail: bagayev@laser.nsc.ru**Singapore***Units: 3, votes: 2, member since 1984*

Optics and Photonics Society of Singapore

新加坡光学与光子学学会

Qian Quemao

Chairman, Optics and Photonics
Society of Singapore

*Director, Centre for Optical and Laser**Engineering*

School of Mechanical and Aerospace
Engineering

Nanyang Technological University

Singapore 639798

Tel: 65-6790-5936

Fax: 65- 6790-5936

E-mail: chairman@opssg.org[Optics and Photonics Society of](http://www.opssg.org)[Singapore](http://www.opssg.org)**Slovak Republic***Units: 2, votes: 2, member since 1948***Dr. Dagmar Senderakova**

Territorial Committee of ICO,
Chairman

Comenius University, Faculty of

Mathematics, Physics and Inf.,

Mlynska dolina F2, SK-842 48

Bratislava, Slovak Republic

Tel: +421 2 60295391, E-mail:

dagmar.senderakova@fmph.uniba.sk<http://www.dep.fmph.uniba.sk/>**Spain***Units: 6, votes: 3, member since 1948***Prof. Inmaculada Pascual**

Dep. de Óptica, Farmacología y
Anatomía, Universidad de Alicante,
Apartado 99, 3080 Alicante, SPAIN

E-mail: pascual@ua.es[Optical Society of Spain](http://www.optical-society-of-spain.org)**Sweden***Units: 1, votes: 1, member since 2008***Dr. Tahani S. Mohamed Shatir**

The Sudanese Committee of Atomic,
Optics and Lasers Science

P. O. Box 321-19, Code 11115

University of Khartoum,

Khartoum, Sudan.

Tel: 249912614425

E-mail: tahanism@yahoo.com**Sweden***Units: 8, votes: 4, member since 1948***Professor Fredrik Laurell**

Chairman, Swedish ICO Committee

The Royal Institute of Technology

(KTH)

Dept. of Laser Physics and Quantum
Optics

AlbaNova University Center

SE-106 91 Stockholm, Sweden

Tel: +46-8-5537 8153

Fax: +46-8-5537 8216

E-mail: fl@laserphysics.kth.se

Switzerland*Units: 6, votes: 3, member since 1948***Prof. Dr. Hans Peter Herzig**

Optics & Photonics Technology Lab
Ecole Polytechnique Fédérale de
Lausanne

EPFL IMT OPT

Rue A.L. Bréguet, 2000

NEUCHÂTEL, Switzerland

Tel: +41 32 718 3270

Fax: +41 32 718 3201

E-mail: hanspeter.herzig@epfl.ch

[Swiss Society for Optics and
Microscopy](#)

Tunisia*Units: 1, votes: 1, member since 2006***Prof. Mourad ZGHAL**

Engineering School of
Communications (Sup'Com)

University of Carthage

Cité Technologique des

Communications –

Rte de Raoued Km 3.5

2083 Gazala Ariana Tunisia

Tel: (+216) 71857000 –

Fax: (+216) 71856829

E-mail: mourad.zghal@supcom.rnu.tn**Turkey***Units: 1, votes: 1, member since 1996**Associate member since 2013***Dr. Meriç Özcan**

Faculty of Engineering and Natural
Sciences

Sabancı University Orhanlı, Istanbul

Turkey

Tel: 90 (216) 483 9506

Fax: 90 (216) 483 9550

E-mail: meric@sabanciuniv.edu**Ukraine***Units: 2, votes: 2, member since 1993***Prof. Oleg Angelski**

ICO Territorial Committee, Ukraine,
President

Chernovtsy University,

Correlation Optics, 2, Kotsyubinsky

Street, 58012 Chernovtsy, Ukraine

Tel: (7) 03722 44730

Fax: (7) 03722 41314

E-mail: angelsky@itf.cv.ua**United Kingdom***Units: 12, votes: 5, member since 1948***Dominic Hurley**

Head of International

The Institute of Physics

76 Portland Place

London W1B 1NT

United Kingdom

Tel: +44 (0) 20 7470 4939

Fax: +44 (0) 20 7470 4848

E-mail: dominic.hurley@iop.org[IOP Institute of Physics](#)**United States of America***Units: 27, votes: 6, member since 1948***Kathie Bailey Mathae**

Director, Board on International

Scientific Organizations

The National Academies

500 Fifth Street, NW

Washington, DC 20001

Tel: 202-334-2606

Fax: 202-334-2231

E-mail: KBMathae@nas.edu**Prof. Duncan T. Moore**

Rudolf & Hilda Kingslake

Professor of Optical Engineering

Professor of Optics

Biomedical Engineering and Business

Administration

Vice Provost for Entrepreneurship

Institute of Optics

University of Rochester
Office: Goergen 409A
Phone: 585 275 5248
E-mail: moore@optics.rochester.edu

Venezuela

Units: 2, votes: 2, member since 1997

Dr. Alberto Fernández

Universidad Central de Venezuela

Facultad de Ciencias
Paseo Los Ilustres
Urb. Valle Abajo.
Apartado Postal 20513
Caracas 1020-A.
Venezuela
E-mail: aferna@ciens.ucv.ve
Comité Venezolano de Óptica

INTERNATIONAL ORGANIZATION MEMBERS

LAM Network *African Laser, Atomic and Molecular Physics Network*

Prof Ahmadou Wagué

Department of Physics,
Faculty of Science and Techniques,
University Cheikh Anta Diop, Dakar,
Senegal
Phone +221 33 864 59 82
Mobile Phone: +221 77 634 19 61
Fax +221 33 824 63 18
mail: wague@refer.sn, ahmadou.wague@ucad.edu.sn, amasweet1@yahoo.fr

EOS *European Optical Society*

Dr. Gilles Pauliat

Institut d'Optique Graduate
School- Paris Saclay 2
avenue Augustin Fresnel
91127 Palaiseau cedex,
France
Phone: + 33(0)1 64 53 34 67
e-mail: president@europeanoptics.org

IEEE *Photonics Society*

Prof. Ken Choquette

IEEE Photonics Society President
Electrical & Computer Engineering
Dept. University of Illinois 3108
Micro and Nanotechnology Lab.
208 N. Wright Street, Urbana, IL
61801USA
Phone: +1 217-265-0563
email: choquett@illinois.edu

OWLS *International Society on Optics Within Life Sciences*

Prof. Gert von Bally

Center for Biomedical Optics and
Photonics, University of Münster,
Robert-Koch-Str. 45, D-48149
Münster, Germany.
Phone: + 49 175 2069916
e-mail: bally@uni-muenster.de

OSA The Optical Society**Prof. Dr. John Howell**

The Racah Institute of Physics, The
Hebrew University of Jerusalem
Edmond J. Safra Campus, Jerusalem
9190401, Israel
Phone: + 972 02 6585834
e-mail: johnhowell178@gmail.com

Headquarters:

2010 Massachusetts Avenue NW,
Washington DC 20036- 0123, USA,
Phone: +1 202 416 1475,
Fax +1 202 223 1096,
Email: kamundsen@osa.org

***RIAO Red Iberoamericana de
Óptica*****Dr. Eric Rosas**

Cluster Mexicano de Fotónica
E-mail: [eric.rosas@photonics-
mexico.org](mailto:eric.rosas@photonics-mexico.org)

***SPIE The International Society
for Optics and Photonics*****Dr. Carmiña Londoño**

National Science Foundation,
2415 Eisenhower Av,
Alexandria, Virginia 22314, USA
Phone: 34-93-581 1933
Fax: 34-93- 581 2155
E-mail: clondono@nsf.gov

Headquarters:

P.O. Box 10, Bellingham, Washington
98227-0010, USA,
Phone +360 676 3290,
Fax +360 647 1445.

ICO BUREAU MEMBERS

Oct 1, 2017 – Sep 30, 2021

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Director, Institute for Photonics
and Nanotechnologies (IFN-
CNR) Dipartimento di Fisica
Politecnico di Milano
Piazza Leonardo da Vinci, 32
20133, Milano, Italy
Phone: +39 02 2399 6150
E-mail: roberta.ramponi@polimi.it

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Prof. Dr. Yasuhiko ARAKAWA

Director, Center for Photonic and
Electronic Convergence
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The University of Tokyo
4-6-1 Komaba, Meguro-ku
Tokyo 153-8505 Japan
Phone: +81-3-5452-5130 or 6245
Fax +81-3-5452-6246
E-mail: arakawa@iis.u-tokyo.ac.jp

Secretary:

Prof. Dr. Humberto MICHINEL

Optics Lab. University of Vigo
Facultade de Ciencias de Ourense
As Lagoas s/n. Ourense, 32004.
Spain Tel: +34 988 38 72 20
E-mail: hmichinel@uvigo.es

Associate Secretary:

Dr. Frank HÖLLER

Carl Zeiss AG Oberkochen
Carl-Zeiss-Straße 2-60, 73447
Oberkochen, Germany
Tel: +49-(0)7364 - 20 4399
E-mail: frank.hoeller@zeiss.com

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Senior Researcher and Head of
Applied Physics, Abdus Salam
International Centre for Theoretical
Physics (ICTP)
Strada Costiera, 11
I-34151 Trieste, Italy Tel: +39
040 2240 607
E-mail: niemela@ictp.it

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(Appointed by the IEEE Photonics
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IEEE Photonics Society President
Abel Bliss Professor of Engineering
Electrical and Computer Engineering
Department University of Illinois
3108 Micro and Nanotechnology
Laboratory, 208 N. Wright
Street, Urbana, IL 61801
Tel: +1 217-265-0563
E-mail: choquett@illinois.edu

Prof. Gilles PAULIAT*(Appointed by EOS)*

Institut d'Optique Graduate

School- Paris Saclay

2 avenue Augustin Fresnel 91127

Palaiseau cedex, France

Phone: + 33 (0)1 64 53 34 67

E-mail: president@europeanoptics.org**Prof. John C. HOWELL***(Appointed by OSA)*

The Racah Institute of Physics, The

Hebrew University of Jerusalem

Edmond J. Safra Campus,

Jerusalem 9190401, Israel

Phone: + 972 02 6585834

e-mail: johnhowell178@gmail.com**Prof. Gert von BALLY***(Appointed by OWLS)*

Center for Biomedical Optics and

Photonics (CeBOP) University of

Münster Robert-Koch-Str. 45

D-48149 Münster, Germany

Phone: + 49 251 8356888 or 8356862

Fax: + 49 251 8358536,

e-mail: bally@uni-muenster.de**Dr. Eric ROSAS***(Appointed by RIAO)*

Chief Intellectual Property

Centro de Investigaciones en Optica

Loma del Bosque 115, Colonia Lomas

del Campestre. León, Guanajuato,

México Código Postal 37150

Tel +52 (477) 441 4200

Fax: +52 (477) 441 4209

E-mail: erosas@cio.mx**Prof. Dr. Ahmadou WAGUÉ***(Appointed by LAM Network)*

Department of Physics,

University Cheikh Anta Diop,

Dakar, Senegal

Tel: +221 33 864 59 82

Cell: +221 77 634 19 61

Fax +221 33 824 63 18

E-mail: wague@refer.snahmadou.wague@ucad.edu.sn**Dr. Carmiña LONDOÑO***(Appointed by SPIE)*

National Science Foundation,

2415 Eisenhower Av, Alexandria,

Virginia 22314, USA

Phone: 34-93-581 1933

Fax: 34-93- 581 2155

E-mail: clondono@nsf.gov

*Elected Vice-Presidents***Prof. John HARVEY**

(Elected from industry) University of
Auckland Private Bag 92019,
New Zealand
Tel: +64 (0) 9 923 8831
E-mail: j.harvey@auckland.ac.nz

Dr. Sara OTERO

(Elected from industry)
Radiantis, S.L.
Parc Mediterrani de la Tecnologia C,
Carrer d'Esteve Terradas, 1, planta 3,
08860 Castelldefels, Barcelona, Spain
Tel: +34 936 38 97 63
E-mail: sara.otero@radiantis.com

Prof. Dr. Qihuang GONG

Physics Department. Peking University
209 Chengfu Rd, Haidian Qu, Beijing,
100871 China
Phone: +86 10 6276 5884
e-mail: qhong@pku.edu.cn

Prof. Dr. Nataliya KUNDIKOVA

Faculty of Physics, South Ural State
University, Lenin Avenue, 76,
Chlyabinsk 454081, Russia
Phone: +7 (351) 267 9041
e-mail: kundikovand@susu.ac.ru

Prof. Adrian PODOLEANU

School of Physical Sciences,
University of Kent, Room 301,
Ingram Building, Canterbury, CT2
7NH, UK
Phone. +44 1227 823 272 E-mail:
A.G.H.Podoleanu@kent.ac.uk

Prof. Seung-Han PARK

Department of Physics College of
Science Yonsei University, Seoul
120-749. Korea
Tel: +82 2 2123 2617
Fax: +82 2 392 3374
E-mail: shpark@yonsei.ac.kr

Prof. Leszek SIRKO

Institute of Physics
Polish Academy of Sciences
Al. Lotników 32/46
PL-02-668 Warsaw, Poland
Phone: + 48 22 843 66 01
e-mail: sirko@ifpan.edu.pl

Prof. Mourad Zghal

Engineering School of
Communications of Tunis (Sup'Com)
University of Cartaghe
Cite Techno. Com. -Rte Raoued Km
3,5, 2083 Gazala Ariana Tunisia
Tel: + (216) 71857000 (#1025)
Fax: +(216) 71856829
E-mail: mmourad.zghal@supcom.tn

*IUPAP Executive Council delegate***Prof. Carmen CISNEROS GUDIÑO**

Instituto de Ciencias Fisicas, UNAM,
Av. Universidad s/n, Col. Chamilpa,
Cuernavaca, Morelos, 62210, México
Tel: +55 5622-1731
Fax: (52) 5556 227731
E-mail: carmen@fis.unam.mx

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Chair: Prof. Yasuhiko Arakawa
(Japan, ICO Past President)

Members:

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Prof. Seung-Han Park (Korea)
Prof. John Harvey (New Zealand)

ICO Strategic Planning Committee:

Chair: Prof. Roberta Ramponi
(Italy, ICO President)

Members:

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Prof. Maria L. Calvo (Spain, not ICO
Bureau member)
Prof. Angela Guzmán (USA/Colombia)
Prof. James Harrington (USA)
Prof. Gert von Bally (Germany)
Prof. Pierre Chavel (France, not ICO
Bureau member)

ICO Committee for Regional Development:

Chair: Prof. John Harvey (New
Zealand)

Members:

Dr. Yanne K. Chembo (France, not
ICO Bureau member)
Prof. Joe Niemela (Italy)
Prof. Seung-Han Park (Korea)
Prof. Gert von Bally (Germany)

ICO Education Committee:

Chair: Prof. Qihuang Gong
(China)

Members: (Inactive)

ICO Prize Committee:

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Members:

Maria J. Yzuel (Spain, Former ICO
Vice President)
John Harvey (New Zealand)
Leszek Sirko (Poland)
Yasuhiko Arakawa (Japan)
Eric Rosas (Mexico)
Gert von Bally (Germany)
Joseph Niemela (USA)
Carmina Londoño (USA)
Sara Otero (Spain)

IUPAP Young Scientist Prize in Optics Committee:

Chair: Prof. Dr. Adrian Podoleanu (UK)

Members:

Jannick Rolland (USA)
Gabriel Popescu (Romania)
Mourad Zghal (Tunis)

ICO/ICTP Gallieno Denardo Award Committee:

Chair: Prof. Mourad Zghal (Tunisia)

Members:

Prof. Joseph Niemela (Italy, ICTP)
Dr. Mitcho Danailov (Italy, not ICO
Bureau member)
Prof. Anna Consortini (Italy, not ICO
Bureau member)
Prof. Ahmadou Wagué (Senegal)

***ICO Galileo Galilei Medal
Award Committee:***

Chair: Prof. Natalya Kundikova
(Russia)

Members:

Prof. Anna Consortini (Italy, not ICO
Bureau member)
Prof. Nataliya Kundikova (Russia, not
ICO Bureau member, Past winner)
Prof. Fernando Mendoza (Mexico, not
ICO Bureau member)
Prof. Joseph Niemela (Italy)

***ICO Traveling Lecturer Program
Committee:***

Chair: Prof. Joseph Niemela (USA,
ICO Treasurer)

Members:

Prof. Seung-Han Park (Korea)
Prof. Humberto Michinel
Prof. Gert von Bally

***ICO ad-hoc Committee on International
Affairs:***

Chair: Prof. Gert von Bally (Germany)

Members:

Prof. Henryk Kasprzak (Poland, not
ICO Bureau member)
Prof. Tomasz Szoplik (Poland, not ICO
Bureau member)

*ICO representatives in other Committees and organizations:***ICO Associate Member in IUPAP Commissions (term 2014-2017):**

C13, Physics on Development: Prof. Ahmadou Wagué (2014-2015)

C15, Atomic and Molecular Physics and Optical Physics: Prof. Humberto Michinel

C17, Quantum Electronics: Prof. Yasuhiko Arakawa

ICO representative in the ETOP Long Range Planning Committee: Prof. Roberta Ramponi and Prof. Joseph Niemela.

ICO representative in the OiC/IP Steering Committee: Prof. Humberto Michinel

ICO Representative to the Trieste System Optical Sciences and Applications Advisory Group (TSOSA): Prof. Roberta Ramponi.

IUPAP Triennial General Assembly, annual IUPAP Council and Chair meetings: Prof. Yasuhiko Arakawa (President).

ISC links and General Assembly: Prof. Roberta Ramponi.

FORMER MEMBERS OF THE ICO BUREAU

1947-1950

T. Smith

A. Arnulf
P. Fleury
J. Hrdlicka
S. S. Ballard
A. C. S. van Heel

Great Britain

France
France
Czechoslovakia
U.S.A.
The Netherlands

President

Treasurer
Secretary
Vice-President
Vice-President
Vice-President

1950-1953

A. C. S. van Heel

A. Arnulf
P. Fleury
S. S. Ballard
L. C. Martin
J. M. Otero

The Netherlands

France
France
U.S.A.
Great Britain
Spain

President

Treasurer
Secretary
Vice-President
Vice-President
Vice President

1956-1959

S. S. Ballard

W. D. Wright
E. Ingelstam
G. Hansen
A. Maréchal
G. Toraldo di Francia

U.S.A.

Great Britain
Sweden
Germany
France
Italy

President

Secretary-Treasurer
Vice-President
Vice-President
Vice-President
Vice-President

1959-1962

E. Ingelstam

W. D. Wright
J. G. Baker
A. Maréchal
P. Mollet
G. Toraldo di Francia

Sweden

Great Britain
U.S.A.
France
Belgium
Italy

President

Secretary-Treasurer
Vice-President
Vice-President
Vice-President
Vice-President

1962-1965 (Posponed to 1966)

A. Maréchal

W. D. Wright
G. Cario
W. L. Hyde
H. Kubota
P. Mollet

France

Great Britain
Germany
U.S.A.
Japan
Belgium

President

Secretary-Treasurer
Vice-President
Vice-President
Vice-President
Vice-President

1966-1969

G. Toraldo di Francia

W. L. Hyde
L. E. Howlett
H. H. Hopkins
H. Kubota
T. Skalinski

Italy

USA
Canada
Great Britain
Japan
Poland

President

Secretary-Treasurer
Vice-President
Vice-President
Vice-President
Vice President

1969-1972

H. H. Hopkins

J.-Ch. Viénot

B. Havelka
R. M. Scott
K. Kinosita
W. H. Steel

Great Britain

France
Czechoslovakia
U.S.A.
Japan
Australia

President

Secretary General &
Treasurer
Vice-President
Vice-President
Vice-President
Vice-President

1972-1975

W. H. Steel

J.-Ch. Viénot

K. M. Baird
B. Billings
A. Fiorentini
B. Havelka
K. Kinosita
H. Koehler

Australia

France
Canada
U.S.A.
Italy
Czechoslovakia
Japan
Germany

President

Secretary General &
Treasurer
Vice President
Vice President
Vice President
Vice-President
Vice-President
Vice-President

1975-1978

K. M. Baird

W. H. Steel
J.-Ch. Viénot
F. D. Smith
B. Karczewski
A. W. Lohmann
L. Plaza
J. Tsujiuchi
W. T. Welford

Canada

Australia
France
U.S.A.
Poland
Germany
Spain
Japan
Great Britain

President

Past President
Secretary General
Vice President & Treasurer
Vice President
Vice President
Vice President
Vice President
Vice President

1978-1981

A. W. Lohmann

K. M. Baird
H. J. Frankena
F. D. Smith

Federal Republic Germany

Canada
The Netherlands
USA

President

Past-President
Secretary-General
Treasurer & Vice-President

E. Marom	Israel	Vice-President
K. Schindl	Austria	Vice-President
T. Skalinski	Poland	Vice-President
J. Tsujiuchi	Japan	Vice-President
W. T. Welford	Great Britain	Vice-President

1981-1984

J. Tsujiuchi	Japan	President
A. W. Lohmann	FRG	Past-President
H. J. Frankena	The Netherlands	Secretary-General
J. N. Howard	USA	Vice President & Treasurer
F. T. Arecchi	Italy	Vice President
K. Biedermann	Sweden	Vice President
S. Lowenthal	France	Vice President
T. Skalinski	Poland	Vice President
P. Varga	Hungary	Vice President

1984-1987

S. Lowenthal	France	President
J. Tsujiuchi	Japan	Past-President
H. J. Frankena	The Netherlands	Secretary-General
J. N. Howard	USA	Treasurer
H. H. Arsenault	Canada	Vice-President
K. Biedermann	Sweden	Vice-President
E. Byckling	Finland	Vice-President
J. W. Goodman	USA	Vice-President
P. Hariharan	Australia	Vice-President
M. P. Petrov	USSR	Vice-President

1987-1990

J. W. Goodman	USA	President
S. Lowenthal	France	Past-President
J. C. Dainty	Great Britain	Secretary-General
P. Hariharan	Australia	Treasurer
H. H. Arsenault	Canada	Vice-President
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A. Consortini	Italy	Vice-President
F. Lanzl	FRG	Vice-President
D. Malacara	Mexico	Vice-President
J. Perina	Czechoslovakia	Vice-President

1990-1993

J. C. Dainty	Great Britain	President
J. W. Goodman	USA	Past-President

P. Chavel	France	Secretary-General
P. Hariharan	Australia	Treasurer
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F. Lanzl	FRG	Vice-President
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G. Sincerbox	USA	Vice-President
C.H.F. Velzel	The Netherlands	Vice-President
M.J. Yzuel	Spain	Vice-President

1993-1996

A. Consortini	Italy	President
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G.G. Mu	Chinese Opt. Soc.	Vice-President
G. Sincerbox	USA	Vice-President
C.H.F. Velzel	The Netherlands	Vice-President
M.J. Yzuel	Spain	Vice-President

1996-1999

T. Asakura	Japan	President
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1999-2002

A.H. Guenther	USA	President
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Y. Petroff	France	Vice-President appointed
B.E.A. Saleh	USA	Vice-President appointed
T. Tschudi	Germany	Vice-President appointed

2002-2005

R. Dändliker	Switzerland	President
A. H. Guenther	USA	Past-President
M. L. Calvo	Spain	Secretary-General
A.T. Friberg	Sweden	Associate Secretary
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H.H. Arsenaault	Canada	Vice-President appointed
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A. A. Sawchuk	USA	Vice-President appointed
T. Tschudi	Germany	Vice-President appointed
G. von Bally	Germany	Vice-President appointed
A. Wagué	Senegal	Vice-President appointed
L. Wang	The Netherlands	Vice-President
A. M. Weiner	USA	Vice-President appointed
I. Yamaguchi	Japan	Vice-President
P. Chavel	France	Senior Adviser (ad personam)
Y. Petroff	France	IUPAP Exec. Council Delegate

2005-2008

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R. Dändliker	Switzerland	Past-President
M. L. Calvo	Spain	Secretary General
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A. N. Bagayev	Russia	Vice-President
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J. Braat	The Netherlands	Vice-President Appointed
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G. Jin	China	Vice-President
I.C. Khoo	USA	Vice-President appointed
B. Y. Kim	Korea	Vice-President
M. Kujawinska	Poland	Vice-President
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H.P. Stahl	USA	Vice-President appointed
A. Wagué	Senegal	Vice-President appointed
I. Yamaguchi	Japan	Vice-President
P. Chavel	France	Senior Adviser (ad personam)
Y. Petroff	France	IUPAP Exec. Council Delegate

2008-2011

M. L. Calvo	Spain	President
A. T. Friberg	Finland	Past-President
A. M. Guzmán	Colombia & USA	Secretary General
G. von Bally	Germany	Associate Secretary
J. A. Harrington	USA	Treasurer
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Z. B Lakhdar	Tunisia	Vice-President
Z. Bingkun	China	Vice-President
H. Lefèvre	France	Vice-President
F. Mendoza Santoyo	Mexico	Vice-President
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M. Oron	Israel	Vice-President
T. Szoplik	Poland	Vice-President
R. Ramponi	Italy	Vice-President appointed
I. C. Khoo	USA	Vice-President appointed
D. T. Strickland	Canada	Vice-President appointed
H. P. Stahl	USA	Vice-President appointed
M. Gu	Australia	Vice-President appointed
A. Wagué	Senegal	Vice-President appointed
C. Cisneros	Mexico	IUPAP Delegate

2011-2014

D. T. Moore	USA	President
M. L. Calvo	Spain	Past-President
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G. von Bally	Germany	Associate Secretary

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Z. Bingkun	China	Vice-President
F. Höller	Germany	Vice-President
H. Michinel	Spain	Vice-President
M. Oron	Israel	Vice-President
R. Ramponi	Italy	Vice-President
T. Szoplik	Poland	Vice-President
A. Diaspro	Italy	Vice-President appointed
Y. J. Ding	USA	Vice-President appointed
U. Gibson	Norway	Vice-President appointed
H.P. Herzig	Switzerland	Vice-President appointed
A. Wagué	Senegal	Vice-President appointed
M. J. Yzuel	Spain	Vice-President appointed
C. Cisneros	Mexico	IUPAP Delegate

2014-2017

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A. Guzmán	Colombia	Secretary General
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F. Höller	Germany	Vice-President
H. Michinel	Spain	Vice-President
J. Niemela	USA	Vice-President
R. Ramponi	Italy	Vice-President
S-H. Park	Korea	Vice-President
J. Zakrzewski	Poland	Vice-President
M. Zghal	Tunis	Vice-President
K. Choquette	USA	Vice-President appointed
J. C. Howell	USA	Vice-President appointed
S. Morgan	UK	Vice-President appointed
E. Rosas	Mexico	Vice-President appointed
P. Urbach	Netherlands	Vice-President appointed
M. Yzuel	Spain	Vice-President appointed
C. Cisneros	Mexico	IUPAP Delegate

PART IV:

THE GENERAL MEETING

MINUTES OF THE 24th ICO GENERAL ASSEMBLY

Grace Room, South Building 3F, Keio Plaza Hotel, Tokyo, Japan

August 22nd and 24th, 2017



The 24th Congress of
the International Commission for Optics

The President of the Commission, Prof. Yasuhiko Arakawa, chaired the General Assembly. The following members of the Bureau were present:

ICO Bureau:

Past-President	Duncan T. Moore
President	Yasuhiko Arakawa
Secretary	A. M. Guzmán
Associate Secretary	G. Von Bally
Vice Presidents	M. Zghal, John Harvey, Seung-Han Park, Joseph Niemela, Frank Höller, Humberto Michinel, Roberta Ramponi, Kent Choquette, John Howell, María J. Yzuel, A. Wagué, C. Cisneros

Apologies presented

Jim Harrington, Jakub Zakrzewski, Stephen Morgan, Paul Urbach, Eric Rosas

Delegates and Observers:

Delegates were requested to sign the attendance list prepared by the Secretariat for both sessions.

Argentina	Marcelo Trivi (2), Roberto Torroba (2), Néstor Bolognini (o) (2)
Armenia	Aram Papoyan
Australia	John Harvey (2)
Belgium	<i>No delegate attended</i>
Belorussia (a)	<i>No delegate attended</i>
Brazil (a)	<i>No delegate attended</i>
Canada	Gilles Pauliat (France) (2)
Chinese Optical Society	Qihuang Gong, Xu Liu, Yan Li, Yidong Huang, Yongtian Wang
Colombia	Jaime Meneses
Cuba	<i>No delegate attended</i>
Czech Republic	<i>No delegate attended</i>
Denmark	<i>No delegate attended</i>
Ecuador (a)	<i>No delegate attended</i>
Estonia	Jyrki Saarinen (Finland)

(1) First session only
(2) Second session only
(o) Observer
(a) Associate Member

Finland	Jyrki Saarinen, Tero Setälä
France	Gilles Pauliat
Germany	Gert von Bally, Frank Höller, Jürgen Czarske, A. Heisterkamp
West Africa (a)	Paul K. Buah-Bassuah (Ghana)
Greece	Maria L. Calvo (Spain)
Hungary	<i>No delegate attended</i>
India	Chandra Shakher
Indonesia	<i>No delegate attended</i>
Ireland	Adrian Podoleanu (UK)
Iran (a)	<i>No delegate attended</i>
Israel	Moshe Oron, Haim Russo
Italy	Roberta Ramponi
Japan	Y. Arakawa, Y. Matsuo (2), K. Ueda (2), T. Yatagai
Korea	Chang Hee Nam, Kyung Hyun Park, Seung-Han Park
Latvia	<i>No delegate attended</i>
Lithuania (a)	<i>No delegate attended</i>
Mexico	Baldemar Ibarra-Escamilla
Moldova (a)	<i>No delegate attended</i>
Morocco (a)	<i>No observer attended</i>
Netherlands (a)	<i>No delegate attended</i>
New Zealand	John Harvey
Norway (a)	<i>No delegate attended</i>
OES (a)	<i>No delegate attended</i>
Poland	Leszek Sirko
Portugal	Ignacio Moreno (Spain) (2)
Romania	<i>No delegate attended</i>
Russia	Nataliya L. Istomina, Nataliya D. Kundikova
Singapore	<i>No delegates attended</i>
Slovak Republic	<i>No delegates attended</i>
Spain	Ignacio Moreno (1), Maria L. Calvo, Humberto Michinel.
Sudan (a)	<i>No delegate attended</i>
Sweden	Fredrik Laurell, Anne l'Huillier
Switzerland	<i>No delegate attended</i>
Tunisia	Mourad Zghal
Turkey (a)	<i>No delegate attended</i>
Ukraine (a)	<i>No delegate attended</i>
United Kingdom	Adrian Podoleanu
USA	J. Greivenkamp, I. Novikova, J. Niemela, D. T. Moore, K. Bailey
Venezuela	Jaime Meneses (Colombia)
EOS	Humberto Michinel
IEEE PH. SOC.	Kent Choquette
LAM Network	Ahmadou Wagué
OSA	John Howell, Liz Rogan
OWLS	Gert von Bally
RIAO	Efrain Solarte
SPIE	M ^a Yzuel, E. Arthurs, C. Londoño, A. Romanyszyn (o)

(1) First session only
(2) Second session only
(o) Observer
(a) Associate Member

Opening session

Tuesday August 22nd, 2:00 PM – 5:00PM (Tokyo time)

Y. Arakawa welcomes all delegates and observers and declares the General Assembly opened.

First session

1. Minutes of the ICO-23 General Assembly

Motion 1: It is moved that the minutes of the ICO-23 General Assembly be approved by the General Assembly

Moved by: H. Michinel, seconded: Gert von Bally. Approved by majority, with no votes against. Abstentions: 6 (USA)

2. Approval of the Agenda.

Y. Arakawa requested to deal with the decision on the date and venue of the ICO XXV General Meeting as item 8, after finances. John Greivenkamp requested that items 4 and 5 be reversed to discuss first the Strategic Plan and then the Application to ICSU.

Motion 2: To approve the Agenda for the ICO-24 General Assembly with the changes requested.

Moved by John Greivenkamp. Seconded by Roberta Ramponi. Approved unanimously.

3. Report of the President for 2014-2017

Y. Arakawa reported on his activities and the activities of the extended Executive Committee related to the celebration of the International Year of Light 2015 (see “Towards ICO 24”, pages 25-34), the elaboration of the ICO Strategic Plan 2017-2023 (see “Towards ICO 24”, pages 307-328), and the application to ICSU to become a Union. Printed version of his report can be found in the ICO triennial report “Towards ICO 24”, pages 9-15. He also reported that 683 papers have been contributed to the ICO 24 General Congress, 100 of them invited. Major attendance (60%) is from Japan, followed by China, Taiwan and the USA. The number of pre-registered participants was 894.

4. ICO Strategic Plan 2017-2023

Y. Arakawa reports on how the ICO Strategic Plan (SP) was prepared by the extended Executive Committee consisting of Y. Arakawa, D. Moore, A. Guzmán, G. von Bally, J. Harrington, Maria L. Calvo, Pierre Chavel. D. Moore hired a project specialist, Alana Cahoon, to assist the extended EXEC. The first draft of the Strategic Plan was prepared by Maria L. Calvo, A. Guzmán and the concurrence of Alana Cahoon. Thorough discussions by the extended EXEC, and the Bureau members (including those representing the member societies) followed. A version of the draft was posted on April 2017 at the ICO webpage requesting comments from all ICO members. The sentences in the document addressing issues to be discussed were highlighted in the “Towards ICO 24” report. The ICO Bureau in its first session on 2017 took in account all comments and performed modifications to highlighted text when considered appropriate. A definitive version is presented to the General Assembly.

Motion 3: To accept the Strategic Plan 2017-2023 for consideration of the General Assembly.

Moved by John Greivenkamp (USA), Seconded by Qihuang Gong (China).

The motion was opened for discussion.

Eugene Arthurs (SPIE): The SP proposes replicate Photonics 21 in less developed countries, and has many wonderful aspirations for O&P worldwide, but there are neither matching resources to achieve those goals nor a plan for how those resources might be matched. The Plan will result only on elevated hopes because of limited resources.

John Greivenkamp (USA): The USA believes that ICO has a very valuable role to play, which is to reach out to developing countries, and countries that are beginning to develop their technology. But in the SP there are no resources allocated to achieve that. It presents very grandiose ideas of becoming the global organization for Optics. But is missing the point of teaching developing countries, and the Plan does not address what ICO is as organization. The member societies would be supportive if centering on activities in developing countries was the main point of the Plan, but the Plan will bring the ICO in competition to the International societies trying to replicate what the societies are doing very well. We should have a plan that be complementary. The SP is lacking to do what is really important for the world. He urges the delegates to vote against the SP, and send back the Strategic Plan to be rewritten in the direction of the role of the ICO, which is addressing developing countries. Nothing else. The Strategic Plan is way too ambitious. The Strategic Plan should focus on the outreach to develop countries and the resources to do that outreach.

Yasuhiko Arakawa (Japan): ICO activities are based on Territories. Territories are country based organizations, and ICO is an associate member of ICSU. Societies are not. ICO will not compete with International Societies. We do not have individual members. Therefore, the hierarchy is different. ICO consists of Territories and has representatives from each of them. I hope that you can understand that difference.

Gilles Pauliat (France). I think what the SP is proposed in line with the purpose of the ICO. For France the ICO is not only an organization for developing countries, the ICO is the place where we all can meet altogether.

Paul Buah- Bassuah (Ghana): the SP recognizes some of the problems in the developing countries, and if you allow it, I might draw to your attention to some issues that the SP looks at. If you look at page 314, the item 7 talks about the ICO Territorial Committees as official representatives of identified geographical territories. In the list of weaknesses it is mentioned that ICO should not lose focus on critical regions like Africa, Latin America, and less developed Asian countries. There is a lot of progress about Africa, as the ICO is concerned. In page 319 under vision there is the item (v) to encourage a balanced geographical representation and involvement in all activities of the Union. What is important is how these things can be implemented fairly. How can we look at it fairly? ICO outreach to some developing countries has been lacking. We should see how the ICO can enhance its reach to those areas. The SP has identified the weaknesses and strengths. The developing countries are looking for how to address those problems. He considers that the SP is a very good document. His comments are in regard to those Territories that cannot pay the ICO fees. If you do not pay, you lose the capacity as a full member and are demoted to associate member. The ICO should look at the ability of those Territories to pay. If this issue can be address, all geographical areas can be addressed. As far as this document he considers that it is in line with ICO's mission, but we have to look how to address those problems. A good work has been done.

John Howell (OSA): He apologized for not having been able to attend the ICO Bureau Meeting on Sunday for being in Jerusalem. He considers that the ICO has a tremendous capacity that any of the societies or academies do not have. Capacities that are complementary in many ways, and can be used for helping development. He would like to avoid repetition of ICO activities within its internal community. He has two concerns: if the ICO changes tax status in the USA, it will be subject to USA law with respect to donations, associated with how the money will be spent. He worries about the freedom to work with international states that he thinks will be lost. He also worries about competing with the societies instead of working complementarily. There is a lot there to do, but the budget is very low. The budget is too small to achieve some of the ideas. The societies are worried of how all is going to be put together. As a Union, the ICO can be influential on helping many groups. If we have someone representing the Union meeting with a minister for example. There is tremendous capacity and the ICO should go to the individual member states asking the needs of every territory and then to the societies asking how they can be of help. What added value the ICO gives to the societies, to the territories, and how much is the cost are the relevant issues. The SP has a lot of neat things.

Adrian Podoleanu (UK): I should think that make a great plan takes a lot of effort, and he thanks the bureau who did it. The SP promises indeed a lot. He understands the point of the USA. He shares the problem of the way that other societies are already doing. It is nothing against the plan, but the ICO should be trying not to compete with other societies. Already in page 309, the SP could state that the plan will be developed "in contact with societies". Societies have a lot of funding.

Roberta Ramponi (Italy): The SP goals are within the mission of ICO. ICO is an umbrella organization that has Territorial Committees but also international societies, and we hope to have others in the future. They can have many more possibilities to do actions that ICO might have. The SP should somehow state clearly that we go to send our message identifying all the issues to ICSU. We are looking for the cooperation and we work in synergy with the international societies that are members of the ICO. We just need to write the appropriate sentence. Maybe we should vote for a general statement that the ICO should look for funding from agencies.

John Harvey (New Zealand) and L. Sirko (Poland) propose to add the sentence “The ICO will work alongside its members to achieve its goals” in ICO’s vision. The SP has a lot of neat things.

Adrian Podoleanu (UK): suggests that item (vii) of the vision that reads “to represent Optics and Photonics in ICSU and liaise with other ICSU bodies as current Unions in which ICO may converge in the near future as the so provisionally proposed International Union of Optics and Photonics (IUOP) by upgrading its organizational structure to the category of a Union,” be replaced by (vii) to represent Optics and Photonics by collaborating with other international and national societies and ICSU bodies as well as liaise with the international and national societies and the ICSU bodies as current Unions in which ICO may converge in the near future as the so provisionally proposed International Union of Optics and Photonics (IUOP) by upgrading its organizational structure to the category of a Union.

Roberta Ramponi (Italy): Add an item (viii) To operate in full synergy with the international organization members so as to achieve the maximum positive impact in favor of worldwide optics and photonics community.

John Greivenkamp (USA): They do not accept these as friendly statements. They do not change the body of the Strategic Plan which aim is to put the ICO in competition with the existing societies and their true mission. This is in opposition to their interest. Umbrella implies that the ICO is above all of the societies. The societies are willing to working together with ICO and have a Plan that helps the work we have to do in developing countries. By voting no, we send the SP back to the Bureau. The Bureau has worked in isolation. Thus the problem of the plan. We have to send it back to the Bureau so that we can contribute to the plan.

Yasuhiko Arakawa (Japan): are you stating that ICO’s mission is only to concentrate in developing countries? Your society (referring to SPIE) is also member of the ICO, so that society actions should be included in ICO’s actions.

John Howell (OSA): the ICO cannot claim credit for all what the societies do. ICO has to be separated and have a clear mission separated from the societies. And what ICO has to do is outreach to developing countries.

Yasuhiko Arakawa (Japan): Japan’s vision of the ICO is that ICO should cover not only activities in developing countries, but ICO should promote advanced Optics and Photonics technologies and basic science. That is our Japanese ICO vision.

John Howell (USA): Maybe other things could be there but in the opinion of the USA, ICO's mission has always been the outreach of the developing countries

Yasuhiko Arakawa (Japan): That is your understanding. ICO emphasizes activities of developing countries but we are also inviting to this conference people that are interested in high technology. The USA vision is very narrow.

John Howell (USA): the USA and the societies look for the good for all, and with the resources of ICO we need to write something that is complementary to the activities of the societies. And the only thing that the ICO can do is outreach to developing countries.

Eugene Arthurs (SPIE): one of the issues with the SP is the change of taxation status within the USA. The 501(c)3 status is in conflict with the ICO.

Duncan Moore (USA): ICO is organized in France and in the USA. Until recently the ICO has been able to send money to Iran or Cuba. The same rules apply to any 501(c)3, and 501(c)4. The idea is that we can get money from donors. He does not think that the change will restrict ICO's to continue supporting activities in countries vetoed by the USA.

Roberta Ramponi (Italy): There are different levels for ICO actions. ICO has members from developing countries, and there is a kind of political support in those countries to its activities. ICO can support the outreach to the policy maker society, and does not need money for that.

What can be done only by ICO and not by the societies? Maybe the ICO is not an umbrella but perhaps a grid. The ICO is not a society. It is an institution that can support actions at the level of policy makers, and that has some money to support activities in the developing countries. The important issue is if the SP is at the right level. The SP lacks a business plan.

Motion 4: (Amendment to Motion 3) To add to the ICO vision in the Strategic Plan 2017-2023 the following sentence to the ICO's vision: "The ICO will work alongside its members to achieve its goals"

Moved by L. Sirko (Poland), seconded by J. Harvey (New Zealand).

Votes in favor: 38

Abstentions: 12 (Armenia, Finland, Korea, Italy)

Votes against: 16 (USA, OSA, SPIE, Germany, OWLS)

Motion approved by majority vote.

Other suggestions for amendments were retired.

John Howell (USA): his concern is that it does not take only a few amendments to change the body of the SP. If we would have a representative from each body, we might be able to get with the document that is representative of the group. But the whole body of the SP needs a revision.

Motion 5: To approve the Strategic Plan as amended by Motion 4. Moved by Duncan Moore, seconded by H. Michinel

Vote Approved by call.

In favor: 65.

Against: 12 (USA, SPIE, OSA).

Abstentions: 16 (Ireland, Italy, Korea, UK, LAM)

Motion approved by majority vote. Other suggestions for amendments were retired.

5. ICO application to become an ICSU Union

Yasuhiko Arakawa reports on the application procedure to ICSU to become a Union. In response to the ICO President's request for letters of support for the ICO application, the ICO received supporting letters from six ICSU Union Members (IUMRS, URSI, IUBS, IUPESM, IUPAC, IAU), four of them within the 6 largest. In addition, ICO also received endorsement letters from eight ICSU Territorial Members (China (CAST), Germany (DFG), Mexico (AMC), Italy (CNR), Spain (CSIC), New Zealand (RSNC), Japan (SC), and UK (Royal Society), and five ICO Territorial Committee Members (SEDO Spanish Optical Society, SFO French Optical Society, SPOF Sociedade Portuguesa, ICO Canadian Territory, DOK German Deutsches Optisches Komitee), and four ICO International Society Members (RIAO, LAM, OWLS, EOS). The action of ICO was also supported by a Nobel Prize Laureate, Prof. Stefan W. Hell, via receiving his supporting letter.

The application was sent before the ICSU deadline, accompanied of the letters of support. The opinion of the IUPAP was asked by the ICSU Executive board.

Comments:

Eugene Arthurs (SPIE) requests that Canada be removed since it is an associate member of the ICO and not a full member.

Maria L. Calvo (Spain) answers that a supporting letter does not require to hold the ability to vote within the ICO

Anne l'Huillier (Sweden) requests to Prof. Arakawa to add Sweden as a Territory supportive of this initiative.

6. Report of ICO Nominating Committee

Duncan T. Moore, Chair of the Committee, presents the interim report. Printed version of his report can be found in the ICO triennial report "Towards ICO 24", pages 152-153. He thanked all who participated in the process and reminded the delegates that nominations are accepted until 24 hours before the last session of the General Assembly.

7. Report of the Secretary-General for 2014-2017

The ICO Secretariat is responsible for the ICO image, for supporting the Bureau activities, advertising ICO awards not only to Territorial Committees but to Research Institutions. But the key role of the Secretariat is to contribute to ICO's mission, the progress and spread of knowledge of optics and photonics, by maintaining a fluid communication with the Territorial Committee representatives and keeping the optics community informed of ICO activities worldwide. To fulfill its role, the ICO Secretariat performs a series of regular activities:

- a) General Assembly: Coordinate logistics of the ICO General Assembly. Request official communication from the ICO members on their official delegates. Prepare attendance lists, appropriate sitting for the delegates and ballots. Prepare Agenda and Minutes of the ICO General Assembly.
- b) ICO Bureau: The ICO Secretariat is responsible for coordinating the logistics of the ICO Bureau meetings, preparing the agenda and supporting documents for each Bureau meeting, and elaborating the minutes. The ICO Secretariat serves for this purpose as the channel of communication between the Bureau and the organizers of the ICO Topical meetings and the ICO General Meeting. The ICO Secretary coordinates also the logistics for the Strategic Planning and Executive Committee Meetings, and prepares their Agendas and Minutes. The ICO Secretary prepares and administers also ICO Bureau online ballots when required.
- c) ICO Executive Committee: The ICO Secretariat is responsible for coordinating the logistics of the ICO Executive Committee meetings, preparing the agenda and elaborating the minutes.
- d) ICO awards: The ICO Secretariat is responsible for making the call for nominations and preparing posters for the dissemination of information on the ICO awards. The ICO Secretary sends the letters of congratulations to ICO awardees, and coordinates the cash payments with the awardees and the ICO treasurer. The ICO Secretary coordinates the logistics of the ICO Award ceremonies with the ICO awardees and the organizers of the conference at which the ceremony is to be held, including schedule and advertisement of the award lecture. Coordinates with the Carl Zeiss Foundation and the Società Italiana di Ottica e Fotonica the preparation and deliver of trophy and medal for the ICO Prize and the Galileo Galilei Medal Award. Order the ICO diplomas, which are hand made on parchment, and coordinate the transfer of monetary award to the awardees with the ICO Treasurer. The Ernst Abbe Medal for ICO Prize, donated by the Carl Zeiss Foundation was replaced by a Glass Trophy. The Galileo Galilei medal for the Galileo Galilei Medal Award is donated by the Società Italiana di Ottica e Fotonica. The Diploma of the Gallieno Denardo Award is prepared by the ICTP.

The ICO administers the IUPAP Young Scientist Prize. The ICO Secretary coordinates with IUPAP the preparation and sending of the IUPAP medal, the IUPAP Diploma and the cash award.

- e) **ICO Newsletter:** The ICO secretary The ICO is the editor in chief of the ICO Newsletter, a quaternary publication which informs the international community on ICO activities and news from Territorial Committees. The newsletter I posted online and 700 high quality printed copies are mailed to 20 postal addresses.
- f) **A special series of articles for the International Year of Light 2015:** The series started by the article “What is Light”, by Barry Masters, which has been translated by experts into Translated into: Spanish, Latvian, Chinese, French, Greek, Armenian, Portuguese, Slovak, Hebrew, Italian, Hindi, Persian, Korean, Turkish. Arabic and German Translations will be soon available. Other articles in the series: “Light we cannot see”, by William T. Rhodes and Geoffrey Alan Rhodes; “A stroll through 3D imaging and measurement” by Gerd Häusler and Florian Willomitzer; “Getting used to Quantum Optics” by Gerd Leuchs; and “The 2015 International Year of Light” by Juste Jean-Paul Ngome Abiaga and Pauline Venegas Hooper, from the Division of Science Policy and Capacity Building of UNESCO.
- g) **ICO Website:** The ICO Secretariat is responsible for the ICO website, and for the information about ICO in the IUPAP and ICSU websites. The site is updated regularly with the latest newsletters, new events, the ICO Calendar of events, and other pertinent information. The ICO webpage (e-ico.org) hosted by GoDaddy. Each Territorial Committee is entitled to publish information on its activities in their e-ico.org/Territory page. Since the International Year of Light, the ICO Secretariat paid for the services of a webmaster, Fernanda Lozada. The ICO owes other domains: myico.org, ico-optics.org, iuop.org (acquired by H. Michinel), iupo.org, iupho.org. ICO also owes a Twitter account, @ICOPNews, @IUOPNews, and a Flickr account: Secretariat ICO.
- h) **Project management tool:** The ICO Secretariat acquired “Smartsheet” a project management tool that was used to facilitate team work for the preparation of the application to ICSU. The tool allows to design a timeline for projects with automatic sending of reminders to members of the team about deadlines for their contributions.
- i) **Report: “ICO Towards ICSU Union: ICO in the Optics and Photonics World” (2016).** Elaborated by the ICO extended Executive Committee with support from the ICO Secretariat and Alana Cahoon, a project specialist hired by Duncan Moore to assist the extended Executive Committee on the preparation of the application to ICSU. The report is available online and verses on the evolution of the ICO, the need for a Union on Optics and Photonics given its multidisciplinary character, and the possibility of becoming a Union as a legacy of the International Year of Light.
- j) **The ICO Strategic Plan 2017-2023:** The first draft of the ICO Strategic Plan was elaborated by the ICO Past President, Maria L. Calvo; the ICO Secretary, Angela Guzmán; and the concurrence of Alana Cahoon. The Strategic Plan was posted online and the Secretariat asks for comments from ICO members. Most of their contributions were included in the final version presented to the General Assembly for approval.

- k) To edit the ICO Green Book: The so-called “Green Book” is the ICO publication of reference. It is edited, published online, and printed for distribution to the delegates to the ICO General Assembly by the ICO Secretariat every three years, prior to the General Assembly. It includes the reports on ICO activities developed in the corresponding three-year period. The book: “Towards ICO-24” was posted online on July 2017 by the International Commission for Optics, ISBN-10: 0-9838507-5-5; ISBN-13: 978-0-9838507-5-5.

Beyond all regular activities, the ICO Secretary focuses many of its activities on two priority areas: a) developing countries, and b) education and training in optics. Three activities of the ICO Secretary are the most relevant in this regard:

1. The long-standing collaboration with the ICTP, the Abdus Salam International Centre for Theoretical Physics in Trieste results in common activities, including the annual “ICTP Winter College on Optics” in Trieste: “Winter College on Optics: Light, a bridge between Earth and Space” (2015); “Winter College on Optics: Optical Frequency Combs: Basics and Applications” (2016); “Winter College on Optics: Advanced Optical Techniques for Bio-imaging” (2107), a College that included hands-on sessions with low cost equipment on Photothermal microscopy, Surface plasmon resonance, Optical tweezers, Polarization microscopy, Laser speckle bio-imaging, Multispectral spectroscopy analysis, Portable mobile-phone microscopes, Determination of the optical properties of thin films and UV-Vis optical fibre-assisted spectroscopy in thin films and solutions. Activities included applications in environmental science (measures of soil and water pollution).

During the Winter College two noteworthy events take place: (a) The award ceremony of the ICO/ICTP Gallieno Denardo Award followed by an ICO sponsored reception, and (b) the meeting of the Trieste System on Optical Sciences and Applications (TSOSA) Advisory Group, with representatives of ICO, OSA, SPIE, OWLS, IAEA, UNESCO, NAS, LAM Network and Institutions of the Trieste System i.e. ICTP, ICS, TWAS, ICGB, Elettra Synchrotron Light Facility and the Laser laboratory at Elettra.

The ICO Secretary has served for the last nine years as the Chair of the TSOSA advisory Committee, which has offered advice to the ICTP on activities on Optics and Photonics for 14 years. The ICO Secretariat also prepares the minutes of the TSOSA Meeting.

2. The ICO Secretary General serves as the coordinator in Latin America of the UNESCO’s Workshop on Active Learning in Optics and Photonics (ALOP). ICO offered the support of its own Territorial Committees when available to help on the organization and dissemination of the Workshop and the new learning method throughout Latin America. In celebration of the International Year of Light 2015, the ICO Secretary General acted as the director of three ALOP Workshops: ALOP San Luis de Potosi, Mexico (July 2015), ALOP Panamá (August 2015), and ALOP Cochabamba, Bolivia (November 2015).

3. Other activities of the ICO Secretary:

- ICSU General Assembly, September 1st- 3rd, Auckland, New Zealand, 2014. A poster and a short communication was presented on the International Year of Light.
- Celebration of the 50th anniversary of the ICTP October 6-9, 2014.
- Opening Ceremony of the IYL 2015, Paris, January 19-20, 2015.
- TSOSA Committee, February 19th, 2015.
- ALOP San Luis de Potosi, Mexico, July 8-12, 2015.
- 12th twelfth annual conference on Hands-on Science, HSCI2015, July 27-30, 2015, Madeira, Portugal.
- ALOP Panama, August 24-28, 2015
- ALOP Cochabamba, Bolivia, Nov 23-27, 2015.
- Closing Ceremony of the IYL 2015, Merida, Mexico, February 4-6, 2016.
- TSOSA Committee, February 23rd, 2016.
- International Conference on Applied Optics and Photonics 2016. Hannover, Germany, 17 - 21 May 2016. Award ceremony. ICO topical meeting.
- International Symposium “Optics and its Applications” (OPTICS 2016), July 25-28, 2016, Yerevan, Armenia.
- OSA 100. Presentation of ICO trophy in commemoration of OSA Centennial. Oct 20, 2016, Rochester, USA.
- Launching of the Mexican Initiative for Photonics, November 9th, 2016, Chapultepec Castle, Mexico.
- USAC/ICO Meeting, January 30th, 2017: to present the ICO Strategic Plan to the USAC/ICO.
- TSOSA Committee, February 21st, 2017.
- International Conference on Applications of Optics and Photonics (AOP 2017), Faro, Portugal, May 8-12, 2017.

The ICO Secretary requests to the General Assembly to consider the following Motions regarding procedures:

Motion 6: *Background:* The registered domicile of the ICO in France must be officially changed from the old address of the Institut d'Optique to its new one. The Bureau notified the French Bank, but an explicit decision of the General Assembly is required in that regard.

French version:

"Réunie à Tokyo le 24 août 2017, l'Assemblée générale de la Commission internationale d'Optique, association déclarée dont le siège était initialement situé dans les locaux de l'Institut d'Optique théorique et appliquée, bâtiment 503, centre universitaire, 91405 Orsay cedex, décide de déplacer le siège de l'association dans les nouveaux locaux de l'Institut d'Optique théorique et appliquée au 2 avenue Augustin Fresnel, 91127 Palaiseau cedex."

English version:

"Meeting in Tokyo on 24 August 2017, the General Assembly of the International Commission for Optics, a non-profit organization under French law initially headquartered at the premises of Institut d'Optique theorique et appliquee, batiment 503, centre universitaire, 91405 Orsay cedex, France, decides to move its headquarters to the new building of Institut d'Optique theorique et appliquee at 2 avenue Augustin Fresnel, 91127 Palaiseau cedex, France."

Moved by SPIE; Seconded by the IEEE. Approved unanimously.

Motion by the ICO Secretariat: *Background:* The ICO Bureau has been taking decisions by electronic means. This procedure should be explicitly approved by the General Assembly. In addition, the ICO Bureau might recommend the calling of an extraordinary General Assembly that might be conducted entirely by electronic means.

Motion: Decisions of ICO governing bodies may be arrived at entirely or in part by electronic means, as appropriate, providing a quorum (51%) is attained.

Eugene Arthurs (SPIE): The ICO is a USA registered organization. Find the rules for electronic voting as stated by the USA.

After a brief discussion, the General Assembly requested the ICO Bureau to bring the motion back when the rules stated by the USA are known.

Motion 7: *Background:* The ICO Rules and Code of practice do not include Rules of Order that shall be used for conducting the General Assembly. While the use of Robert's Rules might have been implicit, the Bureau considers that those rules are parliamentary. Most ICSU Unions have their own Rules of order.

Motion: The ICO Bureau will prepare a proposal for the Rules of Order that shall be used for the conduct of all ICO meetings. Moved by Eugene Arthurs (SPIE), seconded by John Greivenkamp (USA). Approved unanimously.

Motion 8: *Background:* The Institut d'Optique, the legal domicile of the ICO since its foundation is celebrating its centennial in October 2017.

English:

“The General Assembly of the International Commission for Optics congratulates the Institut d'Optique on its centennial, and expresses its gratitude for having served as the hosting Institution of ICO since its origin”.

French version (by Gilles Pauliat):

"L'Assemblée Générale de la Commission Internationale d'Optique félicite l'Institut d'Optique pour son centenaire et lui exprime sa gratitude pour l'avoir hébergé depuis son origine."

Moved by Angela Guzmán, seconded by Eugene Arthurs (SPIE). Approved unanimously.

8. The ICO-25 General Meeting

Gert Von Bally introduced the topic by reminding the General Assembly that they should decide the venue for the next General Congress. The Bureau must review the bids presented and make a proposal to the General Assembly. The Bureau recommends to the General Assembly to accept the bid presented by Germany to host ICO 25. A presentation on the German bid for ICO-25 by J. Czarske followed.

Comments:

Eugene Arthurs (SPIE): The Gender distribution in the preliminary list of organizers, invitees, and committee members is not good. He also inquired if the decision to hold an ICO General Congress in a developing country has been dead.

Gert von Bally answered that some countries cannot be accepted by ICSU rules. ICO wanted to have the meeting in a developing country and contacted some of them even offering a more generous financial support but did not get a proposal. The gender distribution will be improved. Prof Czarske is a fellow of the OSA, SOIE, IEEE, and OWLS. He might be a good bridge between ICO and the member societies. ICO-25 will coincide with the celebration of the 30th anniversary of OWLS.

Motion 9: The General Assembly accepts the bid of the German ICO Territory to organize the ICO 25th General Meeting in Dresden.

Moved by E. Arthurs, seconded by M. Zghal (Tunisia). Unanimously approved.

9. Report of ICO Nominating Committee

Duncan T. Moore, Chair of the Committee, presents the interim report, available in the book “Towards ICO 24”, pp 152. He thanked all who participated in the process and reminded the delegates that nominations are accepted until 24 hours before the last session of the General Assembly, i.e., until August 23rd at 5 PM, Tokyo time.

Session Adjourned, August 22nd, 2017, 5:00 PM.

Second session

Thursday August 24th, 2014. 5:00 PM-8:00PM.

10. Finances

The Treasurer's Report prepared by Jim Harrington was presented as printed in "Towards ICO 24", pages 149-151, by Duncan T. Moore. The treasurer was not able to prepare the budget. The EXEC used the last budget and assumed that the new treasurer will be a good collector. The new budget has set the target of collecting \$20000 more. The revenue will be \$30000.

	Proposed Budget 2017-2020		Actual Budget 2014-2017	
Revenue				
Territories	259 shares	182595	195 shares	148720
International Organizations	16 shares	11280	16 shares	11280
Less not collected		30000		49140
Net dues		163875		110860
Royalties		1880		1880
Total Revenue		165755		112740
Expenses				
Secretariat		22000		21360
Editing, printing, mailing newsletter		13000		11680
Printing & distribution - Green Book		2000		4000
ICO Prizes +travel		18000		9000
ICO award for promotion of O&P		15000		0
Conference support		35000		33500
ICTP College Support		17640		17170
ICO Congress		7500		7500
Traveling lecturer awards		6000		3000
ICSU dues		1670		1670
Total Expenses		137810		108880
Surplus for 3 year period		27945		3860
Additional ICSU dues if accepted as a Union		2564		

Motion 10: To approve To approve the report of the treasurer
Moved by Kent Choquette (IEEE). Seconded by Roberta Ramponi (Italy).
Unanimously approved.

Motion 11: To approve the ICO Budget 2017-2020 as presented by the ICO Bureau.
Moved by Marcelo Trivi (Argentina). Seconded by Quihuang Gong (China).
Unanimously approved.

11. Changes in the ICO Rules and Codes of Practice

Modifications to be approved by the General Assembly were italicized and highlighted in the ICO Green Book “Towards ICO 24”. There is a page on the Green Book related to ICO support of conferences that must be replaced by the page presented to the delegates in printed form as errata. Gert von Bally proposed two modifications to the Rules and Code of Practice.

1st Modification:

Background: The ICO had the request by a commercial organizer of a conference in Singapore to sign a contract concerning the support of ICO and the commercial organizer also demanded transfer of money based in Singapore law. The ICO is ruled by USA law. Modifications have the purpose of avoiding this type of situations.

Modification 1: Under 4 - Classification for the participation of ICO in Meetings and Schools:

3 - ICO Cosponsored Meetings and Schools. Financial participation of ICO:

ICO may offer financial support as part of its agreement to cosponsor a conference or school. However, it does not normally sign a cooperation agreement implying mutual commitments between itself and event organizing bodies.

Motion 12: To approve the modification of the Rules and Code of Practice regarding financial participation of ICO for Meetings and Schools.

Moved by John Greivenkamp (USA), seconded by Maria L. Calvo (Spain).
Approved unanimously.

2nd Modification:

Background: The ICO Bureau meets typically one time per year in the years without a General Meeting, and in addition once immediately before and once immediately after every General Meeting.

Modification 2: Under 15 - ICO Bureau Meetings:

“If events arise that require action from the Bureau between its regular meetings, the Bureau may meet by teleconference or by such electronic or other means of correspondence as it may decide. In such cases, the Executive Committee shall submit a clear description of the issue at hand, with a deadline for reactions. Decisions are made on the basis of the replies obtained from the Bureau Members. Only the votes received are counted, the votes not received are not considered as approvals of the proposition. If the Executive Committee proposes a specific decision on the issue, the decision shall be considered as approved if more Bureau Members vote in favor compared to votes against and abstentions by the specified deadline. In case of a delay in communication, or if the available information is considered insufficient for a decision, the deadline shall be extended, or the decision deferred until a later meeting at the request of at least 4 members of the Bureau.”

John Greivenkamp (USA) asked what would happen if only one-person answers. He suggested to distinguish between abstentions and non-voting by the specified deadline.

Eugene Arthurs (SPIE) says that there have been cases in which the announcement has been sent to a wrong mail address. If the information does not arrive how do you know that it has arrived?

Duncan Moore (USA) answers that when the representative's mail changes there is a problem. He asks the Bureau members to send a reply confirming reception of the information.

Quihuang Gong (China) comments that the technique should be improved.

Adrian Podoleanu (UK) suggested that the procedure be ignited if the majority of the Bureau has answered.

Gert von Bally answered that the votes not received are not considered as votes in favor. It is customary that the EXEC analyzes the issues to present to the ICO Bureau and prepares a recommendation for the Bureau. The Bureau Meetings, even if electronically should have a quorum to be able to take decisions.

Motion 13: To approve the modification of the Rules and Code of Practice regarding the ability to conduct Bureau meetings via teleconference or by electronic means

Moved by Qihuang Gong (China), seconded by M. Trivi (Argentina). Opposed by SPIE (3 votes). Abstention of the US (6 votes) and Poland. (4 votes). All other voted in favor. Approved by majority.

12. Reports of ICO Committees

Updated report of the Nominating Committee on nominations for the ICO Bureau Elections

Duncan Moore presented the updated report of the Nomination committee. The only late nomination was the nomination of Roberta Ramponi to the ICO Presidency. He requested a motion from the General Assembly approving the report of the Nomination Committee.

Motion 14: To approve the report of the Nominating Committee.

Moved by Roberta Ramponi (Italy), seconded by John Harvey (New Zealand). Unanimously approved..

Duncan Moore gave five minutes to each of the candidates to the Presidency to present their statement. Presentations were made in alphabetic order. Ballots were distributed to the delegates and once the votes were casted, the members of the Nomination Committee left the room to proceed with the vote counting.

Report of the CREDO Committee (Presented by J. Harvey, Chair of the Committee)

- The Asia Pacific region has been interpreted as that covered by the CLEO-PACRIM conference. Includes underdeveloped, developing and developed countries.
- Industry Engagement: The Development of Optics and Photonics is crucially dependent on government support. Many countries in the region were surveyed to determine the extent and mechanism of government support for industry /researcher collaboration. Contact points were identified using the IYL database-a very valuable resource. Sustainable development initiatives are consistent with the development of Optics and Photonics. The following results were obtained: Several countries in the region have economies powered by photonic technologies and recognize its importance with government assistance for industry linkages. Others have little or no industry and no specific photonics focused support mechanisms.
- Update on Africa: Although not part of the region, committee members have provided an update on developments in Africa. This update identifies key issues that are relevant to underdeveloped countries in the Asia Pacific region. Key issues for Regional Development are: Telecommunications, Light Poverty, Access to Power, Access to Healthcare. Optics and Photonics can assist with all of these.
- Recommendations: CREDO develops its own database of regional contact people for industry development using ICO territorial committees and the IYL database.
- ICO facilitates the redeployment of low cost lighting and solar power systems developed for African countries to other areas.
- ICO leverages the UNESCO endorsed IDL symbol to promote sustainable development worldwide, as well as in the region.

Report of ICO Prize Committee as presented in the ICO Green Book “Towards ICO 24”, pages 156-158. Presentation by Roberta Ramponi, Chair of the Committee.

Report of IUPAP Prize Committee as presented in the ICO Green Book “Towards ICO 24”, pages 159-162. Presentation by Frank Höller, Chair of the Committee.

Kent Choquette (IEEE Photonics Society) asked for the number of nominees for the award in 2017. Frank Höller answered 8.

Duncan Moore returned to the room with the results of the election of ICO President and by the power invested to him by the ICO, he declares Roberta Ramponi Elected President of ICO.

After congratulations to her, he explains that for all other positions in the Executive Committee there is only one candidate. Therefore, he declared the election of other members of the Executive Committee as unnecessary.

The **ICO Executive Committee 2017-2020** is constituted as follows:

President: Roberta Ramponi (Italy)
Past President: Yasuhiko Arakawa (Japan)
Secretary: Humberto Michinel (Spain)
Associate Secretary: Frank Höller (Germany)
Treasurer: Joseph Niemela (USA)

Eugene Arthurs (SPIE) asks for the floor and offers publicly on behalf of SPIE, that SPIE will pay the fees for four ICO African Territories. He also moves the following:

Motion 15: The General Assembly heartily thanks the outgoing Secretary for her years of service to ICO and her passion for education of science for all, but specially for the developing world. She will leave an indelible legacy for ICO. The General Assembly acknowledges the many contributions of Prof. Angela Guzmán to the ICO.

Moved by Eugene Arthurs (SPIE), seconded by John Greivenkamp (USA).
 Unanimously approved..

Motion 16: The General Assembly thanks the outgoing Treasurer for his work with the many territories and societies to ensure the fiscal health of the ICO. The General Assembly acknowledges its gratitude to Dr. Jim Harrington for his unwavering support for the ICO and its mission.

Moved by Eugene Arthurs (SPIE), seconded by John Greivenkamp (USA).
 Unanimously approved.

Duncan Moore explains then the voting procedure for the election of ICO Vice Presidents. Ballots were distributed, votes were casted, and the nomination committee left the room to count.

Report of Education Committee was not available. The Chair of the Committee, Jakub Jaruzewski, communicated to the ICO Secretariat that there were no activities of the Committee during the period 2014-2017. Presentation skipped.

Report of ICO/ICTP Gallieno Denardo Award. The Chair of the Committee, Mourad Zghal, presented his report. See report in the ICO Green Book “Towards ICO 24”, pages 168-173.

Gert von Bally (Germany) asked for the affiliation of the 2017 awardee. Mourad Zghal answered that the awardee is affiliated to the Academy of Sciences from east Ukraine.

Report from the Traveling Lecturer Program. James Harrington, Chair of the Committee, and ICO treasurer sent his apologies for not being able to attend the General Assembly. His report can be found in the ICO Green Book “Towards ICO 24”, pages 154-155.

Report of the ad hoc Committee on International Affairs, Gert von Bally, Chair of the Committee, presented his report. See report in the ICO Green Book “Towards ICO 24”, pages 174.

13. Conferences with ICO participation

Gert Von Bally presented his report. See written version in the ICO Green Book “Towards ICO 24”, pages 175-181.

Results of the Election for ICO Vice President (1st vote): Mourad Zghal (Tunisia), John Harvey (New Zealand, industry), Sara Otero (Spain, industry), Seung-Han Park (Korea).

Since the two candidates from industry were already elected, Duncan Moore proceeded to the second vote for ICO Vice-Presidents. A short recess was agreed.

14. ICO Bureau Elections for the term 2017-2020:

The elections were held following the Rules and Codes of Practice. A vote was required for ICO President. For all other positions in the Executive Committee, no vote was necessary as there was only one candidate for each position.

Two votes were necessary for the Vice-Presidents. In the first vote, four Vice-Presidents were elected including two Vice presidents from industry. In the second vote, the remaining four Vice-Presidents were elected.

In addition, the appointment of the Vice-Presidents of the International Organization Members was announced. The results were:

2017-2020 ICO EXECOM members		
Position	Name	ICO Territory
President	Prof. Roberta Ramponi	Italy
Past President	Prof. Yasuhiko Arakawa	Japan
Secretary	Prof. Dr. Humberto Michinel	Spain
Associate Secretary	Dr. Frank Höller	Germany
Treasurer	Prof. Joseph Niemela	USA

Elected Vice-Presidents Those in industry are marked with an*	Prof. Qihuang Gong	China
	Prof. Seung-Han Park	Korea
	Prof. John Harvey*	New Zealand
	Prof. Leszek Sirko	Poland
	Prof. Nataliya Kundikova	Russia
	Dr. Sara Otero*	Spain
	Prof. Mourad Zghal	Tunisia
	Prof. Adrian Podoleanu	United Kingdom
Appointed Vice-Presidents	Prof. Dr. Paul Urbach	EOS
	Prof. Kent Choquette	IEEE
	Prof. Ahmadou Wagué	LAM Network
	Prof. John Howell	OSA
	Prof. Gert von Bally	OWLS
	Prof. Eric Rosas	RIAO
	Dr. Carmiña Londoño	SPIE
IUPAP Exec. Council delegate	Prof. Carmen Cisneros	

The new Bureau formally assumes responsibility on October 1st, 2017.

General Assembly, second part ends at 8:00 PM..

Minutes prepared by the ICO Secretariat, to be approved by the ICO 25 General Assembly.

*First draft prepared by the former ICO Secretary, Angela Guzán October 30th, 2017
Reviewed by Humberto Michinel ICO Secretary General and Roberta Ramponi, ICO President. To be approved by the next ICO General Assembly.*

PART V: THE ICO STRATEGIC PLAN 2017-2023



INTERNATIONAL COMMISSION FOR OPTICS
COMMISSION INTERNATIONALE D'OPTIQUE

ICO

The place where the World of Optics meets

Strategic Plan

2017 – 2023

Draft 4 April, 2017

- This strategic plan has been developed by the ICO Executive Committee with the participation of Maria L. Calvo (former ICO President) and Pierre Chavel (former ICO Secretary General) in order to provide a disciplined approach to the management of ICO over the period 2017-2023.
- Contact details: ICO Secretariat, <http://e-ico.org/>

ICO - International Commission for Optics

Founded in 1947, the International Commission for Optics (ICO) is a non-governmental organization representing a global membership in optics and photonics that includes national scientific bodies (53 Territorial Committees) and seven International Member Societies/Networks. Through this international network of scientists and engineers, the ICO promotes interdisciplinary research to address major issues of relevance to science, education, and light-based technologies with a major activity in developing countries. In addition, the Commission actively promotes initiatives for scientific and training activities, and facilitates science education and capacity building [www.e-ico.org].

Suggested citation: ICO (2016). ICO Strategic Plan, 2017-2023. International Commission for Optics, Paris.

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Foreword

Since its inception in 1947, the ICO has served the international community of optics and photonics by fostering an exchange of information through scientific events, publications, topical schools, and technical committees with emphasis on the developing world. We contribute toward the development of the science and technology of optics and photonics as well as its application for scientific and societal purposes.

The ICO recognizes distinguished professionals in optics and photonics with three annual awards: the ICO Prize, the ICO Galileo Galilei Medal Award, and the ICO/ICTP Gallieno Denardo Award. As of 2005, the ICO also administers the IUPAP Young Scientist Prize in Optics.

The ICO actively promoted the application of the International Year of Light through IUPAP and ICSU, essential steps on the way to securing the support of the UNESCO Executive Board. In the final stage ICO asked its Territorial Representatives to seek the support of their ambassadors to the United Nations for IYL. Three of the International Society members of the ICO were funding partners of the IYL, and the ICO endorsed the initiative jointly with IUA, IUPAP, URSI, IUTAM, IUPAB, ISPRS, IUHPST, and the two international councils for science, ICSU and ISSC.

The ICO structure has always been similar to that of the ICSU Union, consisting of 53 Territorial Committees, originally named National Committees, and 7 International Member Societies. The Territorial Committees have the mission to be representative of optics and photonics activity in a given geographical territory and to support its total financial independence. The ICO is currently a Scientific Associate of ICSU and an Affiliated Commission of IUPAP.

Optics and photonics have been identified as a key science and technology for addressing the challenges of society in the 21st century. Optics and photonics have primarily been based on physics however, many other disciplines have evolved and are now deeply connected such as mathematics, geodesy, chemistry, biology, art, and engineering.

To further our contribution to the evolution of human society and culture, we believe there is a need to scientifically expand optics and photonics by emphasizing the interaction with these disciplines. In light of this, the ICO is now in the process of applying to become a scientific union. We ask all scientific communities to recognize the significance of optics and photonics and to support the ICO to become one of the ICSU union members.

Yasuhiko Arakawa, ICO President, 2014-2017

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Annex II: Budget

Note of the editor: Highlighted text relates to issues raised by ICO members, and which are expected to be discussed at the GA.

Introduction and Background

The Strategic Planning Exercise

The purpose of strategic planning is to set overall goals for a business, organization, or institution and to develop a plan to achieve them. It involves asking where the institution is, in what direction it should be headed, and what its priorities should be. Strategic planning is intended to accomplish three important tasks:

1. to clarify the outcomes that an organization wishes to achieve;
2. to select the broad strategies that will enable the organization to achieve those outcomes; and
3. to identify ways to measure progress.

The following ICO Strategic Plan 2017-2023, **presented in draft form**, is intended to serve that purpose and to provide a roadmap for strengthening ICO's international organization competencies in the development and expansion of Optics and Photonics. Particular emphasis is placed on special programs for young scientists; entrepreneurship; sponsorship of local, regional and international activities; and in general to offer services to the world Optics and Photonics community as a non-profit organization with particular focus on the underdeveloped regions of the world.

Authors of this document include the current members of the ICO Executive Committee—Yasuhiko Arakawa, ICO President (term 2014-2017); Duncan Moore, ICO Past President; Angela M. Guzman, Secretary General; Gert von Bally, Associate Secretary; James H. Harrington, Treasurer—and, in addition, Maria L. Calvo, former ICO President (term 2008-2011) and Pierre Chavel, former Secretary (1990-2002). We gratefully acknowledge the administrative assistance of Alana Cahoon.

A strategic plan is a living, evolving document. It is expected that the ICO strategic plan will be reviewed and updated on a regular basis.

The timing of the preparation of this document coincides with the application of the ICO to the International Council for Science (ICSU) for change in status, from that of Affiliated Commission of the International Union of Pure and Applied Physics (IUPAP) and Scientific Associate of ICSU to full Union status¹.

Early Objectives of the ICO and their evolution

At its founding in 1947, because of the priorities of the optics industry immediately following World War II, the ICO had as its principal objectives the study of optical theory, the theoretical study and construction of optical instruments, and the physiological optics of the eye. The scope of research in Optics and Photonics has grown immensely since the discovery of the laser in 1960, and numerous research contributions and technology breakthroughs have originated in disciplines other than physics. We now consider Optics and Photonics to be a transdisciplinary area of science

and technology linked to the development of the global economy. As an example, the Optics and Photonics program of the National Science Foundation of the USA involves Astronomy, Chemistry, Materials Research, Mathematical Sciences and Physics, but also several engineering disciplines: chemical, bioengineering, environmental and transport systems, electrical, communications and cyber systems. It also involves the divisions of Biological Infrastructure, and computer and Network Systems. Optics and Photonics play a key role in improving the well being of the world's people.

Membership

Currently the ICO has 53 Territorial Committee Members, geographically distributed over the five Continents representing every country with any significant activity in optics. Africa is one such member and is comprised of 20 countries. The ICO is an inclusive organization. In many cases the ICO has helped local communities from less developed countries to create their own ICO Territorial Committee and become active members of the international community. ICO and ICTP started the Winter College in Optics earlier in 1993. Since then, the College is organized annually with a high quality selection of key topics, lecturers and laboratory activities. A listing of the number of scientists included in ICO, as an approximation has been prepared. See Appendix I.

The ICO has three categories of Members.

- i) Territorial Committee Members, representing identified optics communities in a set of non-overlapping geographical areas².
- ii) International Society Members³. Such members are membership organizations active in the field of Optics and Photonics on an international level. There are currently Society members: OSA (the Optical Society), SPIE (The International Society for Optics and Photonics), IEEE Photonics Society, EOS (European Optical Society), LAM (African Laser, Atomic and Molecular Physics Network), OWLS (International Society on Optics Within Life Sciences), RIAO (The Iberian-American Network on Optics).
- iii) Associate Members. The Commission may also accept organizations active in Optics and Photonics as Associate Members. Associate Members pay no dues and have no voting privileges.

Application for all categories of membership shall be made to the ICO Secretary and submitted to the next General Meeting for approval.

Leadership

The leadership and executive functions of the ICO resides with the ICO Bureau. The Bureau consists of the Executive Committee (the ICO President, Immediate Past-President, Secretary General, Associate Secretary, and Treasurer), the IUPAP representative, and fifteen additional members, traditionally known as Vice Presidents⁴.

Committees of the ICO Bureau include (a) the Regional Development Committee, which looks for ways to assist optical scientists and engineers in developing countries through the exchange of information with joint organization of schools, often in collaboration with the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy; and (b) the Education Committee, which coordinates the various activities oriented to the education and training in Optics and Photonics (ETOP) in collaboration with international societies members such as IEEE, OSA, and SPIE.

ICO Bureau 2014-2017	Bureau member	TC/member society
President	Prof. Yasuhiko Arakawa	Japan
Past-president	Prof. Duncan Moore	USA
Secretary	Prof. Angela M Guzman	Columbia
Associate Secretary	Prof. Gert von Bally	Germany
Treasurer	Prof. James A Harrington	USA
Vice-president elect	Prof. John Harvey*	New Zealand
Those in industry are marked with an *	Dr Franz Holler*	Germany
	Prof. Humberto Michinel	Spain
	Prof. Joseph Niemela	USA
	Prof. Seung-Han Park	South Korea
	Prof. Roberta Ramponi	Italy
	Prof. Jakub Zakrzewski	Poland
	Prof. Mourad Zghal	Tunisia
	Prof. Kent Choquette	IEEE
	Prof. John C Howell	OSA
	Prof. Stephan P. Morgan	OWLS
Vice-president appointed	Prof. Eric Rosas	RIAO
	Prof. Paul Urbach	EOS
	Prof. Ahmadou Wague	LAM Network
	Prof. Maria Yzuel	SPIE
IUPAP Exec. Council delegate	Prof. Carmen Cisneros	



SWOT Analysis

An analysis of an institution's strengths, weaknesses, opportunities, and threats often precedes strategic planning. A SWOT analysis was initiated in 2011 under the leadership of D. T. Moore. Results of that analysis include the following.

Strengths

1. ICO is a truly international organization, and offers the best opportunities for the representation in Optics and Photonics on a global level.
2. It is fully represented at the national level by its Territorial Committees (TCs). Together with the International Society Members, the ICO offers a friendly and motivating international atmosphere for research in Optics and Photonics and its applications.

3. The ICO is recognized and respected throughout the world for its sponsorship and endorsement of topical meetings, international conferences, and schools.
4. Among the member societies are the leading publishers of scientific literature and advances in Optics and Photonics.
5. ICO has strong relations with ICSU, under its current status as Scientific Associate, and with IUPAP, as an Affiliated Commission. ICO continues to establish ties of cooperation with other ICSU Scientific Associates and Unions.
6. ICO has a good relationship with UNESCO through ICTP. ICO has served in the Trieste System in Optical Sciences and Applications Advisory Group (TSOSA), established in 2006 with the purpose to offer advice on the development and coordination of activities in Optics and Photonics carried out or planned by the Trieste System. The committee was initially established with representatives of ICO, OSA, SPIE, OWLS, IAEA, UNESCO, TWAS, ICTP, the Elettra Synchrotron Facility and the Laser Lab at Elettra. In 2102, the Committee was enlarged to include representatives of the US National Academy of Sciences and the African LAM Network. The TSOSA elected the ICO Secretary as its Chair since its inception. Former ICO Secretary, Pierre Chavel was Chair of TSOSA during the period 2006-2008. Since then A. Guzman, the current ICO Secretary has chaired the TSOSA, by election of its members. ICO officers have provided the ICTP with expert advice and international contacts to help maintain the high scientific standards of the ICTP Winter College on Optics, and more recently to include hands on activities in the College, with equipment accessible to researchers from developing countries, which have been highly appreciated by the students. The ICO and the ICTP established in 2000 the International Award known today as the ICO/ICTP Gallieno Denardo Award for significant contributions in Optics and Photonics. Which recognizes the work of young researchers from developing countries who are active in optics and photonics research and have contributed to the promotion of research activities in in their own or another developing country. In September 2007, the ICTP and ICO agreed to dedicate the Award to the memory and legacy of the late Prof. Gallieno Denardo, who greatly contributed to the development of optics research within ICTP and in developing countries. The contact with UNESCO extends to the ALOP programs (Active Learning in Optics and Photonics) particularly in the Latin-American region. While ICSU has no specific signed programs with UNESCO, the future union, under provisional name of IUOP (International Union for Optics and Photonics) may contribute to provide these links in the forthcoming ICSU-ISSC merged organization.
7. ICO is not structured into individual members but into Territorial Committees (TCs) and International Society Members. The ICO TCs are official representatives of the Optics and Photonics community in identified geographical territories. There are no restrictions to membership, creating a large diversity of geographical representatives.
8. It conforms an open forum allowing the opportunity to meet researchers and educators in Optics and Photonics from all over the world.

9. The work of the ICO through its TCs is complementary to the work of the International Society members. The ICO serves to promote and spearhead the organization of Optics and Photonics communities in different territories, and the International Society members provide benefits to the individuals in those territories, with emphasis on creating local and student chapters.

10. The ICO is a 100% volunteer-managed organization. Scientists, academic and professionals drive ICO, not career staffers.

11. As stated by former ICO President Anna Consortini, “ICO is the United Nations of Optics and Photonics.” The ICO continually strives to be an international organization for national and international societies in optics and photonics and serves as the sponsor, co-sponsor and/or endorsing for initiatives of those societies into the international diplomatic arena, while maintaining neutrality. For the 2005 International Year of Physics, ICO took part as a member of the International Committee since its inception and as an initiative of the ICO Secretariat. The ICO, in its capacity as Scientific Associate of ICSU and Affiliated Commission of IUPAP, helped move the initiative of an International Year of Light through IUPAP, ICSU, and UNESCO. ICO obtained the support for the initiative of many ambassadors from ICO Territories to the United Nations.

12. Being free from national ties and obligations, ICO can practice advocacy and diplomacy in favor of scientists who have been imprisoned elsewhere for defending scientific freedom and responsibility.

13. The ICO can provide public policy support for research and education activities in Optics and Photonics in developing countries and provide more extended local and regional support for the establishment of national initiatives in Optics and Photonics intended to develop Optics and Photonics industries that contribute to sustainable development and human wellbeing. The USA National Initiative for Optics and Photonics was born within the ICO Territorial Committee of the USA (USAC/ICO), and the Mexican Photonics Initiative within the ICO Mexican Territorial Committee. The latter, launched recently by the Mexican government, will be an integrated effort of the government, academia, and industry.

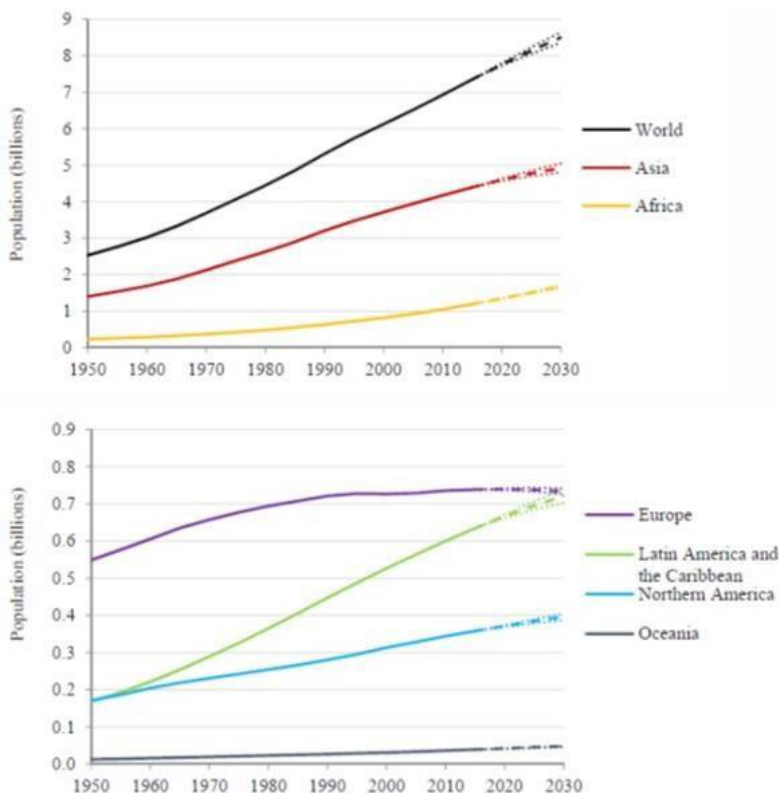
14. One of the International Society Members of the ICO, the IEEE Photonics Society, consists mainly of engineers, who do research in Optics and Photonics. This constitutes an asset for the ICO for implementing solutions to global challenges.

15. The ICO contributes to bridging the scientific gap between developed and developing countries by promoting international scientific collaboration and through its traveling lecturer program.

Weaknesses

1. ICO governance may not be well situated for major changes in demographics expected in the coming one or two decades (see figure). Relations with ICTP can

continue to be strengthened through TSOSA Committee by jointly fostering high level scientific research in Optics and Photonics in developing countries, emphasizing the potential of Optics and Photonics as an enabling science for sustainable development, environmental monitoring, health, etc. , impact programs and interactive means for young scientists on a more extended basis. As to procure a major impact, ICO might fill the lack of appeal to industrial sectors as optical engineers and information scientists. We need more efficient ways of communication and need to increase our marketing.



[†]Dashed line represents the median projection, while dotted lines represent the 95 per cent prediction intervals.
Data source: United Nations (2015). *World Population Prospects: The 2015 Revision*.

2. In some developed countries, ICO lacks major presence, so that ICO is not as recognized and visible as it might be, in part because ICO does not yet participate in a necessary higher number of international research programs aimed at confronting global challenges, although, it tries to be very active to reinforce this issue for the future

IUOP (provisional name for the future International Union dealing with Optics and Photonics, the final name to be selected by the ICO General Assembly).

3. Because of its current status as an Affiliate Commission of IUPAP, the ICO cannot achieve its full potential within ICSU as a source of scientific expertise in light-based technologies for the development and implementation of environmental, sustainable development, and human health policies.
4. ICO's financial model is at present ill suited to its mission. Although there is strength in having a volunteer-run organization, it presents a great amount of work. Funding is needed from governments, industries, or through international research programs. Currently, the fees from Territorial Committee Members generate ICO's only funding source. To add an insight to the financial model there is an Annex at the end of the document showing the current budget as approved by the last GA 2014 (see page 17).
5. Demographic data indicate that in 2030 most of the population in developing countries will be young people in their stage of scholar and academic formation. The ICO may then need to continue offering opportunities appealing to members of developed countries without losing focus on critical regions like Africa, Latin America, and less developed Asian countries.
6. Although two of eight ICO elected Vice Presidents should come from Industry, the connection between the ICO and industry needs to be improved. Optics and Photonics must be considered in the context of its dramatic technological development over the past half-century.

Opportunities

1. **Source of reviewers and articles on Optics and Photonics:** Create a group of peer review volunteers for Optics and Photonics articles in Wikipedia, or a collection of such articles in an Optics and Photonics Wikipedia for the general public.
2. **Science for policy:** Help replicate initiatives like Photonics 21 (Europe), the USA Photonics initiative, Horizon 2020, etc., in less developed countries with the aim to help solve local problems and contribute to regional sustainable development. A step in that direction was the Mexican Photonics Initiative.
3. **Sustainable energy:** Continue work in the sustainable energy area. The ICO has already held workshops on Optics and Energy. During the International Year of Light a large consortium of scientific bodies raised awareness of the ways that light-based technologies can provide solutions in the areas of energy, education, agriculture, health and wellbeing. "Study after Sunset" was one of the Programs of the International Year of Light 2015 which promoted the use of portable solar-powered high brightness LED lanterns in regions where there is little or no reliable source of light. Solar energy is becoming cost accessible for use in residential, commercial, agricultural, and even rural areas. Scientific and technological advances have been driven by Optics and Photonics,

as well as by solid-state physics, thermal science, materials and chemistry. It provides a great opportunity to create a cluster of Unions within ICSU devoted to the search for the next generation technologies for solar energy conversion, widely accessible and reliable.

4. **Science education:** To further contribute to Science education and motivation of young minds towards scientific research. The ICO has experience in education activities at different levels and, in association with several of the International Society Members, holds regularly an international conference on Education and Training on Optics and Photonics. Given the wide range of applications of Optics and Photonics research, the ICO has also been involved in workshops on entrepreneurship for scientists and engineers, and some Territorial Committees have organized exhibits in museums. There is a main concern inside ICO for enhancing working in developing areas of the world, in which the technological gap is more evident than in other highly developed regions. The ICO could seek funds from funding agencies like the African Development Bank, World Bank, USAID, UNIDO and UNESCO for education and entrepreneurship programs aimed at young scientists.

5. **Union Status within ICSU:** ICO is now preparing the application to ICSU to become a Union: *with the provisional name of International Union of Optics and Photonics (IUOP is, in fact just one of the possible names to be considered by the General Assembly for its decision)*. Becoming a Union will open possibilities of direct interaction with other Unions on specific projects that require a multidisciplinary perspective, including engineering and biological sciences. A Union of Optics and Photonics has great potential to contribute to ICSU Programs with a multidisciplinary perspective and can facilitate greater effectiveness for ICO in its programs and activities.

Threats

1. The risk of isolation from the broader international scientific community because of its role as an appendage to IUPAP. One of the main roles of the ICO, to provide an international environment for optical sciences, has been diminished and needing a strong adaptation due to the vertiginous advance of communication technologies and other emerging technologies. There is then a need to enlarge its own community projection and actively join the international community of scientists, inside ICSU organization, confronting global challenges and influencing public policy as expected from a union input.

2. The second biggest threat is its financial model, which is limited to member fees. In this Strategic Plan there is included at the end of the document (see page 18) an Annex with data considerations of the current budget handled by ICO.

3. A lack of participation of early career scientists in ICO activities and governance might lead to succession problems and reduced impact in the future. ICO considers to work inside an education environment and with a projection in less developed regions of the world, while enhancing those key activities in more industrialized countries.

4. A lack of efficient and modern communication may hinder the ability to motivate and facilitate the active participation of all of its members in future programs.

Mission

The mission of ICO is to contribute, on an international basis and wide geographical representation, to the progress and diffusion of knowledge and applications in optics and photonics for the global benefit of mankind. Thus, enhancing an international cooperation.

Vision

The vision of the ICO is to be an international scientific and engineering forum, inside ICSU, engaged on sharing knowledge and expertise in Optics and Photonics that contribute to a global sustainable development and economic growth. Main activities and objectives associated to this vision are:

- i) to contribute on an international basis to the progress and diffusion of knowledge in Optics and Photonics;
- ii) to promote and facilitate research and other scientific and engineering activities in Optics and Photonics that involve international, interdisciplinary collaboration;
- iii) following ICSU current policy, to reinforce the transdisciplinary nature of Optics and Photonics and support the establishment of new cross-disciplinary education curricula;
- iv) to promote and support policy advocacy actions by national members and the international member societies;
- v) to encourage a balanced geographical representation and involvement in all activities of the Union;
- vi) to endorse and provide academic advice when requested for international Optics and Photonics research meetings and related events such as workshops, summer schools, topical meetings, etc., organized by the ICO territories;
- vii) to represent Optics and Photonics in ICSU and liaise with other ICSU bodies as current Unions in which ICO may converge in the near future as the so provisionally proposed International Union of Optics and Photonics (IUOP) by upgrading its organizational structure to the category of a Union.

Values

ICO values include the following:

- A deep respect and appreciation for Optics and Photonics as an enabling science and as a discipline for study
- Excellence and professionalism among its members and the international societies
- Continual progress in the development of Optics and Photonics as both scientific discipline and enabling technology Strong and ongoing international collaborations
- Providing support and visibility to the activities of scientists in developing countries
- Service-oriented attitude
- Engagement in a wide range of select activities
- Providing timely information in optics and photonics to global society
- To connect the world of Optics & Photonics to the social needs and well-being through the support and connections with ICSU and ISSC

Goals and Associated Actions (•)

Short term

1. Promote the growth of Optics and Photonics as enabling science and technology
 - Support Optics and Photonics initiatives in all countries with emphasis in education of a trained workforce able to use Optics and Photonics devices in health, energy and communications applications. The ICO is aware of the need of involving social scientists in projects in these key areas for sustainable development, in order to warrant their appropriateness to local conditions and needs, the support of local policy makers, and the required appropriation of the involved technologies by locals for their long-term success. The ICO looks forward to collaboration with the ISSC scientist in this regard.
2. Increased interaction between developed and developing countries
 - Contribute to scientific collaboration between developed and developing countries in Integrated Photonics, advanced manufacturing, and non-invasive optical techniques for diagnosis.
 - Balanced geographical representation and involvement in all ICO activities
3. Expansion of research and educational role
 - Contribute to programs that disseminate education in Optics and Photonics in developing countries, with emphasis in low-cost energy sources that could contribute to the Energy 4 all Program of the UN, low-cost health diagnosis devices, low-cost food monitoring, and other Optics and Photonics-based technological developments that could help to the achievement of the SDGs.

- Promote regional research and educational programs in Optics and Photonics and its applications in collaboration with the ICTP.
- 4. Increased visibility and stature for ICO on the global scale
 - Support and promote policy advocacy actions by national members and international member societies.
 - Become more active in Science for Policy activities.
- 5. Expansion of role of ICO in international initiatives
 - Contribute in a direct manner to major international research platforms like [Future Earth](#) governed by a Council in which members of the Science and Technology Alliance for Global Sustainability participate, including the [International Council for Science \(ICSU\)](#), as well as through thematic clusters with other ICSU Unions.
 - Encourage/promote development of Cluster of energy: ICO (LED illumination, solar energy) + Material research + electrical engineering + environment + chemistry + physics.
 - Encourage/promote Cluster of bio photonics with IUBS and IUPESM.
 - Encourage the role of optics in developing countries with sustainable development, and provide support for national initiatives in Optics and photonics that contribute to sustainable development policies.

Medium term

1. Increase ICO role in research and education.
 - Build an elected Vice Presidency for research able to write international research proposals for north-south collaboration in areas like human health, renewable energy, etc.
 - Establish the position of VP for education able to create workshops intended for multi-disciplinary teams of natural and social scientists, and engineers, with the aim of solving specific local problems in developing countries, like energy independence, food security, health and disaster risk monitoring.
 - In all the previous mentioned activities ICO may count on the determinant support of the International Society members and the local societies of the TC's.
2. Greater activity in ICSU programs.
 - Participate actively in the procurement of local resources and local political support for the implementation of ICSU programs at the local level.
3. Improved communication and involvement in national policy debates

- Build a modern communication system that allows supporting or promoting the participation of Optics and Photonics experts in regional Knowledge-action networks

Long term

1. Stabilization of the ICO

- Stabilize the structure of the Union by establishing part-time permanent staff positions for an Executive Director and a Communication Officer
- Change the U.S. taxation status of the ICO from that of a 501(c)4 organization to a 501(c)3 organization in order that donations made to the ICO can be tax deductible. This change could be done when the ICO is upgraded to ICSU Union status.

2. Prepare for a new role in ICSU

- Represent Optics and Photonics inside ICSU and liaise with other ICSU bodies as current Unions in which ICO may converge in a near future as the International Union of Optics and Photonics (IUOP)⁵ by upgrading its organization structure to the category of a Union
- Have permanent representation in thematic clusters of Unions involving Optics and Photonics, and serve as communication bridge between researchers and governments on topics related to Optics and Photonics-based technologies
- Establish a more fluent exchange with the Optics and Photonics community worldwide on topics related to ICSU programs that involve Optics and Photonics. Such system might be implemented through the international Member Societies.

General Strategy

1. Create commissions of experts on the topics to be worked in Union clusters.
2. Improve communication strategy and keep the ICO membership informed of possibilities of participation in ICSU programs.
3. Involve early career scientists and engineers on all commissions.
4. Create an ICO Bureau position for early career scientists and/or engineer.
5. Include in the ICO Bureau liaison members of the Union clusters.
6. Contact with the local key leaders regularly to enhance the global network of ICO

Evaluation

The position of ICO as the international organization that represents the field of Optics and Photonics inside ICSU, including issues and studies on a national and international

level, will be evaluated. Key policies need to be defined. All TCs and ICO Bureau members will undertake this task.

Concluding Remarks and Summary

In this Strategic Plan, ICO presents and defines the key items that identify our current objectives, threats, and weaknesses along with information of the structural organization and future changes of our activities and challenges. The plan may be assured by the continuation of our task forces and responsible representatives in the ICO Bureau and the TCs. In these forces we may include as well our current and future partners in the world of science.

The short-term goals for the period 2017-2023 will reinforce ICO stature as an international organization based on national members and international society members for the enthusiastic global promotion and support of Optics and Photonics education and research and facilitate the full integration of the ICO with those of ICSU Unions and reinforce the representation of the Optics and Photonics community within ICSU, acting as an international scientific and engineering organization engaged on promoting international cooperation on Optics and Photonics and on contributing knowledge and expertise in these areas to global research programs.

The Strategic Planning Committee will recommend appropriate strategies for reaching the goals, the action plan, specific responsibilities for implementing the strategy, a timeline for starting and ending the action, and how the outcome will be evaluated.

ICO is now preparing the application to ICSU to become a Union: to be proposed with the provisional name of International Union of Optics and Photonics (IUOP)⁵. Becoming a Union will open possibilities of direct interaction with other Unions on specific projects that require a multidisciplinary perspective, including engineering and biological sciences. A Union of Optics and Photonics has great potential to contribute to ICSU programs with a multidisciplinary perspective. This is especially true with the approaching merger of ICSU and ISSC. Optical scientists and engineers need guidance from social scientists to understand the needs of the communities. To effectively contribute toward the sustainable goals of developing countries, we understand the value of this collaboration. ICO is aware of the social impact that social scientists, engineers, architects and artists brought to the International Year of Light, awakening the awareness of the society on the relevance of Optics in Photonics in our lives. The ICO anticipates an open dialogue with social scientists. We further notice the importance of becoming a union to overcome some of the threats mentioned in the SWOT analysis. In this period, ICO has to connect with ICSU Unions, starting collaborations and defining specific clusters within the science world, not restricted to physics but extended to chemistry, biomedicine, biology, acoustics, astrophysics, and other relevant fields.

Among these ICSU Unions, ICO may maintain its natural links with IUPAP. Inside the future ICSU skeleton as merged with ISSC as a unique organization, the future

International Science Council, ICO could remain a part of IUPAP structure under the current Affiliated Commission status. *Meanwhile, the future IUOP may be created as a separate body of which ICO would be a member (similar cases already exist within the ICSU structure).* It will then create and enhance links to general ICSU-ISSC programs and networking with all Unions dedicated to science and technological world, and, in addition with those involved in policies for wellbeing society.

ICO should actively participate in the major ICSU project Future Earth and bring awareness of the relevance of Optics and Photonics as enabling science for the many areas of science involved. For example, emerging techniques to monitor climate change and its impact involve new Optics and Photonics technologies.

In the mid and long term ICO will attempt to increase its role in education and research by creating elected Vice Presidencies able to propose and/or collaborate on the development of international projects. ICO will also participate in the procurement of resources for the development of those projects and for its own functioning from local governments and other funding agencies. These actions joined with an active participation in clusters and ICSU Programs are expected to stabilize the ICO and its role within ICSU in the long term.

Predicting economic growth and technological change is very difficult, even over the short term. The ICO should permanently be aware of and follow the changes in the social, economic, and political status of the world to maintain its presence in key territories, and to extend its influence to regions that may emerge as leaders in new technologies.

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List of Acronyms

ALOP	Active Learning in Optics and Photonics
EOS	European Optical Society
ETOP	Education and Training in Optics and Photonics
ICA	International Commission for Acoustics
ICO	International Commission for Optics
ICSU	International Council of Science
ICTP	The Abdus Salam International Center for Theoretical Physics
IEEE	Institute of Electrical and Electronics Engineers
ISSC	International Social Science Council
IUBS	International Union of Biological Sciences
IUOP	International Union of Optics and Photonics
IUPAP	International Union of Pure and Applied Physics
IUPESM	International Union for Physical and Engineering Sciences in Medicine
LAM	African Laser Atomic Molecular and Optical Sciences Network
LED	Light Emitting Diodes
MCTP	Mesoamerican Center for Theoretical Physics
O&P	Optics and Photonics
OSA	The Optical Society
OWLS	International Society on Optics Within Life Science
RIAO	Red Iberoamerica de Optica/ Iberian American Network of Optics
SDGs	Sustainable Development Goals
SPIE	The International Society for Optics and Photonics
TCs	Territorial Committees
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations International Development Organization
USAC/ICO	The U.S. Advisory Committee for the International Commission for Optics
USAID	United States Agency for International Development

Annex I

National Societies members of ICO represented in the ICO Territorial Committees⁶

- [Academia Mexicana de Óptica](#) (Mexican Academy of Optics). 2,700 members.
- Armenian Territorial Committee of ICO. 38 members.
- [Australian Optical Society](#). 300 members.
- Brazilian Territorial Committee. 252 members.
- Canadian Territorial Committee. The order of 300 individual members.
- [Chinese Optical Society](#). The order of 15,000 individual members (corporate members are not considered).
- Colombia Territorial Committee ([Sociedad Red Colombiana de Óptica](#) data). 500 members.
- Cuban ICO Territorial Committee. 50 members (this number includes PhD students).
- [Czech and Slovak Committee for Optics and Photonics](#) (unavailable data).
- Danish Optical Society (unavailable data).
- Ecuador ([Sociedad de Óptica y Fotónica del Ecuador](#)). 29 members.
- Estonian Territorial Committee of ICO (Optics Section of the Estonian Physical Society). 30 members.
- [Deutsche Gesellschaft für Angewandte Optik](#) (DGaO, German Society for Applied Optics), the [Fachverband Quantenoptik und Photonik der Deutschen Physikalischen Gesellschaft](#) (Quantum Optics and Photonics Division of the German Physical Society) and the OptecNet (German (Industry) Competence Network on Optical Technologies). Estimated individual members: 3,840.
- Greece (unavailable data).
- [Indonesian Optical Society](#). 73 individual members
- [Institute of Physics in Ireland](#). 600 optics researchers/workers (MSc/PhD students, post-docs, academic staff, and industry).
- [Institute of Physics](#) (IoP, UK). Of a total of 41,000 members (including staff) it was estimated a 5% for UK individual members: the order of 2,000 members.

- Israel Territorial Committee. 400 members (this number includes PhD students).
- Italian Territorial Committee ([Consiglio Nazionale delle Ricerche](#)). 250 individual members.
- Japanese Territorial Committee ([Science Council of Japan](#)). 2,000 individual members.
- Korea Territorial Committee ([Korean Optical Society](#)). 2,000 individual members.
- Latvian Optical Society. 20 members (data provided by EOS).
- New Zealand Territorial Committee ([Dodd-Walls Centre for Photonic and Quantum Technologies](#)). 100 individual members.
- Norwegian Territorial Committee (link provided by [EOS](#)) (unavailable data).
- Photonics and Optics Division, Argentinean Physical Association. 300 members.
- Photonics Finland. 240 members (data provided by [EOS](#)).
- Polish Territorial Committee. 300 members.
- Romania (unavailable data).
- Russian Territorial Committee ([Institute of Laser Physics of the Siberian Branch of Russian Academy of Sciences](#)) (data unavailable).
- Singapore Territorial Committee ([Optics and Photonics Society of Singapore](#)) 90 individual members (including students).
- [Sociedad Española de Óptica](#) (Spanish Optical Society, SEDOPTICA). 500 individual members.
- [Sociedade Portuguesa para a InvestigaÇao em Óptica e Fotónica](#) (Portuguese Society of Optics and Photonics). 74 individual members.
- [Société Française d'Optique](#) (French Optical Society). 834 members (the order of a 20% of the French Physical Society).
- [Swiss Society for Optics and Photonics](#) (SSOM). 293 individual members.
- Sweden Territorial Committee ([Swedish Photonics Platform](#)). 150 members.
- [Taiwan Photonics Society](#) (TPS). 1,200 individual members.
- [The Optical Society of India](#). 1,000 individual members.
- The Sudanese Committee of Atomic, Optics and Laser Science. 350 individual members.
- [Tunisian Optical Society](#). The order of 70 individual members.
- [Unites States Advisory Committee of ICO \(USAC/ICO\)](#). 49,000 members.

- Ukraine ICO Territorial Committee. 1,200 members (this number includes PhD students and holds for the period 1971-2016 according to Ministry of Education and Science of Ukraine data)
- Venezuelan ICO Territorial Committee. 35 members (this number includes PhD students).

Annex II

Budget

The present budget is a summary of income and expenditures, as reported by the ICO Treasurer in 2014 (Green Book Toward ICO-23, page 326). Prior to any consideration from the reader, one may consider that the ICO has no current plans for changing the member fees for the next period. This is explained below on the basis of the handled current budget. The GA will be consulted regarding budget changes related to possible upcoming modifications in the ICO structure and status.

The primary source of ICO income is the membership dues contributed by the Territorial Committees (TCs). The money that the ICO expends is used mostly to support conferences, ICO prizes, and travelling lecture awards. The consolidated budget proposed by the ICO Treasurer for the period 2017-2020 will be presented at the forthcoming ICO-24.

Approximately 46% of the Budget is spent on conferences support, 13% on the publication and distribution of the ICO Newsletter and the ICO triennial report, 20% in awards, and 15% in financial support of the Secretariat, which includes payment of the services of the ICO Webmaster and webpage hosting.

Since the General Assembly in Puebla (2011) ICO has signed a new fiscal sponsorship agreement with the Optical Society of America Foundation (OSAF) allowing charitable donations made to the OSAF to be earmarked for ICO outreach activities.

The reason for this action is that the ICO is in US an 501(c)4 organization. This means that monies donated by US citizens directly to the ICO do not exempt the donor from paying US taxes on their gift. In contrast the OSAF is a 501(c)3 organization (as is the OSA itself) and thus the OSAF can accept donations from US tax payers and their donation will be tax deductible. The Memorandum of Understanding (MoU) is now in place between the OSAF and the ICO. To date the ICO has received one donation of \$25,000.

The next Table includes for comparison the budgets for the triennium 2011-2014 as well as the proposed and approved budget for the current 2014-2017 triennium (**Approved at the 23th ICO General Assembly, August 2014, Santiago de Compostela, Spain**).

Table

Revenue	Budget*		
	Estimated* 2011-2014	Approved** 2011-2014	Approved** 2014-2017
Dues	\$144,525	\$144,525	\$144,525
Less not collected	\$21,740	\$33,000	\$14,000
Net dues	\$122,785	\$111,525	\$130,525
Royalties	\$397	\$600	\$300
Total Revenue	\$123,182	\$112,125	\$130,825
Expenses			
Secretariat	\$17,500	\$20,000	\$22,000
Newsletter - copyediting	\$2,023	\$4,000	\$4,000
Newsletter - printing & distribution	\$9,173	\$12,000	\$12,000
Printing & distribution - Green Book*	\$4,000	\$4,000	\$4,000
Bureau expenses	\$3,811	\$3,000	\$4,000
ICO prizes + travel	\$17,650	\$15,000	\$20,000
Conference support	\$30,300	\$30,000	\$32,000
ICTP school support	\$15,000	\$15,000	\$15,000
ICO Congress	\$7,500	\$7,500	\$8,000
Traveling lecture awards	\$5,000	\$5,000	\$5,000
Reserves or new projects		\$2,000	\$2,000
ICSU dues	\$2,187	\$2,100	\$2,100
Total Expenses	\$114,144	\$119,600	\$130,100
Surplus/(Deficit) for 3 year period	\$9,038	(\$7,475)	\$725
*As of 1 July 2104 **: ICO-22 GA, Puebla, Mexico ++: ICO-23 GA, Santiago de Compostela, Spain			

A somewhat longer-term issue is a re-examination of the units that we assess each TC as a means of determining their dues. The current ICO dues rate is based on \$235/unit. The number of units for any TC varies from 1 to 18. The units that each TC is assigned are based on information from the World Bank on the economic status of the various countries. The ICO established the numbers of units many years ago (according to IUPAP criteria). It is in the ICO concerns to re-evaluate the units assigned to each territory in light of economic changes since the units were established. ICO wants to be certain that the units are assigned equably. While several proposals for readjusting the units have been discussed in various past GA, there has been no reallocation of units to date*. **At this time we do not envision an increase in the \$235/unit dues in the foreseeable future. And, in the hypothetical case of ICO to become a union, the same ICO dues rate would be maintained.** We stress the fact that under the current budget ICO develops all the proposed triennial activities and that this is mainly due to

the very careful analysis of the needed expenditures, in particular, picking up the opinions at the ICO Bureau.

The annual budget of the ICO is approximately €41,000. As a comparison with other unions, one may notice that six of the 30 ICSU Unions have smaller budgets than does the ICO. Ten ICSU Unions have budgets inferior to 55,000 euros and pay ICSU dues of approximately 1,300 euros. The ICO currently pays 500 euros, without having the right to vote. Only two of the ten smaller Unions have staff, all others have a structure similar to that of the ICO.

This Plan presents goals for the long term that might require contracts with UN bodies or local Academies of Science and/or governments, as well as to open the possibility of accepting direct donations through a change of tax status in the USA. At this stage, it is not accurate to preview the opportunities that may arise for the ICO in the international context if it becomes a Union. It is possible that in the long term, the ICO can promote global initiatives with specific local activities whose cost be covered with local resources. Already the ICO has gained experience in this regard with the financing of local ALOP Workshops in Latin America.

*Document prepared by
Maria L. Calvo, Angela Guzman
and the concurrence of Alana Cahoon.*

¹ An Affiliated Commission of the IUPAP consists of an independent international committee or organization of **physicists** with its own well-developed administrative structure and with its own members, dues structures, statutes, and assemblies. They assist on implementing IUPAP principles and participate in joint activities. As an ICSU Union, ICO will bring together scientists and engineers from different disciplines and all parts of the world, who contribute to the advancement of Optics and Photonics Science and Technology.

² The word "territory" does not imply any political position on the part of the ICO, which seeks to assist scientists in Optics and Photonics everywhere in the world to co-operate on an international level.

³ In 1999 the ICO created the category of International Society Members to recognize the fact that contrary to the situation in 1947, most international scientific conferences are organized by large societies that have individual members and that are explicitly active internationally. As of today, ICO has seven International Society Members: The Optical Society (OSA) with 20,000 individual members. The International Society for Optics and Photonics (SPIE) with 20,000 individual members, IEEE Photonics Society (6,000 individual members), the European Optical Society (EOS) formed with 21 National Optical Societies in Europe and 6,500 individual members, Red Iberoamericana de Optica (Ibero-American Network for Optics, RIAO) with 7 Iberian-American Societies or national optics organizations (Colombia, Cuba, Ecuador, Mexico, Portugal, Spain and Venezuela), Optics within Life Science (OWLS) with members from 36 countries, and the African Laser, Atomic, Molecular and Optics Science (LAM) Network with 20 African countries. With this structure, ICO has a fair claim to representing the whole field of Optics and Photonics on an international scale.

⁴ All members of the Executive Committee, except for the Immediate Past-President, are elected by ICO at the General Meeting. ii) The IUPAP representative appointed by the Executive Council of IUPAP under Article 7b of the statutes of the Union, and any Associate Members from IUPAP Commissions. iii) The other Bureau members, who are traditionally known as Vice-Presidents. Eight Vice-Presidents (at least two of whom are from industry) are elected at the General Assembly by the Territorial Committee Members; in addition, also at the General Assembly, every International Organization Member appoints one Vice-President up to the limit of eight; if there are more than eight International Organization Members, eight Vice-Presidents are elected at the General Assembly by the International Organization Members. The Bureau is responsible for the conduct of the ICO business between General Assemblies. The term of office of the Bureau is three years from October 1st in the year of the election. The Article Nr. 5 of the ICO Statutes rules the ICO organizational structure and ICO Bureau organization.

⁵ One may notice that all ICSU Unions start their name with “International Union.”

⁶ All data in this Annex I were provided by the representatives of the ICO Territorial Committees to the ICO Secretariat, except for the USAC/ICO that was estimated, see below. Not all Associate Members are included. Territorial Committees not appearing in the list are those with unknown data.

* Comment: The units were changed in the last ICO GA (2014). A readjustment was done. No new update is being planned in the forthcoming GA 2017.