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ICO Secretary General

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PART I:

ICO TRIENNIAL REPORT
TRIENNIAL REPORT OF THE ICO TO IUPAP
Yasuhiko Arakawa, ICO President 2014-2017

Introduction

ICO was founded in 1947 as an international academic organization, and is now composed of 53 territorial committee members and 7 academic society members. Since that time, ICO has been contributing to the international community by promoting research on optics and photonics through scientific events, publications, education, and international conferences, with emphasis on the developing world. ICO is an associate member of the International Council for Science, ICSU, and also an affiliated member of the International Union for Pure and Applied Physics, IUPAP.

The first General Congress of the ICO, ICO-1, was held in Delft, the Netherlands, in July 1948, the year after the ICO was established, with the aim of providing a forum to discuss progress in optics. Since then, the ICO Congress has been held every three years, and gained participation from all over the world including developing countries. The ICO General Congress has established itself as one of the most prestigious international conferences in the field of optics and photonics. This year’s Congress is the second to be held in Japan, 34 years since ICO-13 was held in Sapporo. It is our great honor to host the ICO Congress in Japan again.

Optics and photonics are interdisciplinary academic fields that cover the fundamental physics of light itself, basic technologies such as generation of light, and a wide variety of applications based on optics and photonics. Over the years, the ICO has contributed to society through application of optics and photonics. Evidence of the contribution is obvious from the fact that many Nobel laureates have accomplished their achievements in the field of optics and photonics. In 2014, Professors Akasaki, Amano, and Nakamura were awarded the Nobel Prize in Physics for their invention and fundamental research of the blue LED. Professor Kajita’s Nobel Prize in 2015 was awarded for neutrino physics, but the photon detector of course played an important role for his discovery. The Nobel Prize in Chemistry 2014 was awarded jointly to Professors Eric Betzig, Stefan W. Hell, and William E. Moerner for the development of super-resolved
fluorescence microscopy. This also indicates that the excellent research in optics has impacted not only the field of physics but that of chemistry and others.

In the period 2014-2017, ICO has supported more than 30 international meetings, including the general congress, topical meetings, regional meetings, schools, traveling lecture programs, and other activities. These include the 2016 ICO annual topical meeting held jointly with the 117th annual meeting of the Deutsche Gesellschaft für angewandte Optik (DGaO) in Hanover, Germany (17-21 May 2016). Two areas of activity in this period stand out, those associated with the International Year of Light 2015 (IYL2015) and those associated with ICO’s move to change its status from that of affiliated member of IUPAP and associate member of ICSU to that of a full ICSU Union. Activities in these latter two areas are elaborated in the following paragraphs.

**Activities on International Year of Light 2015**

The ICO supported the International Year of Light 2015 (IYL2015) initiative since its inception in 2009 in its capacity as a member of IUPAP and ICSU. The active promotion by ICO for the application of the IYL2015 through IUPAP and ICSU was essential to securing the support of the UNESCO Executive Board for realization of the IYL2015.

More than half of the ICO Bureau and over 30 other members of the ICO family attended the opening ceremony of the IYL2015, which was held in Paris in April 2015. For promoting the IYL2015, the ICO created a new ICO Award for the encouragement of activities in optics and photonics by young people in the ICO Territories. Particular emphasis was given to activities that would be sustainable beyond 2015 and that were replicable in other territories.

The main award of $5000 USD was awarded to the Spanish Optical Society (SEDOPTICA) for secondary school outreach activities using the European Commission-funded Photonics Explorer kit. The Cuban ICO Territory was awarded a prize for optics and photonics trainees who are potential scientists of the future in Havana. Their initiative taught young people how to operate five telescopes and to learn practical methods of orientation using the most important stars. Another award went to the IIS Cavazzi sez. Liceo Scientifico, Pavullo, a secondary school in Italy. They organized a one-day science fair called Amazing Light that was open to middle and high school students. The legacy of the IYL2015 by ICO was led to the commencement of the process to create an International Union of Optics and Photonics within ICSU.

In addition to the thousands of activities organized worldwide by ICO Territories during the IYL 2015, the ICO contributed to the realization of the conference Education and Training in Optics and Photonics (ETOP 2015) in Bordeaux, France (29 June – 2 July 2015), where the ICO held its annual Bureau meeting.
Actions for becoming an ICSU Union and ICO Strategic Planning

Since its establishment in 1947, due to the priority of the optical industry immediately after the Second World War, ICO was primarily aimed at promotion of optical theory, theoretical research, construction of optical instruments, and physiological optics aspects of vision research. As a result of the invention of the laser in 1960, the research scope of Optics and Photonics has expanded greatly, and numerous research results and technological advances have been achieved in fields other than physics. We currently believe that optics and photonics are super-disciplines of science and technology contributing significantly to the development of the world economy. As an example, the U.S. National Science Foundation's Optics and Photonics program includes astronomy, chemistry, material research, mathematical science, physics, biotechnology, environment and transportation systems, electricity, communications, and cyber systems. It also includes departments of biological infrastructure, computers, and network systems. Today, optics and photonics play an important role in improving the well-being of the people of the world. Collaborative efforts with ICSU Unions have already begun and will continue to grow.

As an example, the IYL2015 was initiated with the combined support of ICO, IUPAP, and IUPAC within ICSU. International Member Societies of ICO were sponsors and leaders of the organization of a variety of activities, mostly in the developed world. The ICO itself participated in the preparation and reporting of this event through its Territory Committee Members, who sought support from their ambassadors of the United Nations and local resources for their own activities.

The 23rd General Assembly held in Santiago de Compostela, Spain in 2014 directed the ICO secretary to initiate the process of application to ICSU to become an ICSU union. Based on the decision, a working group (so called ICO ICSU Committee) consisting of Y. Arakawa (President), D. Moore (Immediate Past President), M. L. Calvo (Second Immediate Past President), A. Guzmán (General Secretary), G. von Bally (Associate Secretary), J. Harrington (Treasurer) and P. Chavel (Second Past General Secretary) was formed for the action toward becoming an ICSU Union. A draft of the document “ICO Application for the Status of an ICSU Scientific Union” has been prepared by the ICO ICSU Committee members and Prof Pierre Chavel.

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). 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.
Finally, the ICO President sent the document entitled “Application for the status of Union within the International Council for Science (ICSU)” to Professor David Black, Secretary General, International Council for Science on April 5th, 2017.

While working on the application of the ICO to the ICSU, a draft of the ICO Strategic Plan 2017 – 2023 was prepared. 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. The Strategic Plan 2017 – 2023 was attached to the “Application for the status of Union within the International Council for Science (ICSU)” as one of the Appendixes.

The 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.

By reflecting the above three tasks, the ICO Strategic Plan 2017-2023, can provide a roadmap for strengthening ICO’s international organization competencies in the development and expansion of Optics and Photonics. Authors of this document include the current members of the ICO Executive Committee—Yasuhiko Arakawa, ICO President; Duncan Moore, ICO Past President; Angela M. Guzmán, 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) are also involved.

The ICO Strategic Plan is a living, evolving document. It is expected that the ICO strategic plan will be reviewed and updated on a regular basis.

Awards of ICO

One of the most important tasks of ICO is to award excellent researchers. During the period of 2014-2017, three awards have been presented that recognize prominent achievements in optics and photonics every year: the ICO Award, the ICO Galileo Galilei Award, and the ICO / ICTP Gallieno Denardo Award. ICO also manages the IUPAP Young Scientist Award in optics and photonics. These awards encourage scientists and engineers, especially young researchers from developed countries, to pursue excellent research.

ICO established in 1982 the ICO Award, 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. 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 subfield or significantly expanding an established subfield in research or technology. The most recent recipients were Martin Booth (United Kingdom, 2014), Aydogan Ozcan (USA, 2015), and Andrea Alù (USA, 2016).

The Galileo Galilei Award was established in 1993 and contributes to one of the essential missions of ICO. It is to recognize the promotion of optics in difficult situations. This award recognizes outstanding contributions in the optical field to scientific or technical leadership in basic scientific research or development of optical methods or equipment, or establishment of regional optical centers. A relatively unfavorable situation refers to difficult economic or social conditions, or lack of access to scientific or technical facilities or information sources. The most recent recipients were Chandra Shakher (India, 2014), Aram Papoyan (Armenia, 2015), and Guillermo H. Kaufmann (Argentina, 2016).

The ICO / ICTP Galieno Denardo Award was founded in 2000 with Abdus Salam International Theoretical Physics Center ICTP to certify young researchers in developing countries. Nominations need to be documented in a complete curriculum including a list of publications and selected reprints (3 or fewer), full work experience to promote research activities in developing countries, and explanation of candidate outcomes. The winners are invited to a three-week winter college in optics held annually in Trieste, and they can lead a seminar. Travel expenses, living expenses, cash prizes, diplomas are included. The most recent recipients are Rim Cherif (Tunisia, 2015), Rajan Jha (India, 2015), Jehan Akbar (Pakistan, 2016), Mati Horprathum (Thailand, 2016), and Goutam Kumar Samanta (India, 2017).

ICO cooperates with IUPAP by managing the IUPAP Young Scientist Award in Optics (established in 2005). This award is awarded through the ICO annually to scientists who have made remarkable contributions to applied optics and photonics in the research experience of up to eight years since obtaining the doctor's degree. The most recent recipients were Albert Schliesser (Denmark, 2014), Frank Koppens (Netherlands, 2015), and Laura Na Liu (Germany, 2016).

Conclusion

The period 2014-2017 has been one of the most crucial periods for ICO, particularly because ICO aims at a new status in ICSU as an ICSU union. Although it is not clear whether our proposal will be approved by the ICSU General Assembly, to be held in Taipei, Taiwan in October 2017, I believe it has been worth discussing future direction of ICO for globally promoting optics and photonics at this stage.

Finally, I would like to express my sincere thanks to all the ICO Bureau members, the ICO territorial committee members, and the international society members for contributing to all the activities of ICO.
IN MEMORIAM

Remembering the late Charles H. Townes

The international scientific community was ready to celebrate the International Year of Light 2015 (IYL2015) when Charles H Townes passed away, 27 January 2015, at the age of 99.

Townes is remembered for having invented and built the first maser [1] in 1954, skilfully embodying in a practical device the stimulated emission posited by Einstein [2] in 1916. We all know that stimulated emission is minority partner in chaotic thermal emission of radiation; Townes found the way to assign it the principal role, simply by selecting an inverted population [3] of molecules in a resonant cavity. Thirty eight years had been needed to realise how stimulated emission could be used to generate coherent radiation in the microwave range with unprecedented monochromaticity and low noise temperature. Townes was able to call on his expertise in both microwave spectroscopy [4] and quantum mechanics to design a device that was able to amplify and generate microwave radiation using a technique radically different from the usual techniques and that could not originate as a simple improvement of the electronic techniques already known and employed in existing He had in fact achieved important results even in the preceding years. An expert in microwaves because of his work on radar-related projects for the military, he realized [5] that a narrow microwave absorption line (for example the one of ammonia at 23.8 GHz) could be used to stabilize a microwave oscillator, introducing the basic principle of atomic clocks already in 1945.

A man of culture, Townes was accustomed to taking a broad view of problems, and after building the ammonia maser, he began to speculate on the possibility of extending to the infrared and visible part of the electromagnetic spectrum the same basic

Top photo: Charles H Townes (left) and Mario Bertolotti. Bottom photo: The author presenting Townes with a medal from the Italian Optics and Photonics Society in 2004. In the background is Sergio Martellucci.
principles that he had used in masers: inversion of population, resonant cavity, feedback.

He had the good fortune to be able to involve his brother-in-law Arthur L Schawlow in this research. A vital person with a deep understanding of science, Schawlow proved to be an excellent partner in discussing how an optical maser could be realized and in suggesting possible geometries and materials. Four years after the building of the first maser, Townes and Schawlow wrote a seminal paper [6] on possible ways to extend the maser principle to shorter wavelengths. The paper was published in Physical Review in 1958 and started the race to the building of a laser.

Townes’ inclination to work with simple gaseous systems in order to have complete knowledge and control of all the parameters probably prevented him from building the first laser, which came, to the great surprise of many researchers, through the work of Theodor Maiman [7], a person considered to be a new entry in the laser race.

Townes’ eclectic nature motivated him to look at the deep universe to see if there was a trace of his maser invention there. Beginning of the early 1960s he turned his attention to microwave astrophysics, and it was so that, after having discovered ammonia emission in interstellar space [8] – a few years after the announcement by Professor H. Weaver [9] of the existence of radiation amplified by stimulated emission in clouds of OH molecules and using the same Hat Creek radio telescope used by Weaver – he discovered stimulated emission by water vapour in the Orion nebula [10]. In an after-dinner speech at the Washington maser conference in 1992, he reported that one of his collaborators had announced “It is raining, in Orion!” Later, using infrared spectroscopy results, he presented the first evidence of a black hole in the centre of our Galaxy [11].

Few men have had the opportunity and ability to be so creative and influential as Townes. With pivotal ideas and experiments he contributed to the quantum electronic and nonlinear optics fields that were growing between 1955 and 1970. I met him on several occasions, but it was with particular pleasure that we met in Erice, Sicily, at the International Centre and Foundation for Scientific Culture, Ettore Majorana, which was created by Antonino Zichichi and is easily the best place, in my opinion, for the free discussion of physics in a friendly and inspiring atmosphere.

In 1964 Townes was awarded the Nobel Prize in Physics with N G Basov and A M Prokhorov, the Russian scientists who independently arrived at the maser concept, starting from a different path but ending proposing the same mechanism of operation [12].

Sergio Martellucci, the Director of the Quantum Optics courses in Erice, and I invited Townes to participate in the 2004 Quantum Optics Courses in Erice in 2004, and on the 40th anniversary of his receiving the Nobel Prize I presented him with a medal in the name of the Italian Optics and Photonics Society (SIOF). It was a nice ceremony in the Dirac Hall of the Ettore Majorana Centre with a hundred “students” [13] attending from all over the world. Wanting to challenge him, I asked whether he thought that one
should speak of discovery of the maser rather than invention, being that maser action existed in nature. I do not know how much he appreciated the question, but he was very nice and explained that what makes the maser such a special device is not simply the stimulated emission in an inverted population but the presence of cavity and feedback, which do not exist in nature. We then had dinner and entertainment in his honour, with music and dancing in the kiosk of an ancient convent used by the Ettore Majorana Centre. My wife and I, conversing with Townes’ lovely wife Frances, watched Townes, 89 at the time, dance until midnight, at which time he stopped, not because he was tired but because by law we were forced to shut down the music.

We in the optical community and the scientific community at large are saddened by Townes’ death. He was the last of the laser fathers: Basov, Prokhorov, Schawlow and Maiman, major actors of the starting phase, had already passed away.

Anyone working in areas related to atomic clocks, masers, lasers, nonlinear optics and microwave astrophysics are all indebted to him for the important advancements he brought about in those fields.

Ciao Charles, and be happy where you are now!

Mario Bertolotti
University of Roma La Sapienza, Roma, Italy

References

[3] More molecules in the upper energy level than in the lower energy level
Remembering John Nelson Howard, 1921–2015

John N Howard, founding editor of Applied Optics, former OSA President and ICO Vice-President and Treasurer, Chief Scientist of the US Air Force Cambridge Research Laboratory, spectroscopist, Curator of the Rayleigh Archives, and longtime historian to the optics community, died on 15 April 2015, at the age of 94. Indeed, a man of remarkable character and accomplishments passed away.

I first meet John at the ICO-12 meeting in Graz, Austria, in the fall of 1981. Interestingly, I remember being struck by the resonance in his voice – he sounded more like a radio announcer than a journal editor – and then – I can’t recall how we got on this subject – by his consistent readiness to write letters of recommendation for worthy candidates, a truly time-demanding practice. Over the first several days of the conference, I heard rumours of John’s involvement in the movement to the West of a pair of emigrant scientists from Poland. It was only recently that I learned what actually happened. I write more of that later in these remembrances.

My second meeting with John was six years later, in the summer of 1987, when I was invited by him and his wife Irene to their Victorian home in Newton, Massachusetts, to learn about the Applied Optics “editor’s office.” As I wrote in a recent editorial for Applied Optics, this collection of tools, built and used by Dr Howard to administer the Optical Society of America’s then 26-year-old journal during his years as founding editor, consisted of a box of 3 × 5-inch index cards with handwritten names and areas of expertise, accompanied by a small collection of mimeographed form letters. The latter, with notes penned in John’s hand, were used to notify authors of the acceptance of their papers, the need for revisions, or an occasional rejection. Of course, there was much more to the editor’s office than the 3 × 5-inch cards and stack of form letters, but most of the remainder resided in John’s head, in his extraordinary memory. As John’s successor as Applied Optics editor, I worked hard to computerize the “editor’s office”. In truth, however, I have never been convinced that computerization made the office any more efficient.
After reviewing Applied Optics editorial procedures, John and his lovely wife introduced me to some of their outside interests and activities. One involved John’s role in the preservation of the Henry Jacob Biglow House in Newton, Massachusetts, not far from where John and Irene lived. Built in 1885 and in severe disrepair by the 1970s, the Biglow House was scheduled to be torn down. John organized an effort, the Newton Historic Preservation Association, that resulted in the restoration of the house and its conversion into condominium residences in the 1980s, a transformation that was documented and partly funded by the PBS television series This Old House. Another memory I have from that visit is of my introduction to John’s collection of Gilbert and Sullivan opera libretti. There were 14 libretti extant, he told me, and John had them all. Several years later, when my son Brad was a student at MIT and performed in productions of G&S operettas, John and Irene (shown in the photo at about the time John met her) would be there in the audience.

Later memories of John come from a social visit my wife, ICO Secretary Angela Guzmán, and I paid him and Irene in April 2011. John, who had recently celebrated his 90th birthday, and Irene, who looked as young and fair as she did on my first visit to their home, were as stimulating to talk with as they were in 1987. Subjects of conversation ranged from the history and future of the International Commission for Optics (including his recommendation that the ICO apply for membership as a Scientific Union within ICSU, the International Council for Science) to the various recordings of the Brahms Piano Concerto No. 2, a favorite of both John’s and mine. I was pleased to be able to send them a CD recording of the extraordinary Sviatoslav Richter performance of 1960. Subsequently, John wrote me: “I have been busy with my columns for OPN [Optics and Photonics News], but last evening I listened to the Richter recording that you sent me. He is certainly a splendid pianist. I have already three or four recordings, but I agree that his playing is about the best I have ever heard!”
John told us of his courtship of Irene. In the late 1940s he was a student at the University of Florida (UF), at a time when UF was a male-only university. “Fortunately,” he told Angela and me with a sly smile on his face, “the head of the biology department had a daughter.” Irene died in August 2012, leaving John, after 62 years of marriage, with a tremendous hole in his life. I have thought since her death that although John was clearly a star, Irene helped him shine.

For reasons I have never fully understood, Left: John's wife, Irene. Right: on their wedding day. ICO News letter No. 104 July 2015 John enjoyed statistics. Perhaps for that reason he was always ready to publish his annual Applied Optics editorial on that journal’s statistics: number of technical articles, book reviews, etc. In any case, I feel an urge to honour his interest in the subject with some statistics relating to his own passing. Wikipedia documents deaths of important people, the Deaths in April 2015 entries including one on John. Some observations John might have made: of the 526 persons listed, there is only one Howard. There are 11 John’s, including two Sir Johns. Ten of the people listed, including our John Howard, died at age 94. Nine were age 100 or older at their deaths. Five, including John, are listed as physicists; John is the only one associated with optics. There were two “notable deaths consequent to the 2015 Nepal earthquake”, and two “notable convicted drug traffickers executed by Indonesian firing squad”. Well, so much for statistics.

I learned details on John’s role in moving Eastern Bloc scientists to the West only recently, from the two scientists themselves. At the time of the ICO meeting in Graz, Poland was in a state of turmoil, for the country had only recently entered the period of its Solidarity Movement. Husband and wife scientists Tomasz and Joanna Jannson managed to travel together to Austria, where they had been invited to present papers at the ICO meeting. They hoped to emigrate to the West, but required help. Conditions in Poland at that time were such that a return home would almost certainly have left them with no opportunity to leave again, perhaps for many years.

Putting themselves at some risk – they could well have been under surveillance – they sought out John, with whom they had had previous journal-related correspondence, and explained their situation to him in hope that he could help. John, through former OSA President Bruce Billings (who had powerful contacts with the US defence and state departments) succeeded in having the Jannsons’ names added to the Political Refugee List, referred to at that time as the Reagan List, thereby allowing them to be moved from a refugee camp outside of Vienna, put on a plane, and flown to the US. A scary and exciting time for 38-year-old Tomasz and 29-year-old Joanna. Today, with support over the years from John and other OSA luminaries, Physical Optics Corporation, the company Tomasz and Joanna founded in 1985 employs some 300 people.

Think of that success story as one more example of John Howard’s contributions to the optics community throughout his professional lifetime.

William T. Rhodes
Professor of Computer & Electrical Engineering and Computer Science at Florida Atlantic University and Emeritus Professor (retired) of Georgia Institute of
Technology. He served as Editor of Applied Optics from 1987 to 1993, following Dr Howard’s retirement as founding editor of the journal. Additional remembrances of John Howard by Dr Rhodes were published in the July 2015 issue of Optics and Photonics News (OPN).

In memory of Vigen Chaltykyan

5 August 1942 – 21 November 2014.

The scientific community of Armenia recently suffered a great loss, the passing away of Vigen Chaltykyan, Doctor of Physical and Mathematical Sciences, Senior Scientist of the Institute for Physical Research (IPR) of the National Academy of Sciences of Armenia, Professor of the Base Chair of the Russian-Armenian (Slavonic) University at the IPR, and Deputy Chief Editor of the Armenian Journal of Physics.

Vigen Chaltykyan, a man of exceptional scientific professionalism and son of well-known Armenian chemist H Chaltykyan, was born in Yerevan on 5 August 1942. In 1964, after graduating from the Faculty of Physics of Yerevan State University, he began his scientific career at the Institute of Radiophysics and Electronics of the Academy of Sciences of Armenia and joined the Theoretical Department of the IPR upon its creation in 1968. He obtained his PhD in 1970 and became a senior research fellow of IPR in 1972. As a theoretician, he contributed to the development of an absorption-polarization method for the measurement of atomic constants within the group headed by Academician Melist Movssession. Results of his research work in the 1970–80s are today widely used in experiments in new areas of modern physics, including quantum computing. He is known for his pioneering work on the theory of adiabatic transfer of atomic population in three-level systems by a sequence of laser pulses (STIRAP), research that was published in 1975 and experimentally confirmed in the 90s by K. Bergmann’s group in Germany. His studies of the polarization states of bi-photons, carried out in 1985, underlie modern methods of generating entangled states. For his Habilitation (1996), he made a systematic study of magneto-optical effects in resonant media. Despite a weak heart, he continued his research work until his last days. Just two weeks before his death, he submitted an article on recording and retrieval of optical information.

Chaltykyan engaged enthusiastically in teaching activities and in the training of young researchers and students, helping them to describe their results clearly and accurately. Being fluent in three foreign languages, English, German and French, he never refused to translate a student’s or colleague’s article for submission to international journals, often even rewriting the article to make it “more physical”.

[Image of Vigen Chaltykyan]
An erudite man, he was interesting to talk to, surprisingly modest and friendly, always ready to listen and help to find the right words in difficult moments, or to share the joy. Scientific excellence, broad worldview, honesty and integrity, and demanding standards, first of all to himself – these are all qualities that were inherent to Chaltykyan, the scientist and the man.

Vigen Chaltykyan will remain forever in the memory of his numerous colleagues and students.

Prof. Gayane Grigoryan

Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia
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ICO mourns the passing of Roberto Ortega, 1946-2014

A remarkable promoter of optics in Mexico

Prof. Roberto Ortega Martínez was born in Mexico City. He obtained his BSc (physics) from the Universidad Nacional Autónoma de México (UNAM) where he began teaching even before he graduated. While at the UNAM, he was among the outstanding and enthusiastic students that took part in the social demonstrations of 1968 in Mexico.

His BSc dissertation, presented in 1971, included the design and construction of very low electronic noise amplifiers that were used for over a decade in the San Pedro Mártir based Observatorio Astronómico Nacional of the UNAM, OAN-SPM, in Mexico. He also collaborated with the installation of the control instrumentation, the photometric detection systems, and the physical infrastructure of the OAN-SMP 0.84 m and 1.5 m astronomical telescopes. After one and a half years at the Optical Sciences Center of the University of Arizona, OSC-UA, he joined the Facultad de Ciencias of the UNAM, FC-UNAM as instructor, and became FC-UNAM faculty in 1976. He obtained his MSc and PhD degrees from the UNAM in 1976 and 1986, respectively. He also worked as associated senior
researcher of the Instituto de Astronomía of the UNAM, IA-UNAM, from 1975–1982, where he participated in projects on stellar spectrometry, Michelson-Fourier interferometry, and in the electro-mechanical instrumentation installation and maintenance of several astronomical telescopes of the San Pedro Mártir and the Tonantzintla observatories.

In 1983, Prof. Héctor Domínguez, then general director of the former Centro de Instrumentos of the UNAM, CI-UNAM, (currently known as the Centro de Ciencias Aplicadas y Desarrollo Tecnológico of the UNAM, CCADET-UNAM), invited Prof. Ortega to establish an applied optics laboratory, a remarkable effort-consuming project if we consider the small number of optics scientists available at the UNAM in the 1971–1981 decade (a significant number of optics scientists left the UNAM in 1971 to establish the Instituto Nacional de Astrofísica, Óptica y Electrónica, INAOE, in Tonantzintla, and later in 1980, the Centro de Investigaciones en Óptica, CIO, in Leon). In response to these conditions, Prof. Ortega immediately recruited several recognized independent researchers, and in 1984 he established the Laboratorio de Óptica Aplicada of the CI-UNAM (which later became the Departamento de Óptica y Microondas of CCADET).

At the CI-UNAM (and later CCADET-UNAM), Prof. Ortega developed several optical instruments and laser applications in the area of medicine for public hospitals and guided his students to develop laser spectrometers for non-linear optics research and laser applications to medicine (cardiology, odontology, ophthalmology and oncology). In 1995 he rose to the senior researcher level of the UNAM, and was granted the PRIDE D distinction, and became a member of the Sistema Nacional de Investigadores (SNI), where he reached the second highest level in 1998. In 1996 he secured funding from the UNAM and established the first Laboratorio de Óptica de Pulses Ultracortos in Latin America, to carry out research projects in photonics, non-linear optics, and ultra-fast optical phenomena, and devoted his research to the study of the optical self-correlation techniques used for ultra-short pulses characterization, as well as the FROG technique and associated Wigner function modelling. In 2006 he established the Laboratorio de Óptica no Lineal of CCADET. All of the laboratories established by Prof. Ortega are currently recognized as among the most important in Mexico.

Prof. Ortega strongly believed that optics was an illustrative field for young scientists and also that a piece of general culture needed to be appreciated by students at all educational levels. He was a remarkable promoter of optics in Mexico, committed to scientific and technological development. The Mexican optics and photonics community mourns his passing and expresses its condolences to his mother and friends in numerous solidarity messages. RIP.

Dr Martha Rosete, CCADET, UNAM
THE ICO AND THE IYL 2015

The ICO supported the International Year of Light (IYL) initiative since its inception in 2009 in its capacity as a member of the International Union of Pure and Applied Physics (IUPAP) and the International Council of Science (ICSU). ICO actively promoted the application of IYL 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.

The ICO provided more than a dozen national contacts for the IYL Secretariat and created a special Award for the promotion of Optics and Photonics for young people in ICO Territories. The ICO Secretariat prepared a special series for the IYL in the ICO Newsletters. Additionally, the 53 ICO territorial members and the 7 ICO international society members organized over 10000 activities during IYL worldwide. The legacy of the IYL by ICO is the commencement of the process to create an International Union of Optics and Photonics within ICSU.

Contributing to the planning of the IYL

In 2013, the TSOSA chair and ICO secretary, Angela Guzman, suggested scheduling the First 2013 International Planning Meeting of the International Year of Light (IYL) 2015 to meet at ICTP on the day prior to the annual TSOSA Advisory Group meeting. John Dudley, chair of the Steering Committee of the IYL and by then elected chair of the quantum electronics and optics division of the European Optical Society, and Joseph Niemela, co-ordinator of optics and photonics at ICTP, and by then the incoming head of the Office of External Activities of the ICTP, agreed on having ICTP host the meeting.

Dudley presented an update on organization activities and policy issues related to the process required to obtain proclamation of the IYL in the General Assembly of the United Nations. The members of the Steering Committee, J M Dudley, F K A Allotey, and A M Cetto, accompanied by representatives from UNESCO (incl. J P Ngome Abiaga) were preparing the IYL dossier for the ministries of foreign affairs of the major presenting nations, Ghana and Mexico, suitable for transfer to the Economic and Social Council (ECOSOC) of the UN General Assembly. The dossier had to address the United Nations’ guidelines for International Years relating to organizational structure, secretariat, committees, etc. There was a consensus that a natural home for the Secretariat of IYL 2015 would be UNESCO ICTP in Trieste.

After transfer to the UN General Assembly, the aim was for official proclamation during the second half of 2013.

According to the central mission of UNESCO, a priority for the IYL was to focus on developing countries. In the context of Africa, the IYL was to commemorate African contributions to the science of light such as the thousandth anniversary of the...
publication of Kitab al-Manazir (Book of Optics), a seven-volume treatise on optics written by Ibn Al Haythem between 1011 and 1021.


The topics covered in the meeting were as follows:

The YOL was to cover wider cultural, philosophical and artistic aspects of light and its impact in our society. Multidisciplinary activities and partnerships with museums and social scientists were to be pursued. Special attention was to be devoted to activities of interest to young people. The international societies should encourage optics and photonics students at all levels and student chapters to get involved in outreach activities. Emphasis was to be given to involving women role models and to prepare training activities for K-12 teachers.

ICO recommended to all ICO territories initiate planning of their own local activities, co-ordinate all local initiatives, and look for support and involvement of national academies and ministries of education and science. There was already educational material and outreach activities in Europe and the USA that could be exported
worldwide for the IYL. The organizers were to collect existing material and make an effort to share it worldwide.

In its role as Scientific Associate of ICSU, ICO pursued ICSU’s involvement in the IYL and presented the IYL initiative at the ICSU 31st General Assembly in Auckland, New Zealand, 2014.

The Opening Ceremony of the IYL 2015

Some members of the ICO family attending the opening ceremony appear in the photo: 1. Mourad Zghal (VP, Tunisia representative); 2. Duncan T Moore (Past President, USA); 3. Ahmadou Wagué (VP, Ghana representative); 4. Frank Höller (VP, Germany); 5. Gert von Bally (Associate Secretary, German representative); 6. Ari T Friberg (President 2005–2008, Finland representative); 7. James Harrington (Treasurer, USA); 8. Yasuhiko Arakawa (President, Japan representative); 9. Malgorzata Kujawinska (VP 2002–2008, Poland); 10. John Harvey (VP, New Zealand); 11. Abraham Katzir (Israel delegate); 12. Ana Consortini (President 1993-1996, Italy); 13. Angela Guzmán (Secretary General, Colombia); 14. María Luisa Calvo (President 2008-2011, Spain); 15. Rim Cherif (Tunisia); 16. María Josefa Yzuel (VP SPIE, Spain); 17. Mario Bertolotti (Italy); 18. Satoshi Kawata (Japanese delegate); 19. Yukari Matsuo (Japanese delegate); 20. Junko Hayase (Japanese delegate); 21. Satoshi Iwamoto (Japanese delegate); 22. Eric Rosas (VP, Mexico).
More than half of the ICO Bureau and over 30 other members of the ICO family attended the opening ceremony of the International Year of Light 2015. Highlights of the ceremony were the five Nobel Laureate plenaries: Light and Life by Ahmed Zewail, Energy and Climate Change: Challenges and Opportunities by Steven Chu, Einstein, Light, and Time by William Phillips, Light and the Quantum by Serge Haroche, and Efficient Light Conversion and Generation by Zhores Alferov.

Other members and collaborators attending were: John Dudley, President of the IYL 2015 and contributed editor of the ICO Newsletter; Joseph Niemela, Secretary of the IYL 2015 and VP; Zohra Ben Lakhdar, l’Oreal-UNESCO Prize Recipient for Africa & Arab world in 2005, and former ICO VP (2008–2014) was one of the invited speakers; H Philip Stahl (VP 2005–2011); Roberta Ramponi (VP); Giancarlo Righini (VP 1999–2005); Bishnu Pal (former India representative); Aram Papoyan (Armenia representative); Amalia Martínez García (Mexico representative); Valentin Vlad (Romania representative); Kaido Reivelt (Estonia). From Poland: Tomasz Wolin’ski, Michał Makowski, and Weronika Zaperty. From Spain: Santiago Vallmitjana, Joaquín Campos, Sara Perches, and Ana Gargallo. From Portugal: P Pombo, G Figueira. From Singapore: David Payne and Tjin Swee Chuan.

The ICO participated and reported on preparatory meetings for the International Year of Light held annually at the ICTP on occasion of the ICTP Winter College on Optics, and the Award Ceremony for the ICO/ICTP Gallieno Denardo Award (see “An International Year of Light for 2015: UNESCO’s Executive Board supports the initiative” by John Dudley, ICO Newsletter 94 January 2013, and “10th anniversary of TSOSA and Year of Light planning at ICTP”, ICO Newsletter 95 April 2013). The ICO invited its Territorial Committees to promote the creation of national committees for the programming of local and regional celebration activities (ICO Newsletter 99 April 2014).

The ICO Award for the promotion of Optics and Photonics for young people in ICO Territories

The ICO created an ICO Award for the promotion of optics and photonics for young people in the ICO Territories. Emphasis was given to activities that were sustainable beyond 2015, and that were replicable in other territories. The main award of $5000 was awarded to the Spanish Optical Society (SEDOPTICA) for secondary school outreach activities using the European Commission funded Photonics Explorer Kit.

Members of SEDOPTICA contacted by secondary schools prepared the correspondent optics and photonics lab, aiding the secondary school teacher to show a wide range of optical experiences to the students. The secondary school then has the possibility of obtaining a Photonics Explorer kit to have a fully equipped lab integrated in the curricula of the educational centre.
The Cuban ICO Territory was awarded a prize for Optics & Photonics trainees- scientists of the future in Havana. Their initiative taught young people how to operate five telescopes to understand how to localize the brightest celestial objects like planets, satellites constellations and comets and to learn practical methods of orientation using the most important stars and the main rules of the Earth’s movement. The project was developed by a group of scientists and engineers from the Laser Technology Laboratory, Institute of Material Science and Technology (IMRE), in collaboration with the astronomical observatory in Havana University.

A third award went to IIS Cavazzi sez. Liceo Scientifico, Pavullo, a secondary school with a science focus in Italy, located in the Apennine mountains at the boundary with Tuscany. The School serves students from the surrounding mountain area, and is of crucial importance for science dissemination in the local community since there are no universities, research centres or science centres in a range of 45 km. They organized a one-day science fair called “Amazing Light” open to middle and high schools students.

The ICO plans to continue with this award as a legacy of the IYL in support of promotion activities related to the International Day of Light.
The ICO Newsletter special series for the IYL 2015

The ICO Secretariat prepared a special series in celebration of the IYL 2105, written by specialists and intended for all public. The opening article of the series, entitled “What is Light?”, was authored by Barry R. Masters. He, an expert on writing for non-experts, contributed the article without charge to the ICO Newsletter. The ICO received solicitations from high school teachers for translation of the article into their language.

The series consisted of the following five articles:

Opening article:

What is light?
Barry R Masters

So simple: Let there be light! And yet so complicated. Indeed, just what is light?

“And God said, ‘Let there be light,’ and there was light.”
Genesis 1:3

“For the rest of my life, I will reflect on what light is.”
Albert Einstein, c. 1917

“All the fifty years of conscious brooding have brought me no closer to the answer to the question: What are light quanta? Of course today every rascal thinks he knows the answer, but he is deluding himself.”
Albert Einstein, 1951

The ICO Secretariat thanks the professional colleagues that help translate the article into 15 languages:

Spanish: Angela Guzmán

Latvian: The University of Latvia SPIE Chapter team. Advisor: Janis Spigulis. Members: Alise Kalteniece BSc, MSc Optometry and Vision Sciences, Optometrist at the Latvian American Eye Center; MSc. Physics Lasma Asare, Lector at Rigas Stradins University and Research Assistant at University of Latvia; Raitis Grzibovskis Researcher assistant, Institute of Solid state physics, University of Latvia; Varis Karitans Dr. Phys. un Leading researcher at the Institute of Solid State Physics, University of Latvia; Daiga Cerane Student of Optometry and Vision Sciences in University of Latvia.
Chinese: Kuang Tsui Fang, Associate Professor, Department of Optoelectronic Information Engineering, Zhejiang University.

French: Prof Yezid Torres, UIS, Bucaramanga, Colombia; reviewed by Prof. Daniel Courjon, representative of the French minister of research and the CNRS in Franche-Comté and Burgundy.

Greek: Dimitrios S. Tzeranis, research scientist at the Systems Bioengineering Laboratory of the National Technical University of Athens.

Armenian: Tatevik Chalyan, PhD student, Nanoscience Laboratory, Faculty of Physics, University of Trento, Italy


Slovak: Prof Dagmar Senderakova, Faculty of Mathematics, Physics and Informatics, Comenius University at Bratislava, Slovakia.

Hebrew: Prof Dan Oron, Weizmann Institute of Science, Israel.

Italian: Chiara Bortignon, MD Physics student at the University of Trento, Italy.

Hindi: Prof Kehar Singh, Emeritus Fellow, Indian Institute of Technology Delhi, Physics Department, IIT Delhi, New Delhi, India. Prof Phool Singh, The North Cap University (Formerly ITM University), Gurgaon, India


Korean: Dr. Jong Kang Park, postdoctoral associate in Peter So lab at MIT.

Turkish: Dr. Ali Serpengüzel, Assoc. Professor of Physics, Koç University, Micro photonics Research Laboratory, Istanbul, Turkey

German: Prof Gerd Häusler, Max Planck Institute for the Science of Light – OSMIN, Erlangen, Germany.

The other articles of the series were contributed, also free of charge, by distinguished members of the Optics and Photonics Community and the last by UNESCO officers.

They are posted at the ICO webpage and are free-access. Their titles and authors are as follows:
Light we cannot see

“‘The Plover and the Clove can be told apart with ease, By paying close attention to the habits of the Bees...’”

From How to Tell the Birds from the Flowers (1907) by Robert Williams Wood, pioneer of infrared photography.

As adults, we know something about infrared and ultraviolet light. We probably know that bees can see in the ultraviolet portion of the spectrum. And we may be aware that some cameras can take photos of wild animals at night with invisible infrared light. But do we know why? Do we know why digital cameras recording infrared light take better pictures on hazy days than do ordinary digital cameras? Do we know why the IR lights in the TV remote controller appear to the camera with a whitish purple color instead of a deep red? Or — here is a good one — do we know just how many different kinds of photoreceptors are found in the eyes of the mantis shrimp that are sensitive only to the UV? (The answer is: 3!) Some of us do; many of us do not.

Here are some interesting facts concerning IR and UV: we may use to entice that youngster into learning more about light. • Clothing washed in some detergents comes out “whiter than white.” The reason the detergent contains compounds that fluoresce when illuminated with UV light.

By Prof William Rhodes, Florida Atlantic University and Emeritus Professor (retired) at Georgia Institute of Technology, and Geoffrey Alan Rhodes Assistant Professor in the Department of Visual Communication Design at the School of the Art Institute of Chicago. They are father and son.

A stroll through 3D imaging and measurement

fact that we so readily accept the flat photos, the flat paintings, the flat TV screens as representing “the world” (though as parents we cannot but sometimes help wondering whether, for our children, the flat screens of their smartphones and tablets constitute their actual world). One gets the sense that survival is possible with just 2D vision and 2D displays. Why should this be so?

It is of course not quite true that pure intensity data (l(x,y) include no 3D information; we estimate the shape and distance of objects from perspective and from shaded texture, as illustrated in figure 2. The texture can be created or enhanced by proper illumination. Scanning electron microscope (SEM) images are intriguing to us because the surface slope is encoded by the

By Gerd Häusler, professor at the Institute of Optics, Information and Photonics, at the University of Erlangen-Nuremberg, Germany, and Florian Willomitzer, a PhD student with Häusler’s group and working on the real-time 3D movie camera.
Getting used to quantum optics...

...and measuring one photon at both output ports of a beam splitter.

When asked whether a photon can be split, one familiar with parametric down conversion (PDC) is tempted to answer yes, of course. In PDC, a photon is absorbed and two new ones are created, their energies adding up to the energy of the initial photon. In a way one might say that the PDC interaction is a perfect beam splitter, the two output beams being perfectly correlated. This nonlinear optical process is one of the workhorses in quantum optics and deserves many pages of appraisal1 – but it is not the subject of this article. In this article I address

By Prof Gerd Leuchs, Institute for Optics, Information and Photonics, Univ. Erlangen. Director of the Max Planck Institute for the Science of Light in Erlangen.

The 2015 International Year of Light

A resilient and creative approach to counter sustainability challenges.

Light science is a fascinating field. Found at the base of countless discoveries affecting many other fields in the basic and applied sciences, as well as beyond, it is a major developmental driver on many levels, in all spheres, for all societies, with its impact ever-extending. Light and light-based technologies are indeed becoming increasingly central as we advance further into the 21st century. This is especially true when we address the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda, recently adopted by the United Nations General Assembly and relevant for every state, country and region on Earth.

In this context, the 2015 International Year of Light and Light-based Technologies – of which we recently celebrated the closing ceremony on 4–6 February 2016 in Merida (Yucatan), Mexico – forms an important link in the chain working for change, to meet the objectives of the SDGs.

As a precursor for change, the Year made clear that many solutions to local and global challenges, including in science education, food security, existing and newly emerging diseases, natural disasters, energy needs, poverty eradica-

By Juste Jean-Paul Ngome Abiaga and PhD and Pauline Venegas Hooper, UNESCO, Division of Science Policy and Capacity Building.
The Closing ceremony of the IYL 2015

Members of the ICO Bureau and several ICO Territorial Committee Representatives attended the closing ceremony of the International Year of Light 2015, February 4-6, 2016 in Mérida, México.

The ICO received 10 invitations for ICO delegates, which were distributed between ICO Bureau Members. Invited lecturers included two Nobel prize-winners in physics, John Mather (2006) and Shuji Nakamura (2014), and many other distinguished scientists who offer a wide scientific panorama from a global perspective. The ceremony included a film and video festival, where a glimpse of world productions related to the IYL was provided, and a special Colloquium on artificial lighting intended as a forum for dialogue between architects, engineers, designers, manufacturers and entrepreneurs in the lighting industry, and the public.

The ICO congratulates those who conceived the idea of an IYL and gives thanks to members of the ICO Territorial Committees and ICO Member Societies who worked hard throughout the year to make it a remarkable success. We congratulate John Dudley, a member of the editorial committee of the ICO Newsletter, on the tireless leadership that he provided, and Joseph Niemela, ICO vice-president, who oversaw the IYL Secretariat at the ICTP.
MEMBER CONTRIBUTIONS

Territorial Committees

Société Française d’Optique.

ICO Territorial Committee representing France

The family photo at SFO congress OPTIQUE Paris 2013 which took place at Paris 13 University 8-11 July 2013 (credit: Paris 13 University – LPL Laboratory)

SFO is a non-profit organization that promotes optics and photonics both as a scientific discipline and as a vector for technological innovation. SFO rallies approximately 1000 individual members among whom XX% are from the industry and XX% from the academy. SFO also welcomes 40 corporate members. SFO thus makes a link between all the facets of optics and photonics, from basic research to industrial production.

This broad coverage of our discipline is reflected by the structuration of SFO in working groups, so-called “clubs SFO”. The topics of these 20 clubs reflect a large variety of activities such as: optical design and fabrication, optical fibers and networks, thin films, nanophotonics, quantum optics, biophotonics, optics and microwave, metrology…

Some clubs are more cross-cuttings, such as the “teaching committee” and the newly created “women in optics committee”. Each of these clubs organizes small workshops every year.

These clubs cooperate every other year for the SFO General Congress that brings together the whole French community of optics and photonics. The last one was held in Bordeaux in 2016 during 4 days. It gathered about 600 attendants around 6 scientific
topical meetings, a specific meeting dedicated to industry and another one concerning education. PhD students also organized specific activities mainly targeted for PhD students but open to all attendees. During the congress, a privilege time was given to participants who were selected to present their cutting-edge findings through posters. This congress also hosted 35 industrial booths and 5 booths for educational activities. This exhibit was an excellent networking opportunity between companies and young scientists.

These SFO General Congresses are organized in the even years. They alternate with the General Congresses of the French Physical Society, SFP, which are held in odd-numbered years. By a mutual agreement signed in 2015, SFO and SFP agreed to host a specific session to the other society during their General Congresses.

SFO also acts as a networking platform. A specific tool is the directory, which regroups contact details and areas of interest of each member. This tool is accessible online, constantly updated and therefore, has become essential to most members.

SFO is a founding societal member of the European Optical Society, EOS. SFO and EOS share the responsibility of EOS student clubs located in France; these clubs organize scientific and social events for PhD and master students. SFO maintains partnerships with academics, industrials, national and international organizations. SFO played a major role in the coordination of the main events during the International Year of Light in France.

SFO awards scientific prizes:
- Fabry – de Gramont rewarded to an internationally recognized young researcher whose research is distinguished by its quality and its originality.
- Arnulf – Françon, geared towards teachings or training in optics and photonics, is given to an individual who produced excellent teaching materials.
- Léon Brillouin, the largest prize awarded by SFO, is meant to compensate the work of a physicist in optics who has carried out most of his research in France.

**PHOTONIQUES publication**

Photoniques is the flagship publication of the French Optical Society. It is a bimonthly journal dedicated to photonics sciences and optical solutions (design and applications). The magazine publishes a selection of news of the profession, technical and scientific articles and information on products, markets and applications. It is distributed to companies, laboratories and training centers in all areas of optics.
The magazine is associated to a biweekly e-newsletter for the diffusion of on-going information, as well as to a website, photoniques.com, which gathers the news and provides further information to the printed content.

SFO distributes *Photoniques* to all its members. In 2017, for the first time and following an agreement signed with EOS, the March-April issue was a special EOS issue and, as such, broadly distributed to all the EOS members.

Catherine Hercé
Secrétaire générale de la SFO
www.sfoptique.org

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**The U.S. Advisory Committee to the International Commission for Optics**

**USAC/ICO**

The purpose of the United States Advisory Committee is to effect appropriate United States participation in the International Commission for Optics (ICO) through the National Academy of Sciences, which adheres to ICO on behalf of the United States.

The USAC/ICO operates under the auspices of the Board on International Scientific Organizations, Policy and Global Affairs Division of the National Academy of Sciences. It is one of 17 national committees housed within the Board on International Scientific Organizations (BISO). Each of these national committees represents U.S. science to an international scientific union or organization. By being housed together in BISO, the committees have the opportunity to interact and collaborate across disciplines on activities
or issues that are of interest to them. The committees also have linkages to the disciplinary units of the National Academies to which they are most closely related. In the case of USAC/ICO, that linkage is with the U.S. National Committee for Pure and Applied Physics and the National Materials and Manufacturing Board (NMMB).

The USAC/ICO serves as a focal point for the broad U.S. optics and photonics community. The primary goals of the USAC are to:

a. Represent the National Academies and sponsoring societies to the ICO;

b. Promote the advancement and dissemination of scientific and technical knowledge in all fields of optics and photonics;

c. Provide a broad, balanced U.S. participation in the activities of ICO;

d. Strengthen U.S. optical science and technology as a contributor to the international community; and

e. Inform the U.S. optics and photonics communities of research carried out elsewhere in the world.

The committee usually meets once a year, and holds conference calls as needed.

**International Year of Light**

During the past triennium, the major activity of the USAC/ICO has been the International Year of Light and Light-based Technologies 2015 (IYL). The American Institute of Physics (AIP), the American Physical Society (APS), The Optical Society (OSA), SPIE, the international society for optics and photonics and IEEE Photonics Society (IPS) were among those that served as founding partners of IYL, and that helped organize activities and provided financial support for IYL in the United States.

On 12 September, two events were held in the nation’s capital, Washington, DC that drew 1,000 participants. A high-level event, sponsored by NSF, was held at the NAS on September 12, 2015. Organized largely by two sponsoring societies of the USAC/ICO, specifically SPIE and OSA, the event featured the NSF Director, France Cordova, and two Nobel Laureates, Shuji Nakamura (Physics) and Eric Betzig (Chemistry). The NAS provided additional funding for the event. As part of the effort to engage the general public, “Wonders of Light: Family Science Fun” a daytime educational event featuring demonstrations on light science for school-age
children and parents, was held at the Smithsonian National Museum of the American Indian.


A second event, done in cooperation with the Cultural Programs of the National Academies of Science (CPNAS), targeted the general public through a DC Arts Science Evening Rendezvous (DASER). The USAC-ICO proposed the October 2015 program that featured a selection of speakers that focused on the art/science intersection. The event was webcast and can be accessed at http://www.cpnas.org/events/daser-101515.html.

**USAC-ICO Structure and Function**

At its February 2016 meeting in San Francisco, CA, the USAC/ICO decided to decrease the size of the committee since the participating societies—SPIE, OSA, and IEEE Photonics Society—are global organizations and members of the ICO in their own right. The committee now concentrates its efforts on essential functions related to U.S. involvement with ICO. An advisory role within the NAS is also possible, such as with Harnessing Light II in 2013.

The committee now consists of one representative from each society (staggered terms, voting); one representative of the NAS (voting); society executive directors and staff (non-voting); NAS staff (non-voting); U.S.-based ex officio officers of ICO (non-voting); and U.S.-based society vice presidents of ICO (non-voting). The current membership of the USAC/ICO is as follows:

**Chair:**

John Greivenkamp, representing SPIE, University of Arizona

**Members:**

Kent Choquette, representing IEEE Photonics Society, University of Illinois at Urbana-Champaign
Duncan Moore, representing the NAS, University of Rochester
Irina Novikova, representing OSA, College of William and Mary

Ex Officio Members:

- **U.S.-based officers of ICO:**
  
  Duncan T. Moore, *Past President*, University of Rochester
  John C. Howell, *Vice President from OSA*, Hebrew University in Jerusalem, Israel
  James Harrington, *Treasurer*, Rutgers University
  Angela M. Guzman, *Secretary General*, University of Central Florida

- **Member Society Representatives**

  IEEE Photonics Society:  Christopher J. Jannuzzi, Executive Director; Douglas Razzano, Associate Executive Director
  OSA:  Elizabeth Rogan, Chief Executive Officer; Kari Apter, Senior Director, Research and Program Development
  SPIE:  Eugene Arthurs, Executive Director; Allison Romanyshyn, Director, Executive and Administrative Services

- **NAS Staff**

  Kathie Bailey, Director, Board on International Scientific Organizations

  *Kathie Bailey-Mathae, BISO Director, NAS, USA*
Mexican Academy of Optics
ICO Mexican Territorial Committee

Mexico, with three large national laboratories conducting research in this area, has a long tradition in Optics. Mexico became a member of ICO in 1972. Fifteen years later, in 1987, the Mexican Academy of Optics (Academia Mexicana de Optica, or AMO) was founded, and since then the AMO has represented the Mexican Territorial Committee within ICO.

In the triennial period 2014-2017, optical activities in Mexico have been extensive. Some of the especially important events of this period are described in the following paragraphs.

Celebration of the International Year of Light and Light-based Technologies (IYL 2015)

Mexico was among the very first countries to support the initiative leading to the United Nations-proclaimed International Year of Light and Light-based Technologies 2015, and it was in Merida, Mexico, that the closing ceremonies of IYL2015 were held. In all, over 100 events in Mexico celebrated this remarkable Year of Light. The final ceremonies included a magnificent show at the Mayan ruins site of Chichen Itza. A full report can be found on the Mexican IYL site (http://www.luz2015.unam.mx/).

Mexican Optics and Photonics Meeting 2015 (MOPM2015)

The third Mexican Optics and Photonics Meeting (MOPM 2015) was held 9-11 September 2015 at the Centro de Investigaciones en Optica (ICO) in Leon, Guanajuato State. Mexico was honoured by attendance at the meeting of the ICO, SPIE, OSA and RIAO presidents, along with 2015 Nobel prize winner professor William E Moerner. The 2014 ICO Galileo Galilei Award was presented to Professor Chandra Shakher at this meeting.
MOPM, thus far devoted primarily to optics activities in Mexico, is expected to become an international conference, aimed mainly to Latin American countries. The 2017 meeting it will be held in September in Puebla, Mexico, at the Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE).

ISEM-SOI 2015 Symposia.

The 5th International Symposium on Experimental Mechanics and the 9th Symposium on Optics in Industry, ISEM-SOI 2015, took place in the lovely colonial-era city of Guanajuato, Mexico, August 17-21, 2015. The events were hosted by the Optical Research Center (Centro de Investigaciones en Óptica), CIO, León, Guanajuato State, and were sponsored by multiple organizations, including the Mexican Academy of Optics, SEM, and CIO. Symposia were dedicated as part of the celebrations of the International Year of Light 2015 and the XXXV anniversary of the founding of the CIO. Congratulations! The general topic of the symposia was the emerging challenges for experimental mechanics in energy and environmental applications. Participants of ISEM-SOI 2015 came from 15 countries from around the globe. Seven plenary talks were given by internationally renowned investigators; a total of 111 papers were accepted through a peer-review process and presented at the Symposia.
After the participation of Mexico in IYL 2015 and the honour of holding the closing ceremony at Chichen Itza, the Mexican government realized the importance of Optics and Photonics to the country and established a task force to lay out a roadmap for economic growth in this area. On November 9th, 2016, the task force report was released. Prepared by the ICO, AMO, RIAO, and ProMexico, the roadmap, titled “Towards a Brighter Mexico: A Technology Roadmap for Optics and Photonics,” calls for strategic actions and investments among government, academic institutions, and industry to make Mexico the Latin American leader of the optics and photonics industry. As described in the January 2010 ICO Newsletter, “Towards a Brighter Mexico’ is intended to serve as a starting point to create a sustainable and competitive photonics ecosystem jointly coordinated by industry, academia and government. This roadmap focuses on four areas: energy, telecommunications and information.
technologies, health and medicine, and advanced manufacturing; and proposes a timeline for building strong capabilities in specific technologies like light-emitting diodes (LEDs), optical fibres, photovoltaic cells, lasers and detectors. It also includes several recommendations such as the establishment of the Mexican Photonics Cluster to host not only R&D laboratories and photonics related companies, but also cutting-edge scientific facilities like an ultra-high-power laser, a photonics manufacturing institute and a certification centre for photonics products. Thus, Mexico joins other major economies in the world that have already recognized the importance of optics and photonics in the future development.”

*Baldemar Ibarra-Escamilla, AMO President 2017-2018  
Carlos G Treviño-Palacios – AMO Secretariat 2017-2018*

International Organisation Members

**IEEE Photonics Society**

The IEEE Photonics Society ([www.photonicssociety.org](http://www.photonicssociety.org)) is proud to be an international sponsoring society member of the ICO. The Photonics Society forms the hub of a vibrant technical community of more than 100,000 professionals from around the world dedicated to transforming breakthroughs in quantum physics and optical sciences into the photonic technologies that have transformed our world with products and services that continue to revolutionize our daily lives. From ubiquitous and inexpensive global communications via fiber optics, to lasers for medical and sensing applications, to flat-screen displays, to photovoltaic devices for solar energy, to LEDs for energy-efficient illumination, there are myriad examples of the impact of the members of the Photonics Society on the world. The Photonics Society is one of more than 40 societies within the IEEE, the largest technical society on the world, whose mission is dedicated to advancing technology for humanity.
An important function of the Photonics Society is to sponsor, organize, contribute to, and participate in local Chapters, technical journals, technical conferences, outreach activities, and philanthropic efforts that include all aspects of photonics in order to share and benefit from important breakthroughs. In these activities, we seek to partner with and engage the ICO to ensure the beneficial economic, scientific, and humanitarian aspects of photonics can be shared globally.

A critical component of the Society are the more than 100 IEEE Photonics Chapters located around the world. The Photonics Society understands the value of engaged local volunteers which is manifest by the wide diversity of its Chapter events. Focus is placed on member engagement, industry relevance, and impactful outreach. The Society provides both financial and organizational support of its Chapters by providing membership development, promoting visibility in local communities via workshops and educational events, and enhancing student and Young Professional involvement. The Photonics Society has made a dedicated effort to support education and outreach in Latin America, Africa, and India. Volunteer leaders and Chapters hold a variety of programs within these regions to reach students, young professionals and innovators in the field.

The IEEE Photonics Society also recognizes that diversity and inclusion are essential to innovation. To this end, the Women in Photonics initiative seeks to diversify the range of individuals and perspectives building the technology and information of tomorrow. Women in Photonics in partnership with IEEE Women in Engineering, promotes activities that support the participation, engagement and advancement of both women in the photonics and optics community, as well as to inspire girls and women around the world to follow their academic and technical interests. Women in Photonics organizes various professional development and technical events, such as technology...
talks, soft skill seminars, summer schools, networking mixers, K-12 outreach, and online webXs.

IEEE Photonics Society Vice President Kent Choquette working with Tech Light Lab.

The IEEE Photonics Society sponsors 6 specialized technical journals that cover the full spectrum of photonics topics and are designed to provide timely publication of the highest quality original research. These journals include an online-only open access journal, the IEEE Photonics Journal. Furthermore, the Society organizes and financially supports 6 technical conferences. The flagship event is the IEEE Photonics Conference usually held in October, which in addition to serving as the Society's annual meeting offers technical presentations by the world’s leading scientists and engineers in the areas of lasers, optoelectronics, optical fiber networks and associated lightwave technologies and applications.

Finally, the Photonics Society, in partnership with the IEEE Foundation, is proud to have established the of the IEEE Photonics Society Fund. The IEEE Photonics Fund is a transactional fund that provides critical resources to greatly enhance humanitarian and educational projects. From the generosity of donors, more than 99% of contributions to this fund are used to enable programs that enhance technical access, literacy and education around the world. Working with the IEEE Foundation, the Photonics Society strives to be a leader in transforming lives around the globe through the power of technology and education.

Kent D. Choquette  
IEEE Photonics Society ICO Representative
The Optical Society (OSA)

One OSA
Infinite Possibilities

The Optical Society (OSA) is the leading global forum for advancing optics and photonics technology, and promoting knowledge for discovery and impact. In 2016, OSA celebrated its Centennial, marking 100 years of ground-breaking research and applications. Over 20,000 members, 54% residing outside of the US, and 270,000 professionals engage with OSA annually.

OSA continues its long-standing support for ICO programs and events, providing speakers, travel funds and a portal for donations to the ICO. John Howell, Hebrew University in Jerusalem, Israel, is OSA’s appointed Vice President to the ICO Bureau. OSA provided funds for student attendees and student prizes at ICO-24, and OSA President Eric Mazur, Harvard University, USA, is honored to attend as an invited speaker. OSA co-sponsors ETOP, the biennial conference on Education and Training in Optics & Photonics, and was the 2017 managing partner. ETOP 2017 was held in Hangzhou, China, where Eric Mazur represented OSA and served as a plenary speaker.

OSA also provides support to ICTP through for the ICTP Winter College on Optics with an annual US $10,000 grant, as well as free access to the OSA Publishing Digital Library for users at ICTP during the college. Year round, OSA participates in ICTP’s electronic journals delivery program (eJDS), which provides scientists and researchers in developing countries with access to OSA’s distinguished portfolio of journals.

OSA and the OSA Foundation (OSAF) manage a broad portfolio of programs that connect with the mission of ICO and support outreach and education specifically targeted at students and early career professionals as they become active members of research, engineering and corporate communities. A few examples include:

1. OSA offers resources to a network of over 350 OSA Student Chapters and Local Sections (73% outside the US). These resources include grants to support youth education outreach in their communities and programs to connect the general public to the science of light. Grants also support the International OSA Network of Students (IONS) conference series, which is eight regional student chapter-run conferences annually. IONS celebrates its 10th anniversary in 2017.

2. In 2014, OSAF 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 US, Germany, Spain and Mexico.

The 2016 Siegman School at ICFO Institute of Photonic Sciences, Barcelona, Spain; though attendees heard from several luminaries throughout the week, the program also included activities focused on team-building and leadership.

3. In celebration of the OSA Centennial, over 1,400 Explore Optics Kits were distributed along with 46 Optics Suitcases. These educational and outreach kit offers a unique hands-on optics experience for children, teens, and adults through both individual and classroom learning.

The components of the Explore Optics Kit and a student using the peppergram to simulate a hologram at the “Exploring Light Technologies” open house hosted by the Fitzpatrick Institute of Photonics at Duke University in October 2016.
4. The OSA Ambassador Program, launched for the OSA Centennial, provides resources to emerging leaders in the optics and photonics community to facilitate opportunities for them to share their experiences and perspectives with students and early career professionals. In 2016, the Ambassadors collectively visited 46 OSA Student Chapters in 22 countries interacting with 2,300 students.

The 2017 OSA Ambassadors harness the Force. Left to Right – Yoshimoto Okawachi, Alessandro Restelli, Maria Pashchenko, Michelle Sander, Rim Cherif, Arlene Smith, Felipe Beltrán-Mejía, and Danuta Sampson. Not pictured: Rajan Jha

OSA partners on international initiatives to communicate the value of optics and photonics, including:

1. The International Photonics Advocacy Coalition (IPAC), formed by OSA in 2017. This global initiative brings together experts from industry, academia and government to: 1) educate policymakers and influencers about photonics technologies; 2) collaborate and coordinate among industry, government and academia to advance knowledge of photonics technologies; and 3) advocate for funding for optics and photonics initiatives.

2. As a founding member of the International Year of Light (IYL), OSA will support and recognize the annual International Day of Light (IDL) on 16 May starting in 2018. This celebration will be held 16 May every year from 2018, marking the anniversary of the first successful firing of a laser. OSA looks forward to collaborating with the IYL partners.

Contact: John Howell, OSA Vice President to ICO Bureau

Contact: John Howell, OSA Vice President to ICO Bureau
International Society on Optics Within Life Sciences (OWLS)

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).

At present, there are members from 36 countries. Based on this international consortium, the society can offer access to this community of specialists to societies, associations, study groups, international and national bodies, or companies which are interested in this field. Legal bodies are the Board of Directors, the Regional Council, and the Member Assembly. The following Standing Committees were established to support and advise the Board of Directors: Standing Committee on Bylaws and Regulatory Statutes; Standing Committee on Finances; Standing Committee on Technology Transfer, Standardization and Technology Assessment; and Standing Committee on Education and Ethics.

To serve interdisciplinary communication on a world-wide scale, the society holds a biennial International Conference on Optics Within Life Sciences. 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 1 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.

*Prof Stephen Morgan, OWLS President and Vice-President to ICO Bureau*
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, the Sociedad Española de Óptica 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 Investigação e Desenvolvimento en Óptica e Fotónica joined RIAO, and in September that year, the first RIAO Council took office in Lima, Peru for a three years term during the RIAO-Optilas Conference, the flagship optics and photonics conference in the region. RIAO became an ICO International Society Member (ISM) in September 2014 during the ICO 23rd General Congress, held in Santiago de Compostela, Spain; and since June 2016, the Sociedad de Óptica y Fotónica del Ecuador is also a member of RIAO.

As part of the International “Year of Light and Light-Based Technologies 2015” celebration, the RIAO members organized several activities and special conferences, meetings and schools, highlighting the importance of optics and photonics for the core activities in modern society. Among those activities organized during 2014 and 2015, we can name for example: the “Focus Latin America 2014” workshop, (Medellín, Colombia, November 11-13), the “Á Descoberta da Luz” science contest and “Festa da Luz” science fair (Viana do Castelo, Portugal, May 25), the “Light in Science, Light in Life” summer school (Tequisquiapan, Mexico, August 17-20), the “IX Optics in Industry Symposium” (Guanajuato, Mexico, August 17-21), the “XI Reunión Nacional de Óptica” (Salamanca, Spain, September 1-3), the “Mexican Optics and Photonics Meeting 2015” (León, Mexico, September 9-11), the “II Escuela Opto-Andina” (Quito, Ecuador, November 9-13) and the “XIV Encuentro Nacional de Óptica / V Conferencia Andina y del Caribe en Óptica y sus Aplicaciones” (Santiago de Cali, Colombia, November 16-20).
The major triennial conference for the optics and photonics community in the region, the “IX Reunión Iberoamericana de Óptica / XII Encuentro Latinoamericano de Óptica, Láseres y sus Aplicaciones” (RIAO-Optilas 2016), was held on November 21-25, 2016 in Pucón, Chile. Nine plenary and 21 invited talks were presented at RIAO-Optilas 2016 together with other 352 contributed papers, 144 oral and 208 posters, allocated in 48 parallel and 4 mural sessions.

During this 2014-2017 period, the RIAO member societies would have organized also other national meetings and workshops, like the “Taller de Óptica” (Quito, Ecuador, February 29 to March 2, 2016), the “International Conference on Applications of Optics and Photonics” (Aveiro, Portugal, May 26-30, 2014 and Faro, Portugal, May 8-12, 2017), the “Mexican Optics and Photonics Meeting 2017” (Tonantzintla, Mexico, September 6-8, 2017), and the “XV Encuentro Nacional de Óptica / VI Conferencia Andina y del Caribe en Óptica y sus Aplicaciones” (Santander, Colombia, November 20-24, 2017).

As an ICO International Society Member, RIAO participated with the Mexico Territorial Committee for Optics in establishing the “Iniciativa Mexicana en Fotónica” (IMF). IMF is a collaboration between ICO and ProMéxico, the Mexican government agency devoted to promoting the country as an ideal destination for foreign direct investment, aimed to foster synergies between industry, government, academia, and society to facilitate the recognition of optics and photonics as key enabling technologies for the consolidation of Mexico as one of the most important economies in the world and the leader in Latin America. The IMF presented the first roadmap for optics and photonics in Mexico on November 2016, entitled “Towards a Brighter Mexico”.

2016 RIAO Council meeting. From left to right: Guillermo Baldwin (Peru), Abdiel O. Pino (Panama), César Costa (Ecuador), Omar Ormachea (Bolivia), Yezid Torres (Colombia), José Luis Paz (Venezuela), Amalia Martínez (México), Pedro Andrés (RIAO 2013-2016 President), Santiago Vallmitjana (Spain), Efraín Solarte (RIAO 2016-2019 President), Darío Pérez (Chile), Eric Rosas (RIAO Appointed VP to ICO), and Gustavo Torchia (Argentina).
The International Society for Optics and Photonics (SPIE)

Collaborating to advance optics through education, research, publications, advocacy

The ability to support and join with the ICO in the shared missions of advancing and diffusing knowledge in the field of optics is greatly valued by SPIE, the international society for optics and photonics. An integral part of the SPIE’s mission is to support education and outreach programs in optics and photonics; in recent years, the level of support has amounted to more than $4 million USD annually.

SPIE and the ICO were both International Year of Light and Light-based Technologies 2015 (IYL) partners working together with over 119 sponsors help to raise awareness of the importance and many roles of light in enabling human progress and improved living conditions for all. SPIE was committed to establishing a strong foundation for the optics and photonics community to shine during IYL, developing shared community resources and investing $1.7 million USD in the project over a three-year period.

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

María Yzuel of the Universitat Autònoma de Barcelona, a Past President of SPIE, serves as the society’s Appointed Vice President of the ICO, the latest in many roles she has played in the organization. SPIE Fellows currently serving on the ICO Bureau are President Duncan Moore (University of Rochester), Past President Maria Calvo (Universidad Complutense de Madrid), Treasurer James Harrington (Rutgers University; Past President of SPIE), and Elected Vice Presidents Zohra Ben Lakhdar (Université de Tunis El Manar) and Tomasz Szoplik (Warsaw University). SPIE Fellow Fernando Mendoza Santoyo, Director General of the Centro de Investigaciones en Óptica, served as General Conference Chair of ICO-22 in Puebla.

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. 15, 2014

The first African Summer School on Optics and Applications to Sustainable Development (ASOSD) held in Tunis last year, and organized by the Optical Society of Tunisia was supported by SPIE, the ICO, ICTP, the African Laser, Atomic, Molecular and Optical Sciences Network (LAM), and other organizations.

With the ICO and other societies. SPIE supports the work of the International Centre
for Theoretical Physics (ICTP), in ways such as sponsoring the annual ICTP Winter College on Optics. SPIE Fellow and Past President Katarina Svanberg of Lund University Hospital represents SPIE on the Trieste System Optical Sciences and Applications (TSOSA) Advisory Group, established to advise the ICTP in the area of 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 Istituto Nazionale di Fisica Nucleare (INFN).

SPIE provides 172 eligible researchers and organizations with free or low-cost access to the SPIE Digital Library through the INASP program established by the International Council for Science. Free access is also provided to ICTP students and associates through the eJournals Delivery Service program (eJDS).

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.

Contact: María Yzuel, Universitat Autònoma de Barcelona
ICO BUREAU MEETINGS

Minutes of the 2013 ICO Bureau Meeting

Sunday October 27th, 2013, 9:00 AM – 5:10 PM. Tokyo, Japan
Approved on August 2014


Apologies for absence have been received from: C. Cisneros, Y. J. Ding, R. Ramponi, T. Szoplik, María L. Calvo, Maria J. Yzuel, A. Diaspro, H. P. Herzig

Confirmed attendance by video call: R. Ramponi, María L. Calvo, H. P. Herzig

1. Welcome and Opening of the Meeting (Duncan Moore, Chair)

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

2. Adoption of the Agenda (Duncan Moore, 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 Jim Harrington, Seconded by U. Gibson, approved unanimously.

3. Minutes of the ICO Bureau Meeting 2012 (Duncan Moore, Chair)

The final version of the Minutes of the ICO Bureau Meeting 2012 was sent to the ICO Bureau members and comments and corrections were inserted.

Motion 2: To approve the minutes of the 2012 ICO Bureau Meeting. Moved by U. Gibson, seconded by F. Höller. Approved unanimously.

4. ICO President's report (Duncan Moore, ICO President)

ICO President reported on some of the discussions held on the Strategic Planning Committee (SPC) and on its own activities as follows:

1. The SPC recommended to hold major ICO meetings in developing countries.

2. The SPC discussed at length the procedure to be followed for updating the way in which the units of ICO Territorial Committees are allocated. The SPC
suggested to use a combination of GDP and H index to bring a proposal to the next General Assembly in 2014.

3. The ICO President attended the Award ceremony for Prof Mikhail Vladimirovich Fedorov (Russia), Galileo Galilei Awardee 2012, held in Rochester during the Tenth Rochester Conference on Coherence and Quantum Optics and 2nd International Conference on Quantum Information and Measurement (QIM-2). He notes the high quality of the ICO Diploma, handmade in parchment.

4. The ICO President attended RIAO/OPTILAS and ETOP in Porto, Portugal. The join conference had a large attendance. He presided the IUPAP Young Scientist Prize ceremony organized for the 2012 awardee, Nirit Dudovich (Israel), and delivered a lecture on a session on Entrepreneurship.

5. Early December 2013 he will attend a course on entrepreneurship in Mexico. There have been planned also two other activities on entrepreneurship that he will attend: one in Ghana (Fall 2014) and a second one at ICTP (April 2014).

6. ICO President attended the meeting of the IUPAP Council and Commission Chairs (referred to as C&CC meetings) at CERN, October 1-2, 2013. He noticed that the structure of other affiliated commissions is different from that of ICO. The affiliated commission AC2, International Commission on General Relativity and Gravitation, does not have Territorial Committees but only individual members. The affiliated commission AC3, International Commission for Acoustics does their electoral process around regions, and has elected members at large. The affiliated commission AC4, International Commission on Medical Physics, is both an affiliated commission of IUPAP and a member organization of the International Union for Physical and Engineering Sciences in Medicine of ICSU. ICO might need to find a partner international organization to become an International Union of ICSU.

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

ICO Secretary reports on her activities in connection with ICO and implementation of new communication tools for ICO:

- The online ICO publication: “Selected experiments of the 20th century to understand coherence properties of light” by M. L. Calvo is available at http://e-ico.org/node/255.
- The ICO Secretariat created the ICO Bureau as a Community in Google +
- ICO has also a Twitter address: @ICOPNews. The ICO Secretariat tweets news on awardees, and other news relevant for the ICO Community.
- There is a new account in Flickr for collecting photos: Secretariat ICO
The ICO Secretariat has bought and keeps the following ICO domains: e-ico.org, myico.org, and ico-optics.org.

Since the last ICO Bureau, she has edited and published 5 ICO Newsletters, two of them the January 2103 and April 2013 reporting on the initiative of the International Year of light and on the International Planning Meeting for the Year of Light held at ICTP in Trieste. The July 2013 call for attendance to the Topical Meeting in Tokyo, and in the October issue, she published her own article entitled “ICO is steering is future in Tokyo”, where she referred to the forthcoming SPC Meeting and the interrelations between ICO, IUPAP and ICSU, and the road for ICO to become an international union.

The ICO Secretary attended the following meetings:

3. USAC ICO Meeting, March 17, 2013.
4. Workshop in renewable energies, ICSU-ROLAC, April 8-10, 2013. During the meeting ICSU presented the objectives and planned implementation of the Future Earth Programme, a 10-year global initiative for facing challenges posed by the global climate changes, achieve sustainable energy development, prevention of disasters, etc. Optics can play a significant role on the program on topics like energy generation, illumination, environmental sensing and space monitoring of the environment.
5. SPIE Optics and optoelectronics, Prague, April 15-18, 2013, where she organized and presided the award ceremony for the ICO Prize awardee 2012, Romain Quidant (Spain); the IUPAP Yung Scientist Prize in Optics 2010, Shuang Zang (UK); and the Galileo Galilei Prize Awardee 2011, Jan Peřina (Czech Republic). The ceremony was organized in collaboration with SPIE, to whom she thanks for facilitating the venue and providing advertising. The organizers of the Conference ask for ICO endorsement following the ICO Secretariat’s advice, to be able to deliver the ICO Galileo Galilei Award to Prof Peřina, who was unable to travel.
6. The Secretariat coordinated in similar way the Award ceremony for the ICO Galileo Galilei Prize awardee 2012, Mikhail Vladimirovich Fedorov (Russia), at the Tenth Rochester Conference on Coherence in Quantum Optics (June 17-21, 2013). The ICO Secretary planned to attend the conference but decided not to when the ICO President accepted to preside the ceremony, which was taking place at his home town.
7. The ICO Secretary attended RIAO/OPTILAS & ETOP 2013, July 22-26, 2013 and performed the following activities:
• Invited Lecturer to report on the Workshops on Active Learning on Optics and Photonics held in Latin America and the related activities. She is the UNESCO’s coordinator of the Workshop in Latin America, and the director of this UNESCO’s initiative is Joe Niemela (ICTP).

• Preparation and attendance to the IUPAP Award ceremony for Nirit Dudovich

• Speaker at the Women in Optics session

• Meeting with the Council of the Iberian American Network on Optics

• Establishment of contacts to build a Central American ICO TC.

• Establishment of contacts to build an Ecuador & Peru & Bolivia ICO TC

• Holding extremely time demanding discussions on the issue of the overlap in 2016 of the RIAO/OPTILAS (a conference organized by the Iberian American Community and the RIAO Network, with the support of ICO) & LAOP (a conference organized by OSA). She calls again for collaboration of OSA in this regard. The OSA representative mentions that OSA is considering avoiding overlap after 2016, and suggesting holding both conferences in Chile in 2016.

Other activities of the ICO Secretary are the publishing and distribution of the posters announcing ICO awards. The posters are currently design by a professional and published in American and European formats. The ICO Secretary is the Chair of TSOSA Advisory Committee, which advises ICTP in all optics related activities, in particular the ICTP Winter College, and which consists of representatives of other international organizations, UNESCO, TWAS, NAS, and international societies. On occasion of the TSOSA Committee meeting, she suggested to hold the first international meeting on the International Year of Light initiative in Trieste, and currently there have been two meetings, and a third one programmed for February 2014 at ICTP. She and Maria L. Calvo proposed to ICTP a second activity within the ICO/ICTP initiative for Central America, the “College in Optics and Energy” to be held April 28-May 9, 2014, in Chiapas, Mexico, at the new MCTP, the Mesoamerican Centre for Theoretical Physics. Directors of this activity are A. Guzmán, M. L. Calvo and A. Zepeda, the director of MCTP.

The ICO Secretary presented to the SPC a draft for an ICO Membership survey, with the aim of collecting the opinions of the ICO Territorial Committee Members about ICO services and projection into the future.

Regular activities of the ICO Secretariat are the preparation and coordination of ICO Bureau meetings and the elaboration of Agendas and Minutes of Bureau and SPC meetings. For this meeting, the secretariat posted all supporting documents in Google drive in a link available to everybody who knows it. A. Guzmán thanks Y. Arakawa for all his help on coordinating this Bureau Meeting and providing an excellent venue for
it. She also thanks him for his hospitality and warm welcome to all Bureau members, and for organizing social activities to improve the interaction of the ICO Bureau members with the local community.

She finally puts in consideration of the Bureau the following matters that require approval by the ICO Bureau:

**5.1. Reactivation of the Singapore Territorial Committee:** The former adhering body has dissolved completely. A. Asundi took the initiative of organizing a new optical society, the Optics and Photonics Society of Singapore, for which he requested to become the adhering body responsible for the ICO Territorial Committee and committed with the financial dues.

**Motion 3:** To send a welcome back note. Moved by A. Guzman, seconded by J. Harrington, Approved unanimously.

**Action 1: ICO Secretariat:** To send to the Optics and Photonics Society of Singapore a welcome back note.

**5.2** The ICO Secretary proposed to the SPC an amendment to ICO’s mission and vision in the ICO Bylaws, to include “photonics” as a topic properly covered by the ICO. The ICO Bureau will come back to this point later when discussing the SPC recommendations.

**5.3 Reassignment of ICO dues** from ICO Territorial Committees and ICO member societies. The ICO Secretariat presents documentation about the allocation of ICSU National Members’ dues, and ICSU Unions’ dues 2012-2015. She explains that after lengthy discussions, ICSU arrived at a table based on GDP. The vote is not weighted by payment except for financial issues. For financial issues, votes are weighted proportionally to what is paid. Unions pay according with their income. She presents graphics showing the evolution of the number of ICO Territorial Committees since ICO’s birth in 1948, and that of the number of units by regions. She presented to the SPC a proposal for reassignment of ICO. The ICO Bureau will come back to this point later when discussing the SPC recommendations.

6. ICO Treasurer's report (James Harrington, ICO Treasurer)

The ICO Treasurer presents the financial report 2012-2013:

As of October 1, 2013, the ICO has a cash balance of $153,370 in our treasury. This amount is held in US dollars ($114,147) at the US Bank of America and in Euros (28,798€) at the Caisse D’Epargne in Paris. This is a significant increase in our cash balance of $132,325 that I reported at the Bureau meeting in Genoa, Italy in July 2012. 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 in 2013 as in past years is the collection of dues and dues in arrears. While this problem is not quite as severe as in past years, it is an issue that we continue to address. The 2013 dues collected as of October 2013 total $38,520 compared to a total of $48,170 owed in 2013. That is, we have collected 80% of the dues owed for this year. Interestingly, these 2013 dues were collected from 28 out of 45 dues paying Territorial Committees (TCs). That is, only 62% of the TCs paid their dues but those TCs paying accounted for 80% of the money received. The $38,520 collected so far this year is about equal to what was collected in each of the past few years. However, he feels that many of the 17 TCs who have yet to pay their 2013 dues will do so. His assumption is based on the fact that many of these TCs have been members in good standing in the past and that they eventually will pay their dues. He continues to work to not only collect the remainder of the 2013 dues but also money owed by a few TCs from prior years.

As explained in Puebla at ICO-22, only about half of the 56-member TCs in 2011 were paying their dues. As the years have gone by this has led to a fairly large amount of money that the ICO is owed in back dues. My estimate in 2011 was that the ICO was owed about $41,675 in back dues. To partially address this situation, we wrote off $27,325 in bad debt in 2011. The non-payment of dues goes back, in some cases, well beyond 5 years. In fact, there are 11 out of 56 TCs who have not paid or even never paid dues for greater than 5 years. For these TCs the ICO has decided to demote them to Associate status. As a reminder, the Bureau passed the following resolution 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."

In 2012, I made one last attempt to have these 11 TCs settle their dues. I wrote to each of the TCs listed in the table below and told them that they would be demoted to Associate Status unless they paid their dues. He encouraged them to remain members in good standing as well as emphasizing the benefits of ICO membership. However, not a single one of the delinquent TCs responded positively so now these 11 TCs are Associate Members: Belgium, Belorussia, Ghana/West Africa, Hungary, Indonesia, Iran, Lithuania, Moldova, Netherlands, Optical Society of Taipei and Turkey.

One of the problems associated with membership is that some TCs have difficulty determining which optical organization is currently responsible for paying the TC’s ICO dues. Sometimes this has resulted in invoices being sent to the wrong person but usually he is able to locate the correct person responsible for seeing that the dues are paid. He is also concerned about two of our current TCs, Canada and Denmark, as they seem to be having considerable difficulty paying their dues. Unless some financial arrangements can be made they are likely to be demoted to Associate status. Finally, some TCs have difficulty paying their dues as a result of political unrest and difficulty in transferring money to the ICO.

Last year we learned that the IOP would discontinue printing the ICO newsletter. Since the IOP stopped printing our newsletter we have found another printer of our newsletter
as well as a less expensive company to mail out the newsletters. He is pleased to report that the editing and typesetting of the newsletter is being done in the UK by Alison Gardiner a former employee of the IOP and that the mailing is handled by Gemini West. So far, the cost of editing, printing, and mailing the newsletters using these new services has been a reasonable $3,627 compared to $7,700 for the same costs in 2011 which also included printing and mailing the Green books.

As a reminder, the ICO Bureau approved an agreement with the OSA Foundation (OSAF) regarding the acceptance of monetary gifts from US donors for international activities for which ICO can apply to the OSAF for supporting its own programs. 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.

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 territory varies from 1 to 18 units. 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 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.

D. Moore notice that the triennium budget presented was the elaborated with the value of the unit as of 2011, and presents a deficit that was corrected by the General Assembly by increasing the value of the unit. He requested the treasurer to prepare a balanced budget with the new value of the unit.

**Action 2: ICO Treasurer:** To prepare a balanced budget with the new value of the unit.

### 7. Committees reports, except nomination & prizes & awards

#### 7a) Committee for the Regional Development of Optics (CREDO) (Tomasz Szolpik, Chair)

The Chair presented his apologies for not being able to attend the meeting. The report was presented by A. Guzmán.

**Members of the ICO Committee for Regional Development:**

Gert von Bally, Zohra Ben Lakhdar, Ari Friberg, Min Gu, Angela Guzmán, Nataliya D. Kundikova, Carmiña Londoño, John Love, Fernando Mendoza Santoyo, Duncan Moore, Ekmel Ozbay,

Tomasz Szolpik, Ahmadou Wagué, Bingkun Zhou.
Activity 1. Stimulation of scientific contacts between Australian and European universities (Period September 1011-December 2012).

Australian National University in Canberra applied to join European Cooperation in Science and Technology (COST) Action MP0803 - Plasmonic components and devices. The Action had 21 European partners and 3 partners from non-COST countries: Institute of Semiconductor Physics of NAS of Ukraine, School of Photovoltaic and Renewable Energy Engineering (SPREE) Australia, and Southern Federal University in Rostov, Russian Federation.

The process was initiated by Kylie Catchpole and supported by Ilya Shavdrivov both from ANU. It was endorsed by Alexandre Dmitriev from Chalmers University in Sweden, MP0803 coordinator.

The procedure of granting the membership of COST to the non-COST country institution has been interrupted by termination of Action 0803 in December 2012.

Activity 2. Stimulation of scientific contacts between South African and European universities in the fields of photonics, plasmonics and computational electrodynamics (January 2012-June 2012)

In collaboration with Alexander Quandt from University of Witwatersrand in Johannesburg, South Africa, we organized a visit of Robert Warmbier to 3 European partners in COST Actions MP0702 and MP0803. The trip was sponsored by the University of Witwatersrand.

The first visit was to the University of Warsaw, Faculty of Physics, with Tomasz Szoplik as a host. At a workshop organized on May 10th:

- Robert Warmbier, University of Witwatersrand, gave a talk on “Computational Plasmonics for Complex Dielectric Materials”.
- Mohammed M. Shabat, Vice President of the Islamic University of Gaza, Gaza Strip, Palestinian Authority, gave talks on “Nonlinear metamaterials waveguide sensors” and on „Education and research in Palestine”.
- In the audience, there were researchers form the Institute of Physics, Polish Academy of Sciences; Military University of Technology; Institute of Electronic Materials Technology; and the University of Warsaw.

The second visit on May 21st was to the Technical University of Denmark, Department of Photonics Engineering, Copenhagen, with Andrei Lavrinenko as a host.

- Robert Warmbier gave a talk on „Computational Plasmonics for Complex Dielectric Materials”.
- a meeting on applications of EELS (electron energy loss spectroscopy) technique to characterization of plasmonic structures was organized, where plans of future collaboration were accepted.
The third visit was to Bionanophotonics Laboratory at Applied Physics Dept., Chalmers University of Technology in Göteborg, Sweden, with Alexandre Dmitriev as a host. Two possible directions of collaboration were discussed:

- photovoltaics and
- the application of ab initio methods developed in South African group to Swedish nanoplasmonics projects. Target: combination of ferromagnetic and plasmonic materials.

**Activity 3.** The First African Summer School on Optics and Applications to Sustainable Development was held in Carthage, Tunisia on 1-10 September 2013.

The School was supported by US $1,500 ICO grant to fully support student’s participation. The ICO was represented by Zohra Ben Lakhdar.

Two CREDO members gave important contributions to organization of the School: Prof Zohra Ben Lakhdar (Tunis El Manar University, Tunisia) and Prof Ahmadou Wagué (Université Cheikh Anta Diop de Dakar).

Both gave invited talks: Zohra Ben Lakhdar on „ICO activities” and Ahmadou Wagué on „Laser spectroscopy and applications.” PPT presentation of Zohra Ben Lakhdar follows the present report.

**Activity 4.** The University of Zilina, Slovakia, in 2012-2015 realizes the 7FP EU project “The support of quality improvement of universities and the Slovak Academy of Science”.

The Faculty of Electrical Engineering, the University of Zilina, realizes a sub-project „Improving the competitiveness of technical curricula reflecting the current needs of business practice”.

On October 14-18th, 2013, Tomasz Szoplik (University of Warsaw) will give 10 hours tutorial on „Plasmonics and its applications.”

On October 16-18th, 2013, Marian Marciniak (National Institute of Telecommunications, Warsaw) will give 10 hours tutorial on „Optical communication and data transmission”

**7b) Education Committee (Zohra Ben Lakhdar, Chair) Report not available.**

**7c) Traveling Lecturer Committee (James Harrington, Chair)**

The traveling lecturer award provides small grants for scientists and engineers to lecture in the optical sciences. Generally, they lecture in developing countries. The typical grants are around $1,000. The target is to award $5,000 in next triennium. Grants are not to support travel to conferences. We could use more applications.

In the last year there were two awardees:
a) Prof César Costa Vera, from the Dept. of Physics, Escuela Politécnica Nacional, Quito, Ecuador, was hosted at the Faculty of Sciences of the University of Porto, Portugal (July 2013), and within other activities, attended the RIAO-OPTILAS meeting.

b) Prof Jyoti Mazumder, Robert H. Lurie Professor of Mechanical Engineering & Materials Science and Engineering at the Univ. of Michigan was hosted by Prof Anand Asundi, Director of the Centre for Optical and Laser Engineering, School of Mechanical and Aerospace Eng. Nanyang Technological University, Singapore. (April 2013).

8. Reports of liaisons with Member Societies & ICTP

8a) International Societies (ICO Bureau members)

**OSA:** The general message of OSA is to offer its support to ICO activities. But most important is to have a concrete proposal. For a general request OSA cannot answer.

D. Moore asks if U. Gibson is a member of the OSA International Council. ICO should suggest that U. Gibson be a member of the International Council. Is the President of ICO an ad-hoc member of the International council of OSA?

K. Apter offered information on speakers and other activities supported by OSA like student or speaker support for an ICO conference. D. Moore asks if ICO could put a request of money for students to attend the ICO 23 Conference in Santiago de Compostela. U. Gibson suggests contacting the OS AF or the International Council. She also suggests that a member of the OSA Board be invited to attend the ICO 23 Conference. It could be OSA’s President, **Philip Bucksbaum,** or OSA’s Vice President, Alan Willner. U. Gibson can contact Kari to know whom to send the application for financial support to ICO 23.

Duncan Moore states that the ICO President & Bureau members would like to have a lunch or other social activity with students at ICO 23. In ICO 22 in Puebla there was a poster session for students only.

**SPIE:** M. Yzuel is no more in the Board, and SPIE does not have an International Committee. SPIE offers support to student chapters in Spain and Portugal, and there is a student chapter in Salamanca, which could receive support from SPIE to attend the ICO Conference. Phil Stahl could be representing the SPIE at ICO 23.

**LAM** is organizing a meeting in Senegal, January 13-18, 2014, with a meeting of the Council of the African Optical Society and celebrating the 10th anniversary of the African Laser center. SPIE and OSA were asked to send representatives. LAM wants an official representative of ICO. They would be delighted if the ICO President can attend, or if he is not able to, they would like to have the ICO represented by the ICO Past President, Maria L. Calvo.
LAM participated in the meeting in Tunisia, which was attended by Maria Yzuel. The Chinese optical society was also invited. On January the 14th, 2014, there will be a session for launching the African Optical Society. **Members:** Optical societies, networks, centers, and representatives of international societies. The Japanese Optical Society will be also attending. They would like to have the worldwide Optical community to be represented.

Meeting of African laser center in South Africa. LAM is a founder member.

African network of Academies of Sciences: LAM is working with them on science education program.

Visit from somebody from the IC of OSA to the student chapter in Senegal (3 days visit and visited several authorities in the country). The chapter has students from several countries. K. Svanberg helped organizing it. He was supposed to go to Ghana

**OWLS** sent a letter to the United Nations and got accredited by it, G. von Bally attended a conference and get regular invitations and get space for poster and announcements for the participants. Members in 66 countries. Summits (1) Environment and (2) health. A detailed report on OWLS History, structure and activities were presented. OWLS went recently through changes to its bylaws to allow re-election of the President for a further 2 years and to allow all communications to members in electronic form (some aspects specified letters to be written). There will be new elections to the Board in 2014. OWLS also has created a Regional Council with representatives from Africa, Asia, North America, Central and South America, Europe, Austria and New Zealand. OWLS has four standing committees on (i) Technology Transfer, Standardization and Technology Assessment, (ii) Education and Ethics, (iii) Bylaws and Regulatory Statutes, and (iv) Finances. The next OWLS Meeting will be hosted by University of Nottingham, Ningbo Campus, China. The Co-chairs are Steve Morgan, Paul O'Shea, and Mike Somekh.

### 8b) TSOSA Advisory Group (Angela Guzman, ICO Representative and Chair of TSOSA)

The TSOSA Meeting was preceded by the meeting of the Year of Light 2015, which provided the first opportunity for a multi-partner discussion of progress-to-date and future actions relating to the planning for the International Year of Light in 2015 (IYL2015). The meeting began with a general overview provided by John Dudley, who reviewed the significant progress made since the idea for an IYL was first mooted in an IQCE planning meeting in 2009. The background to achieving endorsement by the International Union of Pure and Applied Physics (IUPAP) in 2011 and by the UNESCO Executive Board in October 2012 was described.

Although the anniversaries planned as focal points of the IYL could also overlap with a celebration in 2016, the consensus was to aim for the IYL in 2015 as planned. All participants were provided with a list of the supporting scientific and other partners, a list of the nations who supported the proposal at UNESCO, and a copy of the Resolution passed by the UNESCO Executive Board as well as the accompanying Explanatory
Note. Minutes of the meeting were elaborated by John Dudley and A. Guzmán and have been provided as supporting document to the ICO Bureau Members.

During the TSOSA Meeting there were reports of ICTP activities on Optics. A proposal presented by Pavel Cheben, Luis Ponce, and Lorenzo Pavesi for the Winter College 2014 on Fundamentals of Photonics - theory, devices and applications was approved. It was also agreed that all proposals for the Winter College must be sent before a deadline fixed by the TSOSA Chair and must include an Italian and a woman in the trio of directors. For the Winter College 2014 Maria L. Calvo will be part of a quartet of directors.

As reported in the ICO Secretary report, ICTP, ICO and ICTP joined to organize a College on Optics and Energy (28 April - 9 May 2014) at the Mezo American Center for Theoretical Physics (MCTP), Chiapas, México. Directors are Maria L. Calvo (ICO), Angela M. Guzmán (ICO), Arnulfo Zepeda (MCTP), and Joe Niemela (ICTP). The event is the second of the ICO/ICTP initiative for Central America.

9. Report of the recommendations of the Strategic Planning Committee

9.1 Allocation of units: Duncan Moore, ICO President and Chair of the SPC, reports that there was an extensive discussion on the issue of a reallocation of units. The proposal of the SPC for reassignment of ICO dues is to use a formula based on an average of GDP and H index for Atomic and Molecular Physics and Optics. In order to avoid drastic changes there should be some phasing time for adjusting.

Motion 4: The allocation of ICO units should be a formula based system. Moved by D. Moore, seconded by J. Harrington; approved unanimously.

Motion 5: The reallocation of units should be phased in two steps. Half way in 2017, and the other half 2020. After this initial reallocation, a review of the units should be done for each General Assembly. Moved by D. Moore, seconded by J. Harrington; approved unanimously.

An analysis of the allocating resulting of applying the formula shows that Russia and Italy will have less votes. And we will have to ask if USA, Japan, China, and Germany are interested on having the same number of votes. D. Moore suggests that this issue should be included in the USAC ICO meeting Agenda.

Action 3: ICO Secretary: To prepare the proposal for reassignment of ICO dues using a formula based on an average of GDP and H index for Atomic and Molecular Physics and Optics for consideration of the ICO Bureau, and send the reviewed proposal in advance to the delegates to the ICO General Assembly.

9.2 Amendment to Article 1 of ICO Statutes: The SPC recommended to amend the Article 1 of the ICO Statutes describing the ICO Objective to add the word photonics in the ICO Objective, while maintaining the ICO name. The new Article 1 should read:
“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 its applications. It emphasizes the unity of the cross disciplinary field of Optics.

Optics and Photonics are defined as 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.

The ICO promotes international co-operation 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 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.”

Motion 6: To recommend to the General Assembly an amendment of the Article 1 of the ICO Statutes to include the word Photonics as written above. Moved by D. Moore, seconded by U. Gibson; approved unanimously.

9.3 Financial Support for ICO Bureau Members from developing countries: The SPC discussed and agreed to recommend to the ICO Bureau to consider applications of ICO Bureau members from developing countries as defined by the World Bank for ICO support to attend ICO Bureau Meetings and up to a limit of US$1000.

Motion 7: Beginning with 2014 the President and the treasurer can approve travel expenses for a Bureau member to a Bureau meeting up to $1000. The treasurer should include in the triennial budget $3000 per year to support this activity. The intent is to support the travel of Bureau Members from developing countries. Moved by U. Gibson, seconded by F. Höller. Approved by 9 votes in favor and 2 abstentions.

9.4 ICO role: The SPC members reaffirm their opinion on the ICO role: ICO is a truly international organization and has a role as representative of the Optical Community to IUPAP and ICSU. The member societies of ICO could not play this role in IUPAP and ICSU.

9.5 ICO activities: ICO supports meetings in regions where its member societies do not have strong interests. Member societies do not qualify to hold IUPAP meetings. ICO has a key role on supporting conferences in developing countries. The main financial support for the ICO Congresses comes from the host countries. ICO Congresses are intended to increase the image of the local Committee and not the visibility of ICO. Therefore, the SPC proposes to have a world conference on optics in developing countries. To do this, ICO needs to (i) find a trustable local organizer, and
(ii) have a financial commitment from the host country. ICO could take a partial risk on possible loss (up to $20000). The SPC considers that two out of three ICO Congresses should be held in a developing country. ICO should look for ways to raise money for the conference with foundations or local organizations. ICO can go to the OSA Foundation and other financial sources. If the conferences are organized on a voluntary basis, they cannot be very large. ICO VPs will have to perform specific tasks, offering additional support for the organizers, for example, in the process of reviewing papers. The ICO would collect the registration fees, the submitted papers and help reviewing. The problem is that it is that hosting a large conference results being very expensive for a developing country. But ICO has a history of work in areas of the world where infrastructure needs improvement. To be able to hold a large international meeting in a developing country, ICO should encourage its TCs to make bids, while developing in parallel strategies to solve the funding problem. ICO gives only $7500, therefore the ICO Bureau must build a financial model to secure some fix amount of money. A goal could be to hold the ICO Congress in 2020 in a developing country.

The SPC considers that a way for ICO to be unique, and differentiate itself from other international organizations would be to hold the ICO Congress one out of 3 times in a developing country. G. von Bally mentions that to hold a meeting of 250-300 participants in Germany costs approximately €100000. Doubling the number of participants increases the budget in a 30%. A. Wagué mentions that in Senegal a conference center for 1000 people, charges €2000 per day, and states that African participants must be totally supported.

**Decision:** ICO will encourage bids from developing countries to hold the 2020 ICO Congress. F. Höller and H. Michinel offered help on providing advice on budget issues. ICO should help raising financial support with local governments and USAID.

**9.6 ICO support for conference series:** The SPC would like to see more applications for meeting support to have more diversity in or portfolio. The ICO Bureau can establish a rule for the number of times that ICO gives support to a specific meeting, and decide what meetings will be supported regularly. Currently ICO supports regularly the ICO Congress, the ICTP Winter College, and ETOP. G. von Bally considers that a way to get more applications is to simplify the application process both on timing rules and requirements.

**Action 4: ICO Associate Secretary:** To prepare a proposal for a new procedure and a new simplified application form for meeting support to be distributed to the Bureau Members within 3 months.

**Motion 8:** To direct ICO President to write a letter reminding TCs of their ability to obtain funding for meetings attaching a simplified application form as recommended by the ICO Associate Secretary. Moved by J. Harrington, seconded by Frank Höller. Approved by 10 votes in favor and 1 abstention.
Motion 9: To approve the recommendations of the Strategic Planning Committee and to establish the actions required to implement them. Moved by J. Harrington, seconded by Frank Höller. Approved unanimously.

10. Liaisons to ICSU and IUPAP

10a) ICSU links: News from ICSU and the Future Earth Program. M. L. Calvo was not able to participate via videoconference. A. Guzmán reported that Future Earth is a new 10-year international research initiative that will develop the knowledge for responding effectively to the risks and opportunities of global environmental change and for supporting transformation towards global sustainability in the coming decades. It was born as a response towards current global damage, with the aim to construct a path that guides us to a sustainable Earth in the near future. Future Earth is being established by a partnership for global sustainability including researchers, funders and users of knowledge. The Future Earth Alliance is a Science and Technology Alliance for Global Sustainability, consisting of the following partners: ICSU, the Belmont Forum, the International Social Science Council, the United Nations University, the UNESCO, the UN Environment Program, and the International Group of Funding Agencies for Global Change Research (IGFA). Future Earth will mobilize thousands of scientists while strengthening partnerships with policymakers and other stakeholders to provide sustainability options and solutions.

A. Guzmán reports that ICSU is going through a process of external review. The panel list and ToR for the external review and the 14th ICSU CFRS Meeting Report were sent for information to the ICO Secretariat.

10b) IUPAP links: Ahmadou Wagué (C13): Physics for development. The C13 has given support for the LAM meeting, and for attendants to a meeting in Mexico and in Nigeria. During the last year C13 has co-sponsored only one meeting in optics. C13 has also suggested a classification of countries for dues.

Angela Guzmán (C15) has not attended the meetings of C15. Since the Chair changed, she does not receive invitation to attend, because ICO does not have a permanent representative in the Commission. It is up to the Chair of the Commission to include a representative from ICO. D. Moore mentions that the new Chair of the Commission is Katherine Gebbie, and he can contact her to obtain a permanent representative position for ICO.

Action 5: ICO President: to contact the Chair of C15 to discuss the issue of a permanent ICO representative or liaison in the IUPAP Commission C15.

Yasuhiko Arakawa (C17) is in C17 in the same situation of A. Guzmán in C15.
11. ICO Prize and Awards Committees

11a) ICO Prize Committee (Roberta Ramponi, Chair) was not able to attend but sent her report, which is presented by Y. Arakawa.

The Committee members (2012-2014) are Roberta Ramponi (Chair, ICO VP), Yasuhiko Arakawa (ICO VP), Zohra Ben-Lakhdar (ICO VP), Yujie Ding (ICO VP), Fernando Santoyo (not ICO bureau member), Maria J. Yzuel (ICO VP), and Bingkun Zhou (ICO VP).

There was a nominee 2011-2012 whose nomination was renewed, and there were 6 new nominations in 2013. The ICO Prize Committee recommends to the ICO Bureau to award the ICO Prize 2013 to Tobias Kippenberg for “for his innovative and pioneering research on cavity optomechanics and optical frequency combs using optical microresonators”. Dr. Tobias Kippenberg has given widely recognized, innovative and forward-looking contributions to cavity optomechanics, notably cooling and quantum measurements of mechanical motion and the demonstration of quantum coherent coupling between light and mechanical oscillators. Over the timeframe of the last 6 years, he contributed in a major fashion to two highly active fields of research in modern optics.

There are 6 candidates reserved for 2014. R. Ramponi acknowledges support from the ICO Prize Committee and the ICO Bureau.

Motion 10: To approve the recommendation of the ICO Prize Committee and award the ICO Prize 2013 to Tobias Kippenberg for “for his innovative and pioneering research on cavity optomechanics and optical frequency combs using optical microresonators”. Moved by Y. Arakawa, seconded by Frank Höller. Approved unanimously.

Additional general information about the ICO Prize: The cash award presently carries an amount of US$2000 and up to US$1000 for travel expenses. In addition to the rules adopted by ICO, the Carl Zeiss foundation has generously agreed to donate an Ernst Abbe glass sculpture to the winner.

11b) ICO/ICTP Award Committee (Ahmadou Wagué, Chair) A. Wagué reports that the 2013 award was awarded to Dr. Al-Amri was awarded the ICO/ICTP Prize 2013 for “his pioneering research in the field of optical lithography and microscopy, quantum teleportation and multi-qubit systems, and the reversal of weak measurements.
in optical systems, as well as for his leadership role in establishing a quantum optics research program at KACST, Saudi Arabia under difficult circumstances.”

For the 2014 Award 7 nomination shame have been received. All very good.

11c) Galileo Galilei Award Committee (Bingkun Zhou, Chair) Z. Bingkun reports that there were 6 candidates. The Committee recommends the ICO Bureau to award the Galileo Galilei 2013 Award to Kazimierz Rzążewski. He has a Scopus lists 123 publications and H-index after 1995 equals 23, 2224 citations, 2112 without self-citations. He is near 70 years old; half of his scientific life was behind the Iron Curtain, but keeping collaborations with distinguished colleagues from some of excellent centers in the world in his field. He has published outstanding works in theoretical physics: seminal papers in Bose-Einstein condensation and interaction of radiation and matter; over 200 papers in journals with high impact factors; 4 papers cited more than 100 times; best cited more than 350 times (Scholar Google). The Committee proposed several possible versions of the citation to the ICO Bureau, which highlighted the justification for his scientific work to be considered as achieved under difficult circumstances. After some discussion, U. Gibson recalled that the award is given for people working under difficult circumstances, and the citation should state that.

Motion 11: To approve the recommendation of the ICO Galileo Galilei Award Committee and award the ICO Galileo Galilei 2013 Award to Kazimierz Rzążewski “For scientific contributions to the area of theoretical quantum optics, ultracold atomic gases and theory of intense laser-matter interactions as well as to the creation of Polish quantum optics school under difficult political circumstances”. Moved by Z. Bingkun, seconded by Frank Höller. Unanimous support of the award but 10 votes in favor and one abstention with respect to the wording of the citation.

11d) IUPAP Young Scientist’s Committee (Moshe Oron, Chair)

The committee members were: Prof Carmen Cisneros, Prof Maria Calvo, Prof Nicholas George, Prof Tomasz Szoplik, Dr. Moshe Oron-Chair. There were five candidates. The committee recommends to the ICO Bureau to award the 2013 IUPAP Young Scientist Prize in Optics to Dr. Andrea Alù “For ground breaking work in metamaterials and plasmonics, and for the introduction of the concept of scattering-cancellation-based metamaterial cloaking”. He is the principal author on the paper which introduced the concepts of scattering-cancellation-based metamaterial cloaking and “invisibility” (670 citations).
**Motion 12:** To approve the recommendation of the ICO Committee for the IUPAP Young Scientist Prize in Optics and award the 2013 IUPAP Young Scientist Prize in Optics to Dr. Andrea Alù “For ground breaking work in metamaterials and plasmonics, and for the introduction of the concept of scattering-cancellation-based metamaterial cloaking”. Moved by M. Oron, seconded by A. Wagué. Approved unanimously.

12. ICO participation in meetings and schools

12a) Report on Meetings sponsored during the period July 2012- Sept. 2013 (Gert von Bally, ICO Associate Secretary) G. von Bally reports on Meetings with ICO Support for the legislative period from Oct.1\(^{st}\), 2011 to Sept 30\(^{th}\), 2014 (Status Oct. 2013).

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**Budget overview:**

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<th>Distribution Plan</th>
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**Budget distribution plan:**

|-------------------------------|--------------|------------|------------|

US $ 7,200

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**1 Oct 2011 - 30 Sept 2012 (Period 1)**

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<td>17 December 2011</td>
<td>coop. US $ 0</td>
<td>end. US $ 0</td>
<td></td>
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<tr>
<td>6-17 February 2012</td>
<td>coop. US $ 5,000</td>
<td>coop. US $ 2,000</td>
<td>Maria L. Calvo.</td>
</tr>
<tr>
<td>10-13 April 2012</td>
<td>coop. US $ 2,300</td>
<td>coop. US $ 2,300</td>
<td>Angela Gustman</td>
</tr>
<tr>
<td>30 April-11 May 2012</td>
<td>coop. US $ 2,300</td>
<td>coop. US $ 2,300</td>
<td>Alexander Pielczynski</td>
</tr>
<tr>
<td>14-17 May 2012</td>
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<tr>
<td>27-30 May 2012</td>
<td>end. US $ 0</td>
<td>end. US $ 0</td>
<td>Min Gu</td>
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<td>2-5 July 2012</td>
<td>coop. US $ 0</td>
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<td>Hans Peter Herzig</td>
</tr>
<tr>
<td>4-6 July 2012</td>
<td>coop. US $ 2,500</td>
<td>coop. US $ 1,500</td>
<td>Alberto Diaspro</td>
</tr>
<tr>
<td>3-6 Sept 2012</td>
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<td>coop. US $ 1,500</td>
<td>Valentin Vladi</td>
</tr>
<tr>
<td>16-21 Sept 2012</td>
<td>end. US $ 4,000</td>
<td>end. US $ 1,000</td>
<td>Olek Angielski</td>
</tr>
</tbody>
</table>

US $ 9,300

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12b) Preparation of ICO XXIII (Humberto Michinel). H. Michinel reports that the First call for ICO XXIII has been issued, and the webpage for the event will be ready soon. He presents photos of the location, and reports on the composition of the organizer and Academic Committees. He has planned to hold the first Bureau Meeting:

<table>
<thead>
<tr>
<th>Date &amp; Location</th>
<th>Requested by Applicants</th>
<th>Decision by ICO</th>
<th>ICO Representative</th>
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</thead>
<tbody>
<tr>
<td>1 Oct 2012 - 30 Sept 2013 (Period 2)</td>
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<tr>
<td>4th International Symposium on Transparent Conductive Materials (TCM2012), Crete, Greece</td>
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<tr>
<td>21-25 Oct 2012</td>
<td>Cosp. US $ 2,300</td>
<td>End. US $ 1,000</td>
<td>Marie-Francois David</td>
</tr>
<tr>
<td>5th International Photonics and Optoelectronics Meetings (POEM2012), Wuhan, China</td>
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<tr>
<td>2-5 Nov 2012</td>
<td>End. US $ 0</td>
<td>End. US $ 0</td>
<td>Velkky Tsinin</td>
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<tr>
<td>E-Entrepreneurship Workshop, Addis Ababa, Ethiopia</td>
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<tr>
<td>5-9 Nov 2012</td>
<td>Cosp. US $ 5,000</td>
<td>End. US $ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>The Latin America Optics &amp; Photonics Conference (LAPC), Na Paulo, Brazil</td>
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<tr>
<td>11-13 Nov 2012</td>
<td>End. US $ 0</td>
<td>End. US $ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>ICTP Winter College on Optics: “Trends in Laser Development and Multidisciplinary Applications to Science and Industry”, Trieste, Italy</td>
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<tr>
<td>4-13 Feb 2013</td>
<td>Different Budget</td>
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<tr>
<td>iCOPEN 2015 (International Conference on Optics in Precision Engineering and Nanotechnology), Singapore</td>
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<td>5-13 April 2013</td>
<td>Cosp. US $ 5,000</td>
<td>Cosp. US $ 1,500</td>
<td>Duncan Moore</td>
</tr>
<tr>
<td>SPIE Optics + Photonics 2013, Prague, Czech Republic</td>
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<tr>
<td>15-16 April 2013</td>
<td>End. US $ 0</td>
<td>End. US $ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>Digital Holography and 3D Imaging, Hawaii, USA</td>
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<tr>
<td>21-25 April 2013</td>
<td>Cosp. US $ 2,000</td>
<td>Cosp. US $ 1,000</td>
<td>Gert von Bally</td>
</tr>
<tr>
<td>Ninth Rochester Conference on Coherence and Quantum Optics, Rochester, USA</td>
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<tr>
<td>17-21 June 2013</td>
<td>US $ 0</td>
<td>End. US $ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>Satellite Meeting to &quot;Tenth...&quot;, QM-2, Rochester, USA</td>
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<tr>
<td>18-20 June 2013</td>
<td>US $ 0</td>
<td>End. US $ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>RAIO/OPTILAS 2013, Porto, Portugal</td>
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<td>22-26 July 2013</td>
<td>Cosp. US $ 3,000</td>
<td>Cosp. US $ 2,000</td>
<td>Maria L. Calvo</td>
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<tr>
<td>ETOP 2013 (2013), Porto, Portugal</td>
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<tr>
<td>22-26 July 2013</td>
<td>Cosp. US $ 2,000</td>
<td></td>
<td>Maria L. Calvo</td>
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<tr>
<td>First African Summer School on Optics and Applications to Sustainable Development, Tunis, Tunisia</td>
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<td>1-13 Sept 2013</td>
<td>Cosp. US $ 5,000</td>
<td>Cosp. US $ 1,500</td>
<td>Zoria Lakhdar</td>
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<td>Information Photonics, Warsaw, Poland</td>
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<td>18-19 Sept 2013</td>
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<td>Correlation Optics 2013, Chernivtsi, Ukraine</td>
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<tr>
<td>18-21 Sept 2013</td>
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<td>Cosp. US $ 1,000</td>
<td>Tomasz Szopiuk</td>
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<tr>
<td><strong>US $ 12,000</strong></td>
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<th>Requested by Applicants</th>
<th>Decision by ICO</th>
<th>ICO Representative</th>
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<tbody>
<tr>
<td>1 Oct 2013 - 30 Sept 2014 (Period 3)</td>
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<tr>
<td>ICoT Topical Meeting: 11th Microscopy Conference (MOC11), Tokyo, Japan</td>
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<tr>
<td>LAM'10 International Workshop: Lasers Optics and Photonics and Applications, Dskar, Senegal</td>
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<tr>
<td>ICTP Winter College on Optics: “Fundamentals of Photonics - Theory, Devices and Applications”, Trieste, Italy</td>
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<tr>
<td>19-21 Feb 2014</td>
<td>Different Budget</td>
<td></td>
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<tr>
<td>Design and Fabrication &quot;ODF'14&quot;, Osaka, Japan</td>
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<tr>
<td>12-14 Feb 2014</td>
<td>Cosp. US $ 0</td>
<td>Cosp. US $ 0</td>
<td>Yasuhiko Arekawa</td>
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<td>XXXVIII Annual Symposium of the Optical Society of India International Conference on Optics &amp; Optoelectronics (ICOL 2014), Delhi, India</td>
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<td>5-8 March 2014</td>
<td>End. US $ 0</td>
<td>End. US $ 0</td>
<td>Lakshminarayanan Harra</td>
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<tr>
<td>Int. Conference on Optics Within Life Sciences (OWLS 2014), Ningsbo, China</td>
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<tr>
<td>10-12 June 2014</td>
<td>Cosp. US $ 3,000</td>
<td>Cosp. US $ 1,500</td>
<td>Gert von Bally</td>
</tr>
<tr>
<td>ICo 23rd General Congress &quot;Enlightening the Future&quot;, Santiago de Compostela, Spain</td>
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<tr>
<td>26-26 Aug 2014</td>
<td>(US $ 7,000, different budget)</td>
<td></td>
<td>Humberto Michinel</td>
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<tr>
<td>2nd International Symposium on Optics and Its Applications, Yerevan-Armenia, Armenia</td>
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<tr>
<td>1-5 Sept 2014</td>
<td>Cosp. US $ 1,500</td>
<td>Cosp. US $ 1,500</td>
<td>Humberto Michinel</td>
</tr>
<tr>
<td>Int. Conference on Optics, Photonics and Photosciences (CIOFF), Havana, Cuba</td>
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<tr>
<td>11-14 Nov 2014</td>
<td>Cosp. US $ 3,000</td>
<td>Cosp. US $ 1,500</td>
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on Monday, August 2014, the ICO General Assembly on Thursday 3PM-6PM (5
hours), the conference dinner on Thursday at 9PM, and the second Bureau meeting on
Friday afternoon starting at lunch and ending at 5 PM.

12c) MoU for ETOP (Angela Guzmán). The MoU for ETOP is put down for
consideration of the ICO Bureau.

Motion 13: To accept the ETOP MoU with the substitution of IEEE/LEOS by
Approved unanimously.

12d) Conflict between LAOP, a conference from OSA, RIAO/OPTILAS, and ICO
XXIII (Humberto Michinel) No further comments.

12e) Bid for ICO XXIV (Yasuhiko Arakawa) Y. Arakawa makes a presentation of
Japan’s detailed proposal for hosting ICO XXIV in Yokohama, in September 3rd -8th
2017. The bid was put to consideration of the ICO Bureau.

Motion 14: To recommend to the ICO General Assembly that the ICO 24 be held
in Yokohama on September 3rd -8th 2017. Moved by H. Michinel, seconded by M.
Oron. Approved unanimously.

13. No other business

Meeting adjourned at 5:10PM

Minutes approved by the ICO Bureau, August 25, 2014.
Minutes of the first 2014 ICO Bureau meeting

Monday, August 25, 2014. 9:00 AM – 5:30 PM.
Santiago de Compostela, Spain
Faculty of Medicine, Private Seminar in Base floor.


Apologies for absence have been received from Y. J. Ding, A. Diaspro, H. P. Herzig, T. Szoplik

Invited: J. Niemela joined during the afternoon.

1. Welcome and Opening of the Meeting (Duncan Moore, Chair)

The Chair called to order, welcomed all participants and noted the apologies. He announced that Joseph Niemela was joining the Bureau Meeting in the afternoon to discuss initiatives for the International Year of Light 2015.

2. Adoption of the Agenda (Duncan Moore, 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. A. Guzmán requested to include a presentation by Pedro Andres Bou, the President of the Iberian American Network of Optics (RIAO) at 2PM.

Motion 1: To approve the Agenda adding the presentation of the President of RIAO. Moved by Jim Harrington, Seconded by U. Gibson, approved unanimously.

Motion 2: To approve the minutes of the 2013 ICO Bureau Meeting and to note the decisions and actions list. Moved by F. Höller, seconded by G. von Bally. Approved unanimously.

ICO President reported on his activities in connection with ICO since the last ICO Bureau Meeting in Tokyo, Japan, and the proposal for the reassignment of ICO dues from ICO Territorial Committees and ICO member societies. He informed that the next IUPAP Meeting will take place in Singapore. D. Moore will attend and represent the ICO. D. Moore has been working with IOP in Entrepreneurship Workshops since 2014. The workshops consist of 3 sessions during 5 days. One Workshop is held at the Abdus Salam International Centre for Theoretical Physics (ICTP) every other year. The next
one will be held on April 2015 in Trieste. Two others, in Ghana and Kenya, will be held in December 2014. IOP supports a meeting every year and the IEEE one other meeting in Africa.

He also reported in the meeting of the Strategic Planning Committee (SPC), highlighting the discussion on the role of ICO in the International Year of Light 2015. He will present a summary of the recommendations of the SPC later in the meeting and to the ICO General Assembly.

The ICO President planned a meeting with local students. Local students were running a meeting in parallel with the ICO General Congress. He recommended to the ICO Bureau to consider creating a culture of having this type of parallel meetings with the ICO conference in the future, and to hold one during the next ICO General Congress in Yokohama.

The SPC recommended to hold the ICO Conference in a developing country. D. Moore has been in conversations with a donor, who would help supporting the meeting.

U. Gibson asked for giving access to the SPC summary for the Bureau. D. Moore answered that a summary was going to be presented to the Bureau on the next day.

Regarding the proposal for Share & Units, D. Moore explained that the shares determine the member fees, and that the number of shares is determined by the size of the country’s economy and its Science and Technology indexes. The SPC did a proposal based on a weighted average of the GDP and the h-index. The members of the Bureau were presented the final version of the proposal for reassignment of ICO dues from ICO Territorial Committees (Document IB2014/4.2). The SPC decided that the USA should pay more without getting more votes, and raised the USA membership fees by 50%, which was accepted by the USA Territorial Committee representative. The ICO membership fees are much smaller than those of any other international organization. There will be a three-year phasing to apply the new fees in full. It is a matter of philosophy that we will not reduce anybody else number of votes.

U. Gibson declared her concern on the proposed number of shares for China, since they seemed low when considering China’s development.

D. Moore suggested to review the distribution of shares only every 6 years, not in every General Assembly. He also clarified that the number of units and votes will continue being calculated from the shares using the same formula established in the ICO rules and codes of practice.

Motion 3: To approve the proposal for reassignment of ICO dues to be recommended to the ICO General Assembly. Moved by D. Moore, seconded by A. Guzmán, approved unanimously.

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

The Secretary reported on the regular activities of the Secretariat, as follows:
• To coordinate logistics of the ICO General Assembly, and ICO Award Ceremonies with the Chair of the ICO General Congress.
• To elaborate the Agenda and Minutes of the ICO General Assembly
• To coordinate logistics for ICO Bureau, SPC, and EXEC Meetings with the Territory hosting the ICO Topical Meeting or ICO General Congress.
• To elaborate Agendas & Minutes for the ICO BUREAU, SPC, and EXEC. Meetings
• To advertise ICO Prizes and Awards, and post the Calls for nominations
• To prepare ICO Seasonal Greetings
• The ICO Secretary is the Editor in Chief of the ICO Newsletter (4 issues per year).
• The ICO Secretary is the Editor of the ICO webpage: hosted by GoDaddy, where the ICO owns the domains myico.org, ico-optics.org, luz2015.org, and lummiere2015.org
• The ICO Secretary updates the ICO Calendar of events, and offered an ICO Consolidated calendar of events in optics, that is fed only by ICO and EOS
• Twitter: @ICOPNews
• Flickr: Secretariat ICO

The ICO Secretary has chaired the TSOSA Advisory group for the Trieste System on Optical Sciences and Applications, held during the ICTP Winter College on optics. The TSOSA ADVISORY GROUP consists of representatives of ICO, OSA, SPIE, OWLS, IAEA, UNESCO, NAS, LAM Network and Institutions of the Trieste System i.e. ICTP, ICS, TWAS, ICGEB, Elettra Synchrotron Light Facility and the Laser laboratory at Elettra. The ICO Secretariat prepares the Minutes, reviewing the draft prepared by a scribe at ICTP.


The ICO Newsletter published during this period 3 articles on the International Year of Light” “An International Year of Light for 2015” (January 2103), “10th Anniversary of TSOSA and Year of Light planning at ICTP (April 2013), and “2015 is the International Year of Light” (January 2014).

The ICO Secretary made a summary of other of her activities during the period 2011-2014 that had been already reported in former ICO Bureau Meetings, except for those performed since the last meeting as follows:

1. The ICO Secretary was co-Chair of the ICO-ICTP initiative for Central America continued with the organization of the “ICTP-ICO-MCTP College on Optics and Energy”, Chiapas, Mexico, April 28-May 9, 2014, at the Mesoamerican Center for Theoretical Physics (MCTP) in Chiapas, Mexico. The other co-directors were Maria L. Calvo and Joe Niemela. The College was held as an ICTP activity held outside the ICTP, with the support of
UNESCO, the IAEA, the UNACH (Universidad Nacional Autónoma de Chiapas) and the RIAO. The ICO Secretary presented the poster of the event.

2. To help coordinate the next ETOP in collaboration with SPIE, OSA and IEEE Photonics Society, which will be held in Bordeaux on June 29-July 2nd, 2015. She provides information on important deadlines for submission of abstracts.

3. Regarding the ICO General Assembly, the ICO Secretary lead the process of accreditation of delegates to the General Assembly and in collaboration with the IOP, revived the participation of the UK. The list of attending delegates was provided as supporting document (IB2014/5.3).

4. She updated the Bureau on the RIAO application for ICO Membership as International Society member, mentioning the invitation to the President of the RIAO to present RIAO’s application in person in the afternoon. A letter from the RIAO President, Pedro Andres Bou, was provided as supporting document.

5. She also informed that in order to proceed with an Application of ICO to ICSU to become an International ICSU Union, the ICO General Assembly should express their willingness to turn the ICO into a Union.

6. ICO Treasurer's report (James Harrington, ICO Treasurer)


As of July 1, 2014, the ICO has a cash balance of $172,467 in our treasury. I am pleased to report that this cash balance represents an increase of approximately $35,000 over the cash held at the time of the ICO-22 general assembly in August 2011 in Puebla, Mexico. This amount is held in US dollars ($119,147) at the US Bank of America and in Euros (39,149 €) 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 consolidate budget will be updated at the ICO-23 meeting as this report is being prepared in advance of that meeting.

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 equable 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 in Appendix 1 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 in Annexes 1-3.

D. Moore mentioned that the recommended level of reserves is two times the budget. The ICO has a reserve of thrice its budget.

U. Gibson recommended to hold a strategic session to decide on projects to be presented to the OSA Foundation for the international ICO activities, for which donors have contributed to the OSA.

J. Harrington agreed on the need to follow the rules of the OSA foundation.

D. Moore called the attention of the Bureau back to the YOL and the need for ICO to do something unique for its celebration. He asked the Bureau members for ideas to target something substantial and unique, and report to the donors. Any OSA Foundation support is intended for special projects not for operations.

D. Moore called the attention of the Bureau back to the YOL and the need for ICO to do something unique for its celebration. He asked the Bureau members for ideas to target something substantial and unique, and report to the donors. Any OSA Foundation support is intended for special projects not for operations.

| Motion 4: To approve the financial report presented by the ICO Treasurer. Moved by U. Gibson, seconded by R. Ramponi. Approved unanimously. |
| Motion 5: To approve the proposed budget. Moved by U. Gibson, seconded by R. Ramponi. Approved unanimously. |

U. Gibson mentioned that with the new shares the ICO annual income would increase in $9000/

R. Ramponi remarked that Canada Quebec has a very strong photonics cluster, and they do not want to give the representativeness to others.

M. L. Calvo considered a problem that they do not want to transfer the representativeness out of the Quebec region. The community in Ottawa wants to rebuild the committee.

U. Gibson asked for clarification about the project to bring to the GA for expenditures in specific projects for the YOL. Would they need approval from the GA?

D. Moore answered that the proposals should be brought back to the Bureau since the Bureau is entitled to use the funds of OSA is approved by the OS Foundation.

U. Gibson recalled that the funds belong to the OSA.

D. Moore considered that there is no need to ask for permission, but that eh funds are restricted by the OSA Foundation.

7. Report of the Nomination Committee (M. L. Calvo)

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-23 Congress, “Enlightening the future” to be held 26-29 August 2014 in Santiago de Compostela, Spain. 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 of Maria L. Calvo (Spain, Chair), Anna Consortini (Italy), René Dändliker (Switzerland), Ari. T. Friberg (Finland), Asher Friesem (Israel), Ajoy Ghatak (India), Min Gu (Australia) and Kyoung Yoon Kim (South Korea).

According to ICO rules letters have been sent to the Territorial Committees (TCs) in October 2012 and November 2013 for nominations to be received by March 15, 2014. As of this date, 26 May 2014, the following nominations have been received and/or established by protocol, to wit: Candidate for

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<th>Candidate for</th>
<th>TC</th>
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<tbody>
<tr>
<td>President</td>
<td>Prof Yasuhiko Arakawa Japan</td>
</tr>
<tr>
<td>Secretary</td>
<td>Prof Angela M. Guzmán Colombia</td>
</tr>
<tr>
<td>Assoc. Secretary</td>
<td>Prof Gert von Bally Germany</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Prof James A. Harrington USA</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Candidate</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Manuel F. Costa</td>
<td>Portugal</td>
</tr>
<tr>
<td>Prof Qihuang Gong</td>
<td>China</td>
</tr>
<tr>
<td>Prof John Harvey*</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Prof Joseph Niemela</td>
<td>USA</td>
</tr>
<tr>
<td>Prof Seung-Han Park</td>
<td>South Korea</td>
</tr>
<tr>
<td>Dr. Haim Russo*</td>
<td>Israel</td>
</tr>
<tr>
<td>Prof Alexei Taichenachev</td>
<td>Russia</td>
</tr>
<tr>
<td>Prof Jakub Zakrzewski</td>
<td>Poland</td>
</tr>
<tr>
<td>Prof Mourad Zghal</td>
<td>Tunisia</td>
</tr>
</tbody>
</table>

Present Vice Presidents eligible for a second term are:

<table>
<thead>
<tr>
<th>Candidate</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Franz Höller*</td>
<td>Germany</td>
</tr>
<tr>
<td>Prof Humberto Michinel</td>
<td>Spain</td>
</tr>
<tr>
<td>Prof Roberta Ramponi</td>
<td>Italy</td>
</tr>
</tbody>
</table>

**Past President:** The position of Past President for the term 2014-2017 will be automatically assumed by the current President, Duncan T. Moore (USA). 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 in Santiago de Compostela. 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 26, 2014 while the second and final ICO General Assembly is scheduled for 4:30 PM-7:30 PM hours, August 28, 2014. Additionally, during the immediate future the Nominating Committee will be
collecting 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.

**U. Gibson** asked if endorsements are required.

**M. L. Calvo** answered that they are not required, they are only open official declarations.

**D. Moore** mentioned that endorsements are useful because they mean something when the process of election is evolving.

### 8. Committees reports, except nomination & prizes & awards

#### 8a) Committee for the Regional Development of Optics (CREDO) (Prepared by Tomasz Szoplik, Chair, and presented by Z. Ben Lakhdar)

**Members of the Committee:**

- Gert von Bally, University of Münster, Germany
- Zohra Ben Lakhdar, University of Tunis El Manar, Tunisia
- Ari Friberg, Aalto University, Finland
- Min Gu, Swinburne University of Technology, Melbourne, Australia
- Angela Guzman (ICO Secretary - ex officio), University of Central Florida, Orlando, USA
- Nataliya D. Kundikova, South Ural State University, Chelyabinsk, Russia
- Carmiña Londoño, National Science Foundation, Washington D.C., USA
- John Love, Australian National University, Canberra, Australia
- Fernando Mendoza Santoyo, Centro de Investigaciones en Optica, León, Mexico
- Duncan Moore (ICO President - ex officio), University of Rochester, USA
- Ekmel Ozbay, Bilkent University, Ankara, Turkey
- Tomasz Szoplik (ICO CREDO chair), University of Warsaw, Poland
- Ahmadou Wagué, Université Cheikh Anta Diop de Dakar, Senegal
- Bingkun Zhou, Tsinghua University, Beijing, China

**Action 1. Stimulation of scientific contacts between Australian and European universities** (Period September 1011-December 2012).

Australian National University in Canberra applied to join European Cooperation in Science and Technology (COST) Action MP0803 - Plasmonic components and devices. The Action had 21 European partners and 3 partners from non-COST countries: Institute of Semiconductor Physics of NAS of Ukraine, School of

The process was initiated by Kylie Catchpole and supported by Ilya Shavdrivolov both from ANU. It was endorsed by Alexandre Dmitriev from Chalmers University in Sweden, MP0803 coordinator.

The procedure of granting the membership of COST to the non-COST country institution has been interrupted by termination of Action 0803 in December 2012.


In collaboration with Alexander Quandt from University of Witwatersrand in Johannesburg, South Africa, a visit of Robert Warmbier to 3 European partners in COST Actions MP0702 and MP0803 was organized. The trip was sponsored by the University of Witwatersrand.

The first visit was to the University of Warsaw, Faculty of Physics, with Tomasz Szoplik as a host. At a workshop organized on May 10th, 2012:

- Robert Warmbier, University of Witwatersrand, gave a talk on “Computational Plasmonics for Complex Dielectric Materials”.
- Mohammed M. Shabat, Vice President of the Islamic University of Gaza, Gaza Strip, Palestinian Authority, gave talks on “Nonlinear metamaterials waveguide sensors” and on „Education and research in Palestine”.
- In the audience, there were members of photonics/plasmonics community from several research institutions in Warsaw.
- The second visit on May 21st was to the Technical University of Denmark, Department of Photonics Engineering, Copenhagen, with Andrei Lavrinenko as a host.
- Robert Warmbier gave a talk on „Computational Plasmonics for Complex Dielectric Materials”.
- a meeting on applications of EELS (electron energy loss spectroscopy) technique to characterization of plasmonic structures was organized, where plans of future collaboration were accepted.
- The third visit was to Bionanophotonics Laboratory at Applied Physics Dept., Chalmers University of Technology in Göteborg, Sweden, with Alexandre Dmitriev as a host. Two possible direction of collaboration were discussed:
  - photovoltaics and
  - the application of ab initio methods developed in South African group to Swedish nanoplasmonics projects. Target: combination of ferromagnetic and plasmonic materials.

Result: Contacts of Alexander Quandt and his group (University of Witwatersrand in Johannesburg) with partners of COST Action MP0702 continue. At present, the closest collaboration is with the group of Maurizio Ferrari, Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche, Trento, Italy.
**Action 3. Stimulation of scientific contacts between Ukraine and universities in Europe and USA.**

On September 10-12, 2012,

Prof Oleg V. Angelsky, the director of Correlation Optics Department at Chernivtsi University, Ukraine, co-organized celebration of the 50th anniversary of Optics in Chernivtsi University.

Polish and Ukrainian optics communities decided to commemorate Prof Wojciech Rubinowicz (1889-1974) world-known physicist and optician who was born in Bukovina and was many years affiliated in Chernivtsi University. The bronze memorial plaque was unveiled by Dr. Barbara Rubinowicz, the granddaughter.

Prof Oleg V. Angelsky organizes a series of conferences "Correlation Optics" held in Chernivtsi under the aegis of EOS, ICO, OSA, and SPIE.

- The 11th International Conf. on Correlation Optics held 18-21 September 2013, had the status of an ‘ICO Cosponsored Meeting’ and was supported by US $1,000 ICO grant to assist the participation of students and young highly deserving scientists from developing areas.
- Three ICO CREDO representatives were on the International Programme Committee: Gert von Bally, Min Gu and Tomasz Szoplik.
- The conference program has included 38 invited talks, 33 regular orals, 116 posters, and 7 Invited lectures for SPIE/OSA Student Chapters members. The reports were presented by about 120 researchers from 23 countries in 5 continents: Australia, Canada, China, Czech Republic, Denmark, France, Germany, India, Iran, Italy, Japan, Lithuania, Mexico, Poland, Republic of South Africa, Romania, Russia, South Korea, UK, Ukraine and USA.
- A series of selected papers reflecting recent progress of correlation optics and showing the trend from micro-optics to nano-optics was published in Applied Optics 10th issue of 53rd volume (2014).

**Action 4. The First African Summer School on Optics and Applications to Sustainable Development was held in Carthage**, Tunisia on 1-10 September 2013.

- The School was supported by US $1,500 ICO grant to fully support students’ participation. The ICO Bureau was represented by Zohra Ben Lakhdar.
- Two CREDO members gave important contributions to organization of the School: Prof Zohra Ben Lakhdar (Tunis El Manar University, Tunisia) and Prof Ahmadou Wagué (Université Cheikh Anta Diop de Dakar).
- Both gave invited talks: Zohra Ben Lakhdar on ‘ICO activities” and Ahmadou Wagué on „Laser spectroscopy and applications.”

**Action 5. In 2012-2015, the University of Zilina, Slovakia, under the 7th Framework Programme of the EU realizes a project “The support of quality improvement of universities and the Slovak Academy of Science” (2012-2015).**

Professor Milan Dado, the dean of the Faculty of Electrical Engineering, University of Zilina, who is responsible for the task „Improving the competitiveness of technical
curricula reflecting the current needs of business practice” has organized a series of tutorials given by experts invited from several European countries.

On October 14-18th, 2013, Tomasz Szoplik (University of Warsaw) gave 10 hours tutorial on „Plasmonics and its applications.”

On October 16-18th, 2013, Marian Marciniak (National Institute of Telecommunications, Warsaw) gave 10 hours tutorial on „Optical communication and data transmission”

8b) Education Committee (Zohra Ben Lakhdar, Chair)

As reported by T. Szoplik “The First African Summer School on Optics and Applications to Sustainable Development” was held in Carthage, Tunisia on 1-10 September 2013. It was attended by students from many African countries. The organizers hope to start a series in other countries: Next one will be held in South Africa, and will include laboratory activities in Optics. The organizers are trying to prepare kits for kids with engineering students. Until now they have neither applied for financing nor involved other associations due to the instability in the region. R. Ramponi and M. Yzuel attended.

R. Ramponi mentioned that the School was a remarkable success for the students. They presented posters and there was a Prize for the posters. She appreciated how much students were committed to the work. Students from Europe, in particular from CERN, attended. She also remarked that there are already some kits available.

A. Wagué added that social activities for the students were a real success.

A. Guzmán asked the Chair of the Committee to send the information to the ICO Secretariat and to apply for ICO endorsement or co-sponsorship. These activities are not identified as ICO activities unless a formal application be sent and approved by the ICO Bureau.

8c) Traveling Lecturer Committee (James Harrington, Chair)

The travelling lecture award is designed to provide financial assistance to those scientists and engineers who wish to travel to give a series of lectures on topics in the optical sciences. Most often these 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."

During this three-year period, we have provided five awards. Each awardee was given a grant of $1,000 to help defray travel expenses. The travel grants were given to:

1. Prof Vadim Parfenov, Associate Professor, St. Petersburg State Electrotechnical University, Russia.
Host university: Dr. Luis Ponce, Instituto Politécnico Nacional CICATA-IPN, Unidad Altamira, Carretera Tampico-Puerto Industrial Altamira, Tamps. C.P.89600, Mexico. April 2012

2. **Dr. Annette Ladstätter-Weissenmayer**, Institute of Environmental Physics, University of Bremen, Germany.

Host university: Prof Carlos Rudamas, Escuela de Física, Facultad de Ciencias Naturales y Matemática, Universidad de El Salvador, El Salvador, Central America. April 2012

3. **Dr. Cesar Costa Vera**, Escuela Politécnica Nacional, Department of Physics, Quito, Ecuador.

Host university: Manuel Filipe P. C. M. Costa, Universidade do Minho, Departamento de Física, Campus de Gualtar, 4710-057 Braga, Portugal. July 2013

4. **Prof Jyoti Mazumder**, Robert H. Lurie Professor of Mechanical Engineering & Materials Science and Engineering at the Univ. of Michigan

Host university: Prof Anand Asundi, Director of the Centre for Optical and Laser Engineering, School of Mechanical and Aerospace Eng. Nanyang Technological University, Singapore. April 2013

5. **Dr. Humberto Michinel-Alvarez**, Optics Lab, University of Vigo, Vigo, Spain.

Host university: Prof Ahmadou Wagué, Université Cheikh Anta Diop, Dakar, Senegal. January 2014. A photograph of Dr. Michinel-Alvarez working with students in Senegal illustrates how well our visiting lecturers interact with students and faculty in the host institution.

As a reminder, we welcome new applicants for our travelling lecture awards. The approximate total allocation for these awards is $5,000 for a three-year period. Many applications are intended to attend a meeting and must be rejected by the ICO bylaws. The ICO could have more of the rightful applications.

**9. Reports of liaisons with Member Societies & ICTP**

**9a) International Societies (ICO Bureau members)**

SPIE: Referred to its report available in the ICO23 Green Book.

OSA: Referred to its report available in the ICO23 Green Book. Reaffirmed its will to cooperate with ICO and considers that the ICO provides great means for contacting with other societies. The OSA has been financing speakers for several ICO activities and will continue doing so.

IEEE Photonics Society: No report.

OWLS: During the period 2011-2014 OWLS held OWLS 2012 in Genoa, the most attended until now, when A. Diaspro was OWLS President. The next meeting, OWLS
2014, will be held in Mingo, China. The new President of OWLS is Steven Morgan, who will represent OWLS in the ICO. OWLS 2016 will be held in Mumbai, India co-located with a meeting of the Indian Society of Optics and Spectroscopy. And OWLS 2018 will be held in Perth, Australia.

**LAM Network:** The 10th LAM international workshop has a large representation of African countries. Many international optical societies like OSA, SPIE and OWLS were also represented. Invited speakers were Prof Toyohiko Yatagai and Andrew Forbes. ICO had a lecturer from the international science program in Sweden. The Network has established a committee for the IYL, and will make a preliminary launching of the African Optics and Photonics society during the IYL. It involves the main optical societies of Africa, namely those of Morocco, Kenya, Egypt, South Africa, the LAM Network and the African Laser Center.

**D. Moore** summarized the list of target organizations and countries: Tunisia, South Africa, Morocco (2 organizations), Egypt, Kenya, Ethiopia, Uganda and the African Laser Center. A. Wagué mentioned that they have also invited Nigeria, Cameroon and Rwanda in the West Africa territory. Germany is very supportive of Rwanda. The plan is to a lick off meeting in 2015. The date has not been decided and they plan to organize a preliminary meeting with SPIE and Suni and Katherina Svanberg. But they lack financing.

**EOS:** R. Ramponi reported that EOS went through a reorganization. EOS wants to strengthen links with industry and education. It will hold and industrial meeting and set up student programs, and look for industrial financing of its activities. It will also strengthen its connections with other societies in Asia, like the Chinese Optical Society and the Japanese Society, and members of the US based societies. By the middle of September, they will hold a summer school within the new attitude, to help students follow with lectures.

**9b) TSOSA Advisory Group (Angela Guzman, ICO Representative and Chair of TSOSA) (5 minutes)**

Already presented as part of the ICO Secretary report.

**10. Report of the recommendations of the Strategic Planning Committee (SPC).**

**(Duncan Moore, ICO President and Chair)**

D. Moore reported on the agreements of the SPC. There were three main recommendations to the ICO Bureau:

1. About ICO Financial model: as directed by the ICO GA 2011, the SPC discussed a reassignment of units and votes. Using any development and science indicators, the USA will result on paying more money. **The SPC recommended to the ICO GA to adopt the blue column of the table in Appendix 4 until the GA in 2020.** Probably by then there will be a change in the ICO statutes. The Article 4 of the statutes establishes the official number of delegates corresponding to a number of shares. But the number of shares can be modified by the GA without a change in the ICO statutes. There will be a transition period.
2. The idea of becoming and ICSU member is probably one that we want to analyze more. Pierre Chavel was invited by the French Optical Society (SFO) to talk about ICO. He reported that the Academy of France pays the membership fees only for ICSU members, in particular for ICSU Unions. Therefore, France is supportive of the idea of ICO becoming an ICSU Union. The SPC recommended to the ICO GA to direct the ICO Bureau to apply to ICSU to become an ICSU Union. If the application is approved, the decision of becoming an ICSU Union will be then confirmed by the ICO GA.

3. The SPC recommended to the ICO GA to create an Ethics Committee. Financial model: units and votes: USA to pay more money.

**Motion 6:** To recommend to the ICO GA to approve a reassignment of shares as listed in the blue column of the table in Appendix 4, with a phasing period. Moved by D. Moore, seconded by A. Guzmán. Approved unanimously.

**Motion 7:** To recommend to the ICO GA to direct the ICO Bureau to apply to ICSU to become an ICSU Union. Moved by D. Moore, seconded by A. Guzmán. Approved unanimously.

11. Presentation of RIAO (Pedro Andres Bou)

The *Red Iberoamericana de Óptica* (Ibero-American Network on Optics), RIAO, is a relatively young, not-for-profit supranational optical network that has as its primary focus the strengthening of research and collaboration among researchers, teachers, students, and technicians working on optics, photonics, and related areas in the Ibero-American region. We certainly believe that the RIAO plays a very active role on promoting optics education and research in the Ibero-American area, thereby contributing also to the final mission of the ICO.

The network is then organized as a set of Ibero-American, territorial organizations on Optics. According to the RIAO Constitution and Bylaws, the RIAO is governed by its Council, which is composed by the President, the Secretary, and a representative from every country of the region. The designation of each national RIAO officer is responsibility of the national optical associations already integrated to the RIAO and is done according to the internal procedures stated by their respective communities. The current RIAO Council officers are Dr. Pedro Andrés, RIAO President, Dr. Efraín Solarte, RIAO Secretary, Dr. Luciano Ángel for Colombia, Dr. Juan G. Darias for Cuba, Dr. Andrés Márquez for Spain, Dr. Raúl Rangel for Mexico, Dr. Manuel F. Costa for Portugal, and Dr. José L. Paz for Venezuela.

In relation with this organization, two major events happened in 2013. First, last July 25, 2013 there was a change in the presidency of RIAO. Dr. Eric Rosas, *ad hoc* President of the RIAO since its inception in 2008, handed the responsibility to Dr. Pedro Andrés, which was elected in advance for the period 2013-2016 according to the RIAO by-laws. Dr. Andrés is full professor of Optics since 1994 at the University of Valencia, Spain. In his inaugural address at the RIAO General Assembly, Prof Andrés...
emphasized that there are many potential benefits from a solid Ibero-American network, as the organization of supranational Workshops, Conferences and Summer schools, the exchange of teaching and research experiences, the broadening of Ibero-American networking, the promotion of friendly and effective collaboration among our whole community, and, maybe the most importantly, to have a single voice towards the rest of the worldwide optics.

On the other hand, the VIII Reunión Iberoamericana de Óptica / XI Encuentro Latinoamericano de Óptica, Láseres y Aplicaciones, RIAO/Optilas 2013, was organized July 22 to 26, 2013, at the University of Porto in Portugal and chaired by Prof Manuel F. Costa, at the time President of the Sociedade Portuguesa para a Investigação e Desenvolvimento em Óptica e Fotónica, SPOF. RIAO/Optilas is the classical and reference meeting of the Ibero-American Optics community and, by extension, of the RIAO. 441 participants from 39 countries from all over Ibero-America and the rest of the World attended the Conference. The success of the conference was only possible with the active support, endorsement, and commitment of several Ibero-American national societies and major optical institutions, together with the most important international scientific societies of Optics, including the ICO. The participation of many students and young researchers was very positive and a good sign of the potential growth of the Ibero-American Optics and Photonics research in the near future. It is also noteworthy that the 12th Education and Training in Optics and Photonics Conference, ETOP 2013, was successfully organized in parallel and in an articulated way with RIAO/Optilas 2013.

RIAO activities have increased significantly in recent years. Specifically, only in the past two years RIAO has endorsed and promoted several national meetings and conferences in the region, the 2012 and 2013 Mexican Optics and Photonics Meeting, MOPM 2012 and MOPM 2103, respectively, the XXV and XXVI Reunión Anual de Óptica (the Academia Mexicana de Óptica and the División de Óptica of the Sociedad Mexicana de Física joint meeting), RAO 2012 and RAO 2013, respectively, the XIII Encuentro Nacional de Óptica / IV Conferencia Andina y del Caribe en Óptica y sus Aplicaciones (Colombian National Meeting in Optics / Andean and Caribbean Conference in Optics and its Applications), ENO-CANCOA 2013, the X Reunión Nacional de Óptica (Spanish National Meeting in Optics), X RNO 2012, the II International Conference on Applications of Optics and Photonics, AOP 2014, in Aveiro, Portugal, inter alia, together with other international events held in the region as the 2012 First ICO/ICTP/TWAS Central American Workshop on Lasers, Laser Applications and Laser Safety Regulations, and the 2014 ICTP/ICO/MCTP College on Optics and Energy. RIAO will maintain this kind of actions in the next future expanding it to other Ibero-American territories. In addition, it is becoming more and more common that the benefits that have the members of a national society integrated in the RIAO (e.g., fee reduction, participation in regional prizes and awards, etc.) are extended to the individuals of the rest of affiliated societies.

RIAO has placed special emphasis on the engagement of the whole Ibero-American region with RIAO. This action requires a constructive exchange of ideas and dialog
with the existing regional optical societies or even the promotion of new ones in those countries without a specific scientific association. In this sense, we point out that positive advances have recently been made with Argentina and Chile and some exploratory or preliminary discussions have been held with representatives of Panama, Peru, Ecuador, and Brazil. The RIAO/Optilas 2016 in Chile is a step in this direction. By the way, the first meeting of the Organizing Committee of RIAO/Optilas 2016 was carried out in June 2014 at the University of Concepcion, Chile, with the participation of the RIAO President.

RIAO is in the process of changing the name, and modifying its bylaws on international representation.

U. Gibson stated that in this case there is a pool if national societies that want to have a voice in the table.

R. Ramponi mentioned that the ICO Bureau suggestion for a name change had been taken in consideration.

M. Yzuel: The recommendation of ICO was motivated by the observation of members of the Iberian American community that to use the same name for the network and the main Iberian American Conference (RIAO/OPTILAS) was confusing.

F. Höller asked about the equilibrium between appointed and elected Bureau members, taking in account that the ICO is a member driven organization.

A. Guzmán answered that the bylaws foresaw a maximum of 8 ICO VPs appointed by member societies. If more than 8 societies join the ICO, they will have to decide who their 8 VPs are.

**Motion 8:** To recommend to the ICO GA that the Network of Societies for Optics and Photonics of Iberian America (currently known as RIAO) becomes an ICO International Society Member. Moved by R. Ramponi, seconded by T. Szoplik. Approved unanimously.

### 11. Liaisons to ICSU and IUPAP

**11a) ICSU links (María L. Calvo)**

ICO can participate in the ICSU general assembly. When she was involved as ICO representative, she talked in Rome. Next ICSU General Assembly is taking place in Auckland. Australia. D. Moore will be attending.

**11b) IUPAP links**

C13: A. Wagué reported that the commission was going to have a meeting in Trieste on August 30th. The 28th General Assembly of IUPAP will be held at the Nanyang Technological University in Singapore from 5–7 November 2014.
C15: A. Guzmán: She has lost connection, since the committee should accept ICO representative officially.

C17: Y. Arakawa: He is in the same situation.

**Action 1:** The ICO Secretariat: To send an official letter to each committee and the IUPAP asking for official representation of ICO in C13, C15, and C17.

12. ICO Prize and Awards Committees

12a) ICO Prize Committee (Roberta Ramponi, Chair)

**Committee members (2012-2014):**

Roberta Ramponi (Chair, ICO VP), Yasuhiko Arakawa (ICO VP), Zohra Ben-Lakhdar (ICO VP), Yujie Ding (ICO VP), Fernando Mendoza Santoyo (not ICO bureau member), Maria J. Yzuel (ICO VP), Bingkun Zhou (ICO VP)

There were no new applications in 2014. We need more communication and advertising to get more nominations.

The ICO Prize Committee recommended to award the ICO Prize 2014 to **Martin James Booth** “for his innovative and pioneering research on dynamic optical methods and new approaches to adaptive optics.”

Dr. Booth 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 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 commercialisation 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.

12b) ICO/ICTP Award Committee (Ahmadou Wagué, Chair)

The winners were John Fredy Barrera Ramírez, Associate Professor at the University of Antioquia (Medellín, Colombia) “for his breakthrough contributions to the field of Optical Encryption and its potential applications, as well as his promotion of research and training in optics in Colombia, and dedication to public outreach” and from María Florencia Pascual-Winter, a permanent researcher of the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina, “for her creative theoretical and experimental investigation of original schemes for coherent coupling of optical and microwave interactions in quantum memories for light, and for her commitment to the expansion of the scope of scientific collaboration between diverse research groups.”

Every time the nominations arrive at the last moment. There were new nominations.
12c) Galileo Galilei Award Committee (Bingkun Zhou, Chair)

The evaluation of the 2014 ICO Galileo Galilei Award was ended on June 30, 2014. Z. Bingkun presented the ranking summary table, which includes ranking tables from 9 ICO Galileo Galilei Award Committee members. There was a discussion about the meaning of “under unfavorable circumstances”. The Committee recommended to the ICO Bureau that the ICO Galileo Galilei Award 2014 be awarded to Professor Chandra Shakher from India "for outstanding contributions to the field of holographic and speckle metrology, which were achieved under comparatively unfavorable circumstances”.

12d) IUPAP Young Scientist’s Committee (Moshe Oron, Chair)

There are four candidates and the committee is in the process of selection.

Motion 9: The ICO Bureau approves that the ICO Prize 2014 be awarded to Prof. Martin Booth, University of Oxford, UK, “for his innovative and pioneering research on dynamic optical methods and new approaches to adaptive optics”. Moved by R. Ramponi, seconded by U. Gibson, approved unanimously.

Motion 10: The ICO Bureau approves that the ICO Galileo Galilei Award 2014 be awarded to Professor Chandra Shakher form India with the following citation: "For outstanding contributions to the field of holographic and speckle metrology, which were achieved under comparatively unfavorable circumstances." Moved by Z. Bingkun, seconded by M. Oron, approved unanimously.

13. ICO participation in meetings and schools

13a) Report on Meetings sponsored during the period July 2013- Sept. 2014, and triennial report 2011-2014 (Gert von Bally, ICO Associate Secretary)

The full report on Meetings during the period 2011-2014 appeared in the ICO 23 Green Book. Recent applications need approval of the Bureau. A meeting in Argentina, the Correlation Optics meeting in Chernivtsi, which in this case is co-located with a conference usually organized by M. Suskind in Crimea. 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 2015, none of the proposed meetings qualifies as Topical Meeting. Germany has applied to hold an ICO Topical Meeting in 2016 at the castle of Hanover.

F. Höller mentioned that the conference in Hanover is a great opportunity to invite all members of the ICO Bureau. They had a membership survey in the German Society. One of the questions was “What societies do you know?” ICO was not known. Therefore, he considered to make a join meeting DFG and ICO in a great location.

D. Moore mentioned that ICO should consider holding a Topical meeting in 2016 in Rochester on occasion of the 100th anniversary of the OSA. He would like to propose Rochester as the host for the ICO Bureau Meeting in 2016.
In 2012 the ICO had two topical meetings, one in China and one in Genoa.

13b) Preparation of ICO XXIII (Humberto Michinel)

Report on the organization of ICO 23.

13c) ETOP 2015 (Angela Guzmán)

ETOP will be held on June 29- July 2, 2015 in Bordeaux. It will be organized by SPIE. The topics will be:

- 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 laboratories
- Training and continuing education
- Industry needs driven curriculum development
- Education and training for multidisciplinary education
- International cooperation and co-development in education and training
- Metric and evaluation of education and training


J. Harrington mentioned that the largest ETOP was held in Porto. Before that one the largest was in Tucson in 2003. Collocating the conference with another meeting seems to be appropriate. This time maybe co-locates with another meeting PYLA, a cluster activity for Photonics 21 in Aquitania.

U. Gibson recommended to merge other conferences.

13e) Bid for ICO XXIV (Yasuhiko Arakawa)

Presentation. The ICO 24 will be co-located with the MOC of the OSJ.

D. Moore recommended to include some courses and parallel student activities.

Motion 11: To approve $1500 for the meeting “Discussions on Nano and Mesoscopic Optics (DINAMO-2015)”, El Chalten, Argentina. Moved by G. von Bally, seconded by J. Harrington, approved unanimously.

Motion 12: To approve $1500 ICO support for the 12th International Conference on Correlation Optics, Chernivtsi, Ukraine, 2015. Moved by G. von Bally, seconded by F. Höller, approved unanimously.

Motion 13: To give financial support in amount of $2000 to the DFaG conference in Germany. Moved by J. Harrington, seconded by U. Gibson, approved unanimously.

15. Discussion on ICO activities for the YoL.

Suggestions:

D. Moore: Gathering of YouTube videos.

A. Guzman: Series on life of scientists in the ICO webpage and/or a Youth competition in collaboration with UNESCO consisting perhaps of essays by secondary school students.

J. Niemela: There is the need to have national contact points. The national Committees will organize themselves. People should contact the IYL secretariat and submit request to post information into the site. The lighting industry has been very active and has largely sponsored the IYL 2015. Other active sectors are Astronomy and artists.

D. Moore suggested to address graduate students educated in developed countries working in other.

M. Yzuel: The IYL should emphasize the role of women in science. L’OREAL has an award for women in science with UNESCO. She was in the committee for grants selection. She recommended to look for possible contributions with L’Oreal. Members of the Spanish Committee tried to introduce representatives of cluster companies like Phillips lighting. She recommended also to contact people in the parliaments, to declare the year of public interest in each country, and attract the industries.

D. Moore: Since the ICO budget is $50000, it is not possible to pay $25000 to the IYL common fund to become a founding member. ICO should have been an international Union of ICSU. He suggested to offer $12500 plus other activities in support of the IYL to become a founding member.

J. Niemela mentioned that since the IYL must be self-funded, they sold the partnership in 2014. To pay only half would be a different model. There is one day when children can be connected, connect a project over the world. Light connecting children in the world, and learn how they share. The UN says it is a scientific year to advocate for education, bolstering women in science. The main page will be in English.

D. Moore asked for the type of exhibits that the museums are preparing, and suggested to take the IYL as an opportunity to set lasting things and hands-on activities.
G. von Bally recommended to connect the museums.

M. Oron reported of an exhibition with 500 telescopes in Haifa.

J. Niemela informed that there will be and ALOP in INDONESIA, with a Women chair, who is promising to have 30% teacher participants. The ALOP manual has been translated into French (officially), Spanish and Arabic. They are planning to have many global activities but the important issue is what will be left after the IYL. They intend to bring light to remote areas, and for that they need collaboration with industries. Grandmothers in Africa are learning how to collect light for having light at night. Phillips lighting is going in a tour of Africa. Senegal would be a very good place for start.

M. Yzuel recommended to promote the IYL in the ICO Conferences.

R. Ramponi suggested to have places for orienting the general public about activities to the IYL. A first large event sponsored by the European Union will have two events for young students with education kits. Photonic explorer costs 150 euros each and will provide training for the teachers. She suggested that local governments buy 10 kits. Part of the OSA donation could be for donating kits to Africa. The IYL Secretariat will have to work to get a way to distribute them. The OSA kits can also be bought.

Z. Ben Lakhdar stated that ALOP is a training program. A kit without training has no meaning.

D. Moore asked who would be interested on talking during the week with people and to come back to the second Bureau Meeting and create a committee to go forward.

M L. Calvo asked to report to the GA that we need young people to work. New people.

Z. Ben Lakhdar stated that a revolution on the thinking of people has been brought by light. She suggested to dedicate one day a week to put in the ICO webpage the announcement of a conference. One conference per week, for example by the college of France etc…

16. Other business (All)

G. von Bally suggested the creation of an ethics committee to consider cases of people endangered in their freedom of science. Create a group and a structure within ICO that develops procedures for the cases like Kokabee’s. In order to be prepared for the Bureau Meeting in Tokyo he had the intention to organize a committee for International affairs, and later to present it to the GA to be included in the ICO Bylaws.

Motion 16: In order to be prepared to give support to colleagues of the optics community who are endangered and/or hindered in their free circulation as scientists and engineers, ICO establishes a committee for International Affairs. Moved by Gert von Bally. Not seconded.
M. Yzuel considered that the discussion of cases like Kokabee’s has to go through the Bureau, who has the responsibility. The discussion arose due to the diversity of the countries. We did not arrive to a conclusion. A committee is to investigate if the news are true or how to act. But the Bureau has to take the decision. She suggested to define the committee as a committee for ethics, since the wider topic of International Affairs is hard.

J. Harrington suggested to set up an ad-hoc committee. The Kokabee’s case was indeed unusual.

G. von Bally mentioned that the visa problems are another relevant issue.

D. Moore mentioned that in the case of Kokabee’s, the ICO President was American, then a committee could have signed instead of the ICO President.

G. von Bally stated that we do not have a contact point for this type of cases.

D. Moore answered that the President should be the contact.

M. Yzuel mentioned that colleagues in Iran are having problems for publishing in journals. The idea is a committee that brings the information to the Bureau.

G. von Bally recalled that in the mentioned case, everybody who was motivated did his or her own work, but without coordination.

Z. Ben Lakhdar put the following example: suppose that you are not attacked directly, but your children will be taken. What could be the help of the science community?

G. von Bally answered that we are not prepared for a response.

T. Szoplik agreed with the idea of creating a committee but considered the name to be vague.

U. Gibson understood the proposal as an incident response team. But her sense was that the ICO might want to have a committee where we study things that have happened and come out with procedures that might have been done. What can we do, what can we say? The OSA proposal was delayed because of lacking a set of guidelines to say what to do for response. We need to set them.

D. Moore recommended to decide if such a mechanism should be put in place and if should be ad hoc or permanent. He took a trial vote for some kind of mechanism not yet defined to be able to respond to this type of incidents.

Y. Arakawa asked if there was the need to change the bylaws, in which case it should respond to a study.

U. Gibson asked if there was something in the bylaws that says that ICO has to be supportive of colleagues.

D. Moore recommended to work on it during the next 3 years.
The Bureau did not vote on the motion but notice that the new President would have the possibility to have and ad hoc committee. G. von Bally considered that the next chair of CREDO could advice how to react in the region, a colleague from Poland who works for Amnesty International.

**Appendix 1**

**Performance Budget***

For period 10/1/2011 - 9/30/2014

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**Expenses**

| Secretariat                          | $4,526 | $7,457   | $5,517   | $17,500      | $20,000     |
| Newsletter - copyediting             | $250   | $1,248   | $525     | $2,023       | $4,000      |
| Newsletter - printing & distribution | $4,329 | $2,379   | $2,465   | $9,173       | $12,000     |
| Printing & distribution - Green Book*| -------| -------   | $4,000   | $4,000       | $4,000      |
| Bureau expenses                      | $1,908 | $1,903   | -------  | $3,811       | $3,000      |
| ICO prizes + travel                  | $5,650 | $8,000   | $4,000   | $17,650      | $15,000     |
| Conference support                   | $9,300 | $12,000  | $9,000   | $30,300      | $30,000     |
| ICTP school support                  | $5,000 | $5,000   | $5,000   | $15,000      | $15,000     |
| ICO-23 Santiago, Spain               | -------| -------   | $7,500   | $7,500       | $7,500      |
| Traveling lecture awards             | $2,000 | $2,000   | $1,000   | $5,000       | $5,000      |
| Reserves or new projects             | -------| -------   | -------  |             | $2,000      |
| ICSU dues                            | $750   | $750     | $687     | $2,187       | $2,100      |
| **Total Expenses**                   | $33,713| $38,834  | $41,597  | $114,144     | $119,600    |

**Surplus/(Deficit) for 3 year period**

$9,038 ($7,475)

*Preliminary as of 1 July 2014

In Appendix 2, the Balance Sheet for this past year from 1 October 2013 to 1 July 2014 is given. It is interesting to look at the retained earnings now compared to those of approximately $161,963 presented at ICO-22. In general, this is a reflection of better than anticipated dues collection, the reduction of dues in arrears, and lower expenses.
The final appendix includes for comparison the budgets for this triennium as well as a proposed budget for the next 2014-2017 triennium.
## Appendix 3

### Budget*

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### Expenses

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**Surplus/(Deficit) for 3 year period**

| Surplus/(Deficit) for 3 year period | $9,038           | ($7,475)          | $725               |

*As of 1 July 2104
## Appendix 4: Proposal for reassignment of ICO dues for Territorial Committees

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Minutes approved by the ICO Bureau, June 28, 2015.
Minutes of the 2014 joint meeting of the old and new Bureaus

Santiago de Compostela, Spain
Friday, August 29, 2014. 3:00 AM – 5:00 PM. Santiago de Compostela, Spain
Hotel San Francisco Monumento


Apologies for absence have been received from Y. J. Ding, A. Diaspro, H. P. Herzig, T. Szoplik, Z. Ben Lakhdar, P. Urbach

1. Call to order, introduction (Duncan T. Moore)

D. Moore welcomed all ICO Bureau Members, current and elected and opened the session. He thanked H. Michinel, Chair of ICO-23, and all the organizers of the ICO 23 Conference for having hosted all of us in Santiago de Compostela. He also thanked the members of the Bureau 2011-2014 for their work; he thanked all members who are leaving the Bureau because their term ended. He congratulated all incoming elected and appointed ICO Vice Presidents. The term of the new Bureau will start on October 1st, 2014.

D. Moore hands over to DY. Arakawa, elected President.


Y. Arakawa welcomed the new ICO Bureau members. Since the ICO Treasurer, J. Harrington, was re-elected, no changes in ICO bank Accounts are required, except for the signature of the elected President. The President Elect proposed the Chairs of the ICO Committees as follows:

Nominating Committee: Duncan T. Moore
Long Range Planning Committee: Yasuhiko Arakawa
Committee for Regional Development: John Harvey
Education Committee: Jakub Zakrzewski
ICO Prize Committee: Roberta Ramponi
IUPAP Young Scientist Prize in Optics: Frank Holler
ICO/ICTP Award: Mourad Zghal
Galileo Galilei Award: Ursula Gibson, Maria Yzuel
Traveling Lecture: Seung Han Park, J. Harrington
Chair of ICO 24: Yasuhiko Arakawa

The ICO President declared that he will create an ad hoc Committee on international Affairs (2014-2017) chaired by G. von Bally, and a second ad hoc Committee on the
International Year of Light 2015, chaired by J. Niemela and D. Moore. He also will continue with an ad-hoc Strategic Planning Committee (2014-2017), which he will chair, and will include the 5 members of the Long-Range Planning Committee plus 5 non ICO Bureau members, one of them a young person, if possible one of the ICO award winners. He asked the ICO Bureau members (current and elected) to send him recommendations the next week.

The ICO Bureau members (2014-2017) were kindly asked to offer themselves to be members of the Committee of their preference, and the ICO Bureau members Chairs were asked to decide the structure of their committees and to communicate their decision to the ICO Secretariat.

**Action 1:** The Members of the ICO Bureau (2014-2017) to contact the Committee Chairs to express their will to join one or more of the ICO Committees.

**Action 2:** The Chairs of the Committees to communicate to the ICO Secretariat, the structure of their Committee.

### 3. ICO Representation External Committees 2014-2017 (President Elect)

IUPAP: Yasuhiko Arakawa  
Liaison to IUPAP Commissions:  
C13 Ahmadou Wagué  
C15 Angela Guzman  
C17 Yasuhiko Arakawa

ICSU  
Duncan Moore  
ETOP  
Maria L. Calvo  
TSOSA  
Angela Guzman  
OiC/IP  
Humberto Michinel

### 4. Date and Place of the next ICO Bureau Meeting – proposals (D. T. Moore)

D. Moore proposed that the next Bureau Meeting be held in Rochester on occasion of the celebration of the 100th anniversary of the OSA. He proposed to hold two Topical meetings in 2016, one in Rochester and one in Hanover, Germany, as discussed and agreed in the first ICO Bureau Meeting 2014.

**Motion 1:** The next Bureau Meeting will take place in Rochester on occasion of the celebration of the 100th anniversary of the OSA. Moved by D. Moore, seconded by Y. Arakawa, approved unanimously.

### 5. ICTP Relations and the YoL2015

As discussed in the first ICO Bureau Meeting 2014, ICO President will send a letter to the Secretariat of the IYL, asking for the possibility if becoming a founding member of the IYL, contributing half of the established amount, and contributing in other ways to the IYL through its own National Territorial Committees.
6. ICO Book Preparation (D. T. Moore)

There will no ICO Book prepared by D. Moore in this period.

Meeting Adjourned at 4:30PM
Minutes Approved, June 28, 2015.

Angela Guzmán, ICO Secretary

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Minutes of the 2015 ICO Bureau Meeting

Sunday, June 28, 2015. 9:00 AM – 5:30 PM.
Ibis Hotel Bordeaux Centre Meriadeck, Bordeaux, France


Apologies from: Jakub Zakrzewski, R. Ramponi, Y. Ding, J. C. Howell, A. Wagué, C. Cisneros, E. Rosas, S. Morgan (delegated OWLS representation into Gert von Bally)

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

ICO President Y. Arakawa, and Chair of the meeting, welcomed the participants and invited them to introduce themselves since this is the first Bureau Meeting after the ICO 23 General Congress. A. Guzmán, ICO Secretary reported on the apologies of ICO Bureau members unable to attend and confirmed the quorum.

The Chair called to order and welcomed all participants, noting the apologies.
2. Adoption of the Agenda (Y. Arakawa, Chair)

ICO President Y. Arakawa asked the members for adoption of the Agenda and the Minutes of the ICO Bureau Meetings 2014 with the comments and corrections recommended by the ICO Bureau members.

**Motion 1.** To approve the agenda. Moved by D. Moore, seconded by J. Harrington. Approved unanimously.

**Motion 2.** To approve the minutes of the 2014 ICO Bureau Meeting and to note the decisions and actions list. Moved by D. Moore, seconded by J. Harrington. Approved unanimously.

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

ICO President Y. Arakawa presented the report of his activities relating to ICO since the last ICO Bureau Meeting in Santiago de Compostela, Spain. He attended the opening ceremony of the International Year of light and light-based technologies (IYL 2015) in Paris, France. The opening talk by Joe Niemela, ICO VP, was mainly of political character, and was very well received by the audience. The whole ceremony was a good mix of arts, scientific talks including several by Nobel Prize winners, exhibitions, etc, with emphasis on scientific policy and the impact of light science and light-based technologies in less developed regions of the world. He wished that the ICO would have held a special meeting or activity at the opening ceremony. UNESCO did not charge registration fee, but most probably will charge a fee for the closing ceremony to be held in Yucatan, Mexico. He also reported that he attended the Japanese opening ceremony of the IYL 2015.

Thereafter he reported on the requirements and strategy for the ICO application to ICSU to become an International ICSU Union. He described the mission and vision of ICSU, the requirements for the application, and his own activities on approaching ICSU officers and representatives from Unions and National Members. He explained that the application should be accompanied by supporting letters from 12 ICSU members. He expects to have the application ready for the next Bureau Meeting.

M. Yzuel congratulates Y. Arakawa for this great effort. She asked for clarification about the required support by 12 ICSU members. D. Moore answered that within the 12 letters required, there should be a minimum of 3 letters of support from Unions and 3 from National members. J. Harvey recommended to identify the Unions and National Members with their contact persons and representatives to ICSU. A. Guzmán asked for Joe Niemela’s support through the application procedure. J. Niemela was concerned about the relationship with the IUPAP. D. Moore recommended not to ask permission to apply to the IUPAP, but rather ask for its endorsement. M. Yzuel suggested to use the IYL for making an appointment with the national representatives.

Regarding the ICO Committees, Y. Arakawa kindly asked the Committee Chairs to decide who are the members of the Committees, and to send the list to the ICO
Secretariat. M. Yzuel has already constituted her Committee. F. Höller will send the list immediately. J. Harvey asked how many members should be in the Committee. Y. Arakawa answered 4 to 5. D. Moore clarified that sometimes the Committees can involve non-Bureau Members and recommended to look for the participation of young people.

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

ICO Secretary A. Guzmán reported on the following topics:

4a) Regular activities of the Secretariat:

- To coordinate logistics for ICO Bureau, Strategic Planning (SPC) and Executive Committee (EXEC) Meetings, and different activities with the Territory hosting the ICO Topical Meeting or ICO General Congress, where ICO Bureau Meetings are held or ICO award ceremonies are organized.
- To prepare the Agendas & Minutes for the ICO Bureau, SPC, EXEC.
- To advertising ICO Prizes and Awards and make the Call for nominations
- To prepare the ICO Seasonal Greetings
- To coordinate the logistics of the ICO award ceremonies. The Carl Zeiss trophy for the ICO Prize, the medal donated by the Italian Society of Optics and Photonics for the Galileo Galilei Awardee, the IUPAP Medal for the IUPAP Young Scientist Award on Optics, and the corresponding Diplomas. To coordinate with the ICTP the ICO/ICTP Gallieno Denardo Award ceremony. And to coordinate with the ICO Treasurer and the IUPAP the transfer of funds corresponding to the cash awards.
- Editor ICO Newsletter (4 issues per year).
- Editor ICO webpage: hosted by GoDaddy
- To update the ICO Calendar of events and the ICO Consolidated calendar of events in optics (currently only EOS adds information)
- To prepare the Minutes of the TSOSA Meeting at the ICTP. Currently the ICO Secretary is also the Chair of the TSOSA Committee.

4b) Ceremonies, Workshops and Schools attended:

- Celebration of the 50th anniversary of the ICTP October 6-9, 2014

4c) Other activities: The ICO Secretary and ICO Past President Maria L. Calvo forged the ICO-ICTP initiative for Central America and the Caribbean intended to hold regional ICO/ICTP Schools. The last was the College on Optics and Energy, Chiapas, Mexico, held in Tuxtla Gutierrez, Chiapas, Mexico at the headquarters of the MCTP (2014). Currently the ICO Secretary is working on the organization of the next event of the series.
4d) The ICO Secretariat is editing a special series in the ICO Newsletter in celebration of the IYL.

4e) The ICO Secretariat has a webmaster, Fernanda Lozada.

4f) The ICO Secretariat recommends acquiring the license for a Project management tool, Smartsheet, for the use of the ICO Bureau and the Secretariat. The cost is approximately $140/year and allows planning activities, working in groups, and sending reminders about deadlines, etc.

4g) The Secretariat posted the Call for the ICO Award for the promotion of Optics and Photonics among young people in the ICO territories. The Secretary received the proposals and sent them to the ICO EXEC members for review. The EXEC recommends the Bureau to award the following Territories: First Prize in amount of $5000 for Spain. Second and third Prizes to Cuba and Italy in amount of $1000 each.

**Motion 3.** To approve paying Smartsheet as a project management tool for the ICO Secretariat and Bureau members. Moved by H. Michinel, seconded by J. Harrington. Approved unanimously.

**Motion 4.** To declare the winners of the ICO Call for the IYL as follows: 1st Prize for Spain: $5000. 2nd Prize for Cuba: $1000. 3rd Prize for Italy: $1000. Moved by D. Moore, seconded by J. Niemela. Approved unanimously.

5. ICO Treasurer's report (James Harrington, ICO Treasurer)

J. Harrington, ICO Treasurer, reports that until date 17 out of 46 TCs have paid their 2015 dues, which corresponds to 37% of ICO members. The currencies used for payment are USD (47%) and Euros (53%). He expects that 29 Territories will pay. In 2014 eleven ICO Territories were demoted to the Associate Status. There are three Territories that might be demoted next: Canada, Denmark and Brazil. A warning letter was sent with the invoice, but there has not been an answer. He thanked Pierre Chavel, who manages the French account.

ICO Treasurer presented a look back to ICO finances.

<table>
<thead>
<tr>
<th>Date</th>
<th>Balance in US $</th>
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<tr>
<td>February, 2005</td>
<td>$160,000</td>
</tr>
<tr>
<td>August, 2006</td>
<td>$137,000</td>
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<tr>
<td>January, 2012</td>
<td>$132,000</td>
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<tr>
<td>October, 2013</td>
<td>$153,000</td>
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<td>July, 2014</td>
<td>$176,700</td>
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### Balance Sheet*
As of June 20, 2015
Bureau Meeting - Bordeaux, France

<table>
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<th>Assets</th>
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<td>Checking/Saving</td>
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<tr>
<td>Bank of America - checking</td>
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<tr>
<td>Bank of America - money market</td>
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<td>French account-checking (1 Euro = 1.127 dollars)</td>
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<td>$20,540</td>
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<td>Total checking/money market</td>
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<td>Accounts receivable</td>
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<tr>
<td>Current year dues collected</td>
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<td>Dues still owed in 2015</td>
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<td>Total accounts receivable</td>
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<tr>
<td>Total assets*</td>
<td>$202,889</td>
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</table>

| Liabilities and equity                      |       |
| Secretariat                                 | $4,600 |
| Newsletter - copyediting                    | $630  |
| Newsletter - printing & distribution        | $4,200 |
| Bureau expenses                             | $1,970 |
| ICO prizes + travel                         | $1,000 |
| Conference support                          | $12,500 |
| ICTP school support                         | $5,000 |
| Traveling lecture awards                    | $1,000 |
| ICSU dues                                   | $540  |
| Total liability                             | $31,440 |

| Equity                                      |       |
| Retained earnings                           | $171,449 |
The ICO in the US is a 501(c)4 organization. US donors can make their donations to the OSA Foundation, to which the ICO can apply for support. The OSA Foundation fund for International activities amounts approximately $23,000. The ICO Congress approved ICO expenses for the IYL up to 22K. The ICO Bureau agreed on creating an award for the promotion of Optics and Photonics among young people in the ICO Territories, with a 1st prize of $5000 and 20 other awards of $1000 each. Less proposals than expected were received. Therefore, only $8k from the $22K were spent.

As of June 2015, the income has been $14800. Planned expenses for 2014-2015 amount $31500, distributed as shown below:

In order to improve finances, the ICO could turn into electronic-only Newsletter since the mailing costs are high. The ICO could also look actively for donations, and press harder to collect fees from its territorial committees.

P. Urbach mentioned that the Netherlands have a new optical society, and he expects that the can work and agreement with J. Harrington. They had the same problem with EOS.

J. Harrington mentioned that Denmark wanted money back from the ICO. Donna Strickland tried to contact Canada. The NRC does not pay for the dues. Therefore, researchers have to pay from their own pocket.

J. Harvey asked how long ago the dues per unit were changed. J. Harrington answered that it was a decision of the General Assembly in Puebla. J. Harvey considers that the problem with New Zealand is that the dues amount is too small. He thinks that the ICO budget could be doubled easily if the fees are increased.

D. Moore confirms that after the National Academy of Science, the ICO dues are the cheapest of all international organizations.

J. Niemela asked what amount is given typically to co-sponsor a conference. J. Harrington answered $1000-$2000, while the requests are usually for $5000.

Motion 5. To approve the 2015-2016 Budget as presented by the ICO Treasurer. Moved by M. Zghal, seconded by J. Harvey. Approved unanimously.

6. Y. Arakawa reports that the Strategic Planning Committee is developing the strategy for seeking the membership to ICSU as a Union.
7. Reports of all other Committees

7a) J. Harvey reports on the Committee for the Regional Development of Optics (CREDO). He is conforming the Committee. H. Michinel informs that Equatorial Guinea is interested on joining the ICO.

7b) J. Zakrzewski, Chair of the Education Committee, was not attending the ICO Bureau Meeting and did not send a report.

7c) J. Harrington reported on the Traveling Lecturer Committee. He invited Seung Han Park to be a member of the Committee. After explaining the program, he referred to the recent agreement with the IOP intended to co-finance visits of scientists from the UK and the Common Wealth. J. Niemela mentioned that T. Panesor, the UK contact, has been very active and is also looking for partnerships with the ICTP and other international organizations. The ICTP has a traveling lecturer program intended for a 3-week visit. Local expenses are provided by the host. P. Urbach asked for clarification about what countries are considered to be developing.

7d) M. Yzuel presented the report on behalf of the Chair of the ICO Prize Committee, R. Ramponi. The Committee members (2015-2017) are Roberta Ramponi* (Chair, ICO VP), Zohra Ben-Lakhdar* (not ICO bureau member), Yujie Ding* (ICO VP), John Harvey (ICO VP), John Howell (ICO VP), Seung-Han Park (ICO VP), Eric Rosas (ICO VP), Maria J. Yzuel* (ICO VP), Bingkun Zhou* (not ICO bureau member). Those marked with asterisk were member of the previous Committee. There were two new nominees, one of them recently awarded with the IUPAP Young Scientist Prize in Optics. The Committee recommended the ICO Bureau to award the ICO Prize to that person.

M. Zghal asked if the ICO Prize would be awarded for the same work, since he considered that it is not proper for an organization to award two different Prizes to the same person for the same work.

M. Yzuel answered that the Committee had discussed the same issue, but could not find a clear rule about it in the ICO rules.

Y. Arakawa and D. Moore proposed to ask the Committee to reconsider their decision taking in account the recommendation of the ICO Bureau that two different ICO Awards should not be awarded to a same person for the same work. They regret the lack of guidance for this specific case.

**Motion 6.** The Bureau asks the ICO Prize Committee to reconsider its decision regarding the 2015 awardee, considering the fact that the IUPAP Prize was awarded to the same person in 2013 for the same work. Moved by D. Moore, seconded by J. Niemela. Approved unanimously.

7e) M. Zghal reports on the ICO/ICTP Gallieno Denardo Award Committee. The Committee Members are M. Zghal (Chair, ICO VP), Anna Consortini (not ICO Bureau
member, ICO Past President), Mitcho Danailov (Synchrotron Trieste), Ahmadou Wagué (ICO VP), Joseph Niemela (ICO VP and ICTP). The deadline for submission of nominations is December 10th. The announcement was sent to all ICO Territorial Committees and advertised through the ICTP Network. There were 5 nominations geographically distributed in several continents. The ICO/ICTP Gallieno Denardo Award 2015 was awarded to Rim Cherif (Tunisia) for “her achievements in the field of nonlinear optics and in particular for her valuable contributions to the design of highly nonlinear fibers for super-continuum generation, as well as for her active commitment aimed at the diffusion of research in optics and photonics in Tunisia”, and to Rajan Jha, India for “his breakthrough contributions in the modelling, design and development of high-performance optical sensors and waveguides as well as for promotion of research activities in optics and photonics in India”.

The award ceremony took place in February at the ICTP Winter College on Optics. He would prefer that the deadline be late November because the ICTP must know well in advance to invite the winner. In addition, when two individuals are awarded, the ICTP contributes $1000 in order not to divide the cash award, and they need time to get the money for the award. M Zghal asked the ICO Bureau members to spread the word about the call targeting scientists under 40 working in developing countries. J. Niemela commented that the decision this year was taken too late. He had to call the winners personally.

7f) **M. Yzuel** presented the report of the Galileo Galilei Award Committee. She thanked Y. Arakawa for having chosen her to chair the Committee. She was the Chair when the Award started in the nineties. She has seen that the criteria to award the prize have remained the same. When created in 1992-1993 the award intended to cover the work done by excellent scientists under difficult circumstances in their original country. The members of the Committee are: M. Yzuel (Chair, ICO VP), Anna Consortini (not ICO Bureau member, ICO Past President), Nataliya Kundikova (not ICO Bureau member, Past winner), Fernando Mendoza (not ICO Bureau member), and Joseph Niemela (ICO VP). The former Chair transferred all previous information to the new Chair. Nominations are kept for 3 years. There were 4 new nominees and two from former years. She was pleased to announce that the Galileo Galilei Committee recommended the ICO Bureau to award the 2015 Galileo Galilei Award to Aram Papoyan, from Armenia, for “his important achievements in high resolution spectroscopy of Alkali atoms and for his valuable contributions to the promotion of experimental atomic physics in Armenia”.

**Motion 7.** The Bureau approves the recommendation of the Galileo Galilei Award Committee to award the 2015 Galileo Galilei Award to Aram Papoyan. Moved by M. Yzuel, seconded by J. Harrington. Approved unanimously.

7g) **F. Höller**, Chair of the IUPAP Young Scientist’s Committee reports that he has received only one application. He asked the ICO Bureau to extend the application period.
7h) **G. von Bally** reports on the Ad hoc Committee on International Affairs. The Committee was established to evaluate procedures for advocating in favor of scientists suffering political persecution, limited freedom of practicing their profession for political reasons, or endanger scientists in general. The ICO Bureau discussed the Omid Kokabee’s case and felt the need of establishing criteria for actions in similar cases, like transferring the information to ICSU or Amnesty International. UN bodies that have official committees for this purpose and treaty-based international bodies seem to be the most suitable channels. The last evaluate actions against treaties signed within the UN. There are 10 of these bodies with subdivisions. The Ad hoc Committee on International Affairs is evaluating which body is the most appropriate for ICO. In addition, members proposed that this ad hoc committee deals with some professional ethics rules related to the statutes and rules of the ICO. Currently the committee is evaluating if they will expand their scope.

**M. Yzuel** states that there is the Union of Concerned Scientist, related to the American Physical Society. They work for foreign people coming to work in the US, and that J. Niemela is aware that the appealing process has stopped totally.

7i) **D. Moore** and **J. Niemela** report on the Ad hoc Committee on the IYL 2015

**J. Niemela** thinks that the ICO Award for the promotion of optics and photonics (O&P) among young people should have been more widely advertised.

**D. Moore** mentioned that the ICO allocated $25000 to give 20 awards of $1000 and one of $5000. He considered that the ICO should continue with this award initiative beyond the IYL. The activity in Spain was very good. Since only $7000 were awarded he asked for possible additional ICO actions. He asked the Bureau members of thinking about the legacy of the IYL. **J. Niemela** mentioned that the ICTP wants also to look ahead instead of holding activities only during the IYL. The following were suggested:

- To pay for the digital archiving of ICO archive. Currently there is a storage problem in Madrid. **D. Moore** suggested that the ICO archive be sent to Rochester. **J. Niemela** mentioned that the AIP might be interested on helping digitize the archive.

- A second call of the award for the promotion of O&P among young people offering $3000 for the first price and $1000 for others. But we have to learn how to advertise an award. Probably the International Society members can advertise it through their student chapters. **M. Zghal** informed that the International Meeting of SPIE student chapters will be held for the first time in Africa in September.

**Action:** The ICO secretariat to extend the deadline for submission of nominations to the IUPAP Young Scientist Award in Optics until the end of August.
P. Urbach considered that this kind of prize is not so important. In his opinion it is more important to give awards to individuals, and put more attention on maintaining links with the ICO awardees.

J. Harrington mentioned that in order to create this new award as sustained program we will have to budget it every year. Probably we will need to allocate only $5000 for that purpose.

J. Niemela considered that to continue with the award is important because it motivates people to get involved into how to popularize science. Writing proposals with this purpose to research funding agencies is quite difficult. With this award, the ICO could get people to think on how to get involved in promotion activities.

J. Harvey would like to see sustainability. If the program is successful, funders will be found to support it.

D. Moore would like to see more applicants from Africa, were the ICO territories has few territories. He recommended not to tie the award to Territorial Committees. It should be possible that students from a single university be able to apply.

J. Niemela mentioned that another IYL activity run by students is the organization of one-day activity for public outreach. The ICO should think of how to use this award and its budget to create leadership.

J. Harrington stated that $1000 is not much but could help to find new leaders between the students.

M. Yzuel mentioned that when she visited countries and universities that were inaugurating student chapters, she found that one of the problems was the financial problem. In some countries people cannot send money to the USA to pay for membership fees. A solution could be that instead of sending money for their fees, the membership fees be deducted directly from the grant money.

M. Zghal answered that the Tunisians student chapter cannot transfer money outside the country. He will advertise the award to the students during an ICTP meeting to be held in Tunisia.

**Decision:** To make a second call for the ICO Award for promotion of O&P among young people.

**Action:** Ad hoc Committee for the IYL to prepare the second call for the ICO Award for the promotion of O&P among young people. The deadline will be roughly February 2016 and the Committee will write the rules.
8. Reports of liaisons with Member Societies & ICTP

8a) M. Yzuel reports that SPIE has continued enthusiastically supporting both, the ICTP and the IYL activities. The SPIE has spent 1.5 million dollars for the IYL. SPIE supports the ICTP offering free access to its digital libraries for all students and professors during the Winter College. It has also promoted that the ICTP library offer free access to the SPIE digital library for developing countries. J. Niemela described the ICTP electronic delivery system for its associates. The ICTP has 2-3 librarians, who receive solicitation of a given paper via e-mail and send it to the applicant. Delivery time depend on the demand, but can be as short as 5 minutes. M. Yzuel adds that in some recommendation letters from France for Aram Papoyan it was stated that the access to scientific literature in Armenia was so difficult that they had to ask France for access.

M. Yzuel continues her report stating that SPIE supports ICTP through a grant for research. It also supports the realization of ALOP Workshops and the ETOP Conference. The SPIE student chapters have activities on education and outreach that amount for 3 million per year and this amount will be increased to 3.5 million. Grants cover a wide range of activities: education kits, traveling lecturers, women in optics, etc. Their experience indicates that to make activities in developing countries it is better to do them through recognized organization like the ICTP and the ICO, which have great networks in developing countries. SPIE is aware that the ICO has already recognition in those countries. Through the Student Chapters, the International Societies can work very efficiently on education and outreach, without competition on journals or meetings. Usually the international student chapters of the SPIE and OSA collaborate.

J. Niemela suggested using the ICTP associate scheme to disseminate further the SPIE Program. Currently there are 38 Associates in optics. One of them, Humberto Cabrera got involved in the SPIE Program and got the equipment required to set up a lab at the ICTP, which is now a permanent lab. He also recommends SPIE to team with other organizations like the IOP.

8b) There was no report of the OSA

8c) There was no report of the IEEE Photonics Society. J. Harvey is a member of the society. A Guzman expressed her concern for the lack of communication with the IEEE Photonics Society.
8d) **P. Urbach** reported on EOS. Last year EOS went through a reorganization. It serves as umbrella organization for the European Optical Societies and as such sponsors or endorses many activities. In the next Bureau Meeting, they are going to consider the issue of creating student chapters, as an important step for the future of EOS. EOS is interested in keeping strong its relationship with the ICO. He in his capacity as the appointed VP from EOS will keep very active in the ICO Bureau meetings. EOS is also taking part on the IYL project sponsored by the European Committee of the project Light 2050 by the EPS and EOS, and other partners like the University of Liège in Brussels. Main activities taking place in Europe will be the organization of talks on light and light-based technologies, popularizing light science and illustrating industries. The EOS is making talks for industry, in particular the lighting industry, and scientists in the astronomy department have developed a cell phone app for measuring pollution, aerosols, etc. Part of this project is also the Photonics Explorer kit. Finally, he had a question about ICO’s possible interest in increasing its own visibility in EOS conferences. He thinks that it would be good for the ICO.

8e) There was no report of the LAM Network

8f) **G. von Bally** report on OWLS. The biannual OWLS Conference OWLS 2014 had 200 participants from 10 countries. The Society has the Nobel Prize winner Stefan Hell as an active member. He was in the OWLS council for several years. The Secretary of OWLS lectured at ICTP in 2013. OWLS supported the LAM international workshop in 2014, where the Launching the African Optical and Photonics Society in Senegal was going to take place. The constitution of that society has though not been finalized. One of the central activities of the IYL is going to take place in Acra. The next OWLS conference will take place in 2016 in Mumbai, and the one in 2018 in Perth, Australia.

8g) **A. Guzman** reports on RIAO. Eric Rosas the appointed VP from RIAO had to cancel his flight in the last moment. The RIAO/OPTILAS 2016 will take place in Chile. Contrary to what **D. Moore** agreed with the OSA President **D. Strickland** about holding jointly RIAO/OPTILAS and the OSA conference LAOP in Chile, the OSA will be holding the LAOP in Colombia in the same year.

9. Report on TSOSA Committee

**A. Guzman** reports on the TSOSA Advisory Group. The acronym means Trieste System on Optical Sciences and Applications (TSOSA) Advisory Group. It was created in 2003 and since its inception the ICO has been active member. The TSOSA Advisory Group comprises representatives from the ICO, OSA, SPIE, OWLS, IAEA, UNESCO, NAS, LAM Network and Institutions of the Trieste System i.e. ICTP, ICS, TWAS, ICGEB, Elettra Synchrotron Light Facility and the Laser laboratory at Elettra. The ICO Secretariat has prepared the Minutes, and the ICO Secretary has served as the TSOSA Chair. The TSOSA Meeting was held during the Winter College “Light: A Bridge between Earth and Space: Winter College on Optics”. One of the directors was A. Piegari, former President of SIOF.
J. Niemela added that one of the directors of the Winter College 2016 will be K. Corwin from the Kansas State University. The ICTP will also hold an activity in Latin America in 2016 as part of the ICO/ICTP initiative for Central America and the Caribbean.

10. Liaisons to ICSU and IUPAP

10a) D. Moore reported as the ICO liaison with ICSU. He did not attend the ICSU General Assembly in New Zealand. A. Guzman attended the ICSU General Assembly, where she presented a poster and a short talk on ICO and the IYL 2015.

10b) Y. Arakawa reported having attended the IUPAP C&CC Meeting on April 26th, 2015, where he met the IUPAP President Bruce Mc Kellar. He is optimistic about the possibility of getting IUPAP’s support to the ICO application to ICSU. The President of the Commission for Laser Physics and Photonics (C17) is Deborah Kane from Australia.

J. Niemela reported that the IUPAP Executive Council and Commission Chairs was held at the Abdus Salaam International Center for Theoretical Physics (ICTP) in Trieste, Italy on April 25 and 26, 2015. He attended the second day of the meeting and talked to members of the C15, who consider the ICO application sound.

Action: Y. Arakawa to send letters to the Chairs of the C13, C15, and C17, nominating the ICO representatives as follows: C17: J. Harvey, C13: M. Zghal and C15: A. Guzman.

11. ICO participation in meetings and schools

11a) G. von Bally reported on Meetings sponsored during the period July 2014- July 2015. He put to consideration to the Bureau the case of the MOMP. It is the Mexican Conference on Optics and Photonics, which in celebration of the IYL has invited the ICO President and a Nobel Prize awardee, and they are asking for money to invite people from developing countries.

M. Yzuel considered that it is a very bad precedent for the ICO to support a National Meeting. In many cases a National Meeting has Nobel Prize invitees and many good speakers. What defines a conference as international is the participation of the international international international community. G. von Bally affirmed that certainly the conference has international participants, and is a scientifically important meeting for the region.

Motion 8: To approve ICO support to the Mexican Optics and Photonics Meeting (MOMP) 2015. Moved by J. Niemela, seconded by J. Harvey. Votes in favor: 12 Abstention:1 Approved with one abstention.
<table>
<thead>
<tr>
<th>1 Oct 2014 - 30 Sept 2015 (Period 1)</th>
<th>date</th>
<th>requested by applicants</th>
<th>decision by ICO</th>
<th>ICO representative</th>
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<tbody>
<tr>
<td>Int. Seminar on Photonics, Optics, and its Applications</td>
<td>14-15 Oct 2014</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Gert von Bally</td>
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<tr>
<td>(RHPGA 2014), Samur, Indonesia</td>
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<tr>
<td>Int. Conf. on Optics, Photonics and Photosciences</td>
<td>14-17 Oct 2014</td>
<td>US$ 3,000</td>
<td>US$ 1,500</td>
<td>Ari Frieborg</td>
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<tr>
<td>(CIOFF), La Habana, Cuba</td>
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<tr>
<td>ICTP Wintercollege on “Light a Bridge between Earth and Space”, Trieste, Italy</td>
<td>9-20 Feb. 2015</td>
<td>different budget</td>
<td>Angola Guzman</td>
<td></td>
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<tr>
<td>Discussions on Nano and Mesoscopic Optics</td>
<td>8-12 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
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<tr>
<td>(DINAMO-2015), El Chalten, Argentina</td>
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<tr>
<td>Int. Conf. on Optical and Photonic Engineering</td>
<td>14-16 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
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<tr>
<td>(icOPEN 2015), Singapore</td>
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<tr>
<td>Lighting Up Africa (LUPA 2015), Carthage, Tunisia</td>
<td>15-21 March 2015</td>
<td>US$ 4,000</td>
<td>US$ 1,000</td>
<td>Zohra Lakhdah</td>
</tr>
<tr>
<td>Education and Training in Optics (ETOP 2015), Bordeaux, France</td>
<td>29 June-2 July 2015</td>
<td>different budget</td>
<td>Maria Calvo</td>
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<table>
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<tr>
<th>1 Oct 2015 - 30 Sept 2016 (Period 2)</th>
<th>date</th>
<th>requested by applicants</th>
<th>decision by ICO</th>
<th>ICO representative</th>
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<tbody>
<tr>
<td>20th Microoptics Conference (MOC 15), Fukuoka, Japan</td>
<td>25-28 Oct. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Yasuhiro Arakawa</td>
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<tr>
<td>Int. Conf. on Optics Design and Fabrication</td>
<td>28 Feb.-2 March 2016</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Frank Höfler</td>
</tr>
<tr>
<td>Int. Conf. Micro- to Nano-Photonics (ROMOPTO 2015), Bucharest, Romania</td>
<td>1-4 Sept. 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>Mexican Optics and Photonics Meeting (MDPM 2015), Leon, Mexico</td>
<td>9-11 Sept. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>OptoAndina 2015, Quito, Ecuador</td>
<td>11-13 Sept. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>12th Int. Conf. on Correlation Optics (Correlation Optics 2015)</td>
<td>14-18 Sept 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Sergey Odelev</td>
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</table>

Periode 1 Actual Budget in Total: US$ 10,000

Weingarten, Germany

Int. Conf. on Applied Optics and Photonics 2016 | 17-21 May 2016 | US$ 5,000 | US$ 2,000 | Frank Höfler |
| (ICO Topical Meeting 2016) Hanover, Germany |            |                        |                 |                    |

Periode 2 Actual Budget in Total: US$ 2,000
**SUMMARY**

**Legislative Period**

<table>
<thead>
<tr>
<th>Periode 1</th>
<th>1 Oct. 2014 – 30 Sept. 2015</th>
<th>US$ 12,000</th>
<th>US$ 10,000</th>
<th>US$ 2,000</th>
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<tr>
<td>Periode 2</td>
<td>1 Oct. 2015 – 30 Sept. 2016</td>
<td>US$ 12,000</td>
<td>US$ 2,000</td>
<td>US$ 10,000</td>
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<tr>
<td>Legislative Period in Total</td>
<td>US$ 36,200</td>
<td>US$ 12,000</td>
<td>US$ 24,200</td>
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(32,000 Budget + 4,200 Rest from last Legislative Periode)

**M Yzuel** called the Bureau attention to the fact that many times the members of the Bureau received the request to approve applications that have been submitted after the deadline. She considered that the ICO should maintain and respect the deadline for applications. She also commented that often the financial support request is not justified in the budget. She cited as an example the application from Singapore, which did not justify or explain how they were going to use the money.

**J. Harrington** adhered to her remark and recommended to G. von Bally to check the applications more strictly before sending them to the consideration of the ICO Bureau. He usually looks carefully for the budget.

**G. von Bally** stated that he would love to be very strict when reviewing the applications, but that sometimes there are special circumstances. Singapore has become again a full member of the ICO after years of having been demoted to associate member. He has been also flexible in the case of ROMOPTO and Correlation Optics. Both Romania and Ukraine had difficulties paying their ICO dues. They have negotiated with the ICO Treasurer and now they pay their dues. He thanked J. Harrington and M. Yzuel for their prompt and careful answer regarding the applications.
11b) **H. Michinel** reported on OIC/IP. The OIC/IP was a meeting cosponsored and organized by a pool of organizations like the ETOP. But at the beginning of the first decade of this century SPIE moved away and OSA decided to make its own topical meeting. Information Photonics was celebrated in 2011 and 2015, but the role of ICO in the meeting is not clear.

**Action:** The ICO Secretariat to ask Maria Calvo about the role of ICO in this meeting.

11c) **A. Guzman** reported that the MoU for ETOP I still in effect. The ETOP 2015 is currently being held in Bordeaux and the ICO will have a small stand with the ICO Newsletters that were sent by the ICO Secretariat to the organizers. She also reports that two bids to host the next ETOP are expected: one from China and one from CREOL, UCF, USA.

**12. Report on the ICO traveling lecture program**

The report on the ICO traveling lecture program and the IOP was already discussed by **J. Harrington** in the Treasurer report.

**13. Date and venue for the next ICO Bureau Meeting**

**D. Moore** proposed to hold the next ICO Bureau Meeting in Rochester on occasion of the FiO Meeting (October 16th -20th, 2016). The Bureau already approved this proposal in a former meeting. The EXECOM Meeting will be held on Thursday, October 20th, and the Bureau Meeting on Friday, October 21st at the University of Rochester.

**14. Report of the ICO Nominating Committee**

**D. Moore**, ICO Past President, reported on the activities of the ICO Nominating Committee. He remarked that a year from now the Committee should have put together a slot for officers. He asked the ICO Bureau members who will not run for officer and are interested on serving in the committee to let him know.

*Meeting adjourned at 4:30 pm.*

*Minutes prepared by the ICO Secretariat, reviewed by Y. Arakawa October 11, 2016. Minutes approved by the ICO Bureau, October 28, 2016.*
Draft Minutes of the 2016 ICO Bureau Meeting

Friday, October 21, 2016. 9:00 AM – 4:40 PM.
University of Rochester, Rochester, USA.

Participants: Yasuhiko Arakawa (President), Duncan T. Moore (Past President), Gert von Bally (Associate Secretary & OWLS), James Harrington (Treasurer), Angela Guzmán (Secretary), Seung-Han Park (VP), Eric Rosas (RIAO), Mourad Zghal (VP), John Howell (OSA), Frank Höller (VP), Humberto Michinel (VP), Kent D. Choquette (IEEE Photonics Society), Maria Yzuel (SPIE), Joseph Niemela (VP), John Harvey (VP).

Joining the meeting via teleconference: Roberta Ramponi (VP)

Apologies from: Ahmadou Wagué (LAM), Jakub Zakrzewski (VP), Paul Urbach (EOS), Carmen Cisneros (IUPAP), Stephen Morgan (OWLS).

Invited Guests: Sir Peter Knight, Pierre Chavel, María L. Calvo (attending via teleconference).

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

ICO President Y. Arakawa, and Chair of the meeting, welcomed the participants. A. Guzmán, ICO Secretary reported on the apologies of ICO Bureau members unable to attend and confirmed the quorum.

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

ICO President Y. Arakawa asked the members for adoption of the Agenda and the Minutes of the ICO Bureau Meetings 2015. The definitive version of the Minutes of the two ICO Bureau Meeting 2015 were sent to the ICO Bureau members and comments and corrections were inserted.

M. Zghal refers to the letter that was to be sent by Y. Arakawa to C13 regarding the ICO representative (action 6 in the list of actions). Y. Arakawa answers that he sent a letter asking to change the ICO representative, but he was told that they accept only 5 associate members and for this period the ICO was not one of them. Therefore, the ICO will not have a liaison with C13.

Motion 1. To approve the agenda. Moved by G. von Bally, seconded by A. Guzmán. Approved unanimously.

Motion 2. To approve the minutes of the 2015 ICO Bureau Meeting and to note the decisions and actions list. Moved by F. Höller, seconded by G. von Bally. Approved unanimously.
3. ICO President's report (Y. Arakawa, ICO President)

ICO President Y. Arakawa presented the report of his activities as ICO President since the last ICO Bureau Meeting as follows:

3.1 International Year of Light 2015: He attended the closing ceremony of the International Year of Light (IYL) 2015 in Mérida, México. The ceremony was attended by about 300 participants. The ICO was asked to contribute one page to the final report of the IYL. The extraordinary effort of J. Niemela in the organization of the IYL is appreciated.

On October 19th, 2016, the UNESCO Executive Board released a press communicate endorsing a proposal for an annual International Day of Light celebration as an enduring legacy of the International Year of Light. The International Day of Light is to be celebrated on May 16 every year from 2018. The date was chosen because of May 16 being associated with the invention of the laser.

D. Moore asked if there were many other international days already assigned. Y. Arakawa answered that there are indeed, and the UNESCO does not like to have many International Days but he expects that it be approved.

J. Howell asked for the specific purpose of an International Day of Light. J. Niemela answered that it was intended to focus public attention on the key role played by light and light-based technologies in our civilization, and get a larger awareness on their impact on society. A specific day could be a tool for people in developing countries to show that they are part of an international initiative, and have large outreach.

3.2 117th Annual meeting of the DGaO

The International Conference on Applied Optics and Photonics 2016 (May 17th-21st), an ICO Topical Meeting, was co-located with the 117th Annual Meeting of the German Society of Applied Optics (DGaO). The conference was held at Herrenhausen Castle in Hannover, Germany. F. Höller, President of the DgaO and ICO VP was the Chair of the join event.

IUPAP Links (C&CC Meeting)

Y. Arakawa in his capacity as Chair of the ICO, Affiliated Commission AC1, attended the electronic meeting of the IUPAP Executive Council and Commission Chairs (IUPAP C&CC Meeting) that took place from 27 October to 12 November 2015. This Year the IUPAP C&CC Meeting will take place in Taipei 22-23 October 2016. An item in the agenda of the meeting is the proposal that ICO become a Union member of ICSU. It will be discussed at 14:30 Oct 23, 2016. Y. Arakawa is leaving Rochester tonight to arrive in Taipei on time for the meeting. The President’s presentation ICO evolving toward an ICSU Union has been provided as one of the supporting documents for the ICO Bureau meeting. Y. Arakawa proposes that if the ICO becomes the International Union of Optics and Photonics (IUOP), the new Union should establish liaisons to several Unions, including IUPAP; the contacts should be the Presidents or
the General Secretaries. The IUOP should continue being represented within IUPAP Commissions C13, C15 and C17. The IUPAP will be also welcomed to have its own representatives as Associate Members to IUOP Commissions.

4. The ICO application to ICSU to become and ICSU Union

4.1 Action to become ICSU Union (Y. Arakawa)

The 23rd General Assembly in Santiago de Compostela directed the ICO secretary to initiate the process of application to ICSU to become and ICSU union. (Motion 4, Minutes of the ICO 23 General Assembly)

Based on the decision, a working group (so called ICO ICSU Committee) consisting of Y. Arakawa (President), D. Moore (Immediate Past President), M. L. Calvo (Second Immediate Past President), A. Guzmán (General Secretary), G. von Bally (Associate Secretary), and J. Harrington (Treasurer) and P. Chavel (Second Past General Secretary) was formed for the action toward becoming an ICSU Union.

A draft of the document “ICO Application for the status of an ICSU Scientific Union” has been contributed by Prof Pierre Chavel.

ICO President’s request for letters of support to ICO application: The ICO has already received supporting letters by four ICSU Union members in related fields: URSI, IUCSI, IUMRS and IUBS. We expect to have the support of IMU, IAU, IUPAC and IUPAP. We have also received supporting letters from three ICSU National Members: Germany (DFG), Italy (CNR), and Mexico (Academia Mexicana de Ciencias), we expect supporting letters from New Zealand, Romania, Japan, UK, and some countries in South America. ICSU requires 12 letters of support from Unions and its own national members. In addition, the following members of ICO have expressed in writing their support: International Society Members of ICO: RIAO, LAM (African Laser, Atomic and Molecular Physics Network), OWLS (Optics within the Life Sciences – international society), EOS European Optical Society (announced); Territorial Committee Members of ICO: Australian Academy of Science, French Optical Society, Sociedade Portuguesa para a Investigação e Desenvolvimento em Óptica e Fotónica.

M. Yzuel would have liked to have more direct information from the ICO ICSU Committee. She did not know that the Committee existed. She requested to have more information before the application is presented.

**Action:** A. Guzmán to post the President Report with the other supporting documents.

4.2 Presentation by Sir Peter Knight on ICSU and the application procedure.

Peter Knight was the Chair of the ICSU review panel commissioned by the ICSU Executive Board. The NSF (USA) and the DFG (Germany) are ICSU’s main founding agencies. The review panel gathered information from unions, the ICSU secretariat,
national academies, and many scientists that served in Unions or National academies that never have heard of ICSU. The ICSU serves as a science advisor to the United Nations, and should perform a vital enabling function for international science, nations and scientific unions. There was however extremely fierce criticism of the mismatch between the aspirations of ICSU and reality from the major funders of ICSU. The key recommendations by the review panel addressed ICSU’s vision and visibility. They analyzed the relationships with national academies that fund ICSU, and the Unions that carry the specialist in science. They found the funding fragile. They also analyzed the interaction of the ICSU governance and staff located in Paris with the Unions and the National Academies.

The relationship between ICSU and the United Nations is an ad hoc relationship. The main recommendations for ICSU to regain a preeminent role in the UN were: (a) Adopt a vision that others can be inspired from and follow. (b) Resolve relations with other global scientific institutions. ICSU must develop a strategy to work more closely with the InterAcademy Partnership (IAP), the InterAcademy Council (IAC), the Global Research Council (GRC), and The World Academy of Sciences (TWAS). The IAP plays currently a better role in the UN than ICSU. (c) Secure the funding to support the programs and engagement. Funding is crucially important. The ICSU budget could be amplified if the national members and the unions are unified. (d) Resolve issues in the current governance of ICSU. (e) Address the needs of ICSU regional offices (Africa, Asia, Latin America). The ICSU Secretariat should establish professional development and performance reviews. Members in the regions noticed that they were not properly linked into ICSU. (f) Establish a closer relationship with the International Council for Social Sciences (ICSS). (g) Prepare a consistent mission statement. (h) Develop a communication strategy. (i) Promote selected flagship projects like Future Earth, which are key for ICSU’s future. (j) ICSU should play a more active role in coordinating activities with the Engineering Council.

There has been an evolution towards support of multidisciplinary Unions. The Union of Crystallography was the first of the kind. The traditional Unions are quite appropriate for the so-called core disciplines, but are they responsive to emerging areas like Optics and Photonics, which include science and engineering with translation into business activity? ICO clearly spans all those areas, and it has an important voice to bring together not just the physics of optics but engineering optics, helping bring science into practice and awakening public awareness of the role of optical science to improve the way we live. IUPAP only sees a sliver of the activities in Optics and Photonics. And that is something positive about becoming an independent union.

**J. Harrington** asked what is the total budget of ICSU. **P Knight** estimates the budget in 18 million dollars. It is small for their tremendous aspirations. The budget could be amplified if the members and the Unions had a common purpose.

Some of the recommended strategies by the review panel were: (a) Make use of past Presidents. (b) Form a non-for-profit Foundation. (c) Form dedicated teams for flagship projects (d) Engage in business. (e) Improve gender diversity.
J. Howell inquired about the partners of ICSU in Future Earth. P. Knight explained that Future Earth is a big fund rising operation and recommends visiting Future Earth’s webpage to see why Optics and Photonics will have crucial importance.

P. Knight ICSU must take advantage of changing opportunities. In the last General Assembly, ICSU voted in favor of bringing together ICSU and social sciences, which is important for funding projects like Future Earth. The National Academies think that the merge of ICSU and ICSS is essential.

J. Niemela asked if ICSU is redefining itself. P. Knight answered that if ICSU is going to provide advice to United Nations voters, they will need a more substantial team to address the policy documents that they produce. The ICO could contribute to policies, since it represents a very broad area of Science and Engineering. Until now the ICO is within the IUPAP, a Union that is monodisciplinary and in his opinion, is not appropriate for the character of Optics and Photonics Science.

G. von Bally asked if there are already too many ICSU Unions. P. Knight answered that the review panel felt that there should be an appropriate way to review ICSU’s constituency, and to have appropriate mechanisms for the creation of new Unions according with the many changes occurred since ICSU’s creation.

G. von Bally. The DFG is one of the strong supporters of ICSU and is also a supporter of the ICO application to become a Union. P. Knight noticed that there was no supporting letter form the UK, but he will talk to the President of the Royal Society to get the support from the UK. The ICO Bureau thanked him for his offer.

4.3 Pierre Chavel and Maria L. Calvo comments.

M. L. Calvo: She thanked P. Knight for his presentation and recommendations. ICO has 53 territorial committees, and was created 70 years ago. The territorial representatives represent the Optics & Photonics community and their activities in their respective country. The ICO has developing country members where there are no Academy of sciences. For those cases, the ICO requests a letter from the Ministry of Science or Education from the country that requests membership. The ICO constituency involve not only physicists but engineers, life scientists, and many others. If the ICO is not admitted as an ICSU Union, it will continue working on fulfilling its mission, because the ICO represents multiple disciplines and their national representatives are very prestigious people. The new body should not close the door for other applications, but expand the ICO outreach capacity.

P. Chavel: He found the presentation of P. Knight to be extremely useful and aimed in the right direction. He was invited to join the ICO/ICSU committee because he has a long-term relation with ICO. The ICO with its 53 territories has clearly the broadest and most balanced participation in Optics & Photonics in the world. But not all Territories are powerful and active. The power of the ICO lies in his opinion in the ICO International Society members. That is why 20 years ago he promoted the change of ICO statutes to include the category of International Society Member. Their participation is extremely important. Currently the ICO has 7 VPs representing...
International Societies. But do they really participate as ICO members or just as observers of the body? We want to work together with the International Societies, and then represent Optics & Photonics together, International Societies and territories. The ICO application to ICSU is a wonderful opportunity to create new activities, not just to change the rules. In the ICO/ICSU Committee, we have discussed how to make the transition, statutes and what would be the new activities.

The presentation of P. Knight was aimed in the right direction. Future Earth is the place where we should be. If we look for a new project to participate in Future Earth, and we should look for it altogether. The societies should understand that there is new opportunity for them and they will not just cause expenses, but there will be new funding opportunities.

The Committee has worked under pressure. If we want to present the application in 2017, there will be many teleconferences, and a lot of discussions inside the Bureau. We understand that membership must participate in the process, not just the special committee.

MYzuel thanks P. Chavel for his comments.

J. Howell expressed that he could see a potential value on raising the profile of Optics and Photonics to the level of a Union. He could also see why IUPAP might not want to be supportive. The ICO objectives are different from the 5 pillars that P. Knight described. We are not looking outward, we do not have a vision of how we can serve as UN consultants. Our direction of focus is one way and we should look both ways. Do we need to exist if the Academies and societies are supporting the UN, and filling other roles? Are we redundant if we do not have a vision and visibility, else than bringing together scientists? That is not a vision statement. The ICO needs a vision of the new activities it will help to promote ICO’s visibility.

P. Knight answered that ICSU has a capability that no one else has. It has the National Academies providing policy advice and advocacy to the governments in their own regions, while the Unions are the muscle that provides professional expertise on specific areas. The Inter Academies Panel raises local issues and the Unions balance the role of the local Academies by looking globally. The ICSU articulates the muscle of the Unions while the advising role of the Academies. If understand ICO properly, and I think I do, those two issues are important for the ICO: global impact of O&P and at the same time providing evidence based advice in ways one can proceed locally. The world would be a much worse place if ICSU did not exist and could be better if ICSU was more effective.

J. Harrington asked if J. Howell’s comments represent OSA’s or his opinion.

J. Howell: They are his opinion. He believes that if a structure has a vision, it can move forward more powerfully. Incorporating some of the things we heard today in terms of a vision will allows us to be more productive. He thinks that we can fail if we do not look both ways in terms of how are we going to help diplomats and global causes but also help our constituency, like helping young kids in Africa have experiences in
optics? The last is perhaps the role of this organization rather than having a greater influence in the world.

**A. Guzmán:** Indeed, in the USA, the ICO has low visibility and all the lobby and policy advising is done by the OSA, SPIE and IEEE PS, but in developing countries the ICO endorsement of a Conference or Workshop and the ICO logo is warranty of academic quality. Even if the ICO contributes with a very modest financial support, the possibility of organizing an event endorsed by the ICO, opens local financial resources for the organizers. In that sense, I understand P. Knight’s statement about the possibility of amplifying financial resources via the collaboration between Unions and Academies. The very successful activities of the Union of Astronomy are mostly financed locally.

The ICO was the organization behind the Mexican Initiative on Optics and Photonics, that will be launched next month, and ICO’s support to the proposal was important for the Mexican governmental authorities. Hence, the international organization that is invited by the Mexican government to the launching ceremony is the ICO. There is a very different perception about ICO role in the USA than in many other territories, including Germany. The ICO has also played important roles supporting scientists in the international context that cannot be played by International Societies domiciled in the USA, which motivated the creation of the ICO ad hoc Committee on International Affairs.

**J. Harrington** asked J. Howell for the position of the OSA.

**J. Howell** answered that OSA has not strong opinion one way or the other. They want to understand why there are strong opinions. Personally, he sees the value of ICO’s independence from IUPAP. Being a subcommittee of a powerful Union puts some restricts on our own outreach, and might prevent us for realizing the vision that we have.

The ICO can contribute easily to ICSU’s pillars if the ICO oversees its own agenda.

**K. Choquette** considers that Photonics & Engineering are a very important part of this. Engineering is going to be the solution to the problems faced currently by the world; he can see the value of having a more inclusive mission statement, that involves the solution of global problems through photonics. The IEEE wants to partner with other societies to increase the global outreach of their mission. It is an outstanding opportunity to reach global, and a way to make the reach of societies greater. He does not see that being a Union restricts in any way the role of a Society, but rather expands it. He recommends crafting a broader vision with the perspective of tackling and solving problems, and providing solutions. He would like to see that as part of the vision of A Union of Optics and Photonics.

**J. Howell** sees the need of not being just under the physics umbrella. Optics and Photonics is a heavily engineering oriented discipline.

**4.4 ICO President’s report on the organization of ICO 24**
The venue and the date have been changed. The General Congress will be held at the Keio Plaza Hotel, Shinjuku, Tokyo, Japan, August 21st-25th. The website http://ico24.org/ is already active. The main sponsors are the ICO and the Science Council of Japan (JSC). The co-sponsors are the Japan Society of Applied Physics (JSAP) and the Optical Society of Japan (OSJ). Cooperating organizations are the Chinese Optical Society (COS), the Chinese Society for Optical Engineering (CSOE), the European Optical Society (EOS), The Institute of Electronics, Information and Communication Engineers (IEICE), The International Society for Optics and Photonics (SPIE), The Optical Society (OSA), the Optical Society of Korea (OSK), The Physical Society of Japan (JPS), and the Taiwan Photonics Society (TPS).

It will be sponsored financially by the International Exchange Program of the National Institute of Information and Communications Technology (NICT).

H. Michinel mentioned that the IOP (UK) published the memories of the ICO 23.

K. Choquette offered the possibility of publishing the abstracts in the IEEE explorer.

M. Zghal asked for registration waivers for students from developing countries.

5. Report of the ICO Nomination Committee (Duncan Moore, ICO Past President)

The Nominating committee consists until the date of D. Moore, M.L. Calvo, J. Harvey, and Seung Han Park. Its responsibility is to find nominees for ICO officers. Nominations are made by territories for the positions of President, Secretary, Treasurer, and Associate Secretary. The elections are run at the second sessions at the general assembly. There should be two elected Vice presidents from industry. F. Höller has addressed the DgaO to have a nominee from industry.

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

6.1 Regular activities are the coordination of the logistics for the ICO Bureau, SPC, and EXEC Meetings with the Territory hosting the ICO Topical Meeting or ICO General Congress; to elaborate Agendas & Minutes for the ICO BUREAU, SPC, and EXEC Meetings; to advertising ICO Prizes and Awards, posting the Calls for nominations; to prepare Award ceremonies, Diplomas, medals; to serve as the Liaison of the Bureau with ICO Territorial Committees; to prepare and mail Seasonal Greetings; to be the Editor of the ICO Newsletter (4 issues per year, 700 copies, mailed in printed version to 20 addresses); to be the Editor of the ICO webpage (hosted by GoDaddy), and subpages for each ICO Territory (e-ico.org/XXX); to maintain updated the ICO Calendar of events. The Secretariat administer the Consolidated Calendar of events, introduced to publish all events held by ICO Member Societies. Until now only EOS contributes information, although the Consolidated Calendar was created by request of the IEEE PS. Besides the e-ico.org, the ICO owes the myico.org and the ico-optics.org domains. It also owes the Twitter account @ICOPNews and the Flickr account Secretariat ICO. The webmaster is Fernanda Lozada.
6.2 The TSOSA Advisory Group: The ICO Secretary has served as the elected Chair of the Trieste System on Optical Sciences and Applications (TSOSA) Advisory Group, whose members are 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 Secretariat prepares the Minutes of the TSOSA Meetings, which are also published in the ICO Green book. The 2016 ICTP Winter College on Optics was on “Optical Frequency Combs: Basics and Applications”, and the 2017 “Winter College on Optics: Advanced Optical Techniques for Bio-imaging” will have daily hands-on sessions at the ICTP laboratories, accompanied by library documentation, and finalized with round-table discussions.

6.3 Special series in the ICO newsletter for the IYL: During the International Year of Light 2015 the ICO Newsletter published a special series of articles, initiated with an article by Barry R. Masters entitled “What is light?”, which has been translated by O&P experts into Spanish, Latvian, Chinese, French, Greek, Armenian, Portuguese, Slovak, Hebrew, Italian, Hindi, Persian, and Korean. For the April 2016 issue of the Newsletter, Juste Jean-Paul Ngome Abiaga and Pauline Venegas Hooper, from the UNESCO Division of Science Policy and Capacity Building wrote a special article emphasizing the role of the 2015 International Year of Light and Light-based Technologies, as a precursor for change, to meet the objectives of the Sustainable Development Goals. The IYL, in his words, “made clear that many solutions to local and global challenges, including in science education, food security, existing and newly emerging diseases, natural disasters, energy needs, poverty eradication and climate change, actually do exist, and are based on practical and cost-effective light-based technologies.”

6.4 Project management tool: The ICO Secretary also acquired the license for a new project management tool, SMARTSHEET. She did a demonstration of the capabilities of this tool for group work, showed that all documentation related to the application to ICSU was posted already there, and invited the ICO Bureau members to participate in the process of the elaboration of the application to ICSU, using this tool.

6.5 Ceremonies, Workshops and Meetings attended:

- ALOP San Luis de Potosí, México, June 8-12, 2015.
- ALOP Panamá, August 24-28, 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.

6.6 Other activities: The ICO Secretariat intended to continue the ICO & ICTP Initiative for Central America & the Caribbean with a “Second ICO-ICTP Workshop in Lasers, Laser Applications and Laser Safety Regulations”, that was going to be fully financed by and held at the Universidad Nacional de Colombia, Colombia on Jun 13-24, 2016. The activity was cancelled since the rector of the University decided at the last stage not to provide the funding.

6.7 The ICO archive. The ICO Secretary recalled the need of digitizing the ICO archives located in Spain, and in the German Territorial Committee, as well as the photo archive held by Pierre Chavel in France. The cost of the digitalization process in Germany has been estimated in € 560. The archive files from Spain could also be digitized in Germany.

Motion 3. To allocate financial resources for the digitalization of the ICO archive in Spain and Germany. Moved by J. Howell, seconded by H. Michinel. Approved unanimously.

6.8 Application of the Chinese Society for Optical Engineering (CSOE), a new optical engineering society. The honorary President is Prof Guofan Jin. The deputy secretary-general is Senior Engineer Deng Wei. They are interested on becoming ICO members. The ExCom recommends that the ICO President writes a letter addressed to all Territorial Committee representatives reminding them that the Territorial Committee should represent the whole optics community in the territory, and send a copy of the letter to the Chinese Society for Optical Engineering.

Motion 4. To direct the ICO President to communicate the ICO Bureau decision to the Chinese Society for Optical Engineering. Moved by H. Michinel, seconded by J Harvey. Approved unanimously.

Action: The ICO President to write a letter communicating the ICO Bureau decision to the Chinese Society for Optical Engineering.

Action: The ICO President to write a letter addressed to all Territorial Committee representatives reminding them that the Territorial Committee should represent the whole optics community in the territory.
6.9 Motions related to the administration of the ICO French Bank Account

**Motion 5:** The Bureau of the International Commission for Optics, at its meeting in Rochester (New-York, USA) on 21 October 2016, resolves to modify as follows the list of individuals authorized to operate the accounts established at Caisse d'Epargne Ile de France Paris: Mr Yoshihiko Arakawa, President; Mr James A. Harrington, Treasurer; Mrs Angela Guzman-Hernandez, Secretary; Mr Pierre Chavel, contact person in France.

*French Version (to be sent to the bank)*

Le Bureau de la Commission internationale d’Optique, réuni à Rochester (New York, États Unis d’Amérique) le 21 octobre 2016, a décidé de modifier comme suit la liste des personnes autorisées à faire fonctionner les comptes bancaires détenus à la Caisse d’Epargne Ile de France Paris : M. Yoshihiko Arakawa, président; M. James A. Harrington, trésorier; Mme Angela Guzman-Hernandez, secrétaire; M. Pierre Chavel, correspondant en France.

Moved by J. Howell, seconded by H. Michinel, Approved unanimously.

**Motion 6:** (for the internal use of ICO)

The Bureau of the International Commission for Optics, at its meeting in Rochester (New York, USA) on 21 October 2016, instructs Mr Pierre Chavel not to operate the accounts at Caisse d’Epargne Ile de France Paris unless explicitly requested to do so by the President, the Treasurer or the Secretary.

Moved by J. Howell, seconded by H. Michinel, Approved unanimously.

7. ICO Treasurer's report (James Harrington, ICO Treasurer)

As of October 1, 2016, the ICO has a cash balance of $169,286 in our account. This amount is held in US dollars ($125,040) at the US Bank of America and in Euros (39,473€) at the Caisse D’Epargne in Paris. This is a significant increase in our cash balance of $147,320 reported at the Bureau meeting in Bordeaux, France in June 2015. However, the cash balance this year is approximately the same as in past years. In general, the cash reserves are highest during the year of the ICO Congress. 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 in 2016 as in past years is the collection of dues and dues in arrears. While this problem seems to be getting a little better, it is an issue that we continue to address. The 2016 dues collected as of October 2016 total $41,750 compared to a total of $53,820 owed in 2016. That is, we have collected 78% of the dues owed for this year. Interestingly, these 2016 dues were collected from 30 out of 45 dues paying Territorial Committees (TCs). That is, only 67% of the TCs paid their dues but those TCs paying accounted for 78% of the money received. The $41,750
collected so far this year is about equal to what was collected at this point in the year for each of the past few years. However, I feel that many of the 16 TCs who have yet to pay their 2016 dues will do so. My assumption is based on the fact that many of these TCs have been members in good standing in the past and that they eventually will pay their dues. I continue to work to not only collect the remainder of the 2016 dues but also money owed by a few TCs from prior years.

As a reminder, the Bureau passed the following resolution 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. ”

The only TCs that were demoted this year were Canada and Denmark. Denmark wrote to tell us that they no longer wished to continue their membership in the ICO.

One of the problems associated with membership is that some TCs have difficulty determining which optical organization is currently responsible for paying the TC’s ICO dues. Sometimes this has resulted in invoices being sent to the wrong person but usually I am able to locate the correct person responsible for seeing that the dues are paid. I am also concerned about Venezuela and Brazil as I believe that they are having considerable difficulty paying their dues. Unless some financial arrangements can be made they are likely to be demoted to Associate status.

I am again pleased to report that the editing and typesetting of the newsletter is being done in the UK by Alison Gardiner a former employee of the IOP and that the mailing is handled by Gemini West. So far the cost of editing, printing, and mailing the newsletters using these new services has been about $3,000 compared to $7,700 for the same costs in 2011 which also included printing and mailing the Green books.

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.

J. Howell and K. Choquette asked for clarification of the balance, on what is not owed but billed. K. Choquette also asked for clarifications about the Memorandum of Understanding with the OSA Foundation.

J. Harvey mentions what the current membership fee has barely changed since 1948. The 1948 fee updated would be thousands of dollars. He considers that sometimes is more difficult to pay tiny amounts.
**Balance Sheet**
As of October 1, 2016
Bureau Meeting - Rochester, NY

**Assets**

<table>
<thead>
<tr>
<th>Checking/Saving</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of America - checking</td>
<td>$14,509</td>
</tr>
<tr>
<td>Bank of America - money market</td>
<td>$110,529</td>
</tr>
<tr>
<td>French account-checking (1 Euro= 1.121 dollars)</td>
<td>$23,650</td>
</tr>
<tr>
<td>French account-savings (1 Euro = 1.121 dollars)</td>
<td>$20,598</td>
</tr>
</tbody>
</table>

From OSAF for IYL

<table>
<thead>
<tr>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5,000</td>
</tr>
</tbody>
</table>

Total checking/money market $174,286

Accounts receivable

| Current year dues collected | $41,750 |
| Dues still owed in 2015 | $12,070 |
| Book royalties | $1,294 |

Total accounts receivable $55,114

**Total assets** $229,400

**Liabilities and equity**

| Secretariat | $5,560 |
| Newsletter - copyediting | $768 |
| Newsletter - printing & distribution | $2,193 |
| Bureau expenses | $280 |
| ICO prizes + travel | $3,000 |
| Conference support and ICO-24 | $12,000 |
| ICTP school support | $6,000 |
| Traveling lecture awards | $1,000 |
| ICSU dues | $540 |
| IYL support - Spain, Italy, Cuba | $7,000 |

Total liability $38,341

**Equity**

Retained earnings $191,059

**Total liabilities and equity** $229,400

* Does not include current balance of $25,500 in the OSA Foundation

**K. Choquette** proposed to have a sponsor program for paying the dues. The IEEE PS has a huge chapter in the Netherlands, which could be approached as sponsors. **G. von Bally** mentioned that the fee should be higher for developed countries. **J. Howell** estimated that if the ICO becomes a Union, it might need at least two full time staff positions, which amounts for $5000 a month. The new mission should help increase the budget and hire professional people to do the work. The Union would also need very visible officers. **J. Harvey** suggests making a conversion of the dues paid in 1955 to current value.

**Motion 7.** To approve the financial report presented by the ICO treasurer. Moved by **G. von Bally**, seconded by **J. Niemela**. Approved unanimously.
8. Reports of all other Committees

8.1 Committee for the Regional Development of Optics (CREDO) (J. Harvey, Chair)

8.1.1 Introduction: In developing a strategy for increasing the engagement of governments, industries and research institutes in the Asia Pacific region in Optics, it seems appropriate to summarize the history of previous interactions. In considering this region, I am including Australia/NZ, the Asian countries on the western Pacific Rim, other Asian countries as far west as the Indian subcontinent. These are also the countries considered as contributing regions for the CLEO/PACRIM conference, and it seems appropriate to retain this grouping.

8.1.2 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 discounts and coordination of international conferences. In 2013 the AOS signed a Memorandum of Understanding with the Optical Society of India offering joint membership benefits.

In addition to these more formal interactions, there have been several other collaborative initiatives in the region, some funded by local research Centres and others by local research agencies. These have involved educational initiatives, travelling lecturer programmes, and the promotion of small start-ups 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.

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.

8.1.3 Recent events: The International Year of Light had a great stimulating effect, not only on outreach by scientists to the public, but also on outreach from optics professionals (in Universities and Research Institutes) to schools in many countries in the region. In addition, it provided a vehicle for the local organizing committees to exchange ideas with the organizing committees of neighboring countries, leading to a helpful strengthening of their respective outreach programmes. I was co-chair of the NZ organizing committee and could experience this directly.

Another issue which is perhaps not as widely known as it could be, was celebrated in Australia in 2016. This was the centenary of the birth of Aleksandr Prokhorov, who was one of the co-winners of the 1964 Nobel Prize in Physics for the invention of the laser. 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.

8.1.4 Role of the Committee in 2017: In considering how best the committee can enhance the development of optics research and applications in the region, two initiatives have been considered. These relate separately to the economically well-developed countries in the region, and to those with less well-developed economies.

Economically well-developed countries tend also to have a well-developed community of researchers and related industries in the optics area, and regularly support large, international conferences. From recent experience, it is clear that there is a lack of coordination in setting dates for these conferences, which often clash. The ICO could consider acting as an independently administered database, that anyone in the community could use to access a planned timetable for scheduling international conferences.

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, for bringing power and lighting to off grid communities.

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

A. Guzmán commented that there exist already since several years a Consolidated Calendar of Events at the ICO webpage that was enabled after request of the IEEE PS. The ICO Secretariat has offered and given permissions to the ICO International Member Societies to post their events in that Calendar, but only EOS keeps it updated.

8.2 Education Committee (Jakub Zakrzewski, Chair) No report

8.3 Traveling Lecturer Committee (James Harrington, Chair, and Seung Han Park)

The Traveling Lecture Award (TLA) provides small grants for scientists and engineers to lecture in the optical sciences, usually in developing countries. The typical grant is approximately $1,000/lecturer. The budget is $5,000 for the next triennium. The grants are not intended to support travel to conferences. There are few applications.

The ICO was approached by Tajinder Panesor, Head of International cooperation of the Institute of Physics (IOP, UK) to partner with ICO on the TLA, match ICO’s $1,000 grant. The IOP supports applications of UK or Irish lecturers, who travel to developing countries. The first joint ICO/IOP collaboration TLA was awarded in 2015 to Dr. Colin Sheppard, Italian Institute of Technology, Genova, Italy, who was hosted by Dra Silvia Ledesma, Laboratorio de Procesado de Imágenes, Departamento de Física J. J.
Giambiagi, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires. Dr. Colin Sheppard is Senior Researcher in Nanobiophotonics and Optical Nanoscopy.

In 2016 two TLA were awarded: (i) Dr. Zeev Zalevsky, Bar Ilan University, Faculty of Engineering, Ramat-Gan, Israel was hosted by Dr. Erkin Zakhidov, Uzbekistan Academy of Sciences, Institute of Ion Plasma and Laser Technologies, Tashkent, Uzbekistan; (ii) Dr. Yang Yue was hosted by Dr. Xinrui Xu, Harbin Institute of Technology, Harbin, China.

Dr. Vadim Parfenov, Russia, apply for a visit to Chile and Argentina. He has received 3 previous awards: 2003 (Brazil), 2012 (Mexico), 2014 (Cuba), and would not be supported by IOP. His request is on hold for 2017.

J. Harrington asked if the OSA can send applicants to TLA. J. Howell answered that they receive 5-10 application per year, and they support 5 of them for up to $3000. The lecturers are expected to give 4-5 different lectures in different sites and the host should also provide support. The pool of unapproved applications might not be worth for the ICO. J. Niemela mentioned that the ICTP provides € 2500 for stays of three weeks at ICTP. He recommended to tie the TLA with the ICO/ICTP awards. The TLA can be given to the award winners to volunteer as ICO ambassadors. Already one of the winners went to a remote area in Pakistan for a program for women and undergraduates. They could also bring photonics kits to public high schools.

8.4 ICO Prize Committee (Roberta Ramponi, Chair) (via teleconference)

The ICO Prize Committee members (2015-2017) are Roberta Ramponi* (Chair, ICO VP), Zohra Ben-Lakhdar* (not ICO bureau member), Yujie Ding* (ICO VP), John Harvey (ICO VP), John Howell (ICO VP), Seung-Han Park (ICO VP), Eric Rosas (ICO VP), Maria J. Yzuel* (ICO VP), Bingkun Zhou* (not ICO bureau member). (*members from the 2011-2014 Committee). There were 4 nominees in 2016, one of them already nominated for the Prize in 2015.

For the second year in a row, there was a superposition between recent or present nominations for the IUPAP prize in related topics. Although the rules for ICO prize do not require that the achievements object of the nomination have not been awarded by some other institution, the strong relationship between ICO and IUPAP makes a double appointment embarrassing.

Thus, as ICO Prize Committee, we recommend that:

- A note is included in both ICO and IUPAP instructions that the same scientific achievements cannot be proposed for both prizes, neither the same year nor in different years;
- ICO and IUPAP prize Committees get in touch to be sure not to have the same nominees in the same year.
The Committee recommends to the ICO Bureau to award the ICO Prize to Andrea Alú for “his fundamental and ground-breaking discoveries in the fields of antennas, metamaterials, cloaking, and plasmonics.”

A. Guzmán recalls that the overlap is occurring not only with the IUPAP YSP administered by the ICO as AC1, but with the IUPAP YSP of the C17 Commission. She also remarked that if the ICO Prize is awarded for work done after the previous IUPAP award, and the citation should reflect the new achievements. The citation recommended is very similar to that of the former IUPAP YSP awarded to him.

**Motion 8.** To approve the recommendation of the ICO Prize Committee to award the ICO Prize 2016 to Andrea Alú, under the condition that the Committee provides a new citation. Moved by **E. Rosas**, seconded by **J. Howell**. Approved unanimously.

### 8.5 ICO/ICTP Gallieno Denardo Award Committee (Mourad Zghal, Chair)

For the term 2014 - 2017, the members of the Committee are Prof A. Consortini of University of Florence, Italy; Dr M. Danailov of Synrotron Trieste, Italy; Prof J. Niemela of ICTP, Trieste, Italy; Prof A. Wagué, University Cheikh Anta Diop, Dakar, Senegal; Prof M. Zghal, University of Carthage, Tunisia (Chair). There were 6 nominees for the 2016 Award, and two winners: Dr. Jehan AKBAR from Hazara University, Mansehra, Pakistan for "his breakthrough contributions in the design and fabrication of high performance semiconductor lasers and amplifiers as well as for promotion of research activities in optics and photonics in Pakistan"; and Dr. Mati HORPRATHUM from National Science and Technology Development Agency (NSTDA), Thailand for "his valuable contributions in the development of optical thin film technology for innovative surface functionality as well as for his commitment in diffusion of optical thin film research in Thailand".

The deadline for submission of nominations for the 2017 Award is December 10, 2016. Nominations should be sent to the Chair of the Committee.

### 8.6 Galileo Galilei Award Committee (María Yzuel, Chair)

The Committee members (2015-2017) are: María Yzuel (Chair, ICO VP), Anna Consortini (not ICO bureau member), Nataliya Kundikova (not ICO bureau member, Past winner), Fernando Mendoza (not ICO bureau member), and Joseph Niemela (ICO VP). The Committee considered one candidate nominated in 2014, three in 2015 and two in 2016. The Committee decided to propose to the ICO Bureau Guillermo Kaufmann, from Argentina, as the winner for the Award for 2016, “for the development of novel speckle interferometry techniques and their application in experimental mechanics, materials technology and non-destructive testing.”
Motion 9. To approve the recommendation of the Galileo Galilei Award Committee to award the Galileo Galilei Award 2016 to Guillermo Kaufmann, “for the development of novel speckle interferometry techniques and their application in experimental mechanics, materials technology and nondestructive testing.” Moved by M. Yzuel, seconded by M. Zghal. Approved unanimously.

8.7 IUPAP Young Scientist’s Committee (Frank Höller, Chair)

Motion 10. To avoid further conflict due to nominations of the same candidate to the ICO Prize and the IUPAP Young Scientist Prize, the Chairs of each of these Committees should be members of the other. Moved by G. von Bally, seconded by K. Choquette. Approved unanimously.

Motion 11. To approve the recommendation of the IUPAP Prize Committee to award the IUPAP Young Scientists Prize in Optics 2016 to Prof. Dr. Na Liu for “outstanding contributions to Nanooptics, Nanophotonics, Nanoplasmonics, and Metamaterials”. Moved by G. von Bally, seconded by K. Choquette. Approved unanimously.

8.8 Ad hoc Committee on International Affairs (Gert von Bally, Chair)

The Committee was established to evaluate procedures for advocating in favor of scientists suffering political persecution, limited freedom of practicing their profession for political reasons, or endanger scientists in general. The ICO Bureau discussed the Omid Kokabee’s case and felt the need of establishing criteria for actions in similar cases, like transferring the information to ICSU or Amnesty International.

The members of the committee (Prof Henryk Kasprzak, Wroclaw University of Science and Technology, Poland, Prof Tomasz Szoplik, University Warsawa, Poland, Prof hc Gert von Bally (chair) University of Muenster, Germany) evaluated a possible procedure to approach fast and effectively the Human Rights Protection and Evaluation system of the United Nations (UN Human Rights Bodies). These UN bodies that have official committees for this purpose and treaty-based international bodies seem to be the most suitable channels. The last evaluate actions against treaties signed within the UN. It turned out to be necessary to consider these bodies with their subdivisions as communication channels for individual cases.

In the case of Kokabee besides such contacts the Committee found support by the Special Rapporteur for Iran of the Office of the High Commissioner for Human Rights (OHCHR). His release from prison was announced worldwide in the media.

In addition, members proposed that this ad hoc Committee deals with some professional ethics rules related to the statutes and rules of the ICO. Currently the committee is evaluating to what extent it will expand its scope. It is intended in such cases to include specialists into the team to provide knowledge based recommendations to the ICO authorities.
J. Niemela is aware that there are colleagues that are currently endangered in Turkey. K. Choquette mentioned that the IEEE PS has information that can be shared with the Committee.

8.9 Ad hoc Committee on the IYL 2015 (D. Moore and J. Niemela)

The International Day of Light will be one of the legacies of the IYL 2015. The ICO Bureau decided to continue with the ICO award for the promotion of Optics and Photonics in ICO Territories, as part of the legacy of the IYL 2015. D. Moore proposed to redirect the money assigned to the Award for ICO activities for the Day of Light.

**Action:** D. Moore and J. Niemela: to prepare a proposal for ICO Activities for the International Day of Light.

9. Reports of liaisons with Member Societies & ICTP

9.1 International Societies (ICO Bureau members)

9.1.1. SPIE (M. Yzuel) SPI has 19000 members from 166 countries and 300 student chapters. It holds 20 annual conferences and has 430000 digital library papers. The SPIE develops an altruistic activity in support of the ICO Goals and shares ICO’s missions of advancing and diffusing knowledge in the field of optics. SPIE expects to provide over $4 million USD in support of education and outreach efforts in 2016. These programs include student chapters, scholarships, conference sponsorship, best paper prizes, teacher training, outreach materials, education outreach grants, science fairs and women in optics programs. A study entitled “Women in the Optics and Photonics Workplace” and a slide deck was released in August. SPIE provides free Digital Library subscriptions through the International Network for the Availability of Scientific Publications (INASP) to the following countries: Bangladesh (60), Mongolia (6), Bhutan (1), Afghanistan (2), West Bank & Gaza (10), Samoa (1), Ethiopia (36), Rwanda (15), Congo (2), Côte d’Ivoire (2), Nigeria (17), Namibia (2), Mozambique (10), and El Salvador (8).

**SPIE /ICO/ ICTP Collaborations:** SPIE provides support to the Trieste System Optical Sciences and Applications (TSOSA Committee) with Electronic Journal Delivery Service (e-JDS) 140 free papers for attendants of the Winter College. It also promotes and supports financially the Winter College ($5,000) and the ICTP Anchor Optics Research programme ($30,000) to partially fund an optics position in experimental research at ICTP; SPIE is also co-sponsor of the Active Learning in Optics and Photonics (ALOP) teacher training ($20,000). This year ALOPs have been held in Panama, Namibia, and Nigeria.

SPIE is also member of the Steering Committee of the Education and Training in Optics and Photonics (ETOP), and contributes $6,000 to its organization. Next ETOP will be held May 29-31, 2017 in Hangzhou, China. SPIE also publishes the proceedings of ETOP, which are open access.
During the IYL 2015 SPIE continued to work with ICO and other IYL partners to plan the closing ceremony in Merida, Mexico 4-6 February and to produce “Inspired by Light,” a collection of IYL blog posts that was distributed at the event. SPIE was pleased to collaborate with other members of the IYL Steering Committee to produce a Final Report on the IYL and activities of its partner organizations which included programs by ICO and SPIE. SPIE looks forward to International Day of Light collaborations for 16 May 2018.

SPIE received a request for support of ICO-24 August 2017, and will be a technical co-sponsor for ICO-24. SPIE also expects to assist ICO 24 with a calendar listing, event promotion and by providing best student paper awards.

SPIE looks forward to participating in ICO-24 and plan to send SPIE representatives.

9.1.2. OSA (J. Howell) The OSA has been founding member of Laserfest in 2010, the IYL 2015 and now is celebrating its centenary. The OSA contributed the Light Box to the IYL, a hands-on kit for exploring light and color. The celebration of OSA centenary will be in Rochester, where OSA held its 1921 Annual Meeting, attended then by 50-60 scientists. Since 1916 the role of OSA has been to educate, promote, celebrate and contribute to the growth of optics. For its centenary, the OSA will hold the “Light the Future” Speaker series in different meetings. Main speakers will be: Ira Flatow, Science Friday (Kick-off); Mary Lou Jepsen, Facebook (OFC); Ray Kurzweil, Inventor (CLEO); Joseph Izatt, Duke Univ. and Bernard Kress, Microsoft / Hololens (IAOC); Michio Kaku, Futurist, CUNY (FiO); Susana Marcos, Instituto de Óptica, Científicas, Spain (LAOP); Steven Chu, Nobel Laureate (ACP); Sir David Payne, Univ. of Southampton, UK (Photonics India). The OSA has 109 student chapters in North America, 44 in Europe, 44 in South America, 20 in Mideast & Africa and 124 in Asia & Oceania. In 2017 there will be the 10th Anniversary of the International OSA Network of Students (IONS). Since 2017, more than 40 conferences took place in 20 countries, attended by over 1,500 students. The OSA Foundation finances international projects.

9.1.3. IEEE Photonics Society (K. Choquette) The IEEE Photonics Society (IPS) is one of 42 Societies within the Institute of Electrical and Electronic Engineers. The IEEE Photonics Society has over 6000 members and the IEEE over 421,000 members in more than 160 countries, which 50 percent of whom are from outside the North America. The Photonics Society has four international peer reviewed journals, and owns or co-owns 8 international conferences, including: Optical Fiber Conference (OFC), Conference on Lasers and Electro-Optics (CLEO), IEEE Photonics Conference. All published journal articles and conference proceedings (including co-sponsored conferences) are archived into IEEExplore, the largest electronic database of technical publications in the world.

**International Activities:** Building on the momentum from the 2015 International Year of Light, the Photonics Society has been involved in many facets of international engagement during 2016, including:

- 10 Graduate student Fellowships ($1K) were awarded to international recipients
• 10 conference travel scholarships ($2.5K) were awarded to international recipients

• 4 conference travel scholarships for women ($2.5K) were awarded to international refinements; 11 major women in photonics technical events at international conferences

• IEEE Photonics paper journals shipped to Africa libraries; supporting Summer Schools in Cameroon, East Africa

• 19 International Photonic Society student chapters, including 2 in Africa

• More than $12K contributed to Solar-Aid, humanitarian effort to supply LED lamps to Africa

**Young Professionals Focus:** “While school ties end at graduation, your support from IEEE Photonics lasts through your entire career.” IEEE Photonics provides support through Chapter Forums & Affinity Group Installations, Events at sponsored & cross-discipline conferences, Young Entrepreneurs Day – June 2016, R8 Student & Young Professionals Congress – August 2016, GlobeCom – Dec 2016

**Education:** “Educate the Educator” Sessions; edX Tutorials and MOOCs; Summer School Sponsorships; IEEE Academic – bilingual resources.

**Global strategy:**

**Africa initiative:** Near-Term Initiatives and Actions: Organization of workshops in East Africa; Establishment of 4 new student Chapters; Ghana, Kenya, Nigeria and Tunisia; Outreach activities towards the general public, and particularly youth – STEM.

**Recent Accomplishments:** Workshops in Ethiopia and Cameroon; Humanitarian: SolarAid & Unite to Light; 2 Sponsored Conferences: IEEE AFRICON and High-Level Physics and Solutions Conference; Summer School: “International Cooperation and Academic Exchange" Summer Program.

**Latin America:** Sponsorship of LAOP Poster Session; Region 9 “Volunteer & Chapter Forum”; EE Week; Outreach Activities; Regional Student & Young Professional Rep Recruitment. **Chapter Relations:** Educational Seed Funding Grants; Sponsored 10 chapter-related education events; 22 Young Professional events.

**Diversity:** National Society of Black; Physicist Collaboration; Fundación CIENTEC Collaboration – Latino Network International Engagement.

**Inclusion Activities: Women in Photonics:** IEEE Day 2016 & “Introduce a Girl to Photonics” Week; 4 Chapter Events; Reaching 100+ pre-university students; Connection with Girls Collaborative & Girls Inc.; 110+ hands-on demos & classroom presentations; Reaching 3,300+ pre-university students.

**Student Membership:** Photonics Raspberry Pi Contests; Student Outreach Ambassador Activities; (5) Professional Development Events & Banquets, i.e. UCSB, UK&I, UMICH.
**Photonics Society Social Media: Reach:** Social media followers from 60 different countries; 86,000+ followers on Facebook, Twitter, LinkedIn, etc.; 37% Women and 62% Men – 1% Unidentified; Average Age: 25-43

**Readability:** Our most popular posts have a readability of 1.5K people.

**80/20 Rule:** 80% innovation/science and 20% products, educational tools and services.

**Social Media Campaigns:** #iLookLikeAnEngineer

The IEEE Photonics Society, in partnership with the IEEE Foundation, established the **IEEE Photonics Society Fund** on Oct. 1st 2016. As the philanthropic arm of IEEE, the IEEE Foundation inspires the generosity of donors so it may enable programs that enhance tech access, literacy and education, as well as support the IEEE professional community. With donor support, the IEEE Foundation strives to be a leader in transforming lives through the power of technology and education. The IEEE Photonics Society is currently working on contributing USD $100k from its own budget to the IEEE Photonics Fund.

The IEEE PS can help ICO with communication tools like twitter, and all other communication media. The IEEE foundation can channel donations for international activities. **D. Moore** and **Y. Arakawa** thanked K. Choquette for re-establishing the contact between ICO and the IEEE PS, and thanked him for his thorough report on IEEE Photonics Society activities.

**9.1.4. EOS (H. Michinel)** P. Urbach, the EOS designated VP could not attend the meeting. **H. Michinel** was elected EOS VP last month. The EOS Bureau approved to present the supporting letter for ICO Application to ICSU to become a Union. He proposed to consider the possibility of an agreement with the ICO for joint traveling lecturer grants for lecturers from Europe.

**9.1.5 LAM Network.** No report available.

**9.1.6 OWLS (G. von Bally representing S. Morgan)** The OWLS 2016 conference was held March 16-19, 2016 at the Tata Institute of Fundamental Research, Mumbai, India, which has five major campuses all over India. There were 2 parallel sessions, 100 oral presentations, and 2 poster sessions, with speakers from India, UK, France, USA, Israel, Germany, Netherlands, Australia, Singapore, and Japan. It was the first time that an OWLS Conference was held in India. The organizers were Jyotishman Dasgupta, A. S. R. Koti, Ravindra Venkatramani, and Sudipta Maiti. The society was founded in 1999. Gert founded the society in 1999. The hosting of OWLS 2018 is currently in discussions with Universities in UK, Rwanda, Australia and Romania. There will be a biophotonics meeting in 2017. The Bureau 2016-2018 consists of Prof Stephen Morgan (President), Prof Alberto Diaspro (Vice-president), Dr. Hans-Jochen Foth (Treasurer & Secretary), Prof David Sampson (Vice-president), Prof h. c. Gert von Bally (Honorary President).

**9.1.7 RIAO: The Launching of the Mexican Photonics Initiative (E. Rosas)**
The RIAO consists of 7 society members, the more recently incorporated, the Ecuadorian society for optics. The RIAO/OPTILAS conference is going to take place in Pucón, Chile. The Mexican territory, in collaboration with the RIAO, has been working in the National Photonics initiative for two years, which is a Mexican triple helix strategic alliance seeking to raise awareness of optics and photonics and drive local and foreign funding and investment in four photonics-driven industries: Energy, health and medicine, advanced manufacturing, communications and information technology. On November 9th, the Mexican Secretariat of Economics, ProMéxico, the Mexican Academy of Optics and the ICO Mexican Territorial Committee will release the Photonics Technology roadmap for Mexico. Its milestones are: (i) To achieve intelligent LED urban lighting for Mexico and improve the efficient energy usage in an Urban Operating Systems (USO) environment. (b) To achieve PVs based energy efficiency increase (usage and production), for electricity generation and efficient liquid fuels production. (c) To achieve high-quality, fiber optic based, nationwide urban connectivity. (d) To achieve capabilities for design and production of 2-20 µm photonic sensors and an ultrahigh power laser (petawatt), and to establish certified production processes. To achieve those milestones, they will need to develop manufacture centers for Photonics and certification bodies. The plan contemplates the construction of an ultrahigh-power laser facility for the Mexican cluster, for which they will need international collaboration, and alliances with research institutions worldwide. E. Rosas also requested the support from ICO, OSA, SPIE, IEEE, and the international community to help foster this initiative in Mexico.

K. Choquette asked where the Mexican Cluster will be located. E. Rosas answered that they expect to have space at Universities and companies. Mexico has a recent experience with 708 clusters for different sectors, like the automotive and medical. They also have signed 22 international trade agreements with different countries. Mexico, Colombia, Peru and Chile are the founding members of the Pacific Alliance, a Latin American trade bloc, which will be used by ProExport to replicate the photonics initiative in those countries.

9.2 TSOSA Advisory Group (Angela Guzman, ICO Representative and Chair of TSOSA) Report presented as part of the ICO Secretary report (numeral 6.2).

Y. Arakawa left the floor to D. Moore to preside the meeting, since he had to take a flight to attend the IUPAP Meeting.

10. Liaisons to ICSU and IUPAP

10.1 ICSU links (D. Moore) The ICSU General Assembly will take place in Taipei, October 19-27, 2017. The ICO application for membership should be presented 6 months in advance.

10.2 IUPAP links

10.2.1 M. Zghal (C13) He was not accepted as member of the Committee by C13.
10.2.2 A. Guzmán (C15) Officers of C15: Chair: Toshiyuki Azuma, Vice-Chair: Roberto Rivarola, Secretary: Dominique Vernhet

The call for the 2016 Young Scientific Prize was launched on January 2016. The official announcement was posted on the IUPAP Web site (http://iupap.org/c15-news/). The deadline was March 31, 2016. All members were asked to vote for the IUPAP C15 Young Scientist Prize winner. In 2016, the total number of candidates was 23. There were 25 candidates in 2015. Nine of those lost eligibility and there were 7 new nominations. The objective of the Prize is to recognize a young scientist who made a significant and original contribution in the domain of Atomic, Molecular and Optical Physics. The selection should not be based only on “research metrics” (h or g factors, etc..) which depends very much upon the environment where the young scientist is developing his/her research activities.

The 2016 Young Scientist Award for the Commission on Atomic, Molecular and Optical Physics (C15) was awarded to Dr. Yu-Ao Chen. Yu-Ao Chen received his Master’s degree from the University of Science and Technology of China (USTC) at Hefei (China) in 2004, and his doctorate from Heidelberg University (Germany) in 2008 under supervision of Prof Jian-Wei Pan. After spending several years as postdoctoral researcher and project leader working with Prof Immanuel Bloch in Germany, he returned to USTC at Shanghai (China) as professor to start up his own group in 2011. He has carried out numerous outstanding achievements, namely multi-photon entanglement in quantum information processing, quantum memory toward long distance quantum communication, and recent works on quantum simulation with ultra-cold atoms in optical lattices. He has been already awarded many prestigious prizes including the 2013 Fresnel Prize for fundamental aspects from the European Physical Society and the Qiu Shi Outstanding Youth Scholar in China. Dr. Yu-Ao Chen was invited to give a talk at the 25th INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS (ICAP 2016), held in July in Seoul, Korea.

On July 7th A. Guzmán received information about the C15 annual luncheon meeting at ICAP@Seoul, Korea, to take place on July 26th. She asked for possibilities of participating via conference call but there was none.

J. Harvey (C17) reports that the C17 has not met. Their meeting will be in the next months. Their activities are more related to the award. The Award will be presented at CLEO PACRIM. With respect to the Application of ICO to ICSU, there was a draft response of the C15. C17 had some reservations but it will discuss the application in the next meeting.

11. ICO participation in meetings and schools (Gert von Bally, ICO Associate Secretary)

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Date and Location</th>
<th>Requested by Applicants</th>
<th>Decision by ICO</th>
<th>ICO Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. Seminar on Photonics, Optics, and its Applications (SPIE, Samur, Indonesia)</td>
<td>14-15 Oct 2014</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Gert von Bally</td>
</tr>
<tr>
<td>Int. Conf. on Optics, Photonics and Photosciences (CIOFF, La Habana, Cuba)</td>
<td>14-17 Oct. 2014</td>
<td>US$ 3,000</td>
<td>US$ 1,500</td>
<td>Ari Friberg</td>
</tr>
<tr>
<td>ICTP Wintercollege on “Light a Bridge between Earth and Space”, Trieste, Italy</td>
<td>9-20 Feb. 2015</td>
<td></td>
<td>different budget</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>International Conference on Optics and Photonics (IOP 2015), Calcutta, India</td>
<td>20-22 Feb. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td></td>
</tr>
<tr>
<td>Lighting UP Africa with lasers, optics, and fibres (LAUPA'2015) Carthage, Tunisia</td>
<td>15-21 March 2015</td>
<td>US$ 4,000</td>
<td>US$ 1,000</td>
<td>Zohra Lakhdar</td>
</tr>
<tr>
<td>Discussions on Nano and Mesoptic Optics (DINAMO-2015), El Calten, Argentina</td>
<td>8-12 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td></td>
</tr>
<tr>
<td>Int. Conf on Optical and Photonic Engineering (icOPEN 2015), Singapore</td>
<td>14-16 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td></td>
</tr>
<tr>
<td>Education and Training in Optics (ETOP 2015), Bordeaux, France</td>
<td>29 June - 2 July 2015</td>
<td></td>
<td>different budget</td>
<td>Maria Calvo</td>
</tr>
<tr>
<td>Int. Conf. Micro- to Nano-Photonics (ROMOPTO 2015), Bucharest, Romania</td>
<td>1-4 Sept. 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td></td>
</tr>
<tr>
<td>Mexican Optics and Photonics Meeting (MOPM 2015), Leon, Mexico</td>
<td>9-11 Sept. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>12th Int. Conf. on Correlation Optics (Correlation Optics 2015)</td>
<td>14-18 Sept 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Sergey Odoulov</td>
</tr>
</tbody>
</table>

**Periode 1 Actual Budget in Total**: US$ 8,500
J. Harrington cannot transfer money to Indonesia from the USA. P. Chavel intended to do the transfer but the information on the bank account was not right. J. Niemelä recommended to ask OSA for contact information. G. von Bally will write to the organizers.

**Periode 2 Actual Budget in Total**

US$ 9,500
11.2 Report on bids for the ICO 25th General Congress. The original intention was to make the Congress in a developing country. Everybody in the Bureau was enthusiastic but we were not aware that we must give a substantial support. D. Moore got offers for donations, but they must be made to the OSA Foundation, and the OSA Foundation does not provide support for the organization of ICO conferences. Until the date there are no bids, and most probably we might have to delay the idea of making the conference in a developing country.

A former ICO meeting was held in Ghana, and was supported by ICTP and TWAS, and others. J. Niemela could help.

There have been two letters of intention for bids, one from Canada and other from the UK. We will have to extend the deadline. The bid from Canada is to hold the meeting in Quebec. They request $15000 from the ICO, and from any surplus they will give the first $15000 to ICO. The Chair of ICO-25 would be the chair of the Canadian Territorial Committee.

M. Zghal asked Bureau’s opinion about having the ICO 25 in Tunisia. F. Höller and J. Harrington were encouraging. G. von Bally reminds the previous experience with the ETOP and mentions that extending the deadline is not a problem, but the ICO cannot
change the place in the last moment. F. Höller mentioned that the ICO cannot warrant safety in a developing country. K. Choquette mentions that even in developed countries there are unsafe cities. G. von Bally recommends having a Plan B. K. Choquette recommends that the Conference will not be held in October because of overlap with other activities. S-H Park recommends looking for contacts in all countries using the UNESCO list of the IYL. H. Michinel mentioned that before the meeting the main work is to contact people and build the webpage. ICO 25 can be announced with and optional location, and if needed, the location can be changed 6 months before the meeting. M Zghal reassures that Tunisia hosts conferences every year. H. Michinel comments that if the Bureau is concerned with terrorist attacks, they can happen elsewhere. By consensus it is recommended that M. Zghal presents the proposal and J. Niemela prepares a Plan B.

12. Date and Place of the next ICO Bureau Meeting

Y. Arakawa proposed the following tentative schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 (Sat)</td>
<td>13-18</td>
<td>Execom Meeting</td>
</tr>
<tr>
<td>20 (Sun)</td>
<td>10-18</td>
<td>Bureau Meeting</td>
</tr>
<tr>
<td>21 (Mon)</td>
<td>10-12:30</td>
<td>Opening and Plenary</td>
</tr>
<tr>
<td></td>
<td>16-18</td>
<td>General Assembly</td>
</tr>
<tr>
<td></td>
<td>18-20</td>
<td>Conference Reception</td>
</tr>
<tr>
<td>23 (Wed)</td>
<td>9:30-1230</td>
<td>Plenary</td>
</tr>
<tr>
<td></td>
<td>8-21</td>
<td>General Assembly</td>
</tr>
<tr>
<td>24 (Thu)</td>
<td>16-18</td>
<td>Bureau Meeting</td>
</tr>
<tr>
<td></td>
<td>18-20</td>
<td>Conference Banquet</td>
</tr>
<tr>
<td>25 (Fri)</td>
<td>1030-1230</td>
<td>Plenary and Closing</td>
</tr>
</tbody>
</table>

The Bureau Meeting will have two sessions. The first before the election of the Bureau 2017-2020, on Sunday August 20, 2017. The second session, join Bureau meeting of the 2014-2017 and 2017-2020 Bureau members, to be held on Thursday 24th August 2017. These dates and times are subject to changes as the program of the conference gets defined.

Meeting adjourned by D. Moore at 4:30PM.

ICO Secretariat, June 27, 2017

Reviewed by D. T. Moore, July 10, 2017

Reviewed by Y. Arakawa, July 15, 2017

Draft Minutes to be approved by the ICO Bureau.
FINANCES

ICO Treasurer’s report (2014-2017)

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 equable 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.

Appendix 1 – Performance budget August 2017

<table>
<thead>
<tr>
<th>Performance Budget*</th>
<th>2014 through 2017 Tokyo, Japan,</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>Actual*</td>
</tr>
<tr>
<td>Dues</td>
<td>$160,000</td>
</tr>
<tr>
<td>Less not collected</td>
<td>$49,140</td>
</tr>
<tr>
<td>Net dues</td>
<td>$110,900</td>
</tr>
<tr>
<td>Royalties</td>
<td>$1,880</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>$112,790</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
</tr>
<tr>
<td>Secretariat</td>
<td>$21,360</td>
</tr>
<tr>
<td>Editing, printing, mailing newsletters</td>
<td>$11,680</td>
</tr>
<tr>
<td>Printing &amp; distribution - Green Book estimated</td>
<td>$4,000</td>
</tr>
<tr>
<td>ICO prizes + travel</td>
<td>$9,000</td>
</tr>
<tr>
<td>Conference support</td>
<td>$33,500</td>
</tr>
<tr>
<td>ICTP school support</td>
<td>$17,170</td>
</tr>
<tr>
<td>ICO Congress</td>
<td>$7,500</td>
</tr>
<tr>
<td>Traveling lecture awards</td>
<td>$3,000</td>
</tr>
<tr>
<td>ICSU dues</td>
<td>$1,670</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$108,880</td>
</tr>
<tr>
<td><strong>Surplus/(Deficit) for 3 year period</strong></td>
<td>$3,910</td>
</tr>
</tbody>
</table>

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

The first budget shown in Appendix 1 is the performance budget of our organisation 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.
### Appendix 2 – Balance Sheet

Balance Sheet: Estimated as of August 2017, ICO 24, Tokyo, Japan.

#### Balance Sheet*

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

#### Assets

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

#### Liabilities and equity

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference support</td>
<td>$17,000</td>
</tr>
<tr>
<td>ICO-24</td>
<td>$7,500</td>
</tr>
<tr>
<td>ICTP Winter College – Trieste 2017</td>
<td>$6,170</td>
</tr>
<tr>
<td>Secretariat - A. Guzman</td>
<td>$10,000</td>
</tr>
<tr>
<td>ICO Prizes/awards/travel</td>
<td>$3,000</td>
</tr>
<tr>
<td>Printing and mailing newsletters</td>
<td>$3,860</td>
</tr>
<tr>
<td>ICSU dues for 2017</td>
<td>$582</td>
</tr>
<tr>
<td>Traveling lecture award</td>
<td>$1,000</td>
</tr>
<tr>
<td>IYL-CUBA</td>
<td>$1,000</td>
</tr>
<tr>
<td>Miscellaneous-(SPIE book royalty)</td>
<td>$584</td>
</tr>
<tr>
<td>Bad debt-fraudulent money transfer</td>
<td>$5,500</td>
</tr>
<tr>
<td><strong>Total liability</strong></td>
<td><strong>$56,196</strong></td>
</tr>
</tbody>
</table>

#### Equity

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained earnings</td>
<td>$156,502</td>
</tr>
</tbody>
</table>

#### Total liabilities and equity

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td><strong>$212,698</strong></td>
</tr>
</tbody>
</table>

* Does not include $25,500 in the OSA Foundation
COMMITTEE REPORTS AND AWARDS

ICO Nominating Committee for 2017 elections

Interim report

According to established procedures in the ICO Rules and Codes of Practice, elections for members of the ICO Bureau take place every three years and will take place this year at the ICO 24th Congress, to be held 21–25 August, Keio Plaza Hotel, Tokyo.

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 of Duncan T Moore (chair, USA), Maria Calvo (Spain), Seung Han Park (Korea) and John Harvey (New Zealand).

Pursuant to ICO rules, letters were sent to the Territorial Committees (TCs) in October 2015 and June 2016 for nominations to be received up to 24 hours before the election (19 August 2017). As of 12 June, the nominations shown in the table below have been received and/or established by protocol.

The position of past-president for the term 2017–2020 will automatically be assumed by Prof Yasuhiko Arakawa (Japan).

Added to these in the Bureau composition will be the individuals appointed as vice-president by the Member societies. Regarding the position of elected vice-president, two of these nominations need to be from industry. At this time, we only have one nomination – please consider a nomination in this capacity. It should be remembered that nominations for all positions/officers close 24 hours before the second business meeting (24 August) of the International Commission for Optics General Assembly in Keio, Tokyo, Japan.

The election activities will take place as indicated during the ICO General Assembly – the first session is scheduled 14:00 – 17:00 on 22 August, while the second and final ICO General Assembly is scheduled for 17:00 – 20:00 on 24 August. Additionally, the Nominating Committee will now be collecting candidate’s CV’s and endorsements of candidates from the Territorial Committees.
## Nominations received as of 6 August 2017

<table>
<thead>
<tr>
<th>Position</th>
<th>Nomination</th>
<th>Territorial Committee</th>
<th>Endorsements</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Prof Angela Guzmán</td>
<td>Colombia</td>
<td>Spain, Tunisia, Portugal</td>
</tr>
<tr>
<td>Secretary</td>
<td>Prof Humberto Michinel</td>
<td>Spain</td>
<td>New Zealand, Tunisia, Portugal</td>
</tr>
<tr>
<td>Associate Secretary</td>
<td>Prof Gert von Bally</td>
<td>Germany</td>
<td>Spain, Tunisia</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Prof Joseph Niemela</td>
<td>USA</td>
<td>Spain, Tunisia</td>
</tr>
<tr>
<td>Vice-president</td>
<td>Prof Qihuang Gong</td>
<td>China</td>
<td>Tunisia</td>
</tr>
<tr>
<td></td>
<td>Prof Manuel F. Costa</td>
<td>Portugal</td>
<td>Spain, France</td>
</tr>
<tr>
<td></td>
<td>Prof Adrian Podoleanu</td>
<td>UK</td>
<td>Spain, Ireland, Norway, Latvia, Tunisia, Venezuela</td>
</tr>
<tr>
<td></td>
<td>Prof Gilles Pauliat</td>
<td>France</td>
<td>Belgium, Canada, Romania, Estonia, Sweden, Lithuania, Latvia, Cuba, Indonesia, Spain, Switzerland, Tunisia</td>
</tr>
<tr>
<td></td>
<td>Prof Juergen Czarske</td>
<td>Germany</td>
<td>Switzerland</td>
</tr>
<tr>
<td></td>
<td>Prof Tero Setälä</td>
<td>Finland</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof Leszek Sirko</td>
<td>Poland</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Sara Otero*</td>
<td>Spain</td>
<td>Tunisia, France, New Zealand, Portugal</td>
</tr>
<tr>
<td></td>
<td>Prof Luca Poletto</td>
<td>Italy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof Mourad Zghal</td>
<td>Tunisia</td>
<td>Spain</td>
</tr>
<tr>
<td></td>
<td>Prof John Harvey*</td>
<td>New Zealand</td>
<td>Spain, Tunisia</td>
</tr>
<tr>
<td></td>
<td>Prof Seung-Han Park</td>
<td>Korea</td>
<td>Spain, Tunisia</td>
</tr>
</tbody>
</table>

*Those in industry are marked with *

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**Duncan T Moore, ICO past-president, chair of the ICO Nominating Committee**
ICO Traveling Lecturer Program Report

The ICO Traveling Lecturer Committee consists of Prof J Harrington (Chair) and Prof Seung-Han Park (ICO VP). 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. 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." Each awardee is given a grant of $1,000 to help defray travel expenses.

During this period, the ICO was approached by Tajinder Panesor, Head of International relations at the Institute of Physics (IOP), UK. The IOP proposed a partnership with the ICO on traveling lecturer awards for UK or Irish lecturers, co-sponsoring the ICO travelling lecturer programme with a $1,000 matching grant.
The first joint collaboration with the IOP allowed Dr. Colin Sheppard from the Italian Institute of Technology, Genova, Italy, to visit University of Buenos Aires in August 3-8, 2015. He was hosted by Dra Silvia Ledesma, Laboratorio de Procesado de Imágenes, Departamento de Física J. J. Giambiagi, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires.

Professor Sheppard gave three lectures on the focusing of light, confocal microscopy and super resolution and phase contrast imaging to students from various parts of Argentina, Colombia and Uruguay. He had a fruitful interaction with researchers at the Image Processing Laboratory, which might lead to a longer research visit.

In 2016, the travel grant award was given to Dr. Zeev Zalevsky, from Bar Ilan University, Faculty of Engineering Ramat-Gan, Israel.

Prof Zeev Zalevsky was hosted by Dr. Erkin Zakhidov, Uzbekistan Academy of Sciences, Institute of Ion Plasma and Laser Technologies, Tashkent, Uzbekistan.

As a reminder, we welcome new applicants for our travelling lecture awards. The approximate total allocation for these awards is $5,000 for the three-year period, 2014–2017.

Jim Harrington, ICO Treasurer
Triennial 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 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 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.

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 formal rules of the ICO Prize are found in section 9 - ICO Prize:

Award nomination instructions: [http://e-ico.org/activities/awards#nom](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

The ICO Prize Committee for the term 1 October 2011 to 30 September 2017 has been chaired by Professor Roberta Ramponi, ICO Vice President, (roberta.ramponi@polimi.it) 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 2015-2017 are six ICO Vice-presidents: John Harvey, John Howell, Seung-Han Park, Eric Rosas, Maria Yzuel, Yujie J. Ding (ICO VP until 2016) and two former members of the Committee, Zohra Ben Lakhdar (not ICO Bureau member) and Prof Zhou Bingkun (not ICO Bureau member). Since 2011,
the Carl Zeiss Foundation donates a laser engraved glass trophy for the ICO Prize winner.

The committee is in the process of selection of the 2017 prize.

**2014 ICO Prize: Martin 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 commercialisation 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 superresolution methods in thick tissue; dynamic optical methods for laser machining are being applied. Prof. Booth will receive the prize and deliver his Ernst Abbe Lecture at the ICO 24th

An extended article on his achievements and research areas of interest was published in the [ICO Newsletter 101](#).

**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. Dr. Ozcan received the prize at the International Conference on Applied Optics and Photonics 2016 in Hanover, Germany. Further details on these computational imaging and microscopy techniques can be found in the ICO Newsletter 106.

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 ground-breaking 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. Further details on his work can be found in the ICO Newsletter 110.

Triennial report of the IUPAP Young Scientist Prize in Optics’ Committee

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. Career interruptions will not be counted as time of research experience.

The Prize includes:
The IUPAP Young Scientist Medal with the name and discipline (optics) of the awardee engraved on the back.
• A citation.
• A 1000€ award as established by IUPAP.

The Prize is awarded at a major ICO meeting, where the recipient is expected to deliver an invited presentation.

The IUPAP Prize Committee members (for the term October 1, 2014 - September 30, 2017) are; Moshe Oron (Israel, Chair), Maria Calvo (Spain), Tomasz Szoplik (Poland), Carmen Cisneros (Mexico, IUPAP representative) and Nicholas George (USA). The committee is in the process of selection of the 2017 Prize.

IUPAP Young Scientist Prize in Optics 2014: Albert Schliesser

Albert Schliesser is a Research Assistant Professor at the QUANTOP Center of the Niels Bohr Institute, Copenhagen University, Denmark. He obtained his MSc (Physik-Diplom) from the Technische Universität München, and his PhD (Dr. rer. nat.) in physics from the Ludwig-Maximilians-Universität München. His PhD advisor was TW Hänsch. After a Postdoctoral position as Research Assistant for the Laboratory of Photonics and Quantum Measurement of the Swiss Federal Institute of Technology Lausanne (EPFL), he joined the Niels Bohr Institute. He has been awarded the 2014 IUPAP Young Scientist Prize in Optics “for his outstanding contributions to photonics and optomechanics, in particular by developing a micro-frequency comb and a radio-to-optical mechanical transducer.”

Since his graduate studies, Dr Schliesser has pursued research in optics at its intersections with other physics disciplines such as nanomechanics. In the Laser Spectroscopy division of the Max-Planck-Institute of Quantum Optics he worked on novel spectroscopic techniques based on laser frequency combs and on their applications in sensing and microscopy. One remarkable outcome of this research has been the discovery that frequency combs can be generated in optical microresonators via nonlinear optical processes (P Del’Haye et al, Nature 450, 1214, 2007). Only one cw laser source is necessary to generate a large number of optical sidebands with exactly defined frequency spacing. Such “micro-comb” generators could find applications in trace gas sensing, astronomical spectrograph calibration, arbitrary waveform generation and telecommunications. The technique has been patent-protected and is being explored for commercial use. It is also widely studied in research laboratories, in particular its extension to new spectral domains such as the mid-infrared (A. Schliesser, N. PIfcque, T. W. Hänsch, Nature Phot 6, 440, 2012).
Dr Schliesser has also investigated the coupling of optical fields to micro- and nanomechanical oscillators. His work led to the observation of radiation-pressure induced laser cooling of mechanical modes (A. Schliesser, P. Del'Haye, N. Nooshi, K. J. Vahala, T. Kippenberg, Phys Rev Lett 97, 243905, 2006), and to the first demonstration of cooling in the resolved-sideband regime (A. Schliesser, R. Rivièrè, G. Anetsberger, O. Arcizet, T. J. Kippenberg, Nat Phys 4, 415, 2008). Later he guided the team that first observed the effect of optomechanically induced transparency (S. Weis et al., Science 330, 1520, 2010). With his colleagues, he also showed that optomechanical coupling can be made stronger than the decoherence rates of the mechanical and optical degrees of freedom (E. Verhagen, S. Deleglise, S. Weis, A. Schliesser, T. J. Kippenberg, Nature 482, 63, 2012).

In his present position, he leads a small team geared toward experiments in optomechanics. This team, in collaboration within QUANTOP, the Danish Technical University, and Maryland’s Joint Quantum Institute, has demonstrated a proof-of-principle transducer of radio-frequency signals to the optical domain via a nanomechanical device (T. Bagci et al., Nature 507, 81, 2014). Such transducers enable optical measurements of RF and microwave signals and could deliver a significant boost of the sensitivity with which such measurements can be made, potentially down to the quantum level.

**IUPAP Young Scientist Prize in Optics 2015: Frank Koppens, The Netherlands**

Dr Frank Koppens from ICFO – The Institute of Photonic Sciences in Castelldefels (Barcelona), Spain – was awarded the 2015 IUPAP Young Scientist Prize in Optics for “his remarkable, outstanding, ground-breaking, pioneering and numerous contributions to Nano-Optoelectronics”.

Dr Koppens conducted his PhD research in Delft under the supervision of Leo Kouwenhoven and Lieven Vandersypen, one of the top scientists working on quantum information processing with spins. In recognition of this achievement, he was awarded the prestigious Huygens prize for his ground-breaking work on quantum technologies”. After his PhD, Dr Koppens obtained a postdoctoral position at Harvard with a prestigious IQC fellowship.

Koppens is a world leading researcher on graphene nano-optoelectronics and nanophotonics. Koppens’ contributions to the graphene opto-electronics field have laid the foundation for two novel subfields: graphene-based hybrid systems and graphene nanophotonics (surface plasmonics). Graphene, a material with many fascinating properties, exhibits extraordinary optical behaviour. One specific outstanding feature is the so-called surface plasmons, wave-like excitations that were predicted to exist in the sea of conduction electrons of graphene. The wavelength of graphene plasmons is 100 to 150 times smaller than the wavelength of light, enabling very strong light confinement as
well as slow light, relevant for a plethora of applications such as sensors and opto-electronics. Graphene surface plasmons are tunable by voltages and can be converted into electrical signals, providing a unique platform for merging nano-photonics and nano-electronics.

Koppens’ group has also performed pioneering work investigating graphene as a promising material for light harvesting and photodetection.

An extended article on his achievements was published in the ICO Newsletter 106.

IUPAP Young Scientist Prize in Optics 2016: Laura Na Liu

Laura Na Liu, Professor at the Kirchhoff Institute of Physics, University of Heidelberg, and Group Leader at the Max-Planck Institute for Intelligent Systems, Germany, is the recipient of the 2016 IUPAP Young Scientist Prize in Optics for “outstanding contributions to nano-optics, nanophotonics, nanolasmonics, and metamaterials”.

She graduated with a BS in physics from Jilin University, China, and a MS in physics in 2010, she was post-doc at the Lawrence Berkeley Lab, University of California, Berkeley, USA. In 2011–2012 she was Texas Instruments Visiting Professor at the Electrical Engineering Department of Rice University, Houston, TX, USA.

Since 2012, she is the leader of the Smart Nanoplasmonics group at the Max Planck Institute for Intelligent Systems, Stuttgart, Germany, and in 2015 she became Full Professor at the Kirchhoff Institute of Physics of the University of Heidelberg. Her research group focuses on developing sophisticated and smart plasmonic nanostructures for gaining precise insight into cell biology and catalytic chemistry.

She has received multiple awards: between them a Chinese Government Award for outstanding students abroad in 2008. In 2012, she was awarded the Sofja Kovalevskaja Award of the Alexander von Humboldt Foundation, which provides young researchers with up to €1.5 million as risk capital for innovative projects at an early stage of their careers. Na Liu proposed to use nanoplasmonics to observe biological and chemical processes at the level of individual particles, by combining gold nanoparticles with DNA and observing the dynamics of chemical reactions with high-resolution microscopes. She was awarded the Elisabeth Schiemann-Kolleg Fellowship of the Max Planck Society and the Heinz Maier-Leibnitz Prize of the Deutsche Forschungsgemeinschaft (DFG) in 2013. In 2014, her project “dynamic nanoplasmonics” was awarded a Starting Grant (€1.5 million) of the European Research Council (ERC). During the International Year of Light, the European Optical Society (EOS), awarded her with the Light 2015 Young Woman in Photonics Award.
Example of her work is the creation of a “nanowalker” consisting of a gold nanocylinder with DNA feet that can walk across a DNA origami platform. The movements of the nano-walker can be traced by measuring plasmon resonances in the gold nanocylinder, and the walker’s position by monitoring spectral changes resulting from the interaction with circular polarized light.

**Triennial report of the ICO Galileo Galilei Committee**

**Oct 1, 2014-Sept 30, 2017**

**1-Introduction**

The ICO Galileo Galilei 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 Galileo Galilei 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.

2.1 - 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.

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.

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.

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 by the Bureau and 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 Award Committee consists of Professors María J. Yzuel (Chair, ICO VP), Spain, Anna Consortini, former ICO President, Italy, Nataliya Kundikova, ICO Galileo Galilei Award winner in 1997, Russia, Fernando Mendoza Santoyo, Former ICO VP, Mexico, and Joseph Niemela (ICO VP), Italy.

2- The award winners from 1994 to 2016 are:

1994: Ion N. Mihailescu, Romania.
1995: Rajpal S. Sirohi, India.
1996: Daniel Malacara, Mexico
1997: Natalyia 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
2010: Mohammad Taghi Tavassoly, Iran
2011: Jan Peřina, Czech Republic
2012: Mikhail V. Fedorov, Russia
2013: Kazimierz Rzążewski, Poland
2014: Chandra Shaker, India
2015: Aram Papoyan, Armenia
2016: Guillermo H. Kaufmann, Argentina

3- The Galileo Galilei Award 2015

The ICO Galileo Galilei Award Committee awarded the ICO Galileo Galilei Award 2015 to Aram Papoyan, Director of the Institute for Physical Research of the National Academy of Sciences of Armenia since 2006. The award citation reads “For his important achievements in high resolution spectroscopy of Alkali atoms and for his valuable contributions to the promotion of experimental atomic physics in Armenia”.

A. Papoyan’s main research interests are laser spectroscopy and nonlinear optics of atomic media. He obtained his Master in Radiophysics from the Yerevan State University in 1982, his PhD in Optics in 1991, and his Doctorate in Laser Physics in 2004.

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

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

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

With the help of colleagues from Paris-Nord University, A. Papoyan built the first Armenian single-frequency tunable diode laser system in 1997, and carried out by then the first Armenian experiments on high-resolution atomic spectroscopy. Further
significant development of research in this area brought international recognition to Armenia: nearly 70 articles on coherent, buffer-gas-induced, and magneto-optical effects in alkali metal vapors have been published since then in highly-ranked peer-reviewed journals. The most prominent of those results was a breakthrough technique linked to nanometric-thickness vapor cells, unique throughout the world for over 13 years, which was developed at Papoyan’s home Institute by the group of Prof D. Sarkisyan.

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

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

4- The Galileo Galilei Award 2016

The Galileo Galilei Award 2016 was Prof Guillermo H. Kaufmann from the Universidad Nacional de Rosario, Argentina. Guillermo H. Kaufmann received his DSc degree in physics in 1978 from the University of Buenos Aires, Argentina. He is Professor at the Physics Department of the Universidad Nacional de Rosario, Chief Scientist of the Argentinean National Council for Scientific and Technical Research, and Head of the Optical Metrology Laboratory at the Instituto de Física Rosario. During the last eight years he served as the director of the French Argentine International Centre of Information and Systems Sciences.
Prof Kaufmann has been awarded the ICO Galileo Galilei Award 2016 "For the development of novel speckle interferometry techniques and their application in experimental mechanics, materials technology and non-destructive testing."

He was a post-doc at the National Physical Laboratory, UK, in 1978 and at the University of Michigan, USA, in 1984. He has been visiting researcher at the Swiss Federal Institute of Technology at Lausanne in 1989 and at the University of Cambridge in 1990. Since 1992 he has performed several research stays at Loughborough University, UK. In 1993, he obtained a research award from the government of Japan to visit the Mechanical Engineering Laboratory in Tsukuba. In 1995, 1997 and 1999 he has also worked at the Centro de Investigaciones en Optica, México. Prof Kaufmann has edited two books, and has authored three book chapters and more than 170 scientific papers published in refereed journals and proceedings of international conferences. His major research interests include the development of coherent optics techniques for strain analysis and non-destructive testing, speckle metrology, phase shifting interferometry, fringe analysis and digital image processing. He has served as member of the program committee of the most important international conferences on optical metrology, speckle techniques and optical inspection. He was the coordinator of the Optics Division of the Asociación Física Argentina and the Argentine representative to the International Commission for Optics. He is a member of the Editorial Board of Optics and Lasers in Engineering, and was a member of the Editorial Board of Optics & Photonics News and a topical editor of Applied Optics. He was a member of the Committee of External Evaluation of Centro de Investigaciones en Optica, Mexico. He is a fellow of SPIE and the Optical Society of America. In 2003 the Secretary of Science and Technology of Argentina awarded him the Bernardo Houssay Prize for his contributions in the field of optical engineering. He is the recipient of the 2015 Chandra S. Vikram Award for Optical Metrology awarded by SPIE.

During the last decade, his most important contributions have been carried out in the field of digital speckle pattern interferometry (DSPI). He developed a technique which allows to enhance the visibility of addition DSPI fringes that are obtained when high-speed phenomena are analyzed with pulsed lasers. He has also extensively tested different digital processing techniques to reduce the speckle noise contained in DSPI fringes. For the comparison of different noise reduction methods, he introduced a computer-simulation method which allows to generate speckle patterns showing the expected negative exponential curve of the probability density function of the intensity distribution. This computer method models the generation of the corresponding noise-free patterns used to assess the performance of different noise reduction algorithms. He also introduced the use of wavelet-based methods to reduce the speckle noise contained by DSPI fringes and showed the advantages of this new approach.
He has participated in the development of a novel speckle interferometer designed for studying dynamic events in which phase shifting is performed at a frequency of 1 kHz. This system allows to follow the evolution of the phase as a function of time at a speed of 1000 frames/s. The temporal phase unwrapping method used in this dynamic speckle interferometer permits sequences of several hundred absolute displacements maps to be obtained fully automatically. As temporal phase unwrapping is a 1-D problem, this approach eliminates most of the complex problems encountered with 2-D spatial phase unwrapping. In subsequent publications, he reported on the effect of this speckle dynamic system under mechanical vibrations and studied the performance of different phase shifting algorithms to reduce the phase error introduced by the vibrations. He also used this speckle interferometry system for the detection and measurement of sub-surface delamination defects in carbon fibre specimens.

5- The Galileo Galilei Award 2017

To be decided.

Maria J. Yzuel
Chair of the ICO Galileo Galilei Award

Triennial report of the ICO/ICTP Gallieno Denardo Award Committee

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.

The 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 Szipöcs (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 Florencia Pascual-Winter (Argentina) and John 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)

Members of the ICO/ICTP Award Committee 2015-2017 are Mourad Zghal (Chair and ICO VP), Ahmadou Wagué (ICO VP), Joseph Niemela (ICO VP), Anna Consortini (ICO former President) and Mitcho Danailov.

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 for the promotion of research activity in developing countries. Award nomination form: http://e-ico.org/activities/awards

ICO/ICTP Gallieno Denardo Award 2015: Rim Cherif (Tunisia) and Rajan Jha (India)

The ICO/ICTP Gallieno Denardo Award 2015 has been awarded to Dr Rim Cherif from Carthage University, Tunisia, and Dr Rajan Jha from Indian Institute of Technology Bhubaneswar (ITT-BBS), India.

Prof Rim Cherif has conducted her research activities in the Green and smart communication laboratory (Gres'Com) at the Engineering School of Communications of Tunis (Sup'Com), University of Carthage, since 2005. She has worked on the characterization of photonic crystal fibers, stimulated Brillouin scattering and supercontinuum generation.
Together with her PhD advisor, Mourad Zghal, she created the first OSA student chapter in Tunisia in 2009. In 2012, she became a member of the executive board of the Optical Society of Tunisia. She has organized, or co-organized, more than 10 national and international events, between them a SPIE Optics and Photonics Education Outreach Activity aimed to visit three secondary schools in three marginalized north-east regions of Tunisia: Kef, Siliana and Beja, aimed to attract more students to study science. In December 2014 she organized the Workshop “Shedding Light on the Contributions of Muslim Scholars to Science and Technology”. She was awarded for “her achievements in the field of nonlinear optics and in particular for her valuable contributions to the design of highly nonlinear fibers for supercontinuum generation, as well as for her active commitment aimed at the diffusion of research in optics and photonics in Tunisia”.

Dr Rajan Jha was awarded for “his breakthrough contributions in the modelling, design and development of high-performance optical sensors and waveguides as well as for promotion of research activities in optics and photonics in India”. He is Assistant Professor of Physics in the School of Basic Sciences at Indian Institute of Technology Bhubaneswar, India, and works at the Nanophotonics and Plasmonics Laboratory (NPL), a lab committed to the design and development of optical devices that can meet industrial and societal needs.

Jha graduated from Delhi University in 1999, and received his MSc and PhD degrees from the Indian Institute of Technology Delhi, India, in 2001 and 2007 respectively. From early 2008 to July 2009, he was a postdoc researcher at ICFO – The Institute of Photonics Sciences, Barcelona, Spain. He was awarded the JSPS (Japanese Society for Promotion of Science) fellowship in 2009, and a DAAD fellowship in 2013. He is an Associate of the Indian Academy of Sciences, Bangalore. He is a regular member of the Optical Society of America (OSA), and life member of the Optical Society of India (OSI). His
areas of research are optical fiber sensors and Plasmonics. He has published more than 50 research articles in international journals including a review article.

Dr Jha has collaborated in the fabrication of sensors based on different types of optical fibers to detect different organic compounds and biomolecules that can find wide applications in the food-processing industry and in environmental monitoring. In addition to chemical sensors, the ITT-BSS has developed different sensors for physical parameter determination such as nano-displacement sensor for precision alignment, position and structural health monitoring, and is currently working on the development of low-cost fiber-based biomedical devices such as a non-invasive sensor for glucose detection. Such studies would help in the development of lab-on-chip for next-generation sensors and photonic circuits.

**ICO/ICTP Gallieno Denardo Award 2016:**

Jehan Akbar (Pakistan) and Mati Horpratham (Thailand)

Dr Jehan Akbar obtained his MSc in physics at the University of Peshawar, Pakistan, in 2007, and his PhD at the University of Glasgow, UK, in 2012 under the supervision of Dr Anthony E Kelly and Professor Catrina Coleman. He is currently an Assistant Professor of Physics at Hazara University Mansehra, KPK, Pakistan, and an ICTP Junior Associate. His research work is mainly related to development of semiconductor optical amplifiers and high-power mode-locked lasers.

Dr Akbar has received several national and international awards for his research contributions. Dr Akbar presented his research work in various leading international conferences held in Turkey, Italy, the UK, Japan, South Africa and the USA. His diverse research activities have led to high-impact publications and to new research directions followed by many other researchers. He has published 40 research papers in various international journals and conferences.

His statement: “This unexpected recognition of my efforts gives me a sense of hope and big confidence. I will redouble my efforts in future for promotion of research
activities and optics in Pakistan. I will enjoy doing so as I find great satisfaction in doing research and promoting science.”

Dr Mati Horprathum, a researcher with the National Electronics and Computer Technology Center, Thailand, was awarded for “his valuable contributions in the development of optical thin-film technology for innovative surface functionality as well as for his commitment in the diffusion of optical thin-film research in Thailand”.

Mati Horprathum received his B Ed in science– physics in 2003 from Srinakarinwirot University and his MS and PhD in physics from King Mongkut’s University of Technology Thonburi, Thailand in 2006 and 2009, respectively. Since 2006, he started his career with National Electronics and Computer Technology Center (NECTEC), Thailand, where since 2013 he has been a researcher at the Optical Thin-Film Laboratory. His current works involve thin-film and nanostructure areas, i.e., glancing-angle deposition, nano-microelectronics mechanic devices, surface-enhanced Raman spectroscopy (SERS), fabrications and characterizations of nanostructures, optoelectronic devices, electrochromic thin films, spectroscopic ellipsometry, vacuum designs, and thin-film characterizations. Through his career, his major interests are to utilize the optical thin-film and nanostructure technologies towards local industrial manufactures, as well as medical and environmental applications in Thailand. He has authored and co-author more than 50 refereed journals, 100 proceedings, and has been a regular reviewer for 10 journals. He also holds two Thai patents, and nine Thai patent applications. In addition, he has also organized five international conferences and events in surface sciences, thin-film coatings, and sensors.

ICO/ICTP Gallieno Denardo Award 2017:

Dr G K Samanta of the Physical Research Laboratory, Ahmedabad, India.

Dr Goutam K Samanta received BTech and MTech degree in optics and optoelectronics from the University of Calcutta in 2002 and 2004 and a PhD in photonics from the Institute of Photonics Sciences (ICFO), Barcelona, Spain, in July 2009. He joined Physical Research Laboratory (PRL), Ahmedabad, India, in September 2010, where he started new experimental research in nonlinear and quantum optics. His most exciting work that has drawn great attention among the international community, is the demonstration of optical parametric oscillators producing high-power coherent and tunable optical beam in Airy intensity distribution. He has more than 100 technical contributions in peer-reviewed journals and conference proceedings and is a regular
reviewer of around 15 peer-reviewed journals in the field of optics and photonics including Optical Letters and Optics Express. He was awarded the ICO/ICTP Gallieno Denardo Award for “his significant contributions to the field of nonlinear optics, lasers and quantum optics, as well as his efforts in popularizing science among school students in India.”

In addition to his regular research activities, Dr Samanta has a keen interest in promoting optics and photonics among school and college students in India through hands-on experiments. After joining PRL, he started an outreach program called “Experiments with light” and established a student chapter in PRL with PhD students as its members. So far, he has devised more than 40 hands-on basic experiments to explain many optical phenomena in our daily life including “what is the need of two eyes”, “why sky is red at sunrise and sunset?”, “principles of fibre optics communication” and advanced experiments including optical tweezer, and effect of polarization in double-slit interference pattern. He also distributes optics kit comprising polarizers, 2D grating and a liquid crystal sheet to the students. So far, Dr Samanta and the student chapter members have demonstrated their experiments to more than 10,000 students in Gujarat, India.

*Left:* Experimental program of Physics Training and Talent Search (PTTS), 2016 in Regional Institute of Engineering, Mysore, India. *Right:* Participants of SCOP 2015, in Physical Research Laboratory.

In the past three years, Dr Samanta, has been involved in two programs, advanced BSc for the undergraduate students of Gujarat and Physics Training and Talent Search (PTTS) for the undergraduate students from various parts of India, to motivate students for experimental research. Dr Samanta has also initiated an annual conference named Students’ Conference in Optics and Photonics (SCOP) for professional development of their PhD students. This is a two-day conference, organized by the students and participated by the students along with few invited talks by young faculties of different institutes of India and a plenary talk by an eminent scientist sponsored by the Optical Society of America through its travelling lecture program. Due to such initiative, the PhD and postdoctoral students from various parts of India visit PRL with full funding and share their research and build networking among themselves. In its second year, the conference has already started getting appreciations from various parts of the research community.
Report of the ad hoc Committee on International Affairs

Proposed by the Bureau and agreed by the General Assembly the ICO ad hoc Committee on International Affairs was established 2014 at the ICO-23 in Santiago de Compostela, Spain. Based on actual cases the task of the Committee was defined as to analyse and prepare a procedure for the ICO whom to contact and how to act to give support to colleagues, who are personally endangered in their human rights in particular for professional or political reasons.

Based on their experience and motivation the following members were appointed: Gert von Bally (University of Muenster, Germany) (chair), Henry Kasprzak (Wroclaw University of Science and Technology, Poland), Tomasz Szoplik (University of Warszawa, Poland).

As a result of several discussions the following procedure was evaluated:

Any hint to any contact point of ICO in such a case as described above shall initiate an immediate distribution of information to ICO EXECOM, Bureau and the ad hoc Committee.

Based on the (fast) initial assessment of these ICO authorities the President or the General Secretary informs IUPAP and ICSU.

For further evaluation of the situation and possible actions the ad hoc Committee contacts:

IUPAP and ICSU 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 ad hoc 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.

Actually 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.

Gert von Bally, ICO Associate Secretary
# MEETINGS WITH ICO PARTICIPATION 2014-2017

## Legislative Period 1 Oct 2014 – 30 Sep 2015

<table>
<thead>
<tr>
<th>1 Oct 2014 - 30 Sept 2015 (Periode 1)</th>
<th>date</th>
<th>requested by applicants</th>
<th>decision by ICO</th>
<th>ICO representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. Seminar on Photonics, Optics, and its Applications (ISPhOA 2014), Samur, Indonesia</td>
<td>14-15 Oct 2014</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Gert von Bally</td>
</tr>
<tr>
<td>Int. Conf. on Optics, Photonics and Photosciences (CIoFF), La Habana, Cuba</td>
<td>14-17 Oct. 2014</td>
<td>US$ 3,000</td>
<td>US$ 1,500</td>
<td>Ari Freieberg</td>
</tr>
<tr>
<td>ICTP Wintercollege on “Light a Bridge between Earth and Space”, Trieste, Italy</td>
<td>9-20 Feb. 2015</td>
<td>different budget</td>
<td></td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>International Conference on Optics and Photonics (ICOP 2015), Calcutta, India</td>
<td>20-22 Feb. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
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<tr>
<td>Lighting UP Africa with lasers, optics, and fibres (LUPA’2015) Carthage, Tunisia</td>
<td>15-21 March 2015</td>
<td>US$ 4,000</td>
<td>US$ 1,000</td>
<td>Zohra Lakhdar</td>
</tr>
<tr>
<td>Discussions on Nano and Meso-optic Optics (DINAMO-2015), El Calten, Argentina</td>
<td>8-12 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
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<tr>
<td>Int. Conf. on Optical and Photonic Engineering (IoOPEN 2015), Singapore</td>
<td>14-16 Apr. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td>Anand Asundi</td>
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<tr>
<td>Education and Training in Optics (ETOP 2015), Bordeaux, France</td>
<td>29 June-2 July 2015</td>
<td>different budget</td>
<td></td>
<td>Maria Calvo</td>
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<tr>
<td>Int. Conf. Micro- to Nano-Photonics (ROMOPTO 2015), Bucharest, Romania</td>
<td>1-4 Sept. 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Valentin Vlad</td>
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<tr>
<td>Mexican Optics and Photonics Meeting (MOPM 2015), Leon, Mexico</td>
<td>9-21 Sept. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Angela Guzman</td>
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<tr>
<td>12th Int. Conf. on Correlation Optics (Correlation Optics 2015)</td>
<td>14-18 Sept. 2015</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Sergeyev Odolov</td>
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**Periode 1 Actual Budget in Total**: US$ 8,500

## Legislative Period 1 Oct 2015 – 30 Sep 2016

<table>
<thead>
<tr>
<th>1 Oct 2015 - 30 Sept 2016 (Periode 2)</th>
<th>date</th>
<th>requested by applicants</th>
<th>decision by ICO</th>
<th>ICO representative</th>
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</thead>
<tbody>
<tr>
<td>20th Microoptics Conference (MOC’15)</td>
<td>25-28 Oct. 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Yasuhito Arakawa</td>
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<tr>
<td>OptaAndina</td>
<td>9-13 Nov. 2015</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td>Angela Guzman</td>
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<tr>
<td>Quito, Ecuador</td>
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<tr>
<td>Wintercollege on Optics</td>
<td>15-26 Feb 2016</td>
<td>different budget</td>
<td>Angela Guzman</td>
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<tr>
<td>Trieste, Italy</td>
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<tr>
<td>Int. Conf. on Optics Design and Fabrication</td>
<td>28Feb–2March 2015</td>
<td>US$ 0</td>
<td>US$ 0</td>
<td>Frank Höller</td>
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<tr>
<td>Weingarten, Germany</td>
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<tr>
<td>Int. Conf. on Optics in the Life Sciences (DOLLS) 2016</td>
<td>16-19 March 2016</td>
<td>US$ 2,000</td>
<td>US$ 1,500</td>
<td>Gert von Bally</td>
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<tr>
<td>Mumbai, India</td>
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<tr>
<td>TECNOLASER 2016</td>
<td>29 March-1 April 2016</td>
<td>US$ 5,000</td>
<td>US$ 1,000</td>
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<tr>
<td>Havana, Cuba</td>
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<tr>
<td>Int. Conf. on Applied Optics and Photonics 2016</td>
<td>17-21 May 2015</td>
<td>US$ 5,000</td>
<td>US$ 2,000</td>
<td>Frank Höller</td>
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<tr>
<td>(ICO Topical Meeting 2016) Hanover, Germany</td>
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<tr>
<td>ICO/ICTP Workshop on Lasers, Laser safety and Applications Sede Manizales, Colombia</td>
<td>20 June-1 July 2016</td>
<td>US$ 3,000</td>
<td>US$ 3,000</td>
<td>Angela Guzman</td>
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<tr>
<td>2nd International Seminar on Photonics, Optics and Its Applications (ISPHO 2016) Legian-Kuta, Indonesia</td>
<td>August 24-25, 2016</td>
<td>US$ 3,000</td>
<td>US$ 1,500</td>
<td>Gert von Bally</td>
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**Periode 2 Actual Budget in Total** US$ 12,000

**Legislative Period 1 Oct 2016 – 30 Sep 2017**

<table>
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<tr>
<th>1 Oct 2016 - 30 Sept 2017 (Periode 3)</th>
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<th>requested by applicants</th>
<th>decision by ICO</th>
<th>ICO representative</th>
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<tbody>
<tr>
<td>RIOO-DOTILAS 2016</td>
<td>21-25 November 2016</td>
<td>US$ 5,000</td>
<td>US$ 2,000</td>
<td>Eric Rossas</td>
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<tr>
<td>Pacon, Chile</td>
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<tr>
<td>International Conference on Light and Light-based Technologies Tezpur, Assam, India</td>
<td>26-28 November 2016</td>
<td>US$ 3,000</td>
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<tr>
<td>Wintercollege on Optics</td>
<td>13-24 Feb 2017</td>
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<td>Angela Guzman</td>
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<tr>
<td>Trieste, Italy</td>
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<tr>
<td>OASIS 6</td>
<td>27-28 Feb 2017</td>
<td>US$ 5,000</td>
<td>US$ 2,000</td>
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<tr>
<td>Tel Aviv, Israel</td>
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<tr>
<td>International Conference on Optical and Photonic Engineering (iCOPEN 2017) Singapore</td>
<td>4-7 April 2017</td>
<td>US$ 5,000</td>
<td>US$ 1,500</td>
<td>Anan Asundi</td>
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<tr>
<td>International Conference on Applications of Optics and Photonics (AOP 2017) Faro, Portugal</td>
<td>8-12 May 2017</td>
<td>US$ 2,500</td>
<td>US$ 2,000</td>
<td>Angela Guzman</td>
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<tr>
<td>ETOP Hangzhou, China</td>
<td>29-31 May</td>
<td>different budget</td>
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<td>Jim Harrington</td>
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24th Congress of the International Commission for Optics (ICO-24) Tokyo, Japan

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
<th>Budget</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>24th Congress of the International Commission for Optics (ICO-24) Tokyo, Japan</td>
<td>21-25 August 2017</td>
<td>different budget</td>
<td>Angela Guzman</td>
</tr>
<tr>
<td>13th International Conference on Correlation Optics “Correlation Optics’17” Chernivtsi, Ukraine</td>
<td>11-15 September 2017</td>
<td>US$ 2,000</td>
<td>Sergey Odoulov</td>
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<table>
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<tr>
<th>Period</th>
<th>Actual Budget in Total</th>
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<tr>
<th>Legislative Period</th>
<th>Distribution Plan</th>
<th>Current Expenditures</th>
<th>Rest</th>
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<tr>
<td>1 Oct. 2015 – 30 Sept. 2016</td>
<td>US$ 12,000</td>
<td>US$ 12,000</td>
<td>US$ 0</td>
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<tr>
<td>(32,000 Budget + 4,200 Rest from last Legislative Period)</td>
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</table>

Gert von Bally, ICO Associate Secretary
The ICO-23 General Congress

The ICO welcomed a new international society member: The Iberian American Network on Optics (RIAO)

Santiago de Compostela, the city of pilgrims with its impressive Cathedral and its famous botafumeiro, welcomed the participants in the 23rd ICO General Congress. In the words of its Chair, Humberto Michinel, the Conference Program reflected the rich variety of phenomena to whose study we dedicate our lives and provided a glimpse as to why we are so passionate about it. Experts in optics from all over the world were welcomed to Santiago to debate and interchange information about how light-based technologies provide solutions to global challenges in science, technology, energy, health or education and promote sustainable development, especially in the context of the "International Year of Light and Light-Based Technologies" 2015. The Conference was opened with a plenary lecture by Alain Aspect, ICO Prize 1987.

As traditional in every ICO meeting, special attention was paid to promote participation of scientists coming from developing regions, with special emphasis on attracting students and women, which represent the future of Optics in many emerging regions. With the generous sponsorship of several international organizations, ICO-23 included participants from countries that were never before represented in previous editions of the meeting, reflecting the huge interest and growth of Optics all over the World. During a three-day exhibit, leading optics/photonics companies displayed and demonstrate their latest equipment and new developments, making of ICO-23 a great connection platform between on-the-edge research and entrepreneurship.

The conference theme “Enlightening the future”, again in the words of H. Michinel, “pointed to the need of preparing future generations of scientists to take over and explore fascinating new aspects of light and its applications.” And indeed, a highlight of the Congress was provided by the Ernst Abbe and IUPAP Young Scientist plenary lectures delivered by two young scientists awarded with the Prize, Tobias Kippenberg (2013) and Nicholas Fang (2011), and two awardees of the IUPAP Young Scientist Prize in Optics, Andrea Alú (2013) and Göery Genty (2011). For the first time, students attending the Conference organized their own parallel activities, and invited the ICO President, D. Moore, to discuss with them ways in which they could integrate better
with ICO’s work and also participate actively in the celebration of the International Year of Light 2015.

Meeting with the students. In the first row left, Duncan. T. Moore, ICO President.


The General Assembly was attended by 64 official delegates from 33 ICO Territories, and its six international member societies, and a large number of observers. The General Assembly approved the proposed amendment to the article 1 of the ICO Statutes in order to include the word “Photonics” and the admission of the Iberian American Network of Optics (RIAO) as an international Society Member of the ICO with the right to appoint a Vice President to the ICO Bureau.

Participants in the conference had the opportunity to interact in the many social activities held during the conference, including receptions by the Authorities of
Santiago de Compostela, SPIE and OSA, and a tour of the region that ended with an unforgettable concert of Galician Pipers at a castle in Vigo, the town of Humberto Michinel.

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**Education & Training in Optics & Photonics: ETOP 2015**

The leading international conference on education and training in optics held in Porto with record attendance.

ETOP’ 2015 was collocated and run in parallel with the annual symposium of LAPHIA, the cluster of universities of excellence for laser sciences, in Bordeaux, France. The conference was held at the Institut d’Optique d’Aquitaine, at the campus of Bordeaux University.

ETOP is a biennial conference that brings together educators from around the world to share information about developments and resources for the teaching optics and photonics at all levels. The teaching of optics and photonics, critical fields at the core of today’s world-wide technological infrastructure, must continually be upgraded and renewed in order to meet the growing demands of research, science and industry.

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.
ICO Topical Meeting 2016

The ICO Topical Meeting on Applied Optics and Photonics 2016 was held as a joint conference with the 117th Annual Meeting of the German Society of Applied Optics (DGaO) on May 17 – 21, 2016, in Hanover, Germany, at the Schloss Herrenhausen. The key topics were optical metrology and sensing, optical modelling and simulation, applied laser technologies, polymer optics and photonics, integrated optics and biophotonics. The opening ceremony of the conference was attended by Dr. Gabriele Heinen-Kljajić, Minister for science and research of Lower Saxony.

From left: Prof Yasuhiko Arakawa, ICO President; Dr. Frank Höller, DGaO Chairman; Prof Monika Sester, Vice president for international affairs / Leibniz University of Hanover; Dr. Gabriele Heinen-Kljajić, Minister for science and research / Lower Saxony; Prof. Eduard Reithmeier, Local Host Chairman.

Prof Dr. Dr. h.c. mult. Stefan W. Hell, from the Max Planck Institute for Biophysical Chemistry in Göttingen, Nobel Prize in Chemistry 2014 and ICO Prize 2000, held the Fraunhofer Lecture. Other plenary lecturers were Prof Y. Arakawa, ICO President (nano-optics), Prof Dr.-Ing. Ludger Overmeyer (polymer optics), Prof Dr. Jürgen Popp (biophotonics), Prof Dr.-Ing. Eduard Reithmeier (optical metrology), Prof Dr. Tobias Kippenberg, ICO Prize 2013 (integrated optics), Prof Dr. Kaoru Minoshima (applied laser technology) and Prof Dr. Aydogan Ozcan, ICO Prize 2015 (biophotonic technologies), who held his Abbe Lecture as part of his ICO Prize 2015 award ceremony.

ICO continued its involvement on ICTP activities collaborating with the ICTP Winter College, event where ICO holds 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 2015

The Winter College on Optics 2015 “Light: A Bridge between Earth and Space” covered all aspects of optical-based and photonics-based observing systems deployed in satellites and its numerous applications in meteorology, climatology, atmospheric research, geodesy, gravimetry, astronomy, telecom, navigation, cosmology, planetology, etc. Directors of the College were A. Piegari (Optical Coatings Laboratory-ENEA, Italy), E. Armandillo (European Space Agency, The Netherlands), and W. Chen, (Shanghai Institute of Optics and Fine Mechanics, China).

The ICTP Winter College on OPTICS 2016

The award ceremony was attended by two former ICO presidents, the ICO secretary, and three current ICO vice-presidents. From left to right: María Luisa Calvo, Mourad Zghal, Angela Guzmán, Mati Horprathum, Jehan Akbar, Anna Consortini, Mitcho Danailov, Joseph Niemela, Ahmadou Wagué. Photo courtesy of ICTP, the Abdus Salam International Centre for Theoretical Physics.
The Winter College on Optics 2016 “Optical Frequency Combs - from mult species gas sensing to high precision interrogation of atomic and molecular targets” was directed by K. Corwin (Kansas State University, U.S.A.), M. Marangoni (Politecnico di Milano, Italy), and P. Maslowski (The Nicolaus Copernicus University in Torun, Poland).

Frequency combs have revolutionized the field of optical frequency metrology and paved the way to a new generation of atomic clocks based on ultra-narrow optical transitions. Their fine, discrete, stable, reproducible and controllable spectral structure, also makes combs ideal tools for high-resolution molecular spectroscopy and sensing of multiple trace gases.

**The ICTP Winter College on OPTICS 2017**

The first Winter College in Optics took place in 1993 under the agreement between the Abdus Salam International Centre for Theoretical Physics (ICTP) and ICO. That first college, co-directed by Anna Consortini and Chris Dainty and with local organization by Gallieno Denardo, was dedicated to optical systems. It had a practical training component, with laboratories in optical information processing, Fourier optics and related topics. Since then, there has always been some exposure to practical training in addition to lectures, but in 2017, for the first time, the experimental activities were fully integrated as a major part of the College, as an experiment in itself.

Following the recommendation of the TSOSA Committee, the Winter College 2017 “Applied Optical Techniques for Bio-imaging” rescued the structure of the Winter College in its early days and included hands-on activities in daily laboratory sessions, addressing fundamental and experimental aspects of advanced techniques in microscopy, spectroscopy, laser speckle and other related optical methods. Advanced light microscopy has become one of the most useful tools in the life sciences and environmental research and it has been recently awarded through the 2014 Nobel Prize in Chemistry to E. Betzig, S. W. Hell (an ICO Prize awardee in 2000) and W. E. Moerner.

*Left:* Thermal lens microscopy setup at the IPN (Instituto Politécnico Nacional), México. *Right:* Set up for thermal lens spectroscopy (Applied Optics Lab, IVIC).
The College was attended by 75 participants from 26 countries, 20 lecturers and 10 tutors. As a tradition, short seminars on current research interests were delivered by some of the young researchers coming from various parts of the world, in particular from Africa, Latin America and Asia. The majority of participants, however, presented their work in a couple of lively poster sessions that allowed peer-to-peer feedback as well as cultivating ideas for collaboration.

The College started with the basics of optics of light microscopy, covering the various methods of imaging fluorescent samples, polarization microscopy and image processing, and concluded with some of the latest advances in light microscopy using super-resolution techniques. Sixteen experiments were conducted during the training sessions – most paired to lectures given by international experts, specifically related to photothermal microscopy, a surface plasmon resonance method for precise detection of low-concentration solutions, optical tweezers, multispectral spectroscopy analysis, lock-in photothermal shadowgraph methods, polarization microscopy, laser speckle bio-imaging, portable mobile-phone microscopes, determination of the optical properties of thin films and the influence of the substrate and materials, UV-Vis optical fibre-assisted spectroscopy in thin films and solutions.

Students and professors Luis Ponce (first from the left) and Humberto Cabrera (first from the right) at the experimental sessions.

Besides giving hands-on understanding of the physical principles in optical imaging and theoretical background, the College offered the students additional information and experience in many interesting and relevant applications, for instance, in environmental science (e.g. studying soil pollution by noble metals and water pollution using thermal lens spectroscopy method) and material characterization (by shadowgraph method).
Portable mobile phone microscopes, demonstration with different prototypes by Zacharias Ballard, UCLA, USA.

One of the overarching themes was that the equipment used was in absolute terms “low cost” and could be affordable in nearly any laboratory in the world. In this context, many participants – including those from least-developed countries – gained some ideas for research projects that they could begin at home, together with contacts and possible collaborators. Others, from relatively well-equipped laboratories, found ideas for demonstrations they could set up in their own institutions.

Finally, there was one aspect of the College that has been its hallmark since its beginnings in 1993: participants and lecturers come from a variety of backgrounds and cultures from nearly all continents – notably without there being a majority of any nationality present – and all with the same focus on optics. That situation is almost unique to the Winter College on Optics at ICTP and provides an interesting environment in which the passion for science presides over all other categories for identifying individuals. Another interesting aspect of this is that participants—especially through the poster sessions—can appreciate how local needs combined with universal scientific training lead to locally-relevant innovation. Such innovation is at the very core of capacity building and therefore the future may see specific attention to entrepreneurship and professional development coming to subsequent colleges, and of course many more experiments.

Humberto Cabrera
TSOSA ADVISORY GROUP

Terms of reference

Terms of reference for the establishment of a body to advice 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 programmes 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 programmes. 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 Centres.

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 organisations of TSOSA, with one representative in the body.

Note: During the period 2006-2008, the Chair of TSOSA was Pierre Chavel. During the period 2009-2017, the Chair of TSOSA has been the ICO Secretary General, Angela M. Guzmán. The minutes of the meetings are prepared by the ICO Secretariat.

Minutes of the TSOSA Board Meetings

Minutes of the TSOSA Board Meeting 2014

Tuesday 18 February 2014, Lunqvist Lecture Hall, ICTP, Trieste, Italy


1. Introduction and welcoming remarks

The meeting was opened at 9am by J. Niemela who welcomed everyone and passed on the apologies for his absence from Professor Quevedo who was away from the ICTP attending the Steering Committee meeting at the ICTP's branch in Brazil.

He noted that, since the only new member present was Mourad Zghal, the meeting should focus on new matters and proposals, as all others present were already familiar with ongoing and past activities.

A. Guzmán, the Chair, greeted everyone and reiterated the TSOSA Advisory Committee's desire and endeavour to advise and support the ICTP in all its optics activities. She thanked the ICTP Director for his continued support of such initiatives.

2. Approval of the minutes of the previous TSOSA meeting

The minutes of the February 2013 meeting held in were approved unanimously.

3. Briefing on 2013 activities

1) ICTP Winter College and Preparatory School
J. Niemela reported on the 2013 Winter College and highlighted the statistics showing a split of 67% to 33% male vs. female participation. This compared favourably with the 24% average level of female participation in ICTP activities across all fields.

He pointed out that the TSOSA booklet this year included also the poster and programme of all other optics related activities organized by the ICTP, both in-house and externally.

J. Niemela highlighted the large number of applicants for the 2014 Winter College: more than 400 were received by the deadline. Selection was not easy and every effort was made to choose the best candidates (not always necessarily already in the field of the College, but capable of changing research topic) whilst respecting gender and geographical distribution.

Two Pakistani participants (one of whom had obtained his PhD at SISSA) were denied visas to attend the 2014 Winter College, although it had been possible for a Syrian to participate, despite numerous difficulties of both a bureaucratic and logistic nature.

J. Niemela informed that the 2014 activity had started very well. The Directors of the Winter College had devised a very interesting and successful activity. Eli Kapon's opening lectures on Semiconductor lasers and active devices were mentioned as being outstanding.

The Preparatory School went particularly well, led by Miguel Alonso from the University of Rochester and Imrana Ashraf from Quaid-i-Azam University. Most sessions were blackboard lectures with exercises, at which both teachers excel. Attendance levels were notably high and feedback has been very positive from participants. Around a dozen students were also voluntarily attending evening Skype lectures M. Alonso was giving to his students back in Rochester.

A demonstration of Photonics Explorer kits was given by Amrita Prasad on the Friday afternoon and was extremely well received by the participants. A decision will be made about what to do with the ten kits purchased by ICTP. Participants have been asked to submit proposals.

The importance of hands-on sessions at future optics activities was reiterated by various members of the Committee, as per recommendations at previous TSOSA board meetings. This year Luis Ponce has brought apparatus with him and is giving LIBS demonstrations on a voluntary basis in the evenings which are being very well attended. He is willing to leave behind the LIBS equipment which could have many applications in the laboratory. V. Lakshminarayanan stated it would be ideal to have the focus of the 2015 College linked to experiments. This suggestion was seconded by M. Bertolotti.

J. Niemela reported that the ongoing Winter College was going very well, with the positive development that this year the participants were asking many pertinent questions and intervening actively. Attendance levels were almost 100%.
The gender split was also more even than last year, with 36% of the attendees being female in 2014.

This year SIOF sponsored the travel of several Italian participants, with ICTP providing accommodation in a shared double room and a meal coupon per day.

2) ICTP Training and Outreach Programmes for Optics

J. Niemela reported that the Office of External Activities has added an affiliated centre in Tunisia, the Tunisian Optical Society, working with Z. Ben Lakhdar and M. Zghal.

J. Niemela replied to K. Plenkovich's question regarding the number of affiliated centres by informing that there are now 9 altogether, mostly in optics, which is very well represented as a field, while the others are in mathematics.

M. Danailov informed that there are 4 new Sesame fellowships at Synchrotron Elettra designed for Palestinian students, without specifying this in the announcement, and that applications were open to all nationalities.

J. Niemela drew the meeting's attention to the statistics in the booklet regarding the TRIL and STEP Programmes.

He gave details of an ongoing effort to establish a partnership with LENS (European Laboratory for Non-linear Spectroscopy) in Florence. Professor Quevedo had a meeting at the end of 2013 with the LENS representative, Professor De Natale, in order to establish a collaboration with another institute in Italy with a TRIL-type arrangement working on the optical tweezer project and image analysis. LENS have a team of 5 personnel made up of technicians and post-docs who could mentor ICTP students. LENS is keen to sign an IOM to increase their outreach to developing countries. J. Niemela hopes the agreement will be finalized shortly and will keep the Board informed.

K. Svanberg enquired about the movement of students between Florence and Trieste. She mentioned her contact, Professor Francesco Pavone (who works in biophysics and health applications) who could be approached.

A. Johnson requested to be kept informed of developments and when the details of the partnership and qualification for participating students are finalized.

Z. Ben Lakhdar requested information about medical devices and instruments which are being developed at LENS. J. Niemela mentioned equipment for cancer diagnosis and treatment and photodynamic therapy. Z. Ben Lakhdar stressed the importance that equipment designed to be used in the field should be low-cost, portable and easily maintained and repaired.

K. Svanberg informed that the Bill Gates Medical Foundation will become involved this year in providing such equipment to be placed directly in doctors' hands where it is sorely needed. Some equipment is already in place through links with Professor Pavone's group in Florence.
3) ICTP's STEP and TRIL Programmes

The main features and differences of the TRIL and STEP programmes were then briefly discussed. J. Niemela explained that STEP is a PhD sandwich programme, with the visitors enrolled in a PhD programme in a University in the developing world, whilst TRIL fellows already have at least a Master's degree and often a PhD. The TRIL programme is purely for laboratory experimentation, not to obtain a degree of any sort. The visits last up to a year and are co-sponsored by the hosting laboratory. The positive effects of the Scheme are that fellows get to make new contacts and set up collaborations which tend to last and develop. They also gain valuable experience to take back home and put into practice. The STEP student, on the other hand, returns home to complete the PhD (ICTP has no charter to grant degrees).

4) QCL Project

A. Guzmán then handed the floor to A. Vacchi who outlined the progressive steps of the QCL project.

He gave the motivation for ongoing experiments and the measurements so far achieved. More experimental work is needed to give an accurate test of QED (quantum electrodynamic predictions). The experiment needs an intense source of muons selected from the products of proton accelerators. The source is available now. Spectroscopic measurements of the hyperfine structure require a powerful source. There is an unexplained difference on the results obtained for the proton size by electron-proton and muon-proton scattering. Anomalous muon-proton interactions are suspected. The goal is to produce a spectroscopic laser source at 6758 nm, with linewidth less than 0.07, and with the power and tunability required for measuring the hyperfine splitting, which is also sensitive to other parameters. A quantum Cascade Laser (QCL) had been devised as a unique tool for this purpose but it lacks power and the results have not been so far very encouraging.

A second approach, devised by M. Danailov consists of using a non-linear optics approach to generate the required frequency by frequency difference of two wavelengths. After testing the nonlinear crystals, they expect to be able to obtain 2 millijoule in a two-crystal configuration. Both replied affirmatively to A. Johnson's question that both types of crystal required for the experiments are readily obtainable and that they have 3 or 4 companies who are suppliers. The QCL provides 0.5 millijoule, while with the non-linear crystals it is possible to obtain 2.5 millijoules for single pass and 4 millijoules for double pass.

A complete four-year project was proposed in 2013 to INFN consisting of three stages: (i) the development and testing of the laser system, (ii) the test and preparation of the muonic system, (iii) followed by two years of putting together a complete layout and measurements. The Italian government agency is financing the testing of the Hydrogen target with the muon beam. The proposal included the development of the laser, but it was postponed for being too expensive. The agency will study the project next year.
In the meantime, the laboratory has acquired important laser measurement instruments and is developing detectors. The international collaboration is expanding. A. Vacchi went to Japan to work for 5 days with the muon beam at RIKEN, and currently there is collaboration with Delft University of Technology for the optical cavity. This collaboration, along with a collaboration with KTH Royal Institute of Technology, Stockholm, are expected to increase from now on and up to 2018 when final measurements are expected to be performed.

A Johnson asked if the QCL was then not going to be used as the laser source. A. Vacchi answered that they will continue developing the QCL, and they are discussing the possibility of using it as a seed, following a proposal of M. Danailov. Since they have the QCL, and the know-how, they are going to use it for different applications, particularly in ring cavities for very precise molecular spectroscopy.

M. Bertolotti asked for the list of publications, and A. Vacchi answered that 2 were made in 2012 about the experimental method.

Two students from Togo are expected under the STEP programme, and a returning visitor, Dr. Komlan, who discussed his thesis in 2013 on QCL will be visiting for 10 months in 2014. A. Vacchi expressed his wish for Komlan to use QCL in an applicative way during his stay.

M. Danailov then took the floor to speak about the STEP programme. The main change this year is that the 3 to 4-month duration of the STEP programme is to be increased to 6 months to enable students to complete experiments, as the current length of the visit does not allow sufficient time for this. ICTP will fund the extra months. He lamented the constant decline in STEP visitor numbers. Previously there have been 6 or 7 students per year, which dropped to 2 to 3 and currently stands at one visitor.

He explained that this is due to the IAEA's narrowing of the scope of acceptable research fields of interest to the Agency. Now, although good applications are being submitted and receiving very positive feedback, such as the tweezer-related application from Senegal, funding is not forthcoming. The current situation is rather paradoxical in that the few who are eventually accepted by IAEA are not in research fields ongoing locally.

A. Wagué made enquiries about the composition of the selection committee and the scheduling of its next meeting. Danailov informed that the next selection would take place in Vienna in March 2014.

M. Danailov concluded his report with news of the fruitful one-month visit of a Syrian Associate in October 2013, as well as the substantial progress which is being made on free electron lasers. Two publications were accepted in 2013 and there is general recognition that work is going well.

There is another ICTP Program, TRIL, for people with PHD. They get an experience in another lab and they make contacts and collaboration. TRIL can be up to a year and co-sponsored by the laboratory, which puts half of the funding. For STEP, PhD
students from a developing country are supervised at ICTP by a co-advisor, and a home organization awards their degree.

A. Guzmán recommended to extend the TRIL program for stays or research internships for graduate students. PhD Programs in some developing countries require research experience abroad and include partial or total funding for that purpose.

J. Niemela mentioned that IBM hires PhD and M Sc students from developing countries. Some Universities are also opening branches in developing countries, and the Italian government for example sends students to the US. Collaboration with other organizations like TWAS and WOSD might be considered in this regard.

4. SIOF and ICTP Collaboration Projects

A. Consortini spoke briefly to the meeting via Skype and her observation that there is a proliferation of student chapters of SIOF in the South of Italy was confirmed by J. Niemela, who encouraged a possible link with fellow students in nearby Tunisia. The OSA/SPIE student chapters were cited as a great example of how to empower students. The first ICTP outside activity in Armenia will be held in 2014. G. Von Bally confirmed he is considering attending.

5. Initiatives of international organizations in support of ICTP programs.

Following the coffee break, A. Guzmán invited reports on the initiatives of the various international organizations present.

LAM

A. Wagué reported briefly on the activities of LAM. He informed that an international Workshop on photonics for sustainable development was held in Senegal from 10-15th January 2014. A meeting was held regarding the launching of the African Optics and Photonics Society, which will take place during the IYL. Egypt, Tunisia, Algeria, Morocco, Nigeria, Kenya, Cote d'Ivoire, Ghana, Senegal and South Africa are founding members. SPIE is an international partner on the Committee and there will be an ICTP and an OSA representative. Many members of the Committee are present at the TSOSA meeting, including M. Zghal, Z. Ben Lakhdar, A. Johnson, J. Niemela and A. Wagué himself. J. Niemela suggested publicizing the new Society during the IYL. A. Wagué thanked ICTP, SPIE and the Science Programme in Sweden for their support.

K. Svanberg reiterated J. Niemela's praise for the high level of the January Workshop which had seen purely African scientific results presented, with many outstanding publications. It was very encouraging for the future. A. Wagué was congratulated for the excellent scientific programme.

A brief discussion of the organization of the new Society ensued. J. Niemela stressed it is not a replacement of LAM. A. Wagué confirmed that there will be no incompatibility with existing networks, LAM will be a member of the Society, the intention being rather
to join forces to represent and promote Optics throughout Africa. J. Niemela recommended to create a financing committee for funding to make the society viable.

K. Plenkovich enquired if there will be opportunities and sponsorship for young African physicists to take part in future activities. A. Wagué informed that more than 100 students applied to attend the January Workshop but there was insufficient funding to invite them. He mentioned also other problems caused by lack of funding, such as the high cost of printing posters. J. Niemela remarked that ICTP printed 15-20 posters presented this year at the Winter College. ICTP offers a tutorial about how to write a poster before allowing the printing. There was a large number of poster presenters at this year's Winter College: 52 participants have exhibited their work this year, which is twice the usual amount. The SPIE prizes have been awarded to participants from South Africa, Lithuania, India and Colombia.

K. Plenkovich intervened asking if SPIE can provide help with introducing the teaching of entrepreneurial skills to participants of future Colleges, as they have a whole programme dedicated to this. J. Niemela informed that the USA State Department is already collaborating, confirming K. Plenkovich's statement that the US want to invest in this area and consider it very important. There was a brief discussion about the possibility of introducing entrepreneurial training at the Winter College, perhaps involving Duncan Moore and/or the IOP, who already organize the biennial Entrepreneurship Workshop at ICTP.

**SPIE**

A. Guzmán invited K. Svanberg to give her presentation of the SPIE's activities, during which she reported that SPIE supports the ICTP/INFN laboratory. SPIE will give US$ 25,000 to the IYL and US$ 5,000 to the 2015 Winter College. US$ 20,000 are also given annually to ALOP. J. Niemela mentioned that the UNESCO funding has been reduced, but ICTP is assuming UNESCO’s dues. ICTP support for an ALOP activity is maximum €5000. For holding several ALOPs, more facilitators will be required. Z. Ben Lakhdar reminded of the process followed to train a facilitator, from participant, to assistant, to facilitator. K. Svanberg highlighted, in particular, the plight of countries such as Thailand, Ethiopia and Tunisia, and mentioned new additional SPIE working areas: An Education Conference that will take place in August at SPIE, during which there will be an Optics and Photonics Symposium, and a new fund of $90000 for Education Outreach Grants that could help the realization of ALOPs in Latin America. There are also producing educational resources and translating posters and other materials for the IYL. SPIE has also created a scheme to promote women in science.

K. Plenkovich confirmed that travel scholarships have just been established and encouraged those present to urge good students to apply for the US$ 2000 awards to attend SPIE events as there are good possibilities of requests being granted while the scheme is in its infancy. The 2015 Photonics South event in Rio de Janeiro was mentioned as being particularly suitable. She also asked J. Niemela to put a link in the ICTP webpage to the SPIE program of free publications for ICTP.
K. Svanberg showed a map of the SPIE's activity, with 126 countries highlighted where they are currently providing support.

**OWLS**

G. Von Bally took the floor to report on OWLS activities. As part of Optics within Life Sciences, he mentioned the support given to the OPTILAS activity in Porto in July 2013, as well as the LAM10 International Workshop which took place in Senegal in January 2014. OWLS had also played a role in setting up the African Photonics Society.

The OWLS AGM will take place from 10-12 June 2014 in Ningbo, China, at the Campus of the University of Nottingham. ICO will act as co-sponsor.

**OSA**

The OSA Chief of Staff, Sharon Grace, attending the meeting for the first time, was formally introduced, and reported. OSA will celebrate its centennial in 2016. Its mission is to promote generation, application, archiving and worldwide dissemination of knowledge in Optics & Photonics. Its membership is 18500, and continues growing. It includes members from 100 countries. It has 143 members in Africa from 13 different countries, with the largest number in South Africa and Egypt. It has 329 student chapters and 5000 student members. Just in 2013, 40 student chapters were added. There are 2 chapters in North East Africa and 7 in South Saharan Africa.

S. Grace went on to mention the IONS students net, which has held 37 conferences since 2006. The OSA Foundation attracted 7000 students in 2013, with 247 travel grants and 220 awards and prizes given to students from 55 countries.

OSA has MoUs with numerous organizations including SPIE and the ICTP, and work with peer societies. Collaboration is strong on the national photonics initiative in USA.

The 150 staff at OSA focus mainly on five areas:

1. National security
2. Energy
3. Health
4. Communications
5. Manufacturing

The OSA's 100th anniversary will follow the IYL.

Since 2000, OSA has supported the Winter College by donating an amount of US$ 10,000 per year. For the duration of each Winter College, an electronic delivery service gives free access to OSA journals to all participants. 7 OSA journals are currently listed in the top 25 international optics journals.

J. Niemela enquired about the possibility of marking the centenary of OSA during the 2016 Winter College. S. Grace, in reply to a question from A. Friberg, regarding the
OSA Annual meeting in Rochester in 2016, outlined the OSA's plans for its centenary year. A new centenary advisory group has been set up and will meet at the end of March to commence strategic planning. A book will be written about optics innovations and developments. There will be a gala and various celebratory activities. The OSA website will show the developing history of optics, with photographic evidence and historical information being added. Oral histories are planned, and interviews with luminaries to be made available online.

A. Guzmán invited A. Johnson to complement the report of S. Grace on OSA's activities. He reiterated the plans to mark OSA's centennial in 2016.

**EOS**

R. Ramponi spoke about ongoing financial problems and logistic upheavals linked to the move of the Headquarters from Germany (Hannover) to Finland. The biennial meeting will take place in September or October 2014.

Despite the current difficulties, the usual topical meetings are being held throughout the year and the student club programme has recently been resumed, following its suspension in 2013 due to lack of funding. Clubs in France, Russia, Italy and a couple in USA are supported.

A. Friberg enquired about the number of topical meetings planned per year, as he considers them the singularly most important feature of EOS. R. Ramponi replied that more will be held in 2015 than 2014, due to the scheduling of the General meeting this year. EOS will also participate actively in the IYL, and this is currently under discussion.

**ICO**

A Guzmán reports that ICO continues supporting the Winter College with $5000 per year, and provides the cash award for the ICO/ICTP Gallieno Denardo Award. The award ceremony is held every year at ICTP during the Winter College. The ICO and ICTP will continue in 2014 with the ICO/ICTO Central America initiative on Optics and Photonics, with an ICTP activity outside Trieste, the ICO/ICTP/MCTP College on Optics and Energy, to be held at the MCTP, the Meso American Centre for Theoretical Physics, a daughter institution of ICTP in Tuxtla Gutérrez, Chiapas, México.

J. Niemela mentioned also the entrepreneurship schools to be held in Latin America, organized by D. Moore, ICO President.

ICO will build a webpage for the IYL in Spanish and will use its direct communication with its 52 Territorial Committees to help establish national committees, and gather information on their activities in celebration of the IYL.

**6. Discussion on topics for future Winter Colleges and suggestions of possible College Directors**

A. Guzmán reported that one proposal had been submitted by the deadline.
J. Niemela confirmed that it is a very complete proposal, more so than in previous years.

K. Svanberg enquired if the proposal meets the criteria for the Directors (an Italian, a representative from the developing world and at least one woman).

J. Niemela replied that Angela Piegari (President of the Italian Society of Optics and Photonics) will be one of the Organizers, together with Errico Armandillo from ESA. One of the two Chinese Directors who were proposed will be confirmed shortly.

K. Plenkovich enquired if the list of lecturers has been defined, and if some names could be put forward. J. Niemela stressed the importance of bringing the Chinese into the community.

7. Recommendations to ICTP by TSOSA members:

M. Bertolotti suggested that, given the lack of knowledge of most participants from emerging countries of the history of astronomy, it would be useful to include a series of lectures, totalling approximately 12 hours over the fortnight, after dinner for those interested. He already has a programme for the lectures and volunteered to give them, together with P. Benvenuti. The contents include developments in China, the Arab world, México, up to Europe and the US. Astronomy has very exceptional results: extra solar planets, proofs of general relativity, bending of light, indirect proof of gravitational waves of massive systems, gravitational lens in space, etc.

A Wagué would like to contribute some ideas to this initiative. The TSOSA Committee expressed in general its approval for this suggestion.

In 2013 the TSOSA Board recommended the creation of a committee in charge of preparing experimental activities during the 2015 Preparatory School and Winter College. The Committee members are: Z. Ben Lakhdar, A. Consortini and V. Lakshminarayanan. J. Niemela suggested that V. Lakshminarayanan could contact the Directors well in advance to plan the hands-on activities. M. Danailov agreed that this needs to be sorted early, and said that Elettra could be involved in some of the topics. M. Bertolotti stressed the importance of this component of the programme for the benefit of the participants, and would like to have in the lab at ICTP general optical components. J. Niemela invited M. Bertolotti, as EOS representative, to be actively involved in the preparations, and mentioned that the Committee needs a Chair.

V. Lakshminarayanan manifested that ideally there should be some correlation between the committee and the directors of the Winter College. The Committee must get in contact with the directors. He will assume the role of Chair of the Committee and takes responsibility to contact he directors of the Winter College.

Decision: The special Committee for experimental activities during the Preparatory School and Winter College will be chaired by V. Lakshminarayanan, who will be in contact with the Winter College Directors to organize those activities.
Decision: Mario Bertolotti, as EOS representative, will be member of the committee.

Decision: The Chair of the special Committee should contact the Winter College directors as soon as they are chosen.

J. Niemela asked L. Ponce to bring the equipment for LIBS, and wanted to know if the TSOSA committee would like to see a LIBS apparatus to stay at ICTP. Z. Ben Lakhdar considered the equipment very useful for students to learn how to manage this technique, and recommended to talk with L. Ponce after the TSOSA Meeting. The equipment is currently at ICTP and students can prepare two sessions. In addition, M. Bertolotti might have some experiments involving satellite information. Z. Ben Lakhdar suggested to do some simple experiments with interference and diffraction that are used in the interferometric measurement. This year students had the possibility of practicing with the photonics explorer, and in a former Winter College they did ALOP. Both activities were very well received.

Action: The special Committee for experimental activities during the 2015 Preparatory School and Winter College was invited to draw up a list of equipment available and define what needs to be either borrowed or bought.

J. Niemela asked for further comments on the proposal. None were forthcoming, so the proposal for the 2015 Winter College was accepted, with the proviso that it will be modified according to the comments of the Committee today, and bearing in mind that it will be the first Optics activity to take place in Italy during the IYL.

Decision: The TSOSA committee accepted by consensus the proposal sent by A. Piegari for the Winter College 2015: “Light: A bridge between Earth and Space.”

In view of the forthcoming Year of Light celebrations, M. Yzuel suggested a tie-in social event before the start of the Winter College to highlight its importance with invitations to authorities and some form of involvement with the city of Trieste, not just the scientific community. J. Niemela acknowledged that the Winter College, given its history, size and the fact that it will be the first activity in Italy during the IYL, would be the right opportunity to publicize the Year of Light and its various events, which still under discussion and planning. Various suggestions included ludic activities for children and a talk by M. Bertolotti to which local high schools could be invited. M. Yzuel suggested giving a history of the Winter College.

J. Niemela could invite a Nobel Laureate.

Z. Ben Lakhdar recommended to invite a lecturer who speaks Italian.

R. Ramponi reported that there will be the 2015 universal exhibition in Milan, where she is trying to organize an exhibition related to the European project Photon. They are connecting with regional and local authorities with the intention of having a special event at the opening or the closing of the exhibition. She also contacted authorities in Berlin, who would like to rebuild the exhibition FASCINATION FOR LIGHT, which
was financed by the European Commission and dismounted. Other activities for Photon could be mixing music and light, and the realization of small congresses for high school students, with emphasis on girls.

K. Plenkovich mentioned a series of lectures including hands on activities mainly driven by students with tutors.

The TSOSA Committee aimed to achieve Public recognition for ICTP in connection with the YoL.

K. Plenkovich suggested some demonstrations. J. Niemela was willing to consider different possibilities: games, laser sources, etc. M. Bertolotti could offer a talk on the history of lasers. M. Yzuel mentioned that a celebration could serve to advertise the Winter College between young people and in Trieste in general.

J. Niemela mentioned that the ICTP community has not been informed, except for F. Quevedo, but he will take the opportunity for a special colloquium, if possible with a Nobel Laureate. A. Guzmán suggested John Hall; M. Yzuel, John Madder; and M. Bertolotti, Ted Hänsch, since there exists a good connection with Florence. He recommended to act soon after the TSOSA Meeting.

**Decision:** J. Niemela will inform the ICTP Director of the importance of the 2015 activity also to the entire ICTP community and suggest a Special Colloquium with an invited speaker to be defined at a later date.

**8. ICO/ICTP Gallieno Denardo Award:**

The Committee members were A. Wagué (Chair) together with A. Consortini, M. Danailov and J. Niemela (Committee).

In 2013, two outstanding young scientists will receive the award: John Fredy Barrera Ramírez (Colombia) "for his breakthrough contributions to the field of Optical Encryption and its potential applications, as well as his promotion of research and training in optics in Colombia, and dedication to public outreach", and Maria Florencia Pascual Winter (Argentina) "for her creative theoretical and experimental investigation of original schemes for coherent coupling of optical and microwave interactions in quantum memories for light, and for her commitment to the expansion of the scope of scientific international collaboration between diverse research groups".

Both winners will give a 30-minute talk. J. Niemela reported that the prize has grown in stature and appears not only on the ICTP’s web page, but also in the local press, thus putting Optics in the spotlight.

**9. Election of TSOSA Chair**

Various TSOSA Committee members expressed their appreciation of the work of A. Guzman, who was nominated to continue as Chair by M. Bertolotti. A. Wagué seconded the nomination, which was accepted unanimously by the Committee.
Decision: To elect A. Guzmán as the TSOSA Chair 2015.

Meeting adjourned at 1:30 pm.


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Minutes of the TSOSA Board Meeting 2015

February 18, 2015, ICTP, Miramare, Trieste, Italy

Attendees: (official representatives in bold)

M. Bertolotti (Representing EOS), M. L. Calvo (ICO Past President), A. Consortini (Representing SIOF), M. Danailov (Representing Elettra Sincrotrone Trieste), A. T. Friberg (Past President ICO), A. M. Guzmán (Representing ICO, TSOSA Chair), A. Johnson (Representing OSA), V. Lakshminarayanan (Univ. of Waterloo), G. Manatova (OSA), J. Niemela (Representing ICTP), K. Plenkovich (SPIE), R. Ramponi (Past President EOS), K. Svanberg (Representing SPIE), A. Vacchi (INFN), G. von Bally (Representing OWLS), A. Wagué (Representing LAM Network), M. J. Yzuel (Past President SPIE), Elizabeth Nolan (OSA), M. Zghal (Optical Society of Tunisia)

J. Niemela (JN) opened the meeting and introduced to all the participants. A. Guzman (AG) chairing the meeting. Fernando Quevedo sends best wishes for a fruitful meeting (JN). AG started with salutations and indicating this is the 13th TSOSA meeting.

1. Approval of the Minutes of 2014 meeting

Receiving comments from Andrea Vacchi (AV) and Anna Consortini (AC). The amendments were introduced in the text. Minutes approved.

2. Briefing activities

JN reported. Indicated that Milcho Danailov (MD) was not able to attend the meeting. He mentioned the importance of TSOSA Board for supporting Optics activities at the ICTP. We have no staff assigned and have the support from ICTP Secretariat.

He informed on the Sandwich Program, a very good opportunity for developing countries young scientists (see booklet). They are trained in Italian laboratories for
experimental work with an extension of 3-9 months. The College in Optics started around 20 years ago\(^1\) and it is considered a model for ICTP, it changes topic and directors every year. Some of the participants continued to be attached to ICTP as Associate. The college of 2014 was on Fundamentals of Photonics with 105 participants and a very good gender balance (the order of 50% women participants). It was a very active College with very good interactions between lecturers and participants. It was also very much appreciated the course on computing simulation and hands-on activities.

Anthony Johnson (AJ) asked to JN if students from US can obtain scholarship. The response was that this can be done through NAS and that it is good to have students from US as well. ICTP used to offer free lodging to all participants and that it is very positive to have interaction of students from all over the world. JN also added that care is needed in all colleges to be sure that all participants are attending the daily activities.

He reported on the activity held in Yerevan (Armenia) (see booklet) where the OSA and SPIE student chapters organized various activities. There was as well good participation from many countries. It was the first activity of ICTP in Armenia.

He informed on the 2015 Winter College with a Chinese co-director (may be first time). Regarding gender a 53% of participants have been women.

At this time Miltcho Danailov arrives to the meeting. He informed that Humberto Cabrera, ICTP Associate in Optics has helped this year for the laboratory with low cost set-up in confocal microscopy. Some material needed to be purchased and it was directly charge to the J. Niemela Office budget. Also, Mourad Zghal was helping in the activities and was very successful in the Multidisciplinary Laboratory for research and experimental training. There has been in addition evening activities for X-Ray sensor development. Regarding the number of participants there is a fluctuation and this year 2015 there was a lower number than in 2014, of the order of 12 participants less. It was important to adjust the budget and the geographical distribution of all the attendees. One reason for lower number could be that Space Optics is not an extended topic.

Katarina Svanberg (KS) was asking if there was more people applying than accepted and the answer was yes. They are usually selected according to CV and research work done in the field of the College topic.

Also, geographical distribution must be considered. In general, the College has a large number of participants from India and Iran. The maximum ideal number could be 150 participants but this can go beyond the budget and depending on economic conditions of each participant.

The College needs to enhance presence of more participants from Europe and to try new programs for attracting this community. Also, the College looks for orientation to

\(^1\) My comment (MLC): there might be in 1990 when Chris Dainty, then ICO President, visited ICTP and agreed with Gallieno Denardo for starting a college in optics.
professional activities, tutorial work, preparation of posters, and ICTP is helping in this task (JN).

Anna Consortini (AC) mentioned that directors are included in the statistics and asked if there is possible to have the presence of teachers from Secondary Schools. JN answered that the ICTP is preparing some possible activities for Secondary Schools, and added that in 2016 there will be an activity in optical vortices at the ICTP. Angela Guzman reported about the external activities. There was a power point presentation on the activity ICO/ICTP/MCTP School on Optics and Energy, held in Chiapas, Mexico, May 2014. Currently planning other activities within the ICO/ICTP initiative for Central America, which started in 2012 with a first ICO/ICTP external activity on lasers, laser safety and applications, held in Costa Rica. In these activities, the support of Mexican colleagues was important. In both Schools, there have been hands-on activities.

Anthony Johnson (AJ) asked if the initiative can include Haiti, the Dominican Republic. JN answers that the MCTP has a program to bring participants from the region to Chiapas, Mexico. Brazil has also programs. There are also activities in Venezuela. There was a conference on fluid dynamics in Venezuela. Participants from Trinidad and Tobago go to Venezuela.

Ahmadou Wagué (AW) requested whether there were some proceedings published for the Chiapas College. AG responded that at the MCTP website the presentations of the lectures are free download. AW added that this was a good example of activity to be done in African countries and he added the necessity to extend ICTP external activities. He considers a good idea to have activities in Africa and Latin America. There was a small activity in Africa on optical tweezers, entirely hands-on. Part of a broader vision of ICTP should be to delocalize and do more activities outside ICTP. There is interest on these topics in Africa. JN mentioned that the STEP Program includes topics of optical tweezers and biophysics. AW answered that the STEP Program is indeed too short, since is in general limited to three months.

Miltcho Danailov (MD) added that the laboratory for ultrafast pulsed lasers is a working ICTP facility providing research results at high level, and is well recognized worldwide. It also attracts visitors to the free electron laser facilities. But last year (2014) there were less visitors from the STEP program. The IAEA has not supported laser research during the past three years. The STEP Program has been supported by ICTP but rather on different topics. There were also less ICTP Scientific Associate visitors in the area of optics. A new subject of research has started recently in collaboration with a local hospital in photodynamic therapy for cancer. The lab offers a lot of possibilities and they are looking for students.

The Associates collaborate in the Winter College providing experiments, visits and training with small groups of participants.

AW recommended to have a special meeting with the Chair of International Cooperation of the IAEA aiming enhanced collaboration with Africa. MD added that
extending programs is difficult these days. JN informed that there is a new affiliated center in Tunisia for activities in optics and photonics. Also, there is the SESAME synchrotron project in Jordan, which includes an infrared lab. The ICTP has funded participation of Palestinians in this lab.

Mourad Zghal (MZ) indicated that centers like the one in Tunisia are vital for South-South cooperation. They provide opportunities for people to go to countries with similar scientific level. The affiliated center has built a network of 10 countries, between them Ethiopia, Chad, Senegal, and Cameroun. Students spend 2-6 months in the lab at the University of Tunis. They work on theoretical calculations and experiments such as laser breakdown spectroscopy. They are able to publish their research and then defend their PhD thesis in their own country. Last year they had assistance from ICTP to establish collaboration with affiliate centers in Senegal and South Africa (2 different institutions) while maintaining links with Europe and host scientist from Italy, France, USA, Canada and South Africa. Andrew Forbes was one them. Angela Guzman (AG) asked for advertisement on the ICTP support for South-South collaboration. She commented that there are now interesting collaboration projects in Latin-America and they can be good examples to be exported for other geographical regions activities. Some of them are funded with local resources. JN mentioned that currently there is an effort for a join PhD for Central America lead by SUCA. Most researchers in Central America are experimentalists and work in the area of optical engineering. AG recommended ICTP to prepare a brochure for advertisement of this initiative, which could be distributed by ICO through its RIAO Network. JN offered to prepare a pdf file with the information on the College of Optics and Energy.

Anna Consortini (AC) manifested her complacency with the new ICTP lab and suggested to increase the number of participants attending the activities organized by Humberto Cabrera in the Multidisciplinary Laboratory, and asked him to continue training the students. He already trained two women, one from Colombia and one from Venezuela.

J. Niemela continued to inform on the ICTP activities. The ICTP contributed 100000 euros for synchrotron activities. The Director of the Indian Institute of Science and Technology ISST, Bangalore, is the Chair of the review panel of Elettra. Four million of dollars were given to train people in India to build a synchrotron, including detectors.

A total of two million euros has been used to purchase a new very high-resolution detector, and SESAME points to the third-generation light source, as part of the initiative science for peace. AW mentioned that there will be a preliminary workshop in South Africa for the African light source project. JN mentioned that the Vatican is releasing a new stamp for the International Year of Light.

There is a continuation for expanding laboratories activities at ICTP for experimental training. Also, there are currently new programs with participation of Iranian scientists. JN mentioned also the case of Omid Kokabee now in prison for three years in Iran. There are current initiatives through Vatican in search of a solution. ICTP is having a good relationship with the Iranian Government and the Year of Light 2015 can be an
opportunity to try some actions. Maria Calvo (MC) informed that the health of Omid Kokabee is in poor conditions and that efforts with diplomatic world and governments are most efficient and needing a prompt action. The subject will be treated in the meeting of the 19 February 2015.

3. Information from Andrea Vacchi (See report in the booklet distributed)

He explained the current experimental activities. The most important one is the development of a large area Silicon Drift detector (SDD), invented by Emilio Gatti (Italian). For that purpose, they use previous results in a work done in Milano. An important key application for last generation detectors is now being held in CERN, Geneva, at the LHC, obtaining very good performances. The basic is the replacement of the Silicon-Lithium detector. There is now a good detector for low energy X-rays, which opens a new field for applications in x-ray astrophysics. The European Space Agency was supportive of a LOFT project intended to develop the SDD in Trieste. The objective is to look for a vector technology to be commercialized, this is a very expensive device. The last testing was done in collaboration with Elettra with very satisfactory results. They are obtaining performances at room temperature that they were able to get only at low temperatures. Measurements last ten minutes instead of ten hours or days. They solved the problems of vacuum, and electronic and mechanical interfaces. One single pixel was able to do as good as 8 of the previous detectors. The final target is the detection system for the free electron lasers. Detection systems are still developing. They are trying to involve SESAME synchrotron installations and have already contacts with SESAME Director. A detector system developed in the lab, including every aspect – design, characterization, connections, electronics – and especially if working at room temperature, opens a lot of room for collaboration and applications, like cultural heritage and photo luminescent analysis of food contamination.

They are also developing another experiment with protons. Some inconsistencies in the measurement of the charge radius of the proton by normal atomic spectroscopy and by measuring Lamb shift of a muonic atom, where a muon replaces an electron in the atom. They measured hyperfine splitting of the 2S to 2P line of the muonic atom spectrum using a tunable high power laser at 6.7 microns. The muon beam is a very critical part of the experiment and a characterization of the beam is needed. Also, studying the conditions of operation under low-temperature. The research on Quantum Cascade Lasers (QCL) was an initial experiment and it involved scientists from Togo and Ghana. Last year they contributed in international conferences with a new scheme for difference frequency generation. The construction of the laser is a 50K euro project. The design of the optical cavity is another critical issue, and they are using the facility to develop other experiments in resonant and in ring cavities. There is a current collaboration with Elettra for a new design. They are now benefitting from some European programs for financing and there remain two years for the final experiment. The estimated required budget for all of these activities is 3 million euros.

4. International organizations report
E. Nolan provided an overview of the annual activities in OSA, membership, student chapters, activities. They have focused on African sponsorship programs. They have as well other programs for lecturing in different countries around the world and a policy for Open Access of the journals. OSA is participating in education programs such as ETOP. They promote the distribution of optics kits to young students and schools. A. Johnson mentioned that this year OSA has offered free membership for one year to all Winter College participants. M. Zghal reported that OSA and SPIE student chapters will have a joint IONS meeting in Africa cosponsored by the African spectral imaging network.

Katerina Svanberg (KS) reported on SPIE annual activities with a power point presentation. She emphasized that SPIE contributed $25000 as founding sponsor of the International Year of Light (IYL) 2015 and thanked the collaboration of the ICTP offering to host the IYL Secretariat. SPIE contributes $5000 to the ICTP Winter College and provides electronic journal delivery to ICTP during the College. SPIE has contributed to the anchor research Programme at ICTP providing partial support to the ICTP/INFN lab by an amount of $90000 over three years. SPIE also supports hands-on learning contributing with $20000 to the ALOP (Active Learning on Optics and Photonics) program. JN informed that the next ALOP activities will be in Indonesia at the atomic energy commission facilities, in Ghana, and perhaps in Jordan, Mongolia in June 2015, South Africa and Nigeria. The availability of facilitators would be a potential problem. He added that there is an interest to organize ALOP in Pakistan but there are many difficulties at the moment. They are planning to contact Malala Yousafzai, Peace Nobel Prize 2014 for support. JN added that SPIE has been providing the primary outside funding. UNESCO does not have a fix budget for the ALOP Programme. The ICTP finances the ALOP activities with $4,000-$5000/year. A possibility for 2015 is to have funding from the IYL budget. There are also contacts in Mexico. AG in her capacity as coordinator of the ALOP Programme in Latin America reported that the Mexican Physical Society might sponsor a follow up ALOP Workshop in Mexico. Eric Rosas from the Mexican Academy of Optics has been very supportive in this regard. And there are plans for another three ALOPs in Latin America: Bolivia, Panama and Ecuador.

KS continued informing on SPIE activities with additional areas as educators’ programs and student chapters. There are special activities related to women in optics with the annual calendar and, an international network for the availability of scientific publications (INASP) for scientists from developing countries around the world. SPIE participates in ETOP activities, and will co-sponsor with ICTP an activity in Yerevan, Armenia, in October 2015. Next ETOP conference will be held in Bordeaux, France, July 2015. Currently 137 abstracts have been submitted and most probably there will be a post-deadline call.

Gert von Bally (GvB) informed on OWLS activities. He presented the report on a power point presentation. The last meeting of the society was held at the University of Nottingham Ningbo in China in 2014, with the elections of a new Board, and the creation of a new regional council. The new President is Stephen Morgan. He
highlighted the fact that Stephan Hell, Nobel Prize in Chemistry 2014, was in the Board of OWLS for various years, in particular occupying the position of Secretary. OWLS will participate in the 10th LAM international workshop in Ghana, May 26-28, 2015, and will be present at the launching of the African Optical Society in Senegal. The next OWLS conference will take place in Mumbai, India, March 16-18, 2016. In 2018, the OWLS conference will be in Perth, Australia.

Roberta Ramponi (RR) reported on EOS activities. The society is now under a reorganization process. The new office is located in Finland and the new President is as well from Finland.

Ahmadou Wagué (AW) reported on LAM activities. The LAM annual Meeting was held in January 2014 in Dakar, Senegal. The new African Society for Optics and Photonics is under development and they planned the launching for IYL 2015, mid-July with the support of ICTP and IUPAP. There is a special Committee for founding the society and a web page is under preparation. KP asked what national societies are involved. AW answered that hey work with representatives from optics groups from most African countries instead of societies because the latter do not exist. But international societies are also involved.

Anna Consortini reported on activities of the Italian Society for Optics and Photonics (SIOF). They are collaborating with various activities at ICTP, in particular with the organization of the Winter College 2015, and participating in the events in Italy of the IYL 2015. SIOF will have a new Board in 2015, and the NRC will change the representative of the Territorial Committee.

Mario Bertolotti (MB) added information on a conference in Optics in Micro Systems, September 2015, and a conference being organized at the Vatican under the title “Fiat Lux”, to be held in Rome, 3-5 June 2015 intended to highlight links between science, religion and philosophy.

Angela Guzmán (AG) reported on ICO activities. The ICO/ICTP Gallieno Denardo Award is traditionally announced during the Winter College. The Committee for the term 2014-2017 is chaired by Mourad Zghal. Other members of the Committee are Prof A. Consortini of University of Florence, Italy; Dr M. Danailov of Synchrotrone Trieste, Italy; Prof J. Niemela of ICTP, Trieste, Italy; and Prof A. Wagué, University Cheikh Anta Diop, Dakar, Senegal. ICO also offers traditionally a reception for the Winter College attendees. The ICO/ICTP initiative for Central America, which started with the First ICO/ICTP/TWAS Central-American College in Lasers, Laser Safety and Applications held in Costa Rica in May 2012, continued with the ICTP/ICO/MCTP College on Optics and Energy, held on May 2014 in Chiapas, Mexico. It was quite a successful event with the order of 30 participants from Mexico and other Latin-American countries and very high-level speakers. A third event is being planned for 2016. These activities have been developed in cooperation with the RIAO, a new international society member of ICO, as approved by the ICO General Assembly in Santiago de Compostela, August 2014. There is now a Call for ICO awards for the
promotion of Optics and Photonics among young people in the ICO Territories in
celebration of the IYL 2015. The total budget foreseen for these awards is US$25,000.

5. Topics for future Winter College (see booklet with proposals)

The list of received proposals was:

1) Optical and Photonic Instruments and Systems: Analysis and Design.

This proposal was presented by Vengu Lakshminarayanan (VL). He gave some details
on the possible contents and program. After conversations with Dr. Hazra in Calcuta
and Mourad Zghal they want to train people for optical design jobs, in particular those
students that have less opportunities. They plan to bring Zeemax to do simulations with
Mathematica. The topics is useful although it is real basic, fundamental, old fashion
optics. The proposal did not include Italian nor woman co-director. Several discussions
addressed that point, since TSOSA agreed on those guiding rules previously.

2) Optics and Quantum Optics at the Nanoscale.

This proposal was prepared by C. Sibila from the University of Rome and presented by
Mario Bertolotti. RR asked in which way this College would differ from the one held
on 2012. Joe Niemela proposed that if this topic was approved, a change in the program
and contents of the Preparatory School will be needed. This then could create some
complications in the organization. KS indicated that it was needed to consider the third
world attendees and if this topic could be considered in local laboratories as to develop
feasible experiments with an inadequate infrastructure and lack of funds. MB remarked
that plasmonics and quantum optics are now object of experimental research that does
not require very expensive instrumentation. It has applications on quantum
cryptography, quantum computing and the optical properties of new materials. RR
considered that combining quantum optics with plasmonics would be too complicated.
VL answered that quantum optics can be taught in a simple way and phenomena at the
nanoscale is a very interesting area at the frontier of research. AG mentioned that she
learnt from Abdus Salam that there is no one science for third world countries and
another for rich countries, and that the ICTP was created with the aim to offer scientists
from developing countries the possibility of doing research at the frontiers of science,
because science is universal. AC would like to see a more international proposal,
because three recent Colleges have originated from Italian researchers. She added that
the first Winter College was on Optical Design.

3) Optical Frequency Combs: Basic Applications.

This proposal was presented by Miltscho Danailov (MD) after the deadline. RR
indicated the importance of the topic and its connection with optical metrology.

A voting took place among the official representatives of societies and international
organizations inside TSOSA. The result was favorable to the first proposal, but there
was an important mandate on that the precise list of Co-Directors should comply with
the agreed TSOSA guidelines in this regard.
However, further discussion among various members of TSOSA took place after the meeting was adjourned. Motivated by the issue of the lack of a women director for the College on Optical Design, KS asked for a reopening of the discussion in an evening session, in which, after various discussions and reconsiderations, the adopted topic was the third one in the previous mentioned list. The final voting favored the topic: “Winter College on Optics: Optical Frequency Combs - from multispecies gas sensing to high precision interrogation of atomic and molecular targets”. MD and JN will take care on the preparation of the list of Co-Directors, invited speakers and Preparatory School.

6. ICO/ICTP Gallieno Denardo Award 2015

For the year 2015 the Award was awarded to two young scientists:

Rim Cherif, Carthage University, Tunisia. The citation reads: For her achievements in the field of nonlinear optics and in particular for her valuable contributions to the design of highly nonlinear fibers for supercontinuum generation, as well as for her active commitment aimed at the diffusion of research in optics and photonics in Tunisia. And Rajan Jha, from the Indian Institute of Technology (IIT) Bhubaneswar, India. The citation reads: For his breakthrough contributions in the modelling, design and development of high performance optical sensors and waveguides as well as for promoting research activities in optics and photonics in India. It is expected, as it is customary, that the two awardees deliver the Gallieno Denardo Lecture at the time of the Award ceremony.

7. Election for TSOSA Chair

It was proposed that the current TSOSA Chair and ICO Secretary General, Angela Guzman, be re-elected for the year 2016. (Motion: first Mario Bertolotti, second: Gert von Bally). It was unanimously approved.

8. Other business No further business to be considered.

Meeting ended at 2:00 PM.


Minutes of the 2016 TSOSA Board Meeting

ICTP, 23 February 2016

Attendees:

K. Apter (representing OSA), M. Bertolotti (representing EOS), M. L. Calvo (ICO Past President), A. Consortini (representing SIOF), M. Danailov (Elettra Sincrotrone

2 From her own handwritten notes
Trieste), A. T. Friberg (ICO Past President), A. M. Guzmán (ICO representative and TSOSA Chair), A. Johnson (Representing OSA), V. Lakshminarayanan (University of Waterloo), J. Niemela (ICTP), K. Plenkovich (SPIE), R. Ramponi (Past President of EOS), K. Svanberg (Past President of SPIE), G. von Bally (OWLS Honorary President), A. Wagué (President LAM Network), M. J. Yzuel (Past President of SPIE), M. Zghal (Tunisian Society of Optics).

Meeting opens at 9:00 AM

J. Niemela (JN) opened the meeting and introduced all the participants. Fernando Quevedo is not at ICTP. He sends best wishes for a fruitful meeting. JN proposed some changes in agenda. The discussion of proposals is to be held earlier. He considers that the Minutes should reflect the opinion of the Committee regarding the quality of proposals presented. He is considering including a Chinese representative to the TSOSA, and present ideas for restructuring the committee. He would like the committee to address the issue of how to help Optics at ICTP, perhaps playing not only an academic role but a political role.

A. Guzman (AG) chairing the meeting. Maria L. Calvo serving as Secretary and scribe.

AG started with salutations and indicating this is the 14th TSOSA meeting.

1. Approval of the Minutes of 2015 meeting.

AG thanked Maria L. Calvo for preparing the Minutes. Some errors were reported and corrected. The Minutes were approved unanimously.

2. Briefing on 2015 activities

Joe Niemela (JN) reported. There was the organization of the College on Space-based Optics in collaboration with SIOF and ESA. There is a proposal for another school on this topic in 2016, which would include training in techniques needed for space-based optics. Such proposal cannot be funded by ICTP.

a) ICTP Winter College and Preparatory School

JN reported. Female attendance to the Winter College was 36%. The ICTP average is 26%, and the world’s average is 20%. During the last four years, this percentage has put the Winter College in the upper side of the distribution. Female Faculty are however only 8%. More attention can be devoted to this issue to invite more female and young Faculty to lecture. The higher number of participants are coming from India and Iran. The selection of participants is always done based on their background and merit, maintaining a good balance in geographical distribution. Mario Bertolotti (MB) requested information on the criteria regarding applicants working in the field of the college. JN responded that each College addresses specialized topics. The selection committee looks for students working in that area. But they look also for well qualified people, since the preparatory school cannot get poorly prepared students to the level of the school. In general, many aspects should be considered.
Vengu Lakshminarayanan (VL) mentioned the importance to have hands-on activities in the Preparatory School, especially if the topics of the Winter College are more applied. It was very important the work done last year for Hands-on-activities, with special mention to Anna Consortini (AC), M. Danailov and Humberto Cabrera (HC). Hands-on activities were very successful. Participants volunteered to work at night and on weekends. The experiments will be maintained as permanent installations. Krisinda Plenkovich (KP) indicated that there is an unbalance in number of participants from China and Latin-America and in the case of China, it may depend on the particular initiatives of Chinese institutions. KS remarked that in China the initiative should come from the professors. Some discussions arisen. JN pointed out that China is very active in optics, but students seem to lack information on ICTP. Applications from South-America are not very high. KS pointed out that we need to have the countries of origin from applicants. JN agrees. KS noticed the high number of Iranian participants. MLC commented that this is due to the current restrictions for Iranian young scientists to travel and that ICTP offers them a good opportunity to attend a scientific forum. JN informed that he visited Iran recently and met with authorities. ICTP is a neutral territory and it is helping many scientists in the world. KS mentioned that SPIE has similar problems and is identifying regions to work for chapters. SPIE could help promote ICTP activities through the chapter network to increase applications from target countries.

Ahmadou Wagué insisted in the permanent strong links between ICTP and Iran with long cooperation and financial support. JN indicated the importance of establishing links between participants. Ari Friberg (AF) mentioned the very low participation of students from USA as well as from Eastern Europe. JN clarified that in any case, the Winter College is not restricted to participants from developing countries. Kari Apter (KA) mentioned that the NAS has a budget to support the participation of one US student, but this year no US student was attending. JN mentioned that the ICTP can offer lodging and maintenance but no travel expenses to US students. And all agree that to set up a procedure to have a worldwide number of participants is needed. Gert von Bally (GVB) reminded the idea of Gallieno Denardo searching to have presence of students at the ICTP with financial support from their countries of origin.

JN appreciated the hands-on-activities. JN informed on the data of Winter College 2016 with very good level of participants, 30% female, and thanked the work done by Federica del Conte, secretary of the college. He mentioned that there was a cut on the main budget, the order of 20%-30% for applied physics activities. There was an ICTP activity, a special workshop in South Africa, organize by M. Zghal and Andrew Forbes in 2015 for the International year of Light (IYL) (see booklet). There was 32% female attendance. Mourad Zghal informed that for the South-Africa activities many applications from Iran were received.

Maria Yzuel (MY) mentioned the importance that the lecturers may remain for various days at the Winter College to favor interactions with students. Miltcho Danailov (MD) pointed out that usually various lecturers are present during the whole college. AC suggested to recommend to the lecturers to put understandable titles to their lectures.
JN commented that discussions are needed to define better the kind of college we want and conditions from the co-directors. He would like to have a more relaxed template, because the schedule is densely packed, and students are offered lots of information without too much time to process it. MD agreed upon that sometimes the number of lectures is very high, and they always have to convince the directors of removing some topics. MB followed that due to this situation the college looks more as a workshop. He insisted on the need to provide bibliographical references to the students. The Preparatory School is usually well focused and enhancing good experiments. AC stated that most of the lecturers prepare conferences instead of lectures. AG indicated that the percentage of female faculty members of the college is very low and this limits the role model that women could play within the female participants in the College. She also stated that hands-on-activities need to be reactivated in the college as it was done in the 80’s. GVB pointed out the need for having clear directions to be addressed to co-directors, including a definition of their roles. This has to be considered for the next Winter College 2017. K. Svanberg (KS) agreed with MB and GVB and commented that a presentation that might be superb for an international conference is not adequate for the College. TSOSA should provide instructions to the directors, and not limit its activities to be informed about how the WC went. Lecturers should stay at least five days in the college and provide a written explanation of the aim of their lecture. JN agreed that all the mentioned points should be considered, including tutorials for poster preparation. AC agreed on the previous comments and that interaction between co-directors is needed. Anthony Johnson (AJ) mentioned that usually not all co-directors are able to stay at the college for various days due to academic duties.

b) Other ICTP activities in optics and ICTP programs used for Optics (TRIL, Associates, STEP, SESAME) and Point 3.- Laser lab at Elettra

JN informed on the STEP Programs. There has been a lot of activities inside STEP and not only related to synchrotron. The STEP support for activities in Optics amounts for $250000. The SPIE program goes quite well with many participants from the world of optics. They have focused in the preparation of the laser system for the muon experiment, and achieved the extreme narrow linewidth needed by using intracavity etalons.

MD added that there were two ICTP associate members from Iran and Syria working in the laser lab in fiber laser characterization. They did measurements on optical fiber and have various publications (see booklet). In particular, the Syrian participant obtained very good results. At the present state, the optics students have sometimes not quite wide acceptance by the IEAE for the STEP program and cuts of financial support provided by the IAEA for optics and lasers are expected. There was an application from Senegal that was not accepted by the Agency. Selection takes place in March and September, and the Agency has its own rules. JN indicated that financing these programs is not easy since the resources provided by the ICTP are not enough, and many countries have cut their budgets for science. MD added that at Elettra and University of Trieste there was an Iranian student working in femtosecond lasers with Dan Cojoc. The lab is small compared with other facilities around the world but is the
only one in the world able to produce very coherent light. They have been publishing in Nature. It is a small facility but produces results at the level of those of large machines.

JN added that the work being done in Elettra is quite innovative, and constitutes a good example for the world because the group has been very creative and showed that excellent scientific work can be done in a small facility. There are current contacts with Iranian scientists to create a new line at the synchrotron source. AW asked if the ICTP could create a program for short visits from Associates. JN answered that the TRIL program oversees such visits.

c) The ICO/ICTP Gallieno Denardo Award 2016

MZ Chair of the Committee presented the information. He explained the type of award and reasons to be created in 2000. In 2008 the name was extended to Gallieno Denardo on his memory. The call for nominations was announced to ICTP Associates and to ICO Territorial Committees. The ceremony is scheduled in the afternoon of the 23rd February at the ICTP main building. The current members of the Committee are: A. Consortini of University of Florence, Italy; M. Danailov of Sincrotrone Trieste, Italy; J. Niemela of ICTP, Trieste, Italy and A. Wagué, University Cheikh Anta Diop, Dakar, Senegal. For the year 2016 four applications were received and added other two more from the precedent 2015 call. The countries of origin of the nominees are Armenia, Thailand, Pakistan and India. The Committee has selected Jehan Akbar (Pakistan) and Mati Horprathum (Thailand). MZ commented that more applications from China and other countries are needed for the forthcoming call.

d) QCL Project: SPIE Anchor research

The general aim is to measure the hyperfine splitting of the ground state energy level of muonic-hydrogen by inducing a laser-stimulated singlet-to-triplet transition ($^3S_1 - ^1S_0$). To produce the muonic hydrogen, pulses from an intense, low energy muon beam strike a hydrogen target. Measuring the energy difference ($^3S_1 - ^1S_0$) in the muonic hydrogen requires a tunable laser source at a mid-IR wavelength of 6785nm and a line-width <0.07nm, tunable in the range 6785+xxx−3nm with a high-power output.

RR explained that there are currently two experimental activities in parallel: the development of the laser and experiments on the muonic beam. Currently they are testing the energy transfer efficiency from the muonic beam into the hydrogen gas target to produce muonic hydrogen. A. Vacchi is in Oxford working on the gas targets.

The main experimental challenge has been to build a cavity providing sufficient laser power. A set-up based on QCLs has not delivered enough energy density. They are considering a redesign of the cavity and investigating how matrixes of QCLs might operate. Simultaneously they are studying the realization of a tunable, narrow-bandwidth mid-IR source based on a nonlinear optical system (see report presented in the booklet). A full-time person, PhD student or Post Doc, dedicated to the design of the cavity is needed. They have contacted various universities: Delft, Naples that have
experience in the subject. It is organized a meeting with Andrea Vacchi, in April 2016 to discuss on the current results and to include a student from Naples. MD commented that there was some delay in obtained the funding, but the oscillator has been ordered. They are now preparing the amplifier system to reach the energy output needed for the measurement of the wavelength value with high accuracy. It is needed at least two independent laboratories to test comparative measurements. The frequency comb technique is very expensive, so they are looking for alternative ways.

The research on Quantum Cascade Lasers (QCL) was an initial experiment and it involved scientists from Togo and Ghana. They are now benefitting from some European programs for financing and there remain one year for the final experiment. They have started another work in optical cavities with a whole budget estimated in 3 million euros.

MD presented the current work in Free Electron Laser (FEL) installed at Elettra. The work concentrates in studies for high degree of coherence of pulses, high stability spectral and spatial quality, high flexibility and high accuracy in pumps-probe experiments. He showed a presentation with details on the scheme for the experiment. A first demonstration for chirp amplification was experimentally observed. There are, in addition other current studies in non-linear optics and Raman laser. The installations are all very expensive and financial support is always required. MLC and MB expressed the thanks to MD for the impressive work done.

3. Discussion on proposals for future Winter Colleges.

AG resumed the required process and specific instructions imparted to co-directors and lecturers. There were two proposals sent to the TSOSA Chair. A third proposal sent by MLC after the deadline was presented, and after a justification of MLC the TSOSA decided to consider the three proposals. GVB indicated that a clear deadline data is needed every year. AG reminded that this is already done (see Booklet). The Committee reviewed the list of the precedent Winter Colleges. AF indicated that the proposal for attosecond lasers was a very high-level topic and not very appropriate for the Winter College. RR explained the proposal and the relation with ELI European project with possibilities of training positions. TF added that the list of participants from 2016 College and precedent College might be checked to assure that participants can participate in the mentioned European project. AW agreed that the topic is good but maybe inappropriate for the College. AG mentioned that topics of that proposal are certainly in the frontiers of physics but in her opinion the Winter College should not necessarily always verse on advanced applications. It is also important to learn on the advances of basic optics and photonics science and its foundations.

There was another application entitled “Optics in Food and Farm Applications.” KS presented the ideas and summary of the proposal and emphasized the importance of the topic. VL supported this application. AJ indicated that in the proposal there was only one person from Africa. AF considered the topics interesting and unusual. In his opinion, these topics are too far from the main core of ICTP and the objectives of the college, and Optics and Photonics play a very thin role on food quality and farming.
MY stated that in the opening ceremony of the IYL 2015 there were mentioned 6-7 challenges for light, between them health and the use of optics and photonics to identify molecules that are damaging for health. This is one of the big challenges and potential application of light based technologies.

The third proposal “Advanced Optical Techniques for Bioimaging”, was presented by MLC and discussed. She mentioned that H. Cabrera will develop and coordinate the lab sessions. She attempts with this proposal to recover the structure of the College in early times, when the students could do hands-on activities. The idea is to reduce the number of lectures and have lab sessions of two hour to instruct the participants on the use of imaging and analysis techniques. H. Cabrera is planning to design experiments on plasmon physics, optical tweezers, and photothermal lenses. MD remarked that in the laser lab there are experimental setups for lithography and the atomic force microscope. Visits of some of the participants to Elettra could be organized for demonstrations of more advanced microscopes.

AW requested to extend the topic to multispectral microscopy, and consider applications of multispectral imaging and diagnostics to food and farming. He offered himself as a lecturer, and suggested to have a director from Africa. MLC agreed on the relevance of the topic.

MB mentioned the possibility for proposing gravitational waves as topic, since the main system to detect gravitational waves is based on optical interferometry and the detectors used are based on Quantum Optics. This topic is in the top frontier of Physics. He remarked that the College should not verse only on normal applications, but on current hot scientific topics of general interest, including scientists from developing countries. The Committee suggested that this could be a proposal for the 2018 College.

MY supported the proposal on food applications because it introduces more applied topics. MB mentioned that bioimaging was a good proposal well oriented for students and he supported the proposal. AF indicated the risk that students do not attend the activities. MD added that there is all type of participants and some are clearly interested in the whole college. And considering the poster presentations the level is a good one. RR mentioned the need to revise previous topics to see if there is any overlapping. VL indicates that both farm and food and imaging are relevant topics. MZ indicate that the three proposals were good ones. He noticed the preference for the proposal including hand-on-activities that is usually missing in many colleges nowadays. AW indicates that he supports the proposal on bioimaging if topics on food are also included, as well as the participation of lecturers from the Swedish team on this subject. RR supported the proposal on laser physics and indicated that the other two proposals are good ones. AF enhanced the contains on hand-on activities. MD agrees with the proposal on bioimaging but some lecturers on food characterization might be included as well. MY stressed the proposal on food techniques contains many applications. AG added that the proposal is a good one but may be too general. AC mentioned that experimental work in the college is very important and adding computing laboratories. She has done similar work at the Preparatory School. AJ agrees with the proposal on bioimaging.
providing that some modifications be done. There was a voting procedure and the proposal for the College on Bioimaging was approved by a majority to be recommended to the ICTP as the topics of the Winter College 2017.

4. Initiatives of international societies and organizations in support of ICTP programs including note on OSA centennial celebration

All the representatives of international organization attending the TSOSA meeting: OSA (AJ), SPIE (KS), OWLS (GVB), LAM (AW), SIOF (AC), Tunisian Optical Society (MZ), EOS (RR) and ICO (AG)presented some resume of activities with the aid of slides presentations. Many of them were related to the celebration of the IYL2015. SPIE added that they are contributing with an amount of 5000 euros for the support of the college. OSA is celebrating its centennial and LAM the 25th anniversary of its creation. AG indicated that for resume of activities it is important that international societies present resume of activities related to collaboration with ICTP. JN enhanced the enormous amount of activities carried out at the occasion of the IYL2015 celebration and the number of ICTP centers of excellence mostly dedicated to optics.

5. Discussions on restructuring TSOSA/ how to move forward

JN started mentioning that restructuring TSOSA needs many inputs and ideas. TSOSA played a very important role when there was a new director incoming. The TSOSA committee, and the individual societies could have direct contact with the directors so that they understand the importance of optics and photonics. Optics needs to be maintained as important subject in ICTP. The ICTP may profit from the contacts that international societies and organizations have. The ICTP never had on its structure a responsible person for optics activities. TSOSA serves a political purpose, and serves advising in expertise. The IYL required a huge effort for ICTP, which run the IYL Secretariat without taking any overhead. In all we had the support of current ICTP Director Fernando Quevedo.

Regarding the TSOSA structure, JN considers that TSOSA should consider including representatives from the Chinese Optical Society and the Head of the TWAS to maintain and enhance the collaboration with TWAS. In 2015 the TSOSA Committee had a problem with the voting procedure after a discussion on the election of TSOSA Chair. TSOSA is an advisory board, which should work by consensus. JN wants to open a discussion on how the TSOSA Committee should move forward and remain being valuable for the ICTP well into the future.

MY reminded that Gallieno Denardo always requested the support of international societies. She considers that the TSOSA can include other societies and have a wider geographic representation. JN states that the main goal is the outreach of optics to the developing world. He agrees on considering other international organizations to have a larger political and geographic coverage. AJ stressed the fact that TSOSA should be a consensus-based Board, and avoid confrontations that may lead to losing members. JN
added that indeed a consensus-based Board is what ICTP needs, and it is very important to emphasize the fact that TSOSA has been always linked to optics institutions.

KP mentioned the need to check the terms of reference and to maintain contacts during the year as well. It is needed to prepare a template with terms of reference for the Winter College. The team for this work was formed by: VL, KP, RR, JN, AG, AW, MB, and GVB. The template needs to reflect the College structure. MLC asked how flexible will be this template. JN responded that it is intended to serve mainly as a guideline. Deadline for the preparation of the template: 15 March 2016. All attendants agreed. A draft will circulate among TSOSA members on due time.

JN expressed ICTP appreciation of the Committee and its members, who travel with their own resources to attend the meeting and provide voluntarily their expert advice to the ICTP.

6. Other business No further business to be treated.

Meeting ending at 13:35.

LIST OF ACTIONS

1. The SPIE to advertise the Winter College through their student chapter networks.
2. SPIE and OSA to help with an updated list of possible women lecturer for the specific topics of the Winter College.
3. To recommend the USAC/ICO to send a student to the Winter College.
4. The TSOSA Committee to write directions for the directors of the college requesting that the lecturers stay 5 days. VL, KP, RR, JN, AG, AW, MB and GVB were delegated to write a template.

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 (ICSU) 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 ICSU. 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 ICSU 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 ICSU 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 Programme Committee and in the Organising 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 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 Award are usually invited speakers at the Immediate next ICO Congress.

10 – The 2017 Congress, ICO-24, will be held in Tokyo, Japan in August 2017. Previous ICO Congresses were held in the following countries:
In green, countries that have hosted ICO General Meeting and General Assembly.

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).

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 1997-2017, the list of other ICO major events is as follows:

- August 1997, ICO 50th Anniversary, Education and Training in Optics, Delft (Netherlands)
- February 1998, ICTP/ICO Winter College on Optics, Trieste (Italy)
- August 1998, ICO Topical Meeting on Optics for Information Infrastructure, Tianjin (China)
- 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)
- February 2004, ICTP/ICO/OSA/OWLS/ SPIE, Winter College on Interferometry and Applications in Modern Physics, Trieste (Italy)
- July 2004, ICO Topical 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, Accra (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)
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.


2012 ICTP/ICO/OSA/SPIE/EOS/OWLS/CEI Winter College on Optics: Advances in Nano-Optics and Plasmonics. Trieste (Italy)


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 to Science and Industry. Trieste (Italy)

ICO Topical Meeting: 18th Microoptics Conference (MOC’13). October 2013, Tokyo (Japan).


ICO Cosponsorship 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:

Prof Gert von Bally
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 Council for Science (ICSU) 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 ICSU. 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 ICSU 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 ORGANISATION 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 Organisation 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.


**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 emphasises 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 utilisation 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 organisation, on an international basis, of scientific meetings and summer schools. It emphasises 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 Council for Science (ICSU).

**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 recognised by the body representing the Member in IUPAP, or (c) if no such body exists be recognised by the council of IUPAP.

3b) International Organisation members. Such members are membership organisations active in the field of Optics on an international level.

3c) The Commission may also accept organisations 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:
### 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 Organisation Member appoints one Vice-President up to the limit of eight; if there are more than eight International Organisation Members, eight Vice-Presidents are elected at the General Meeting by the International Organisation 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.

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<th>Category</th>
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<tr>
<td>VI</td>
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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 organising 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 organisations 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.

Modifications to be submitted for approval of the ICO-24 General Meeting, Tokyo, Japan, August 2017, are italicized and highlighted.

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 Council of Science (ICSU) concerning the free circulation of scientists. In particular, organisers of ICO meetings and of meetings cosponsored by ICO are requested to follow the "advice to organisers of international scientific meetings" issued by the ICSU Standing Committee on the free circulation of scientists.

**Note:** International Council for Science (ICSU)
5 rue Auguste Vacquerie,
75116 Paris, France,
Phone: +33 1 45 25 03 29, Fax: +33 1 42 88 94 31, Email: secretariat@icsu.org, http://www.icsu.org

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 authorised 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 organisation 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 Organisation 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 Organisation, expressing adherence to the ICO Statutes, and including a proposition for the number of shares;

b) a description of the operation of the Organisation, 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.

**Organisation 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 organisation 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 organisation 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 Organisation Members:**

The number of votes $N_{v2}$ of an International Organisation 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:

$$N_{v2} = N_{s2} \frac{\sum N_{v1}}{\max\left(\sum N_{s1}; \sum N_{s2}\right)}.$$
[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 Organisation 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 Organisation 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 Organisation 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 Organisation Members and are elected only by the International Organisation 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 Organisation 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 Organisation 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 detail of votes is 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 Organisation Members (IOM):

For the Vice-Presidents appointed by the International Organisation Members, prior to the General Meeting, every International Organisation Member appoints one representative. If the representative is elected on the Executive Committee or as one of the eight elected Vice-Presidents, the International Organisation Member appoints another representative at its earliest convenience but no later than September 30th.

- If there are less than eight International Organisation members, their representatives automatically become Vice-Presidents.
- If there are more than eight International Organisation Members, unless a consensus agreement is found among the International Organisation Members, the election of their eight Vice-Presidents takes place last and the candidates are automatically the appointed representatives of the International Organisation Members.

The Nominating Committee contacts the International Organization Members 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.

<table>
<thead>
<tr>
<th>ICO CATEGORY</th>
<th>1-ICO General</th>
<th>2-Other major ICO events</th>
<th>3-ICO Cosponsored</th>
<th>4-ICO Endorsed</th>
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<tbody>
<tr>
<td>REQUIREMENTS</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>a) ICSU rules on free movement of scientists</td>
<td>SR</td>
<td>SR</td>
<td>SR</td>
<td></td>
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<tr>
<td>b) good scientific quality as perceived by the ICO Bureau</td>
<td>SR</td>
<td>SR</td>
<td>SR</td>
<td></td>
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<tr>
<td>c) international character (typically &gt; 30% participants and &gt; 50% program Committee members from outside territory)</td>
<td>SR</td>
<td>SR</td>
<td>SR</td>
<td></td>
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<tr>
<td>d) industrial participation in Committees</td>
<td>UR</td>
<td>UR</td>
<td>UR</td>
<td></td>
</tr>
<tr>
<td>e) registration fee to follow IUPAP rules</td>
<td>SR</td>
<td>UR (see text)</td>
<td>UR (see text)</td>
<td></td>
</tr>
<tr>
<td>f) timeliness very clear, novelty</td>
<td>SR</td>
<td>UR</td>
<td>UR</td>
<td></td>
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<tr>
<td>g) participation in the ICO Proceedings Donation Programme</td>
<td>UR</td>
<td>UR</td>
<td>NR</td>
<td></td>
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<tr>
<td>h) approval by Territorial Committee (if there is one)</td>
<td>SR</td>
<td>SR</td>
<td>SR</td>
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<tr>
<td>ICO PARTICIPATION</td>
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<tr>
<td>h) ICO Secretary or Associate Secretary in Organising Committee</td>
<td>SR</td>
<td>UR</td>
<td>NR</td>
<td></td>
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<tr>
<td>i) ICO designates one member of Programme Committee</td>
<td>SR</td>
<td>SR</td>
<td>UR</td>
<td></td>
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<tr>
<td>j) ICO associated from the beginning (usually at least 18 months in advance)</td>
<td>SR</td>
<td>SR</td>
<td>NR</td>
<td></td>
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<tr>
<td>k) use of ICO logo</td>
<td>SR</td>
<td>UR</td>
<td>PO</td>
<td></td>
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<tr>
<td>l) grant</td>
<td>PO</td>
<td>PO</td>
<td>NO</td>
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<td></td>
<td>PO</td>
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<td>NO</td>
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</tr>
</tbody>
</table>
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 organisers 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 organisers 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 organisers in the form of a treasury advance; it is made available to the organisers 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 organisers 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 organisers will reimburse ICO the amount X plus a quarter of the surplus;
- if the surplus is larger than 4X, the organisers 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 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 Programme 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 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 Programme:

ICO has established in 1988 a Travelling Lecturer Programme 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 so as 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 Bureau,
- 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.

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 unfavourable 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 centres.

10.2.2 - "Comparatively unfavourable 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.

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4 For 2008-2017, these amounts are a cash award of US$2000 and up to US$1000 towards travel expenses.
5 The 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 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 Bureau\(^6\) 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\(^7\),

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:


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 countries\(^8\), who conduct their research in a developing country.

The award will be given to scientists less than 40 years old\(^9\) 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.

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\(^6\) For 20011-2017, these amounts were: a cash award of US$1000 and up to US$1000 towards travel expenses.

\(^7\) The Società Italiana di Ottica y Fotonica (SIOF) has generously agreed to donate the Medal.

\(^8\) Developing Countries are defined by the list of Developing Countries of the United Nations Organisation.

\(^9\) Specifically, 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 amount\(^{10}\) and a diploma.

2) The ICTP invites the winner to attend a three weeks College\(^{11}\) 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 honouring 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.

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\(^{10}\) For 2008-2017, the amount is US$1000.

\(^{11}\) The ICTP in Trieste organises 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 organised 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.\textsuperscript{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,**

\textsuperscript{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.

General.
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 Programme:
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 Programme. At least all ICO General, Topical, Regional and Cosponsored Meetings participate in the Programme. 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 organisers of the meetings. The ICO Secretariat will keep the mailing list and send the appropriate mailing labels in due time to the meeting organisers. 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 Programme.

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*

**Dr. Gabriel M. Bilmes**
Centro de Investigaciones Opticas (CONICET-CIC)
Casilla de Correo Nº 3, C.P. 1897 Gonnet, Bs.As.
Tel:+54-221-471-5249
Fax:+54-221-471-2771
E-mail: gabrielb@ciop.unlp.edu.ar
Asociación Física Argentina

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
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Korea
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Fax: +82 2 392 3374
E-mail: shpark@yonsei.ac.kr

Prof. Jakub Zakrzewski
Zakład Optyki Atomowej
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2083 Gazala Ariana Tunisia
Tel: + (216) 71857000 (#1025)
Fax: + (216) 71856829
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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
ICO COMMITTEES, 2014—2017

ICO Nominating Committee:
Chair: Prof. Duncan T, Moore (USA, ICO Past President)

Members:
Prof. Maria Calvo (Spain)
Prof. Seung-Han Park (Korea)
Prof. John Harvey (New Zealand)

ICO Strategic Planning Committee:
Chair: Prof. Yasuhiko Arakawa (Japan, ICO President)

Members:
Prof. Duncan T. Moore (USA)
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. Jakub Zakrzewski (Poland)

The Committee was inactive.

ICO Prize Committee:
Chair: Prof. Roberta Ramponi (Italy)

Members:
Prof. Zohra ben Lakhdar (Tunisia, not ICO Bureau member)
Prof. Yujie Ding (USA) (2014-2015)
Prof. John Harvey (New Zealand)
Prof. John Howell (USA)
Prof. Seung-Han Park (Korea)
Prof. Eric Rosas (Mexico)
Prof. Maria J. Yzuel (Spain)
Prof. Bingkun Zhou (China, not ICO Bureau member)

IUPAP Young Scientist Prize in Optics Committee:
Chair: Dr. Frank Höller (Germany)

Members:
Prof. Mourad Zghal (Tunisia)
Dr. Moshe Oron (Israel, not ICO Bureau member)
Prof. Joseph Niemela (Italy)
Prof. Carmen Cisneros (Mexico)
Prof. Cornelia Denz (Germany, not ICO Bureau member)
Prof. Humberto Michinel (Spain)
Prof. Paul Urbach (The Netherlands)

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 Award Committee:**

**Chair:** Prof. Maria Yzuel (Spain)

**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. James Harrington (USA)

**ICO ad-hoc Committee on the International Year of Light 2015:**

**Members:**
- Prof. Duncan T. Moore (USA)
- Prof. Joseph Niemela (Italy)

**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 organisations:**

**ICO Associate Member in IUPAP Commissions (term 2014-2017):**
- C15, Atomic and Molecular Physics and Optical Physics: Prof. Angela M. Guzmán
- C17, Quantum Electronics: Prof. Yasuhiko Arakawa

**ICO representative in the ETOP Long Range Planning Committee:** Prof. María L. Calvo and Prof. James Harrington.

**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. Angela M. Guzmán.

**IUPAP Triennial General Assembly, annual IUPAP Council and Chair meetings:**
Prof. Yasuhiko Arakawa (President).

**ICSU links and General Assembly:** Prof. Duncan T. Moore.

**Addresses of ICO Committee members who are not currently Bureau members:**

**Prof. Maria L. Calvo,** Universidad Complutense de Madrid, Departamento de Optica, Facultad de Ciencias Físicas, Ciudad Universitaria, E 28040 Madrid, Spain. Tel: +34 91 394 4684, Cell: +34 64 946 8006, Fax: +34 91 394 4683, e-mail mcalvo@fis.ucm.es

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Dr. Fernando Mendoza Santoyo, Centro de Investigaciones en Optica, CIO, Loma del Bosque 115, Colonia Lomas del Campestre, León, Guanajuato, México. Código Postal 37150. Tel +52 (477) 441 42 00, fmendoza@cio.mx

Krisinda Plenkovich, SPIE Director of Education and Community Services

Prof. Dr hab Henryk Kasprzak, Vision Optics Team, Institute of Physics Room 18/4, building A-1, Wroclaw University of Technology, Wyspiański Coast 27, 50-370 Wroclaw, Poland. Tel: (4871) 320-33-06. Fax: (4871) 328-36-96, e-mail: Henryk.Kasprzak@pwr.edu.pl

Prof. Tomasz Szopluk, Institute of Geophysics, Faculty of Physics, University of Warsaw, ul. Pasteura 7, 02-093 Warsaw, Poland. Tel: + 48 22 55 46 822, e-mail: tszopluk@mimuw.edu.pl
### FORMER MEMBERS OF THE ICO BUREAU

**1947-1950**

<table>
<thead>
<tr>
<th>T. Smith</th>
<th>Great Britain</th>
<th>President</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Arnulf</td>
<td>France</td>
<td>Treasurer</td>
</tr>
<tr>
<td>P. Fleury</td>
<td>France</td>
<td>Secretary</td>
</tr>
<tr>
<td>J. Hrdlicka</td>
<td>Czechoslovakia</td>
<td>Vice-President</td>
</tr>
<tr>
<td>S. S. Ballard</td>
<td>U.S.A.</td>
<td>Vice-President</td>
</tr>
<tr>
<td>A. C. S. van Heel</td>
<td>The Netherlands</td>
<td>Vice-President</td>
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<tr>
<td>L. C. Martin</td>
<td>Great Britain</td>
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<tr>
<td>J. M. Otero</td>
<td>Spain</td>
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<td>E. Ingelstam</td>
<td>Sweden</td>
<td>Vice-President</td>
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<tr>
<td>G. Hansen</td>
<td>Germany</td>
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<tr>
<td>A. Maréchal</td>
<td>France</td>
<td>Vice-President</td>
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<tr>
<td>G. Toraldo di Francia</td>
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**1959-1962**

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**1962-1965 (Postponed to 1966)**

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<tr>
<td>W. L. Hyde</td>
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<tr>
<td>H. Kubota</td>
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### 1966-1969

<table>
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<th>Italy</th>
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<tr>
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<td>L. E. Howlett</td>
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<td>H. H. Hopkins</td>
<td>H. Kubota</td>
<td>T. Skalinski</td>
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<table>
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<tr>
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<th>Japan</th>
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<table>
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<tr>
<th>Treasurer</th>
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<tr>
<td>T. Skalinski</td>
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</table>

### 1969-1972

<table>
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<tr>
<th>President</th>
<th>Great Britain</th>
<th>Secretary General &amp; Treasurer</th>
<th>France</th>
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<tr>
<td>H. H. Hopkins</td>
<td>J.-Ch. Viénot</td>
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<td>B. Havelka</td>
<td>R. M. Scott</td>
<td>K. Kinosita</td>
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<tr>
<td>W. H. Steel</td>
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### 1972-1975

<table>
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<tr>
<th>President</th>
<th>Australia</th>
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<td>W. H. Steel</td>
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<td>B. Billings</td>
<td>A. Fiorentini</td>
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### 1975-1978

<table>
<thead>
<tr>
<th>President</th>
<th>Canada</th>
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<th>Australia</th>
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<tr>
<td>K. M. Baird</td>
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<td>J.-Ch. Viénot</td>
<td>F. D. Smith</td>
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<tr>
<td>B. Karczewski</td>
<td>A. W. Lohmann</td>
<td>L. Plaza</td>
<td>J. Tsujiuchi</td>
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<td>W. T. Welford</td>
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### 1978-1981

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<tr>
<th>President</th>
<th>Federal Republic Germany</th>
<th>Past-President</th>
<th>Canada</th>
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<tr>
<td>A. W. Lohmann</td>
<td>K. M. Baird</td>
<td>H. J. Frankena</td>
<td>F. D. Smith</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>USA</td>
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</table>
E. Marom  
K. Schindl  
T. Skalinski  
J. Tsujiuchi  
W. T. Welford  
Israel  
Austria  
Poland  
Japan  
Great Britain  
Vice-President  
Vice-President  
Vice-President  
Vice-President  
Vice-President

J. Tsujiuchi  
A. W. Lohmann  
H. J. Frankena  
J. N. Howard  
F. T. Arecchi  
K. Biedermann  
S. Lowenthal  
T. Skalinski  
P. Varga  
Japan  
FRG  
The Netherlands  
USA  
Italy  
Sweden  
France  
Poland  
Hungary  
President  
Past-President  
Secretary-General  
Vice President & Treasurer  
Vice President  
Vice President  
Vice President  
Vice President

S. Lowenthal  
J. Tsujiuchi  
H. J. Frankena  
J. N. Howard  
H. H. Arsenault  
K. Biedermann  
E. Byckling  
J. W. Goodman  
P. Hariharan  
M. P. Petrov  
France  
Japan  
The Netherlands  
USA  
Canada  
Sweden  
Finland  
USA  
Australia  
USSR  
President  
Past-President  
Secretary-General  
Treasurer  
Vice-President  
Vice-President  
Vice-President  
Vice-President  
Vice-President

J. W. Goodman  
S. Lowenthal  
J. C. Dainty  
P. Hariharan  
H. H. Arsenault  
M-W Chang  
A. Consortini  
F. Lanzl  
D. Malacara  
J. Perina  
USA  
France  
Great Britain  
Australia  
Canada  
O.E. Soc. Taipei  
Italy  
FRG  
Mexico  
Czechoslovakia  
President  
Past-President  
Secretary-General  
Treasurer  
Vice-President  
Vice President  
Vice-President  
Vice-President  
Vice-President

J. C. Dainty  
J. W. Goodman  
Great Britain  
USA  
President  
Past-President
P. Chavel
P. Hariharan
T. Asakura
A. Consortini
F. Lanzl
G. Lupkovics
K. Rebane
G. Sincerbox
C.H.F. Velzel
M.J. Yzuel
France
Australia
Japan
Italy
FRG
Hungary
former USSR
USA
The Netherlands
Spain
Secretary-General
Treasurer
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President

1993-1996
A. Consortini
J.C. Dainty
P. Chavel
R.R. Shannon
T. Asakura
K. Chalasinska-Macukov
S.S. Lee
F. Merkle
G.G. Mu
G. Sincerbox
C.H.F. Velzel
M.J. Yzuel
Italy
Great Britain
France
USA
Japan
Poland
Korea (Republic of)
FRG
USA
The Netherlands
Spain
President
Past-President
Secretary-General
Treasurer
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President

1996-1999
T. Asakura
A.Consortini
P. Chavel
A.T. Friberg
R.R. Shannon
K. Chalasinska-Macukov
R. Dändikler
A.H. Guenther
M.C. Hutley
S.S. Lee
F. Merkle
G.G. Mu
J. Ojeda-Castañeda
Japan
Italy
France
Finland
U.S.A
Poland
Switzerland
U.S.A
U.K.
Korea (Republic of)
Germany
Mexico
President
Past-President
Associate Secretary
Treasurer
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President
Vice-President

1999-2002
A.H. Guenther
T. Asakura
P. Chavel
A.T. Friberg
USA
Japan
France
Sweden
President
Past-President
Secretary-General
Associate Secretary
G.T. Sincerbox  USA  Treasurer
H.H. Arsenault  Canada  Vice-President appointed
R. Dändliker  Switzerland  Vice-President
U. Kim  Korea (Republic of)  Vice-President
J. Ojeda-Castañeda  México  Vice-President
G. C. Righini  Italy  Vice-President
C. Sheppard  Australia  Vice-President
L.L. Wang  Netherlands  Vice-President
M.L. Calvo  Spain  Vice-President
A.A. Friesem  Israel  Vice-President
D.A.B. Miller  USA  Vice-President appointed
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
G.T. Sincerbox  USA  Treasurer
H.H. Arsenault  Canada  Vice-President appointed
A. A. Friesem  Israel  Vice-President
N. G. Gaggioli  Argentina  Vice-President
G. Jin  China  Vice-President
B. Y. Kim  Korea  Vice-President
M. Kujawinska  Poland  Vice-President
G. C. Righini  Italy  Vice-President
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  Senior Adviser (ad personam)
P. Chavel  France  IUPAP Exec. Council Delegate
Y. Petroff  France

2005-2008

A. T. Friberg  Finland  President
R. Dámndliker  Switzerland  Past-President
M. L. Calvo  Spain  Secretary General
G. von Bally  Germany  Associate Secretary
A. A. Sawchuk  USA  Treasurer
| A. N. Bagayev | Russia | Vice-President |
| M. Gu | Australia | Vice-President Appointed |
| J. Braat | The Netherlands | Vice-President Appointed |
| A. M. Guzmán | Colombia & USA | Vice-President |
| G. Jin | China | Vice-President |
| I.C. Khoo | USA | Vice-President appointed |
| B. Y. Kim | Korea | Vice-President |
| M. Kujawinska | Poland | Vice-President |
| H. Lefèvre | France | Vice-President |
| J. Love | Australia | Vice-President |
| G. Sincerbox | USA | Vice-President appointed |
| H.P. Stahl | USA | Vice-President appointed |
| A. Wagué | Senegal | Vice-President appointed |
| I. Yamaguchi | Japan | Vice-President |
| Y. Petroff | France | Senior Adviser (ad personam) |

| 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 |
| Y. Arakawa | Japan | Vice-President |
| Z. B Lakhdar | Tunisia | Vice-President |
| Z. Bingkun | China | Vice-President |
| H. Lefèvre | France | Vice-President |
| F. Mendoza Santoyo | Mexico | Vice-President |
| D. T. Moore | USA | Vice-President |
| 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 Exec. Council Delegate |

**2008-2011**

**2011-2014**

| D. T. Moore | USA | President |
| M. L. Calvo | Spain | Past-President |
| A. M. Guzmán | Colombia | Secretary General |
| G. von Bally | Germany | Associate Secretary |
J. A. Harrington  USA  Treasurer
Y. Arakawa  Japan  Vice-President
Z. B Lakhdar  Tunisia  Vice-President
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 Exec. Council Delegate
PART IV:

THE 2017 GENERAL MEETING
MINUTES OF THE 23rd GENERAL ASSEMBLY OF THE ICO

Held on August 26th and 28th, in Santiago de Compostela, Spain

The President of the Commission, Prof. Duncan T. Moore, chaired the General Assembly. The following members of the Bureau were present:

**ICO Bureau:**

- Past-President: M. L. Calvo
- President: Duncan T. Moore
- Secretary: A. M. Guzmán
- Associate Secretary: G. Von Bally
- Treasurer: J. Harrington

*Apologies presented by* Y. J. Ding, A. Diaspro, H. P. Herzig.

**Delegates and Observers:**

- Argentina: Marcelo Trivi, Gabriel Bilmes
- Armenia: Aram Papoyan
- Australia: John Holdsworth
- Belgium: No delegate attended
- Belorussia (a): No delegate attended
- Brazil (a): No delegate attended
- Canada: Eric Ippen
- Chinese Optical Society: Zhou Bingkun, Gong Qihuang, Liu Xu, Liu Fang
- Colombia: Román Castañeda S., Efraín Solarte (o) (1)
- Cuba: Manuel P. C. M. Costa
- Czech Republic: Miroslav Hraboiský, Petr Schovanek
- Denmark: No delegate attended
- Ecuador (a): No delegate attended
- Estonia: Ari T. Friberg
<table>
<thead>
<tr>
<th>Country</th>
<th>Delegates/Attendees</th>
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<tbody>
<tr>
<td>Finland</td>
<td>Ari T. Friberg, Jani Tervo</td>
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<td>France</td>
<td>Gilles Pauliat , P. Chavel</td>
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<td>Germany</td>
<td>Gert Von Bally, Frank Höller</td>
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<td>Ghana / West Africa (a)</td>
<td>Paul K. Buah-Bassuah , K. Sidiki Diomande (o) (1)</td>
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<td>Greece</td>
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<td>Hungary</td>
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<td>India</td>
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<td>Indonesia</td>
<td>No delegate attended</td>
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<td>Ireland</td>
<td>Andrew Moore</td>
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<td>Islamic Republic of Iran (a)</td>
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<td>Israel</td>
<td>Moshe Oron, Haim Russo</td>
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<td>Italy</td>
<td>Massimo Santarsiero, Anna Consortini, Roberta Ramponi, Giancarlo Righini</td>
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<tr>
<td>Japan</td>
<td>Yasuhiko Arakawa, Toyohiko Yatagai</td>
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<td>Korea (Republic of)</td>
<td>Seung-Han Park</td>
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<td>Latvia</td>
<td>Jani Tervo</td>
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<td>Lithuania (a)</td>
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<td>Mexico</td>
<td>Raúl Rangel Rojo, Amalia Martínez, Eric Rosas (o) (1)</td>
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<td>Moldova (a)</td>
<td>No delegate attended</td>
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<td>Morocco (a)</td>
<td>No observer attended</td>
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<td>Netherlands (a)</td>
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<td>New Zealand</td>
<td>John Harvey</td>
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<td>Norway (a)</td>
<td>No delegate attended</td>
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<td>OES, Taipei, China (a)</td>
<td>No delegate attended</td>
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<td>Poland</td>
<td>Tomasz Szoplik, Katarzyna Chalasinska-Macukow, Jakub Zakrzewski</td>
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<tr>
<td>Portugal</td>
<td>Manuel Filipe P. C. M. Costa</td>
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<td>Romania</td>
<td>Valentín Vlad</td>
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<tr>
<td>Russia</td>
<td>Nataliya L. Istomina, Nataliya D. Kundikova, Svetlana Kotova, Stanislav Shandarov</td>
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<tr>
<td>Singapore</td>
<td>No delegates attended</td>
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<td>Slovak Republic</td>
<td>Hrabovský Miroslav</td>
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<td>Sweden</td>
<td>Fredrik Laurell, Klaus Biedermann</td>
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<td>Switzerland</td>
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<td>Tunisia</td>
<td>Mourad Zghal, Zohra Ben Lakhdar (o)</td>
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<td>Turkey (a)</td>
<td>No delegate attended</td>
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<td>Ukraine (a)</td>
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<td>United Kingdom</td>
<td>Kishan Dholakia, Andrew John Waddie</td>
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<td>United States of America</td>
<td>H. Philip Stahl, Eric Ippen (1), Duncan T. Moore, J. Harrington, Ana Ferreras (o)</td>
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<tr>
<td>Venezuela</td>
<td>Román Castañeda S.</td>
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EOS
IEEE PHOTONICS SOCIETY
LAM Network
OSA
OWLS
SPIE
(1) First session only
(2) Second session only
(o) Observer
(a) Associate Member

No delegate attended
No delegate attended
Ahmadou Wagué (1)
Ursula Gibson, L. Rogan (1), K. Apter (1) (o)
Gert von Bally
María Yzuel, Eugene Arthurs (1)

Opening session

Tuesday August 26th, 4:30 PM

D. Moore welcomes all delegates and observers and declares the General Assembly opened.

First session

1. Minutes of the ICO-22 General Assembly

**Motion 1:** It is moved that the minutes of the ICO-22 General Assembly be approved by the General Assembly

Moved by: D. Moore, seconded: J. Harrington, approved unanimously.

2. Approval of the Agenda.

D. Moore requested to postpone the decision on new member applications to the second session of the General Assembly.

**Motion 2:** It is moved to postpone the decision on new member applications to the second session of the General Assembly

Moved by: D. Moore, seconded: Frank Höller, approved unanimously.

3. Report of the President for 2011-2014 and report of the Strategic Planning Committee

D. Moore initiated his presentation with a demonstration on GRIN devices. He invited the participants to a meeting for planning activities for the International Year of Light 2015 on Thursday August 29th, 3-4PM in the Bureau Meeting room. He reported on his activities on entrepreneurship training in partnership with the IOP. Workshops on
entrepreneurship were held at ICTP in 2012, in South Africa in 2013, at the MCTP in Mexico in 2014, and in Guatemala in 2015. The workshop consists of 12 teaching hours during a week.

He chaired the Strategic Planning Committee that build a Strategic Plan for ICO for 9 years. In 2012 at Genoa, Italy, he presented the results of a SWOT analysis, which can be found in the minutes of the ICO Bureau Meeting 2012, “Towards ICO 23” pages 119-123.

Printed version of his report can be found in the ICO triennial report “Towards ICO 23”, pages 9-13.

After the President’s report, Paul Buah Bassuah expressed his appreciation for the entrepreneurship activities that the ICO President has done, especially in Africa.

4. Report of ICO Nominating Committee

M. L. Calvo, Chair of the Committee, presents the interim report. Printed version of her report can be found in the ICO triennial report “Towards ICO 23”, pages 169-170. She thanked all who participated in the process.

5. Report of the Secretary-General for 2011-2014

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 most important 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 fulfil its role, the ICO Secretariat performs a series of regular activities:

a) **General Assembly**: Coordinate logistics of the ICO General Assembly, 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 awards**: The ICO Secretariat is responsible for making the call for nominations and preparing posters for the dissemination of information on the ICO awards: ICO Prize, ICO Galileo Galilei Award, Gallieno Denardo ICO/ICTP Prize, and the IUPAP Young Scientist Prize in Optics. Posters with information of these four awards can be downloaded, both in American and
European formats, from the ICO web site. The ICO Secretariat prepares letters acknowledging reception of nominations and supporting documentation for the ICO Prize and the IUPAP Young Scientist Prize in Optics, when requested by the Chairs of the Committees. The ICO Secretary coordinates the logistics of the ICO Award ceremonies with 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 delivery of trophy and medal for the ICO Prize and the Galileo Galilei 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 Award is donated by the Società Italiana di Ottica e Fotonica. The Diploma of the ICO/ICTP 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.

d) 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. It contains news on ICO sponsoring of meetings and schools, the traveling Lecturer Program, the ICO Prize, the ICO Galileo Galilei Award, the Gallieno Denardo ICO/ICTP Award, the IUPAP Young Scientist Prize in Optics and other relevant events. To reduce printing and distribution costs, the number of printed copies were reduced from 2000 to 700 during the 2011-2014 period, and the postal distribution from 72 to 20 mailing addresses. A series of articles on the road towards the declaration of the International Year of Light 2015, and its motivation was published in the ICO Newsletters (January 2013, April 2013, and April 2014). The ICO Secretariat also contacted representatives of the ICO Territorial Committees asking to demand support of their national delegates at the United Nations to this initiative. The Secretary contributed with an article on ICSU in the ICO Newsletter October 2013, “ICO is steering its future in Tokyo”, stating that the fact that ICO’s scientific activities do not fall primarily within the scope of a single ICSU Scientific Union Member enabled ICO to become an International Scientific Associate of ICSU, and remarking that in 1998, John Howard, ICO treasurer 1984–1987, suggested that ICO was perhaps mature enough to become an ICSU Union, and affirming that ICO could find within ICSU a proper niche in which to expand its activities and international political influence, especially in regards to new technologies appropriate for climate change monitoring and mitigation through expanded use of clean energy sources.
e) **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, 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. The ICO owes other domains: myico.org, icooptics.org, Luz2015.org, Lummiere2015.org.

f) The ICO Secretariat maintains the online ICO Calendar of events. The ICO webpage hosts the consolidated calendar of events in optics, intended to advertise all events held by its member societies, but only EOS contributes information. ICO also owes a Twitter account, @ICOPNews, and a Flickr account: Secretariat ICO.

g) **Memorandums of Understanding:** The ICO Secretariat is involved on the procedure for the establishment and renewal of Memorandums of Understanding (MoUs) with organizations member of ICO.

h) **Membership Applications:** The ICO Secretariat maintains the information database on members, and accompanies prospective members in the application procedure. There are currently 49 Territorial Committees (TC) and 2 Associate Members. An application from RIAO to become and ICO International Society Member has been received and approved in first instance by the ICO Bureau.

i) **The ICO Green Book:** The so-called “Green Book” is the ICO publication of reference is edited and distributed by ICO Secretariat every three years prior to the General Assembly. It includes the reports on ICO activities developed in the corresponding three-year period. Copies are mailed by the ICO Secretariat by July of the year of issue to all Territorial Committees and ICO Bureau members. The book: “Towards ICO-23” was published in July 2014 by the International Commission for Optics, ISBN 13: 978-0-9838507-0-0. It can be downloaded from the ICO webpage. Copies of the book are available for ICO delegates at the General Assembly.

j) **Other ICO publications:** Online Publication: “Selected experiments of the 20th century aimed to understand coherence properties of light.” Edited by M. L. Calvo and posted online by the ICO Secretariat.

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: Optics: Advances in Nano-Optics and Plasmonics (2012); Trends in Laser Development and Multidisciplinary Applications to Science and Industry.
During the Winter College two significant 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, ICGEB, Elettra Synchrotron Light Facility and the Laser laboratory at Elettra. The ICO Secretary has served for the last three years as the Chair of the TSOSA advisory Committee. The ICO Secretariat also prepares the draft of the minutes.

The ICO&ICTP initiative in Central America was launched and two activities were held: the “First ICO-ICTP-TWAS Central American Workshop in Lasers, Laser Applications and Laser Safety Regulations”, San José, Costa Rica, April 30-May 11, 2012” and the “ICTP-ICO-MCTP College on Optics and Energy”, Chiapas, Mexico, April 28-May 9, 2014.” Co-directors in both activities were M. L. Calvo, A. Guzman and J. Niemela. The RIAO has been very supportive of these initiative.

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. The ICO Secretary General has been the director of ALOP Chile (January 2010), ALOP Peru (April 2010), ALOP-SPN in Bogota, Colombia (the first follow-up workshop in Latin America) (December 2010), ALOP Medellin, Colombia (July 2011). The National University in Colombia has undertaken a decisive role to disseminate the method in the country. The ICO Secretary General has been the director of ALOPs in San Andres, and Tumaco.

The ICO Secretary thanks the College of Optics and Photonics (CREOL) at the University of Central Florida for hosting the ICO Secretariat during this period.

Other activities of the ICO Secretary:

- Visit to Armenia in 2012 as OSA Traveling lecturer invited to the “2nd International Symposium on Optics and its Applications” Yerevan-Ashtarak, Armenia. Sept 1-5, 2014. She had a Meeting with the Territorial Committee, and deliver a Lecture at State Pedagogical University. As result of her contacts and ALOP Workshop was held in Armenia. (Nov-Dec. 2012).
• Visit to Argentina (TOPFOT, May 2012). She was invited Lecturer in a Student’s Meeting and met with the Argentinian Territorial Committee.

• International Conference “Micro- to Nano-Photonics III - ROMOPTO 2012, Sept 3-6, 2012

• TSOSA and IYoL Meeting, February 10-15, 2012

• USAC ICO Meeting, March 17.,2012

• Workshop in renewable energies, ICSU-ROLAC, April 8-10, 2012

• SPIE Optics and optoelectronics, Prague, April 15-18, 2012. Award ceremonies for Romain Quidanr (ICO Prize), Shuang Zang (IUPAP Young Scientists Award), and Jan Perina (Galileo Galilei Award).


• Organization of other Award Ceremonies: Tenth Rochester Conference on Coherence in Quantum Optics (June 17-21, 2012): M.V. Fedorov (Galileo Galilei Award). And three Award ceremonies to be held at ICO 23.

6. ICO and the International Year of Light 2015:

The ICO Secretary reports that to be a “Founding member” of the International Year of Light, the international societies demand that the ICO contributes to a fund with $25000. Although ICO has accompanied the initiative of the IYL 2015 since its inception, has worked at the diplomatic level with the representatives of its Territorial Committees, and informed periodically on the advancements in its Newsletter, the international societies require that the ICO contributes also monetarily in order to appear in the IYL home webpage. The ICO Secretary considers that ICO is the only international organization for Optics & Photonics with a character akin to the UNESCO and ICSU. ICO should decide its own activities and use its own resources on support of the activities of its Territorial Committees.

A discussion on the amount and destination of a special ICO Budget for the IYL 2015 followed.

7. ICO application to become an ICSU Union
Information on the issue was provided by the ICO President and Secretary.

**Motion 3:** The ICO General Assembly, the governing body of the International Commission for Optics, a scientific associate of ICSU, resolves that the ICO will adhere to ICSU statutes and rules of procedure.

Moved by D. Moore, seconded by A. Guzmán. Approved unanimously.

**Motion 4:** The ICO General Assembly directs the ICO secretary to initiate the process of application to ICSU to become an ICSU union.

Moved by D. Moore, seconded by A. Guzmán. Approved unanimously.

### 8. Finances

Treasurer's Report presented as printed in “Towards ICO 23”, pages 164-168.

**Motion 5:** To approve the ICO budget 2015-2017 as presented by the ICO treasurer.

Moved by James Harrington, seconded by John Holdsworth. Approved unanimously.

### 9. Changes in the ICO Bylaws

Modifications to be approved by the General Assembly were italicized and highlighted in the ICO Green Book “Towards ICO 23”, pages 218-222. The modification consists of replacing “Optics” by “Optics and Photonics” everywhere in ICO Bylaws.

**Motion 6:** To approve the modification in ICO bylaws in order to replace everywhere the word “Optics” by “Optics and Photonics”

Moved by P. Chavel, seconded by R. Ramponi. Vote: None opposing, no abstention, approved unanimously.

*Session Adjourned, August 26th, 2014, 7:50 PM.*

### Second session

**August 28th, 2014. Opened at 4:45 PM.**

10. **Updated report of the Nominating Committee on nominations for the ICO Bureau Elections**

Maria Calvo presented the report of the Nomination committee. The members of the Nomination Committee responsible for the counting of the votes were Anna Consortini, Ari Friberg, Klaus Biederman, Colin Sheppard and María L. Calvo. No late nomination
was received. She reviewed late endorsements that have been received. There was only one candidate for each of the Executive Committee members. Therefore, she declared the election of the Executive Committee unnecessary.

By the power invested to her by the ICO, she declares Yasuhiko Arakawa Elected President of ICO.

The ICO Executive Committee 2014-2017 is constituted as follows:

- **President:** Yasuhiko Arakawa (Japan)
- **Past President:** Duncan Moore (USA)
- **Secretary:** Angela Guzmán (Colombia)
- **Associate Secretary:** Gert von Bally (Germany)
- **Treasurer:** James Harrington (USA)

Maria Calvo proceeds for the first vote for ICO Vice Presidents. She presented the candidates to Vice President as stated in her previous report during the first session of the General Assembly with updated endorsements. No new candidates had been nominated. She explained the procedure to follow for voting. Delegates attending signed attendance list, and votes were distributed. Votes were casted and the nomination committee left the room to count.

### 11. Reports of ICO Committees


- **b)** [Report of ICO Prize Committee](#) as presented in the ICO Green Book “Towards ICO 23”, pages 177-180. Presentation by Roberta Ramponi, Chair of the Committee.


- **d)** [Report of Education Committee](#) was not available. Presentation skipped.


- **f)** [Report from the Traveling Lecturer Program](#) presented by James Harrington, Chair of the Committee. He explains the purpose of the program. It provides small grants for scientists and engineers to lecture in the optical sciences, generally in developing countries. The typical grants are approximately of US$1,000. See report in the ICO Green Book “Towards ICO 23”, pages 170-172.
12. Conferences with ICO participation

Gert Von Bally reports that the ICO endorsed and/or co-sponsored 35 meetings of high scientific level during the period 2011-2014. He presented his report. See written version in the ICO Green Book “Towards ICO 23”, pages 194-203. He prepared a new version of the application form that is available online. He remarked that the meeting in Ukraine will be held jointly with a meeting that usually takes place in Crimea. The next ICO Topical Meeting will be held in Hannover, Germany in 2016, with the support of the Volkswagen Foundation. ICO also supports the series of MOC in Japan and will continue providing support to the ICTP Winter College. Finally, he pointed out that the bids for ICO-25 in 2020 are now open and that the deadline for proposals is April 15th, 2016.

13. Date and venue of the General Meeting ICO 24

A bid for ICO-24 had been presented to the ICO Bureau from the Japanese Territorial Committee. The Bureau has recommended the General Assembly to approve the application. Yasuhiko Arakawa on behalf of the Japanese Territorial Committee presents to the General Assembly his formal proposal for holding ICO 24 in Yokohama, Japan, on September 3-8, 2017. The Bureau recommends approving the application. The president proposes to vote on this recommendation.

Motion 7: To accept the proposal of the Japanese Territorial Committee to host the next ICO General Conference ICO 24 at Yokohama, Japan.

Moved by John Holdsworth (Australia), seconded by Zhou Bingkun (China), approved unanimously.

14. Updated report of the Nominating Committee on nominations for the ICO Bureau Elections

Results of the Election for ICO Vice President (1st vote): Mourad Zghal (Tunisia), John Harvey (New Zealand, industry), Frank Höller (Germany, industry).

Since the two candidates from industry were already elected, Maria Calvo proceeded to the second vote for ICO Vice-Presidents.

15. Admittance of new members.

During the period 2011-2014 the ICO Secretariat received and presented to the Bureau the application of the Iberian American Network on Optics (RIAO) with supporting documents to become an ICO International Society Member. The President of RIAO made a presentation in support of the application. He informed to the General Assembly that the ICO Bureau studied the application documents and recommended RIAO’s membership with two conditions: (a) that RIAO considers a change of name to avoid confusion with the Iberian American Conference of the same name, and (b) that the
RIAO appointed Vice President be from Latino America. He proposed a motion in these terms.

A. Guzmán moved that the RIAO be accepted by the General Assembly with the conditions recommended by the ICO Bureau to become an ICO International Society member with 1 unit, 1 vote, and with the right to appoint a Vice President. Phil Stahl seconded.

Discussion: Gert von Bally stated that the RIAO started from ICO Territorial Committees, and thereafter it presented itself as a society of societies. He does not agree with a creating a group of territorial committees to warrant representation in the ICO Bureau. But since the Bureau wants representation on Latin America, the suggestion is that the RIAO appointed VP be from Latin America.

He asked to place on record that he opposes the admission of RIAO as ICO International Member Society.

Phil Stahl amended the motion in order to accept RIAO’s membership without the conditions recommended by the Bureau, since the issues addressed by these conditions are internal issues of the organization, and ICO should not intervene in internal issues of its member societies.

Pedro Andres stated that the RIAO members think that this recommendation is really convenient because the network aims the promotion of optics in Latin America. He agrees however with Phil’s amendment. He believes that the inclusion of Spain and Portugal is intended to give support to Latin America’s initiatives but they do not want to have a key role in the network. Members of RIAO did not agree at first with the conditions imposed by the ICO but after thinking of their purpose, they agreed.

Eugene Arthurs stated that the objections held are that RIAO is a transnational organization. SPIE supports the application of RIAO.

Pedro Andres mentions that Spain discussed the idea. He is aware that there are people that think that there are duplicities. Spain and Portugal do not want to bring the thought of playing a double role. For them the suggestion of the ICO Bureau is reasonable and they accepted that the VP appointed by RIAO comes from Latin America. If accepting the conditions helps the growth of this young network, which currently has a lot of other problems to solve, Spain agrees with the suggestion. He added that Mexico is part of North America and the network intends to include also the Caribbean.

Ana Consortini asked if RIAO is an association of territories or a professional network. She would not agree with accepting an association of territories.

Pedro Andres answered that according to its bylaws, RIAO is a supranational network consisting of several Iberian American national organizations, the Mexican Academy of Optics (AMO), the Optical Society of Portugal, the Spanish Optical Society, the Colombian Society for Optics, and Divisions of Optics of physical societies in other countries.
The amended motion was voted.

Votes in favor: 37
Votes against: 21
Abstentions: 31
Motion amended approved by majority.

**Motion 8:** To accept RIAO’s membership to the ICO as an International Society member with 1 unit and 1 vote.

Moved by A. Guzmán, seconded by Phil Stahl and amended by Phil. Stahl. Moved by James Harrington, seconded by John Holdsworth. Approved unanimously.

**Finance continued**

a) **Financing of activities for the IYL 2015**

**Motion 9:** To approve ICO expenses from reserves into the IYL.

Moved by D. Moore, seconded by John Holdsworth, approved unanimously.

b) **New distribution of shares and votes.**

ICO President presented the ICO Bureau proposal for a new distribution of shares and votes, and explained the criteria used on preparing the proposed distribution. There was a long discussion on the validity of the criteria.

*Phil Stahl* stated that the USA supports financial equality but the representatives of USAC/ICO will have to discuss the issue of shares and votes with their constituency. He considered that the index scales apply more for manufacturing. He considers that UNESCO has a better index for S&E activity.

*Eugene Arthurs* warns that there are two different GDPs.

*Phil Stahl* remarked that the General Assembly voted in favor of becoming an Union. He recommends looking carefully ICO bylaws, shares and votes and reconsider this issue in the next General Assembly.

*Duncan Moore* explained that an average of GDP index and h index was done.

*Pierre Chavel* mentioned that the ICO has been using and algorithm established by the IUPAP in 1947, and included in the article 4A of ICO statutes. In the meantime, IUPAP has changed its own shares and votes distribution. The ICO is not following the IUPAP. The ICO Bureau prepared a table, and the ICO President is asking for a vote for the table not for the algorithm, which might be somehow arbitrary.
Duncan Moore mentioned that International Organization fees like ICSU are based in GDP.

John Holdsworth considered that if ICO becomes a Union, it will have to change shares and votes, but in the meantime ICO can use the new table and review it in three years.

Gert von Bally reminded everybody that the decision of becoming a Union is not only ICO’s.

Raúl Rangel proposed to proceed to vote.

Gert von Bally asked if the societies vote, since the table only concerns the Territories. The ICO President answered that all delegates including those of the societies are entitled to vote.

The ICO President asked to concentrate in the proposal rather than on the criteria and called for a vote. The proposal included an appropriate period of adjustment of the fees for those Territories increasing their contribution, in particular the USA.

Motion 10: That the shares and votes for the territories as presented in the accompanying table (Annex 1) be approved.

Moved by D. Moore, seconded by Jakub Zakrzewski.
Votes against: SPIE, Poland
Abstentions: USA, Spain and Romania.
Votes in favor: all other. Approved by majority.

Motion 11: That the shares and votes be reviewed at least every third general assembly.

Moved by U. Gibson, seconded by P. Chavel. Approved unanimously

c) ICO budget for the IYL 2015.

The ICO President lead a discussion oriented to estimate the amount of resources that the delegates would agree on devoting to activities for the IYL 2015.

John Hodsworth encouraged people to expend money on ICO activities and discuss if the budget approved by the General Assembly should be used to support specific ICO activities.

Gert von Bally expressed that he wanted ICO to use the money wisely and on ICO activities.
The elections were held following the Rules and Codes of Practice. For all 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, three Vice-Presidents were elected including two Vice presidents from industry. In the second vote, the remaining three Vice-Presidents were elected. In addition, the appointment of the Vice-Presidents of the International Organization Members was announced. The results were:

**President:** Yasuhiko Arakawa (Japan)

**Past President:** Duncan T. Moore (USA)

**Secretary:** Angela M. Guzmán (Colombia)

**Associate Secretary:** Gert Von Bally (Germany)

**Treasurer:** James Harrington (USA)

**Vice Presidents:**
- M. Zghal (Tunisia)
- John Harvey (New Zealand, Industry)
- Seung-Han Park (Republic of Korea)
- Joseph Niemela (USA)
- Frank Höller (Germany, from industry)
- Humberto Michinel (Spain)
- Roberta Ramponi (Italy)
- Jakub Zakrzewski (Poland)
- Stephen Morgan (Italy, appointed by OWLS)
- Yujie J. Ding (USA, appointed by IEEE Photonics Society)
- Ursula Gibson (Norway, appointed by OSA)
- Paul Urbach (Switzerland, appointed by EOS)
- María J. Yzuel (Spain, appointed by SPIE)
- A. Wagué (Sénégal, appointed by the LAM Network)

Pending: RIAO appointed VP.

Pending: IUPAP representative

IUPAP will be asked to confirm Carmen Cisneros as the delegate to ICO from its Executive Committee. The new Bureau formally assumes responsibility on October 1st, 2014.

### 16. Other business

Motion 12: That the budget approved on April 26, 2014, for the period 2015-2017 be modified to add $11000, to the budgets for 2015 and 2016 to support activities associated with the international Year of Light.

Moved by James Harrington, seconded by Haim Russo (Israel). Approved unanimously.
ICO Secretary asked if the General Assembly has to approve the procedure of electronic vote for the Bureau. Gert von Bally mentioned that according to the law the votes in absence should be postal. A motion by Phil Stahl, seconded by Ana Consortini in favor of electronic votes was withdrawn after the ICO President stated that mail currently is electronic and the ICO Bureau has been using and will continue using this procedure.

No further business to be reported. President D. Moore invites all new elected ICO Bureau Members to the stage. He wishes a fruitful period of work.

**Motion 13:** That the ICO 24 General Assembly be adjourned.

Moved by Raúl Rangel (Mexico), seconded by Gert von Bally. Approved unanimously

General Assembly, second part ends at 9:00 PM.

### Annex 1: New Shares and votes

<table>
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<th>PROPOSED CHANGE IN NUMBER OF SHARES AND VOTES FOR ICO TERRITORIES BEGINNING IN 2015</th>
<th>Current Shares</th>
<th>Current votes</th>
<th>New Shares</th>
<th>New votes</th>
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Latvia 1 1 1 1
Estonia 1 1 1 1
Armenia 1 1 1 1

TOTALS 195 102 259 105

TOTAL INCOME $45,825 $60,865

Minutes prepared by the ICO Secretariat, to be approved by the ICO 24 General Assembly.

First draft prepared by the ICO Secretary, November 4, 2015
Reviewed by María L. Calvo, ICO Past President and Chair of the Nomination Committee, November 11, 2015
Reviewed by Duncan T. Moore, ICO President 2011-2014. May 18, 2016
Correction by M. Yzuel, October 13, 2016.
Final review by Duncan T. Moore, ICO President 2011-2014. August 1, 2017
XXIV GENERAL ASSEMBLY OF THE ICO

Grace Room, South Building 3F, Keio Plaza Hotel, Tokyo, Japan

August 22 and 24, 2017

Provisional Agenda

Two sessions are planned for the 24th General Assembly of ICO in conjunction with the ICO 24 General Scientific Conference:

Session 1: Tuesday, August 22, 2:00 PM – 5:00 PM
Session 2: Thursday, August 24, 5:00 PM – 8:00 PM

The provisional agenda is listed below. Proposed changes should be preferably requested to the ICO Secretariat (angela.guzman@creol.ucf.edu, ico.secretariat@gmail.com), by August 1st, 2017, in written form. Otherwise they should be requested by writing to the President before the beginning of the first session.

1) Minutes of the ICO XXIII General Assembly.
2) Approval of the Agenda.
3) Report of the President for 2014-2017
4) ICO application to become an ICSU Union
5) ICO Strategic Plan 2017-2020
6) Report of the Secretary for 2014-2017
7) Finances:
   a) Treasurer’s report
   b) Proposed budget for 2017-2020
8) Changes in the ICO Rules and Codes of Practice as indicated in the ICO Greenbook “Towards ICO 24”
9) Reports of the ICO Committees:
   a) Nominating Committee
   b) Committee for Regional Development of Optics
   c) ICO Prize Committee
      d) IUPAP Young Scientist Prize in Optics Committee
   e) ICO Galileo Galilei Award Committee
   f) ICO/ICTP Award Committee
g) ICO Travelling Lecturer Committee

h) ICO Education Committee

10) Conferences with ICO participation

11) Date and venue of the General Meeting ICO-XXV

12) Late nominations for the ICO Bureau Elections.

14) ICO Bureau Elections for the term 2017-2020

15) Other business.
## Proposed budget for the 2014-2017 triennium

### Revenue

<table>
<thead>
<tr>
<th>Description</th>
<th>Proposed 2014-2017</th>
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<tr>
<td>Dues</td>
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<tr>
<td>Less not collected</td>
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<td>Net dues</td>
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<td>Royalties</td>
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<td><strong>Total Revenue</strong></td>
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### Expenses

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<th>Description</th>
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<td>Newsletter - copyediting</td>
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<tr>
<td>Newsletter - printing &amp; distribution</td>
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<tr>
<td>Printing &amp; distribution - Green Book*</td>
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<tr>
<td>Bureau expenses</td>
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<td>ICO prizes + travel</td>
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<tr>
<td>Conference support</td>
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<td>ICTP school support</td>
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<td>ICO Congress</td>
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<td>Traveling lecture awards</td>
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<td>Reserves or new projects</td>
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<td>ICSU dues</td>
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<td><strong>Total Expenses</strong></td>
<td>$130,100</td>
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**Surplus/(Deficit) for 3 year period**

$725

*As of 1 July 2014

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*James Harrington, ICO Treasurer*
THE ICO STRATEGIC PLAN 2017-2023

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.

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].


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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 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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Early Objectives of the ICO and their evolution

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Leadership

SWOT Analysis

Strengths

Weaknesses

Opportunities

Threats

Mission

Vision

Values

Goals and Associated Actions (*)

General Strategy

Evaluation

Concluding Remarks and Summary

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List of Acronyms

Annex I:
National Societies members of ICO represented in the ICO Territorial Committees

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 status.

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 areas.

ii) International Society Members. 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 Presidents.
 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.

<table>
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<th>ICO Bureau 2014-2017</th>
<th>Bureau member</th>
<th>TC/member society</th>
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<td>President</td>
<td>Prof. Yasushiyo Arakawa</td>
<td>Japan</td>
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<tr>
<td>Past-president</td>
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<td>USA</td>
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<td>Secretary</td>
<td>Prof. Angela M Guzman</td>
<td>Columbia</td>
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<td>Associate Secretary</td>
<td>Prof. Gert von Bally</td>
<td>Germany</td>
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<td>Treasurer</td>
<td>Prof. James A Harrington</td>
<td>USA</td>
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<tr>
<td>Vice-president elect</td>
<td>Dr. Franz Holler</td>
<td>Germany</td>
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<td>Those in industry are marked with an *</td>
<td>Prof. Humberto Michiel</td>
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<td></td>
<td>Prof. Joseph Niemela</td>
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<td>Prof. Seung-Han Park</td>
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<td>Prof. Roberta Ramponi</td>
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<td>Prof. Mouarad Zghal</td>
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<td>Vice-president appointed</td>
<td>Prof. Kent Choquette</td>
<td>IEEE</td>
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<td>Prof. John C Howell</td>
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<td>Prof. Stephan F. Morgan</td>
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<td>Prof. Paul Urbach</td>
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<td>Prof. M. Yzuel</td>
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<td>IUPAP Exec. Council delegate</td>
<td>Prof. Carmen Ginevros</td>
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**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.

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) 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). 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.

References

Angela M. Guzman, “ICO is steering its future in Tokyo”, ICO Newsletter 97, October 2013.


**List of Acronyms**

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<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>ALOP</td>
<td>Active Learning in Optics and Photonics</td>
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<td>EOS</td>
<td>European Optical Society</td>
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<td>ETOP</td>
<td>Education and Training in Optics and Photonics</td>
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<td>ICA</td>
<td>International Commission for Acoustics</td>
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<td>ICO</td>
<td>International Commission for Optics</td>
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<td>ICSU</td>
<td>International Council of Science</td>
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<td>ICTP</td>
<td>The Abdus Salam International Center for Theoretical Physics</td>
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<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>ISSC</td>
<td>International Social Science Council</td>
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<td>IUBS</td>
<td>International Union of Biological Sciences</td>
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<td>IUOP</td>
<td>International Union of Optics and Photonics</td>
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<td>IUPAP</td>
<td>International Union of Pure and Applied Physics</td>
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<td>IUPESM</td>
<td>International Union for Physical and Engineering Sciences in Medicine</td>
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<td>LAM</td>
<td>African Laser Atomic Molecular and Optical Sciences Network</td>
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<td>Light Emitting Diodes</td>
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<td>MCTP</td>
<td>Mesoamerican Center for Theoretical Physics</td>
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<td>Red Iberoamérica de Optica/ Iberian American Network of Optics</td>
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<td>UNIDO</td>
<td>United Nations International Development Organization</td>
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<td>USAC/ICO</td>
<td>The U.S. Advisory Committee for the International Commission for Optics</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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Annex I

National Societies members of ICO represented in the ICO Territorial Committees

- **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 (corporative 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 Investigação 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).
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.

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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.
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.

One may notice that all ICSU Unions start their name with “International Union.”

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.