INTERNATIONAL COMMISSION FOR OPTICS
COMMISSION INTERNATIONALE D'OPTIQUE

# ICO

The place where the World of Optics meets

# 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.
- *Contact details*: ICO Secretariat, http://e-ico.org/

**ICO - International Commission for Optics**

Founded in 1947, the International Commission for Optics (ICO) is a non-governmental organization representing a global membership in optics and photonics that includes national scientific bodies (53 Territorial Committees) and seven International Member Societies/Networks. Through this international network of scientists and engineers, the ICO promotes interdisciplinary research to address major issues of relevance to science, education, and light-based technologies with a major activity in developing countries. In addition, the Commission actively promotes initiatives for scientific and training activities, and facilitates science education and capacity building [www.e-ico.org].

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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 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 are missioned 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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# 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.[1]

## 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. Nowadays, Optics and Photonics play a key role in improving the well-being of the world's people.

## Membership

Currently the ICO has 53 member territories, geographically distributed all over the five Continents (one Territory comprising 20 countries in Africa), representing every country with any significant activity in optics. 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.

The ICO has three categories of Members.

i) Territorial Committee Members, representing identified optics communities in a set of non-overlapping geographical areas.[2]

ii) International Organization Members[3]. Such members are membership organizations active in the field of Optics and Photonics on an international level. Examples include OSA, SPIE, and EOS.

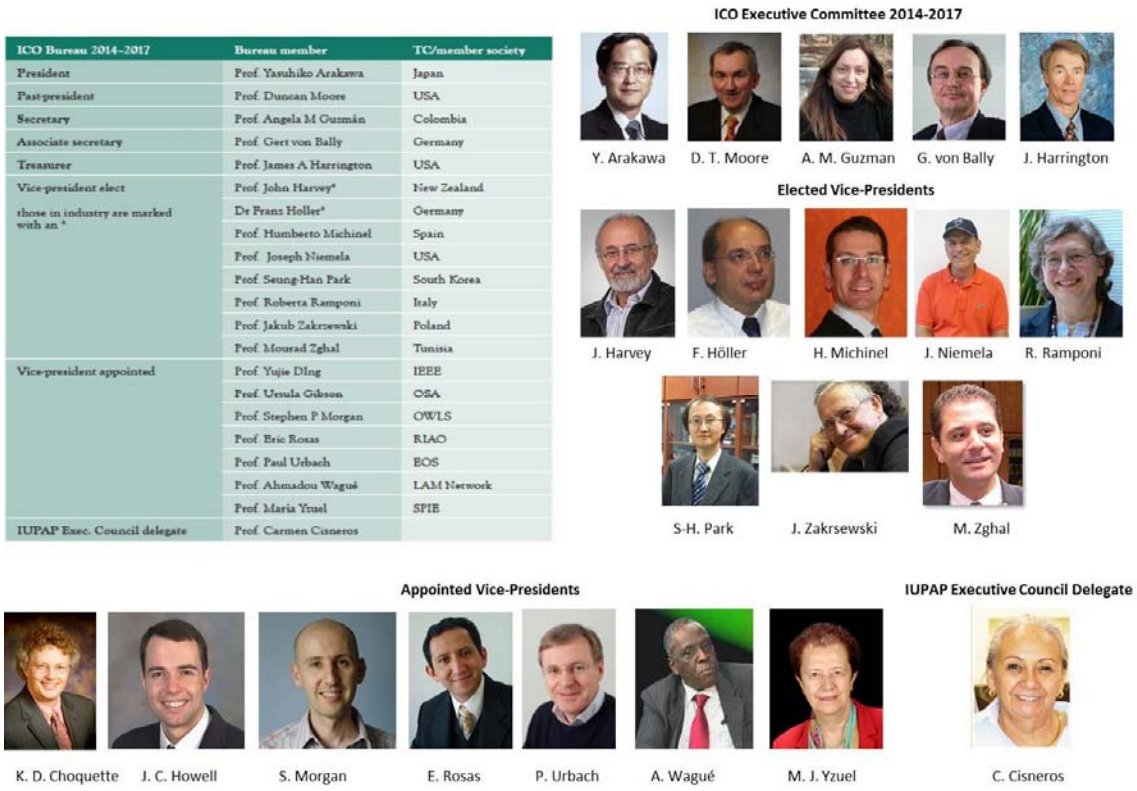
iii) Associate Members. The Commission may also accept organizations active in Optics and Photonics as Associate Members. Associate Members pay no dues and have no voting privileges. Application for all categories of membership shall be made to the ICO Secretary and submitted to the next General Meeting 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.[4]

Committees of the ICO Bureau include (a) the Regional Development Committee, which looks for ways to assist optical scientists and engineers in developing countries through the exchange of information with joint organization of schools, often in collaboration with the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy; and (b) the Education Committee, which coordinates the various activities oriented to the education and training in Optics and Photonics (ETOP) in collaboration with international societies members such as IEEE, OSA, and SPIE.

| ICO Bureau 2014–2017 | Bureau member | TC/member society |
|---|---|---|
| President | Prof. Yasuhiko Arakawa | Japan |
| Past-president | Prof. Duncan Moore | USA |
| Secretary | Prof. Angela M Guzmán | Colombia |
| Associate secretary | Prof. Gert von Bally | Germany |
| Treasurer | Prof. James A Harrington | USA |
| Vice-president elect | Prof. John Harvey* | New Zealand |
| those in industry are marked with an * | Dr Franz Holler* | Germany |
| | Prof. Humberto Michinel | Spain |
| | Prof. Joseph Niemela | USA |
| | Prof. Seung-Han Park | South Korea |
| | Prof. Roberta Ramponi | Italy |
| | Prof. Jakub Zakrzewski | Poland |
| | Prof. Mourad Zghal | Tunisia |
| Vice-president appointed | Prof. Yujie Ding | IEEE |
| | Prof. Ursula Gibson | OSA |
| | Prof. Stephen P Morgan | OWLS |
| | Prof. Eric Rosas | RIAO |
| | Prof. Paul Urbach | EOS |
| | Prof. Ahmadou Wagué | LAM Network |
| | Prof. Maria Yzuel | SPIE |
| IUPAP Exec. Council delegate | Prof. Carmen Cisneros | |




# SWOT Analysis

An analysis of an institution's strengths, weaknesses, opportunities, and threats often precedes strategic planning. A SWOT analysis was initiated in 2011 under the leadership of D. Moore. Results of that analysis include the following.

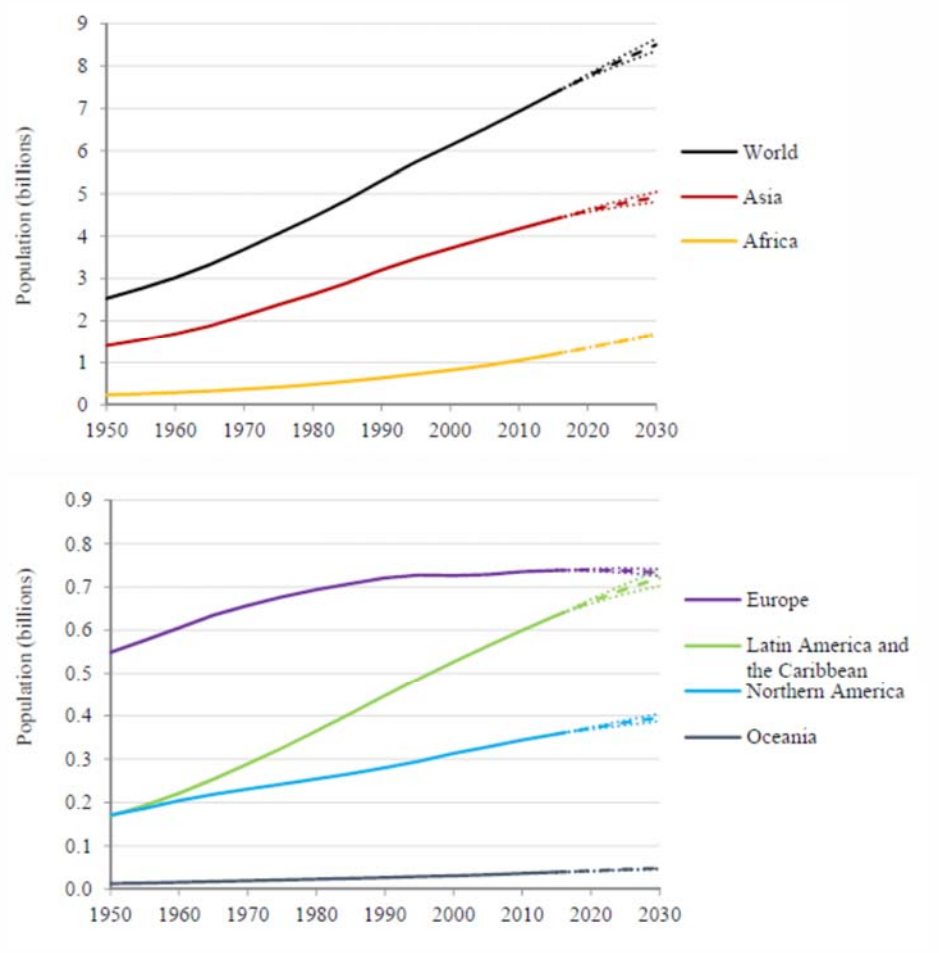
## Strengths

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 its international societies, 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 its 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. 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 IUOP 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 Societies. 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 its International Society members. The ICO serves to promote and spearhead the organization of Optics and Photonics communities in different territories, and its 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. ICO is driven by scientists, academic and professionals, 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 the umbrella organization for national and international societies in optics and photonics and serves as the conduit 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 member societies 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 is not currently well situated for major changes in demographics expected in the coming one or two decades (see figure). We lack 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 lack efficient ways of communication and need to increase our marketing.




†Dashed line represents the median projection, while dotted lines represent the 95 per cent prediction intervals.
Data source: United Nations (2015). *World Population Prospects: The 2015 Revision*.

2. In some developed countries ICO lacks major presence, so that ICO is not as recognized and visible as it might be, in part because ICO does not yet participate in a necessary higher number of international research programs aimed at confronting global challenges, although, it tries to be very active to reinforce this issue for the future IUOP (provisional name for the future International Union dealing with Optics and Photonics, the final name to be selected by the ICO General Assembly).
3. Because of its current status as an Affiliate Commission of IUPAP, the ICO cannot achieve its full potential within ICSU as a source of scientific expertise in light-based technologies for the development and implementation of environmental, sustainable development, and human health policies.
4. ICO's financial model is ill-suited to its mission. Although there is strength in having a volunteer-run organization, it presents a great amount of work for people who are not compensated in any way. Funding is needed from government, industry, or through international research programs. Currently, the ICO's only funding source is generated by fees from Territorial Committee Members.
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 is still weak. 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, 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 its 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. 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: International Union of Optics and Photonics (IUOP, this 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 by the vertiginous advance of communication technologies. There is then a need to look outside its own community and actively join the international community of scientists confronting global challenges and influencing public policy.

2. The second biggest threat is its financial model, which is limited to member fees.
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.
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 the ICO is to contribute to and promote, on a worldwide scale and international basis, the progress and diffusion of knowledge and applications in Optics and Photonics.

## Vision

The vision of the ICO is to be recognized unequivocally as the international umbrella organization for the enthusiastic global promotion and support of Optics and Photonics education and research.

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 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 proposed International Union for 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 member organizations
- Continual progress in the development of Optics and Photonics as both scientific discipline and enabling technology
- Strong and ongoing international collaborations
- Service-oriented attitude
- Engagement in a wide range of select activities
- Providing timely information in optics and photonics to global society

## 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.

2. Increased interaction between developed and developing countries

    - Contribute to scientific collaboration between developed and developing countries in Integrated Photonics, advanced manufacturing, and cancer diagnostics.

    - 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 ICSU Programs like Future Earth, 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.

### Medium term:

1. Increase ICO role in research and education.

    - Build a 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 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 in ICSU and liaise with other ICSU bodies as current Unions in which ICO may converge in a near future as the International Union for 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 ICO 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 in the world, including issues and studies on a national and international level, will be evaluated. Key policies need to be defined. This task will be undertaken by all TCs and ICO Bureau members.

## 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 the international umbrella organization for the enthusiastic global promotion and support of Optics and Photonics education and research and facilitate the full integration of the ICO within ICSU. 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 as 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. We further notice the importance of this action 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 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 well-being 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 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 notoriously difficult, even over the short term. The ICO should permanently be aware of and follow the changes in the social, economic, and political status of the world to maintain its presence in key territories, and to extend its influence to regions that may emerge as leaders in new technologies.

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[1] An Affiliated Commission of the IUPAP consists of an independent international committee or organization of **physicists** with its own well-developed administrative structure and with its own members, dues structures, statutes, and assemblies. They assist on implementing IUPAP principles and participate in joint activities. As an ICSU Union, ICO will bring together scientists and engineers from different disciplines and all parts of the world, who contribute to the advancement of Optics and Photonics Science and Technology.

[2] The word "territory" does not imply any political position on the part of the ICO, which seeks to assist scientists in Optics and Photonics everywhere in the world to co-operate on an international level.

[3] In 1999 the ICO created the category of International Society Members to recognize the fact that contrary to the situation in 1947, most international scientific conferences are organized by large societies that have individual members and that are explicitly active internationally. As of today, ICO has seven International Society Members: The Optical Society (OSA) with 20,000 individual members. The International Society for Optics and Photonics (SPIE) with 20,000 individual members, IEEE Photonics Society (6,000 individual members), the European Optical Society (EOS) formed with 21 National Optical Societies in Europe and 6,500 individual members, Red Iberoamericana de Optica (Ibero-American Network for Optics, RIAO) with 7 Iberian-American Societies or national optics organizations (Colombia, Cuba, Ecuador, Mexico, Portugal, Spain and Venezuela),

Optics within Life Science (OWLS) with members from 36 countries, and the African Laser, Atomic, Molecular and Optics Science (LAM) Network with 20 African countries. With this structure, ICO has a fair claim to representing the whole field of Optics and Photonics on an international scale.

[4] All members of the Executive Committee, except for the Immediate Past-President, are elected by ICO at the General Meeting. ii) The IUPAP representative appointed by the Executive Council of IUPAP under Article 7b of the statutes of the Union, and any Associate Members from IUPAP Commissions. iii) The other Bureau members, who are traditionally known as Vice-Presidents. Eight Vice-Presidents (at least two of whom are from industry) are elected at the General Assembly by the Territorial Committee Members; in addition, also at the General Assembly, every International Organization Member appoints one Vice-President up to the limit of eight; if there are more than eight International Organization Members, eight Vice-Presidents are elected at the General Assembly by the International Organization Members. The Bureau is responsible for the conduct of the ICO business between General Assemblies. The term of office of the Bureau is three years from October 1st in the year of the election. The Article Nr. 5 of the ICO Statutes rules the ICO organizational structure and ICO Bureau organization.

## List of Acronyms

| | |
|---|---|
| ALOP | Active Learning in Optics and Photonics |
| EOS | European Optical Society |
| ETOP | Education and Training in Optics and Photonics |
| ICA | International Commission for Acoustics |
| ICO | International Commission for Optics |
| ICSU | International Council of Science |
| ICTP | The Abdus Salam International Center for Theoretical Physics |
| IEEE | Institute of Electrical and Electronics Engineers |
| IUBS | International Union of Biological Sciences |
| IUOP | International Union of Optics and Photonics |
| IUPAP | International Union of Pure and Applied Physics |
| IUPESM | International Union for Physical and Engineering Sciences in Medicine |
| LAM | African Laser Atomic Molecular and Optical Sciences Network |
| LED | Light Emitting Diodes |
| MCTP | Mesoamerican Center for Theoretical Physics |
| O&P | Optics and Photonics |
| OSA | The Optical Society |
| OWLS | International Society on Optics Within Life Science |
| RIAO | Red Iberoamerica de Optica/ Iberian American Network of Optics |
| SDGs | Sustainable Development Goals |
| SPIE | The International Society for Optics and Photonics |
| TCs | Territorial Committees |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNIDO | United Nations International Development Organization |

| | |
|---|---|
| USAC/ICO | The U.S. Advisory Committee for the International Commission for Optics |
| USAID | United States Agency for International Development |

*Document prepared by Maria L. Calvo, Angela Guzman and the concurrence of Alana Cahoon.*
*29 December 2016*