

## Report of Affiliated Commission AC1 for 2015

Affiliated Commission AC1: the International Commission for Optics (ICO)  
Chair: Yasuhiko Arakawa (ICO President)

### Background

ICO was founded in 1947 and is an Affiliated Commission of the International Union of Pure and Applied Physics (IUPAP), and a Scientific Associate of the International Council of Science (ICSU). Its objective is to contribute to the progress in the field of optics and photonics. The Commission has three categories of Members : Territorial Committee Members (53 members including two Associate Members), International Organization members such as OSA and SPIE (6 members). The governing body of ICO is its General Assembly, usually held every three years during an ICO Congress that includes an international conference on optics. Between General Assemblies, a Bureau is responsible for the conduct of the Commission. The Bureau consists of the President, the Past-President, the Secretary General and the Associate Secretary, the Treasurer, and fourteen Vice-Presidents, (eight elected) of whom at least two are from industry.

### Bureau Members for the term of 2015-2017

Yasuhiko Arakawa (ICO President), Duncan Moore(ICO Past President), Angela M Guzmán (Secretary), Gert von Bally (Associate Secretary), James A Harrington (Treasurer), John Harvey (Vice-President elected), Franz Holler (Vice-President elected), Humberto Michinel (Vice-President elected), Joseph Niemela (Vice-President elected), Seung-Han (Vice-President elected), Roberta Ramponi (Vice-President elected), Jakub Zakrzewski (Vice-President elected), Mourad Zghal (Vice-President elected), Yujie Ding (Vice-president appointed, IEEE), Ursula Gibson (Vice-president appointed, OSA), Stephen P Morgan (Vice-president appointed, OWLS), Eric Rosas (Vice-president appointed, RIAO), Paul Urbach (Vice-president appointed, EOS), Ahmadou Wague (Vice-president appointed, LAM Network), Maria Yzuel (Vice-president appointed, SPIE), Carmen Cisneros (IUPAP Exec. Council delegate)

### Bureau Meeting 2015

The Bureau meeting was held on June 28<sup>th</sup> in Bordeaux, France.

### Sponsoring (or co-sponsoring) scientific conferences

- Winter College on Optics: "Light: a Bridge between Earth and Space", 9–20 February 2015, Trieste, Italy
- International Conference on Optics and Photonics (ICOP 2015), 20–22 February 2015, Calcutta, India
- Lighting UP Africa with lasers, optics, and fibres (LUPA'2015), 15–21 March 2015, Carthage, Tunisia
- Discussions on Nano & Mesoscopic Optics (DINAMO-2015), 8–12 April 2015, El Chalten, Argentina
- International Conference on Optical and Photonic Engineering (icOPEN 2015), 14–16 April 2015, Singapore
- ICO Topical Meeting: Education and Training in Optics and Photonics (ETOP 2015), 29 June – 2 July 2015, Bordeaux, France

- International Conference "Micro- to Nano-Photonics IV - ROMOPTO 2015, 1 – 4 September 2015, Bucharest, Romania
- Mexican Optics and Photonics Meeting “MOPM 2015”, 9 – 11 September 2015, Leon, Mexico
- Twelfth International Conference on Correlation Optics “Correlation Optics ’15”, 14–18 September 2015, Chernivtsi, Ukraine
- 20th Microoptics Conference (MOC'15), 25 - 28 October 2015, Fukuoka, Japan

### **Awards**

The following four awards are under selection or receiving nominations: ICO Prize, Galileo Galilei Award, IUPAP Young Scientist Prize in Optics, ICO/ICTP Gallieno Denardo Award

### **Activities for International Year of Light 2015**

One of ICO’s focuses in 2015 is the celebration of the International Year of Light and Light Technology (IYL2015). IYL2015 is a global initiative to show the citizens of the world the importance of optical and photonic science and technology in their lives. ICO contributes to the IYL2015 as one of the endorsing partners together with the International Council of Scientific Unions (ICSU), the International Union of Pure and Applied Physics (IUPAP), and other academic unions. The opening ceremony of the IYL2015 was held on 19–20 January at the UNESCO Headquarters in Paris, gathering together 1200 people, including eminent scientists, industrialists, high officials, decision-makers, and promising young researchers. The event certainly provided a suitable forum for scientific and policy sharing in science and technology. All Executive Committee members of ICO participated in the ceremony as delegates of ICO. In addition, many ICO territorial committees also sent their several delegates to the ceremony.

There have been lots of events sponsored by ICO or related organization for celebrating the IYL2015 in the world. For just an example, a commemorative opening ceremony was held in Tokyo, Japan in April with 1,100 participants. It was sponsored by Science Council of Japan which is working as the ICO territorial committee in Japan.

## Report of Affiliated Commission AC2 for 2015

Affiliated Commission AC2 is the International Society on General Relativity and Gravitation (ISGRG).

**Meetings:** ISGRG meets triennially with our next meeting, *GR21*, scheduled for July 2016 at Columbia University in New York City. The Scientific Organizing Committee chaired by Prof. Eric Poisson of Guelph University (Canada) has been active over the past year and has completed nearly all its work. The first announcement of the organizers may be found at <http://www.isgrg.org/GR21FirstAnnouncement.pdf> and the conference website at <http://www.GR21.org>.

**Young Scientist Prize:** In 2015, we awarded the 3rd IUPAP General Relativity and Gravitation Young Scientist Prize to Prof. Nicolas Yunes of Montana State University. The citation reads “For his wide-ranging and important contributions to the field of gravitational wave astrophysics.” While Prof. Yunes has already received his medal and check, the official presentation will be made at GR21 with travel funds for the 2014, 2015, and 2016 winners provided through the generosity of Prof. A. Ashtekar.

**Other Prizes:** ISGRG offers two thesis prizes, the Jürgen Ehlers Thesis Prize in the areas of mathematical and numerical general relativity and the Bergmann-Wheeler Thesis Prize in the broad area encompassing all approaches to quantum gravity. Nominations for both prizes are currently open. The awards will be made at GR21.

**Centennial of General Relativity:** On November 25, 1915, in Berlin, Albert Einstein presented for the first time the complete field equations for his theory of general relativity. ISGRG as well as gravitational physicists around the world are marking the centennial of this event in many ways. ISGRG has endorsed a conference to be held from 30 Nov to 5 Dec 2015 in Berlin (near the site of the original presentation). This will be our official celebration of the centennial. It is being organized jointly by the Max Planck Institutes for Gravitational Physics (Albert Einstein Institute) and the History of Science. The first part of the meeting will consist of reviews of current research frontiers in physics and astronomy that are impacted by general relativity. The second part will consist of a historical examination of the development of the theory and its integration into mainstream physics. See <http://www.einsteinconference2015.org> for additional information. We are maintaining a list of other centennial activities by national general relativity organizations on our website, including regional meetings and public lectures, as we hear about them. Also in honor of the General Relativity centennial, ISGRG commissioned a volume of review articles by distinguished authors, edited by A. Ashtekar, B. Berger, J. Isenberg, and M. MacCallum, entitled “*General Relativity and Gravitation: a Centennial Perspective*.”<sup>1</sup> The volume, published by Cambridge University Press, appeared in June 2015. Any royalties will accrue to ISGRG to support its programs. A conference sponsored by ISGRG was held at the Pennsylvania State University, 8 – 12 June 2015, to commemorate the release of this volume. See

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<sup>1</sup> See <http://www.cambridge.org/us/academic/subjects/physics/cosmology-relativity-and-gravitation/general-relativity-and-gravitation-centennial-perspective> for additional information.

<http://event.gravity.psu.edu/index.shtml> for additional information about the conference.

Finally, ISGRG has launched a Centennial Membership Drive to increase participation in our Society.

Gary Horowitz  
ISGRG President (2013-2016)

## AC3 International Commission for Acoustics (ICA) Report to IUPAP C&CC Web meeting October 2015 Marion Burgess ICA President 2013-2016

**1. ICA Governance** The ICA Vice President, Jing Tian from China, resigned in May due to a change in work conditions. As the General Assembly is to be in 2016 when a new board is elected, the board agreed to appoint one of the current members to the role of Vice President. At the board meeting in early June, Jeong-Guon Ih from Korea was selected as interim Vice President.

**2. Symposium Support** Annually, the ICA provides support for specialist symposia and selection requires some international involvement with priority for developing countries. The list of symposia supported in 2015 was included in our report to the April C&CC meeting. The applications for support for 2016 are due at the end of October 2015.

**3. Early Career Award** Applications for the prestigious “ICA Early Career Award” have been sought from the member societies and the successful recipient will be announced and give a plenary lecture at the 2016 congress.

**4. ICA Congress** The major activity for the ICA is the congress held every 3 years. Planning is now well in hand for ICA 2016 to be held in Argentina and preliminary planning is in progress for ICA 2019 to be held in Germany. The short listing for the host for the ICA 2021 was made at the 2015 board meeting and the decision will be made at the board meeting held in conjunction with the ICA 2016 congress.

**5. International Year of Sound** The ICA is continuing with the plans for the International Year of Sound in 2019. A steering committee and a working committee have been established and the time line is being formalized with advice from our colleagues who gained success in the bid for the International Year of Light. We have received very enthusiastic support from a range of organisations and are now completing the second draft of our prospectus. Once the new executive committee of UNESCO has been appointed we will seek to obtain the necessary country support. We have a well respected acoustician based in Paris who has agreed to undertake the necessary direct communications with the delegations.

We had a competition for student acousticians to design a logo for the IYS and have just completed the selection from the 18 submissions. All applications had to include a rationale for their proposed logo. There maybe some refinements but the basic design is shown below from a student in The Netherlands.





## **International Commission on Medical Physics Committee, IComMP International Union of Pure and Applied Physics (IUPAP) Affiliated Commission AC4: Medical Physics**

**Fridtjof Nüsslin, Chair**

### **Short Report on Activities from May-to September 2015**

#### **Background**

##### **Organizational Structure of AC4**

The International Organization for Medical Physics (IOMP) represents over near 20,000 medical physicists worldwide and has 84 national member organizations. The mission of IOMP is to advance medical physics practice worldwide by disseminating scientific and technical information, fostering the educational and professional development of medical physics and promoting the highest quality medical services for patients.

Medical Physics is a branch of Applied Physics that applies scientific principles, methods and techniques in practice and research for the prevention, diagnosis and treatment of human diseases with the specific goal of improving human health and well-being. The profession Medical Physicist has been recognized by the International Labor Organization (ILO) in 2010 as a professional group listed in the ILO classification system ISCO-08 under '*Physicists and Astronomers*'. To strengthen Medical Physics science within IOMP and to link IOMP to IUPAP the International Commission on Medical Physics (IComMP) has been established which has been approved as IUPAP Affiliated Commission AC4.

Objectives of AC4:

- (1) to promote medical physics in its scientific and professional aspects in the physics community by interaction with the IUPAP commissions,
- (2) to specifically link to the C6 commission "Biological Physics" ,
- (3) to apply for support of the ICMP congress series,
- (4) to participate in the IUPAP Young Scientist Award program

##### **Mission of AC 4:**

The mission of IOMP is to advance medical physics practice worldwide by disseminating scientific and technical information, fostering the educational and professional development of medical physicists, and promoting the highest quality medical services for patients.

#### **Members for the term 2015-2017:**

Slavik Tabakov (IOMP President), Madan Rehani (IOMP Vice President), Kin Yin Cheung (IOMP Immediate Past President), Virginia Tsapakh (IOMP Secretary General), Anchali Krisanachinda (IOMP Treasurer), Geoffrey Ibbott (IOMP Chair Science Com), John Damilakis (IOMP Chair Education & Training Com), Yakov Pipman (IOMP Chair Professional Relations Com), Tae Suk Suh (IOMP Chair Publication Com), Simone Kodlulivich (IOMP Chair Awards & Honors Com), **Fridtjof Nüsslin (Chair IUPAP AC4, Past President IOMP)**, Aihua Xie (Chair IUPAP C6 Biological Physics), Sandro Scandolo (Chair IUPAP C13 Physics for Development), Hideo Nitta (Chair IUPAP C14 Physics Education), Ana Maria Marques da Silva (Porto Alegre, Brazil), Eric KT Addison (Kumasi, Ghana).

#### **Short Report**

##### **1. World Congress for Medical Physics & Biomedical Engineering in Toronto:**

The triannual WC is the key event of the medical physics and bioengineering community. The WC-2015 has been held in Toronto in 7-12 June. The broad spectrum of 19 scientific program tracks attracted more than 2000 delegates from 86 countries around the world. Important global issues have been discussed, e.g., Global Health, Food and Water Safety, Environmental toxins, Personalized Medicine, Brain-Machine interfaces, Education and Outreach, etc. The strong collaboration with national and international organizations, such as the IAEA and the WHO aiming to improve global

health and safety in medicine became visible in various joint events. As in previous congresses a highlight was again an IUPAP sponsored workshop dedicated to the young medical physicists and bioengineers from the developing countries (sect 2). Embedded in the congress was the traditional awards ceremony where the winners of the IUPAP Young Scientist Medal have been honoured.

## **2. Workshop “Medical Physics Capacity Building in Developing Countries”:**

Since several years the International Organization for Medical Physics (IOMP) organizes at its congresses a workshop dedicated to the specific challenges of the developing countries. At the WC-2015 the focus of this workshop was on the Medical Physics capacity building. The IOMP in cooperation with their Regional Organizations initiated various actions aiming to improve the situation for medical physics in the developing countries, specifically to increase the number of qualified clinical medical physicists in the understaffed regions. Partnering with the IAEA and the WHO provides an excellent platform to promote medical physics in the developing countries to advice in equipment operation and dosimetry, and to implement medical radiation protection standards. Thanks to the congress sponsoring program of IUPAP and the travel grant program of the IOMP, among the about 70 attendees many young scientists from developing countries attended this event. The Workshop in Toronto covered presentations from Brazil, Philippines, Bangladesh, Morocco, Uganda, Nigeria and Ghana. It was very encouraging to see that the majority of the presentors were women. As a result the workshop on medical physics capacity building highlighted again the global problem of lacking qualified medical physicists in radiation medicine, particularly in developing countries. This is an even more serious issue when considering the complexity of modern equipment which on the other side is the condition for the evident achievements in health care, both in diagnosis and radiotherapy. In contrast, examples like the progress in some countries like Ghana demonstrate that concerted actions from national authorities, international organizations and the national medical physics community has power to change the adverse situation in less favorable regions. Follow-up workshops are planned for the period ahead, including the International Conference on Medical Physics in Bangkok (December 2016) and the World Congress on Medical Physics and Biomedical Engineering in Prague (June 2018). (See also the AC4-article in the last IUPAP Newsletter.)

## **3. IUPAP Young Scientist Award:**

The International IOMP Conferences are traditionally the appropriate forum for the presentation of the annual IUPAP Young Scientist Medal. At the WC2015 in Toronto the 2014 and 2015 the IUPAP award has been delivered to

Dr. Jan-Bernd Hövener, Medical Physics, Dept. Radiology, University Medical Center Freiburg, Germany. Dr. Hövener is awarded the IUPAP young scientist medal 2014 for his work on hyperpolarization, a method to increase the power of magnetic resonance (MR) significantly.

Dr. Guerda Massillon-JL, Instituto de Física, UNAM, México:

Dr. Massillon is awarded the IUPAP young scientist medal 2015 for her work on dosimetry in high ionization-density radiation. This has important implications for treatment of cancer patients using modern radiotherapy.

The call for the IUPAP YS Medal 2016 will be sent out by the IOMP Awards Committee shortly.

## **4. IUPAP Interim WG “Accelerator Science”:**

The AC4 was invited to nominate 2 scientists with expertise in the medical application of accelerators (medical imaging, radiation therapy, production of radioisotopes) as members of the new IUPAP Interim WG “Accelerator Science”. The following scientists have been nominated:

Geoffrey S. Ibbott, Ph.D., Professor and Chairman Department of Radiation Physics  
UT M. D. Anderson Cancer Center, Houston, USA  
and

Michael Moyers, Ph.D., Chairman and Professor of the Department of Medical Physics,  
Shanghai Proton and Heavy Ion Center (SPHIC).

**5. Business Meeting of the AC4:**

A short business meeting of the new AC4 has been held in Toronto, 11<sup>th</sup> June 2015. The reelected Chair welcomed particularly the new members and gave an introduction on the IUPAP. A brief review of the recent activities of the IUPAP, specifically the last C&CC meeting at Trieste in April 2015 have been presented.

**6. Next meeting of the AC4:**

During the International Congress for Medical Physics 2016 in Bangkok, 2-5<sup>th</sup> December.

Munich, 16 September 2015

Fridtjof Nüsslin  
Chair IUPAP AC-4  
Past-President IOMP