

# **Affiliated Commission Reports to the IUPAP C&CC Meeting**

November 5-6 2010

## AC.1. International Commission for Optics

The International Commission for Optics (ICO) was founded in 1947, with the main objective to incentivize and expand the activities in the area of science of optics and photonics, and with a particular emphasis on those regions of the world less favored. ICO is organized by Territorial Committees (TC). At present, there are a total of fifty one TC distributed in all the five Continents.

These activities are concentrated in the following actions:

- 1) Sponsorship, co-sponsorship and endorsement of scientific meetings devoted to general and special topics in the area of optics and photonics.
- 2) Support of the activities of the optics and photonics programs at the Abdus Salam International Center for Theoretical Physics (ICTP), in Trieste (Italy). ICTP is a research and training center attached to UNESCO.
- 3) Four different awards addressed to scientists of the optics and photonics community under the following definitions: ICO Prize, to be given each year to an individual who has made a noteworthy contribution to optics, published submitted for publication before he or she has reached the age of forty. IUPAP Young Scientist Prize in Optics, offered by IUPAP and managed by ICO, to a scientist who has made noteworthy contributions to applied optics and photonics during a maximum of eight years of research experience after having earned a PhD degree. The award was created in 2009. ICO Galileo Galilei Award, awarded for outstanding contributions to the field of optics which are achieved under comparatively unfavorable circumstances. ICO/ICTP Gallieno Denardo Award, it is reserved for young researchers from developing countries (as defined by the United Nations), who conduct their research in a developing country.
- 4) ICO Travelling Lecture Program, to promote lectures on modern aspects of optics in interested territories by scientists of international reputation with good lecturing skills. The program is aimed specially at developing nations, but is not necessarily restricted to them.
- 5) Periodical publication of the ICO Newsletter, with a total of four annual issues and disseminated to all the ICO Territorial Committees.
- 6) Participation in the Education and Training in Optics and Photonics (ETOP) activities and in the Scientific Advisory Committee along with three professional societies: IEEE/LEOS, OSA and SPIE.
- 7) Participation in the Steering Committee of the Information Photonics series of meetings (earlier defined as Optical Computing).
- 8) Participation in the international program: Active Learning in Optics and Photonics (ALOP) with special emphasis on Latin-American centers and addressed to High School and Colleges teachers. ALOP is an educational program specially encouraged by UNESCO.

For the period for which this report is centered one can specifically mention the following events for the above mentioned items:

**Item 1)** A total of eleven scientific meetings were sponsored and co-sponsored by ICO (see attached separate file). The total budget dedicated to this item was of 10,000 USD. In particular, for the first time, and ICO Topical meeting on Optics and Energy will be held in Paris, next 28-29 October, 2010, as a joint venture with the European Optical Society (EOS) and under the EOS General Meeting and the so-called PRI-Opto exhibition dedicated to optics and photonics technologies. IUPAP was sponsoring this Topical Meeting and accorded a grant of a total of 3,500 euros, to support the attendance to the meeting to scientists from developing countries. This grant has been distributed as follows: Zohra Ben Lahkdar (Tunisia, 350 euros), Paul Buah-Bassuah (Ghana, 350 euros), Marembo Karemera (Rwanda, 1,000 euros), Tahani Mohammed Shatir (Sudan, 750 euros), Ahmadou Wagué (Senegal, 350 euros), Klaudia Zenkova (Ukraine, 350 euros), Mourad Zghal (Tunisia, 350 euros). Among the seven awardees a total of three are women in science from Ukraine (one) and two from Africa.

ICO was offering a grant of 1,000 USD to an African scientist and another 1,000 USD to an Armenian scientist to attend the last Photonics Europe meeting, held in Brussels last January 2010, and as a first accorded grant to an SPIE meeting organized by SPIE Europe.

**Item 2)** ICO is traditionally involved and sponsor, with financial support, in the organization of the ICTP Annual Winter College held at the ICTP, Trieste, Italy. For the year 2010 the College was organized for the topic on Optics and Energy and with attendance of 100 participants, all young scientists and PhD students, mainly coming from developing countries. Moreover, ICO is a founder member of the so called Trieste System for Optical Sciences and Applications (TSOSA) Advisory Group, created by the late Prof. Gallieno Denardo in 2003 to promote optical sciences in the developing world. TSOSA includes representatives from SPIE, ICO, OSA, the European Optical Society (EOS), Optics Within Life Sciences (OWLS), the IAEA, UNESCO and science programs across Europe. Currently, TSOSA is chaired by the ICO Secretary General, Angela Guzman.

**Item 3)** For the first time ICO has awarded the 2010 IUPAP Young Scientist Prize in Optics. The award has announced on January 2010 and it was publicized at the ICO official website and in a special article published in the ICO Newsletter, October 2010 issue. The first winner is Dr Eleftherios Goulielmakis, a 35-year-old research scientist at the Max Planck Institute of Quantum Optics in Garching, Germany, is the first recipient of the IUPAP Young Scientist Prize in Optics, administered by ICO. Dr. Goulielmakis was awarded the prize in recognition of his "outstanding contributions in attosecond physics, particularly for the generation of attosecond pulses and their application for the direct measurement of light waves". It is expected that Dr. Goulielmakis will deliver the Award Lecture along with the presentation of medal and cash at the next ICO General Conference, ICO-22, to be held in the city of Puebla (Mexico), next 15-19 August 2011. The ICO-22 is an IUPAP sponsored conference. The 2010 Gallieno Denardo Award was received by the Brazilian young scientist Cleber Mendonça, from the University of Sao Paulo. And the citation read: "for the development of novel methods and procedures of nonlinear optics, in particular the use of femtosecond pulses and femtosecond laser micro-fabrication in polymers for investigating nonlinear optical properties of organic compounds, and for establishing effective interdisciplinary collaborations within Brazil". The award ceremony took place last February 2010 at the occasion of the Winter College on Optics and Energy, ICTP, Trieste, Italy. The 2010 ICO Prize and the 2010 Gallieno Denardo Award will be announced at the occasion of the forthcoming ICO Annual Bureau Meeting, to be held in the Institute d'Optique, Palaiseau, France, next 30 October 2010.

**Item 4)** During the year 2010 an ICO Traveling Lecturer Program was carried out by Prof. Maxim Tomilin, from the National Research University of Information Technologies, Mechanics and Optics (University ITMO, Saint Petersburg, Russia), visited the Optics Research Center (CIOp-CONICET-La Plata-CIC) and UID Optimo, Engineering Faculty, National University of UNLP, La Plata, Argentina, under a visit organized by Prof. Hector Rabal. Prof. Tomilin delivered various conferences on liquid crystals characteristics and applications in optical microscopy.

**Item 5)** For the year 2010, celebrating the 50th Anniversary of the Laser, various special articles on the history and development of laser sources have been published at the ICO Newsletter. In addition to this action, ICO signed an agreement as a supporter of the LaserFest initiative from OSA and SPIE. All the corresponding issues of the 2010 ICO Newsletter can be downloaded from: <http://www.ico-optics.org/newsletters.html>

**Item 6)** ICO is now involved as a co-sponsoring organization in the forthcoming ETOP, to be held for the first time in Africa, at the University of Tunisia, next July 2011.

**Item 7)** The forthcoming Information Photonics conference, belonging to the series of meetings held every two-three years, is now under an almost closed up organization by the National Research Council of Canada. It will take place next May 2011 in Ottawa. It is expected that by that occasion the Steering Committee will have the periodical technical meeting.

**Item 8)** The first ALOP program, supported by ICO, was held this year of 2010, in Peru, as an action of the ICO Secretariat. Organized by the Universidad Católica de Santa Maria it was addressed to high school teachers of the area of the city of Arequipa, located in the Northern department of Arequipa and lasted the first week of June 2010. The program was quite a successful one and it is expected to have continuity in 2011 in the Latin-American regions.

Maria L. Calvo, ICO President  
October 2010

## AC.2. International Commission on General Relativity and Gravitation

The principal event of our year was the triennial GR conference. GR19 was held in July 2010 in Mexico City, at the Centro Banamex.

The local organizers had managed very well to cope with the drop in sponsorship following the credit crunch, by renegotiating some deals and careful husbandry. Sadly, one of the sponsors who withdrew was the Gravity Research Foundation, who have on several occasions funded talks broadening the range of topics. There were 733 registered participants, of whom 187, mostly students, were allowed free registration. Sponsorship from IUPAP, and AC2's own limited funds, assisted some of these participants.

As usual the conference had plenary talks in the morning, covering the whole field of AC2's interest, and in the afternoons there were parallel contributed papers sessions. There were 15 plenary talks (3 of the speakers being women) and 17 parallel sessions (5 of the chairs being women). A book containing abstracts of all submissions was circulated. Those authors not selected for oral presentation were given the opportunity of posters.

During the meeting the Xanthopoulos Prize (similar to but predating IUPAP Young Scientists Prizes) was presented to Stefan Hollands (Cardiff). The inaugural triennial Ehlers and Bergmann-Wheeler Prizes (for the best PhD theses in classical and quantum gravity respectively) were presented to Nicholas Yunes (Princeton) and Victor Taveras (Louisiana State). The annual GWIC thesis prize (for which AC2 acts as fundholder) was presented to Holger Pletsch (Hanover). The Hartle Prizes, for student presentations at the meeting, were awarded to Amitai Bin-Nun (U Penn), Samuel Gralla (Chicago), Ian Morrison (UC Santa Barbara), Vivien Raymond (Northwestern), David Sloan (Penn State), Jan Steinoff (Jena), Charalampos Markakis (Wisconsin, Milwaukee), Bethan Cropp (Wellington, New Zealand) and Francesca Vidotto (Marseille). The inaugural Chandrasekhar Prizes, for postdoctoral presentations at the meeting, were awarded to Parampreet Singh (Perimeter Institute), Mark Hannam (Vienna), Thomas Corbitt (LIGO Lab, MIT) and Woei Chet Lim (AEI). AC2 gratefully acknowledge support from FORTH (Greece), Springer-Verlag, the UK Institute of Physics Publishing, and World Scientific for the Xanthopoulos, Ehlers, Bergmann-Wheeler and Chandrasekhar Prizes respectively.

The Society also awarded its first Fellowships, to Alessandra Buonanno (Maryland), Alejandro Corichi (UNAM, Mexico), Gabriela Gonzalez (Louisiana State), James Hough (Glasgow), Don Marolf (UC Santa Barbara), Roger Penrose (Oxford), Frans Pretorius (Princeton), Carlo Rovelli (Marseille), Madhavan Varadarajan (RRI, Bangalore) and David Wands (Portsmouth).

The Commission itself (alias the Society's committee) held 3 meetings during GR19. IUPAP support for Commission meetings was used to enable a number of less well-funded members, in particular IUPAP representatives, to be present.

The first meeting reviewed the previous three year's activities and included reports from the editors of the Society's journal (whose impact factor rose from 1.8 to 2.6 in 2009), from PANAGIC and GWIC, from IUPAP C&CC meetings, and its information website <http://hyperspace.aei.mpg.de/>. The last is now under the care of the Albert Einstein Institute (AEI), after 20 years being run by me as Secretary of the Society. AEI have also become custodians of our archives, and I have sent them my personal almost complete collection of proceedings and abstracts volumes from past GR conferences.

The second was to hear bids for the site of the next meeting. It was agreed that GR20 will be held in Warsaw in July 2013, and that Amaldi 10 (in the Amaldi series which is organized by GWIC and sponsored by IUPAP via AC2) will be held there simultaneously.

This recommendation was accepted by the General Assembly of the Society, which also elected new officers and committee members in accordance with the constitution. I became President and Beverly Berger became Secretary. My predecessor, Abhay Ashtekar, automatically becomes Deputy President. The Assembly also reviewed membership, finance and administration and heard the reports from the journal, PANAGIC, GWIC, IUPAP, and Hyperspace.

The third committee meeting was to discuss future plans. AC2 is exploring suitable ways to mark the centenary of general relativity in 2015, such as a review volume and possibly a video.

With the change of Secretary, the location of the Society's web pages has changed. We now have a non-geographic domain name, [www.isgrg.org](http://www.isgrg.org), currently hosted by a commercial web host and managed by Penn State University.

By a long-standing agreement, IUPAP appoint four members of the AC2 committee, each for a six-year term, two changing after every GRn conference. AC2 itself nominates possible IUPAP members, seeking, in doing so, to improve geographic, subject and/or gender balance among its members. The two members retiring in 2010 are Odylio Aguiar (Brazil) and Alexei Starobinskii (Russia): the latter has been elected to the committee anyway. The continuing IUPAP members are Nigel Bishop (South Africa) and Yongge Ma (P.R. China). AC2 proposes as the new IUPAP members Nadia Margalhaes (Brazil) and David McClelland (Australia).

## AC.3. International Commission for Acoustics

*The purpose of the ICA is to promote international development and collaboration in all fields of acoustics including research, development, education, and standardisation.*

### Board Members

**President** Samir Gerges - [samir@emc.ufsc.br](mailto:samir@emc.ufsc.br)

**Vice President** Sonoko Kuwano - [kuwano@see.eng.osaka-u.ac.jp](mailto:kuwano@see.eng.osaka-u.ac.jp)

**Past President** Philip Nelson - [pan@isvr.soton.ac.uk](mailto:pan@isvr.soton.ac.uk)

**Secretary General** Marion Burgess - [m.burgess@adfa.edu.au](mailto:m.burgess@adfa.edu.au)

**Treasurer** Hugo Fastl - [fastl@mmk.ei.tum.de](mailto:fastl@mmk.ei.tum.de)

**Canada** Michael Stinson

**China** Chaohuan Hou

**France** Phillipe Blanc-Benon

**Italy** Adriano Alippi

**Korea** Suk Wang Yoon

**Poland** Eugeniusz Kozaczka

**Russia** Alexander Maizel

**Spain** Antonio Perez Lopez

**Turkey** Zerhan Yuksel Can

**USA** Charles E. Schmid

**EAA** Luigi Maffei

**FIA** Jorge Patricio

**ICU** Ewald Benes

**IIVAV** J. L. Bento Coelho

**I-INCE** H. Tachibana

**WESPAC** Renhe Zhang

### Report from ICA to IUPAP

The ICA board elected at the ICA General Assembly in 2007 continues with the executive comprising Samir Gerges as President, Sonoko Kuwano as Vice President, Hugo Fastl as the Treasurer and Marion Burgess as Secretary General. There will be new election at the 2010 Board and GA in Sydney in August 2010. In the next report we will report the new officers and awards given.

The 2009 board meeting was well attended and the early start allowed for good discussion on many matters important to ICA at this time. In particular there was further consideration of the governance and options for changes to the structure of the board. A proposal for a revision to the board structure has been prepared and sent to the member societies for their comment with a view to modification and voting by the ICA membership at the next General Assembly in Sydney in 2010. The country membership of the ICA has not been increasing while it is clear that the interest in acoustics is expanding. The majority of the larger acoustical societies are members and more work is being made by the President and board to encourage the smaller and less well established acoustics groups in developing countries.

The Board continues with its task of obtaining greater acknowledgement of the role of acoustics with a view to seeking full membership of ICSU. The inclusion of the following international affiliates has increased the strength of the board: European Acoustics Association (EAA), IberoAmerican Federation of Acoustics (FIA), International Institute of Noise Control Engineering (I-INCE), International Institute of Acoustics and Vibration (IIVAV), Western Pacific Acoustics Commission (WESPAC) and the International Congress on Ultrasonics (ICU). The Board has set up an International Conference Coordination Committee with a view to encouraging improved coordination of these international activities.

The major activity for the ICA is the congress held every 3 years. In 2010 this will be held in Sydney Australia and we look forward to the assistance of IUTAM in promoting this important activity. In the current international economic environment it will be a challenge to ensure that this event is both scientifically and financially viable.

## AC.4. International Commission on Medical Physics

### Membership of AC-4

The last meeting of AC-4/ICoMMP took place at the World Congress 2009, 7-12 September 2009 in Munich, Germany.

Due to the new term of IOMP Officers membership of AC-4/ICoMMP is expected be finalized by the end of November 2009. So far the following members have been appointed:

#### IOMP Officers:

Fridtjof Nüsslin (President IOMP, ICoMMP/AC-4 Chair)  
Kin Yin Cheung (Vice-President IOMP)  
Barry Allen (Past-President IOMP)  
Madan Rehani (Secretary General IOMP)  
Slavik Tabakov (Treasurer)

#### IOMP Committee Chairs

Maria do Carmo Lopes (Education & Training, ETC)  
Harald Paganetti (Science, SC)  
Raymond Wu (Professional, PRC)  
William Hendee (Publication, PC)

#### Associate Members from IUPAP Commissions:

Jose Onuchic (C6, Biological Physics):  
Professor Ahmadou Wague (C13, Physics for Development: Universite Cheikh Anta Diop in Dakar, Senegal)  
Jolly Pratibha (C14, Physics Education)

#### 3 external scientists co-opted by ICoMMP:

to be nominated

### Background

The International Organization for Medical Physics (IOMP) represents over 18,000 medical physicists worldwide and has 79 affiliated 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 as a branch of Applied Physics 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 Affiliated Commission AC-4 which is identical with the International Commission on Medical Physics (ICoMMP) of IOMP aims to strengthen medical physics science by interacting with the physics community represented in IUPAP.

### Recent Activities

#### IOMP International Conferences on Medical Physics (ICMP)

Beyond the meetings organized by the Regional Organizations the international showcase of the current status of medical physics is the ICMP. Priorities of these events are demonstrating most recent achievements in research, education & training and professional matters of medical physics. With regard to the situation of medical physics in the developing countries, the lack of appropriate research and training infrastructure and the deficits in health care systems, ICMP addresses particularly problems there. The forthcoming ICMP-2011 will be hosted by the Asociación Latinoamericana de Física Médica (ALFIM) jointly with the Brazilian Association of Medical Physics at the Center of Events of the Pontifical Catholic University of Rio Grande do Sul in Porto Alegre, Brazil on April 17-20, 2011. Main topics are New Strategies in Radiation Shielding calculations and surveys, Modern Radiotherapy: Risks and Benefits, PET/CT Acceptance Testing and Quality Assurance and Quantitative PET/CT Imaging, Radiation Protection for Interventional Radiology and Cardiology, MDCT Dosimetry and Adapting Traditional Clinical Medical Physics to Digital Radiography.

An involvement of IUPAP is planned (e.g. a symposium jointly organized by AC-4 and C6, workshop on Development & Training Medical Physics in Latin America (involvement of AC-4,

C13, C14). IUPAP Vice-President Marcia Barbosa from Porto Alegre will liaise with COC. IUPAP Young Scientists award will be delivered at the ICMP-2011). AC-4 will apply for IUPAP sponsoring of travel grants for young scientists.

### **Education and Training**

Due to the IOMP mission a number of activities have been developed to improve education & training of medical physics in developing countries. Priorities are fostering the collaboration with the two major international bodies acting in this field, the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA). Based on the recently approved IOMP Policy Statements on The Medical Physicist: Role and Responsibilities (PS-1) and on Basic Requirements for Education and Training of Medical Physicists (PS-2). There is an increasing demand from medical physicists for implementing a certification process to all medical physicists practicing in medical institutions on a global basis. IOMP attempts to harmonize the national systems in medical physics worldwide. Currently standards and procedures for creditation are being developed.

### **Medical Physics in Developing Countries**

Recognizing the understaffing of medical physicists in health care and the lack of appropriately qualified research and teaching personnel in developing countries, IOMP is pursuing the establishment of an E&T network. According to the current IOMP focus areas Africa and Latin-America an action plan is under development initiating at selected reference institutions in those regions E&T centers. The concept is based on a close cooperation of local/regional medical physics groups and physics university departments with the major medical physics stakeholders and support by WHO and IAEA. Priorities are E&T based on international standards, interlinkage with local physics research activities and sustainability.

Since education and research activities ideally have to be combined, IOMP is currently exploring opportunities for establishing research centers on medical physics preferably in developing countries. This concept particularly challenges for cooperation with the physics community represented in IUPAP.

At the annual meeting of the AAPM-2010 in Philadelphia a joint session of IOMP & AAPM on "The situation of Medical Physics in the Developing Countries" has been organized by H.Paganetti (Chair Science committee IOMP, member AC-4). Reports have been given from the perspective of the IAEA demonstrating their wide activities including training material available. Surveys from the IOMP's current focus areas Africa and Latin-America provided insight in the deficits, understaffing and on the other side the great efforts undertaken to bridge the gap to the high-tech countries in clinical practice and research. Several initiatives to improve the situation of medical physics in the developing countries have been discussed.

### **International Conference on Biological Physics**

The Commission C-6 on Biological Physics (Chair José Onuchic) organizes the 7<sup>th</sup> ICBP in San Diego on 19-24 June 2011. (see report C-6). Through AC-4 IOMP has been invited to incorporate a symposium "*Molecular Imaging: Bridging Biology, Physics and Medicine*". R.Hofmann (GFP-Optical Imaging), St.Jiang (MSCT/CB) and myself (Molecular imaging in Cancer treatment) agreed to lecture.

### **EMITEL Project**

The international project EMITEL has developed an Encyclopaedia for Medical Physics with Multilingual Dictionary. IOMP was one of the project partners, the others were King's College London and King's College Hospital, University of Lund and Lund University Hospital, University of Florence, and the AM Studio, Bulgaria. EMITEL was financially supported by the EU Leonardo programme. Dr. Slavik Tabakov (former Chair of ETC and newly elected Treasurer) is the co-ordinator. The final report has been approved. The EMITEL web site ([www.emitel2.eu](http://www.emitel2.eu)) was officially launched at the opening of WC2009. The encyclopaedia is available free on the Internet and includes a Multilingual Dictionary of Terms, which cross-translates the 3000+ specific terms in any of its 25 languages. See [www.emitdictionary.co.uk](http://www.emitdictionary.co.uk). Each term is explained with an article (in English). Many articles include diagrams, images and tables. The overall volume of EMITEL is 2000+ pages.

## **IOMP Model Curriculum for postgraduate (MSc-level) education programme on Medical Physics**

It aims to present guidance on the organisation of post-graduate (MSc level) courses and presents several models for this. The main issues discussed at the Model Curriculum are: Overall number of contact and self-reading hours; MSc project and thesis; Structure of the Curriculum and model of teaching delivery; Entry requirements; Students' assessment. At a later stage these will be supplemented by detailed Syllabi. The Model also proposes IOMP-ETC help in the development of Medical Physics Education and ways for its validation – a stage of importance for the further accreditation of MSc courses. The project is at completion and all will be ready before ICMP2011. (Slavik Tabakov et al.)

### **Miscellaneous**

- **IUPAP Young Scientist Award:** selection process has not yet started, the presentation of the IUPAP Award is planned for the ICMP-2011 in Brazil).
- **Visa denial:** at the last World Congress-2009 in Munich German authorities denied the delivery of visa to a high ranked scientist from Iran. Follow-up of the issue ended in a disclaimer. With regard to this case AC-4 encouraged IUPAP to consider establishing a registry to collect similar cases reported from all members of the Union.
- **Memorandum of Understanding:** MoU have been signed with the World Health Organization (WHO) and the International Radiation Protection Association (IRPA)

Fridtjof Nüsslin  
Chair AC-4  
President IComMP  
President IOMP  
Munich, October, 2010