Reports from IUPAP Commissions

Collected for the October meeting 2013, by Cecilia Jarlskog

The reports here below are from

- Commission on Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants (C2)
- Commission on Statistical Physics (C3)
- Commission on Cosmic Rays (C4)
- Commission on Low Temperature Physics (C5)
- Commission on Biological Physics (C6)
- Commission on Semiconductors (C8)
- Commission on Magnetism (C9)
- Commission on the Structure and Dynamics of Condensed Matter (C10)
- Commission on Particles and Fields (C11)
- Commission on Nuclear Physics (C12)
- Commission on Physics for Development (C13)
- Commission on Physics Education (C14)
- Commission on Atomic, Molecular, and Optical Physics (C15)
- Commission on Plasma Physics (C16)
- Commission on Quantum Electronics (C17)
- Commission on Mathematical Physics (C18)
- Commission on Astrophysics (C19)
- Commission on Computational Physics (C20)

COMMISSION C2

Report to the IUPAP Council & Commission Chairs meeting,
CERN, Geneva, 1 – 2 October 2013,
from Commission C2 – SUNAMCO

Commission on Symbols, Units, Nomenclature, Fundamental Constants and Atomic Masses

9 September 2013

Membership: The Director of the BIPM is *ex-officio* a full Member of C2 without national affiliation. Michael Kuhne retired as Director on 31 December 2012 and has been replaced as a Member of C2 by the new Director, Martin Milton.

Succession Planning: This is an area where C2 may run into a real problem of continuity and sustainability: the Secretary, Jens Dilling, is in his third term; the Vice-Chair, Jörn Stenger, is in his second term but has indicated that he does not wish to proceed to the position of Chair; and Stephen Lea is Chair in his second term, having been somewhat anomalously Secretary in his first term. Other members currently in their second term have not been very active, although this is in part due to the difficulty in meeting as a full Commission without budget.

Supported Conferences: C2 supported one conference in 2012: the Conference on Precision Electromagnetic Measurement (CPEM 2012), Washington DC, USA, 1–6 July 2012. Despite their best efforts to identify suitable candidates, the conference organizers were unable to allocate all of the funds for travel for physicists from developing countries and reimbursed IUPAP US$5,000 of unused funds.

Awards: C2 expects to continue to advertise and award the IUPAP Young Scientist (Early Career) Prize in Fundamental Metrology biennially (normally making two awards) and hence is making no award in 2013.

Meetings: A small number of commission members met on Monday 10 June 2013 at BIPM, Sèvres, in advance of a meeting of the CCU. The principal topic was succession planning as discussed above.

Representation: IUPAP's representative at the meeting of the Consultative Committee for Units of the CIPM, held at the BIPM, 11-12 June 2013, was C2 Member William Phillips (USA). Unfortunately he was unable to be present and his contribution was presented by past C2 Chair Peter Mohr (USA), present as representative of NIST. C2 Members Jörn Stenger (Germany) and Stephen Lea (UK) were also present as national representatives and C2 Associate Member Savely Karshenboim (Russia) as an invitee of the President of the CCU, Ian Mills. The meeting addressed issues associated with the eventual implementation of the "New SI", including the *mis en pratique* of the new definition of the kelvin. There was also a discussion, led by William Phillips and Peter Mohr, of the way angle and count rate are treated in the current SI, these being found by many to be unsatisfactory.

Clemens Elster (Germany) and Wolfgang Wöger (Germany) have represented IUPAP at meetings of the Joint Committee for Guides in Metrology (JCGM) and its working groups in Nov/Dec 2012 and May/June 2013. Reports from the Nov/Dec meetings have been received and are appended below.

Proposal for a resolution at the 2014 GA: It has been suggested that the debate on angle and count rate in the SI begun at the CCU meeting could be taken forward in the form of an IUPAP GA resolution (in favour of an approach more palatable to physicists), this being the means IUPAP has at its disposal to influence formally the decisions of the CIPM.

Red Book: Work continues on the informal project to update the SUNAMCO Red Book (IUPAP-25 "Symbols, Units, Nomenclature and Fundamental Constants in Physics"). A web domain,

www.sunamcoredbook.org, and hosting have been obtained with a view to getting an online version available quickly, pending future development of the IUPAP website.

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COMMISSION C3

Report on the activities of the C3 Commission

Statistical Physics

The main activities of the C3 commission are:

•The organization of the (triennial) **Statphys** Conference.

•Selecting the recipient of the **Boltzmann medal**, the highest international recognition for outstanding research contributions to the field.

•Selecting the recipient of the **Young Scientist Award** in Statistical Physics.

Statphys 25

The Statphys25 meeting was held on July 22-26, 2013 at Seoul National University in Seoul, Korea. It attracted 850 participants from all over the world. The scientific program consisted of 10 plenary lectures, 46 invited talks, 194 contributed talks and 349 poster presentations.
The conference website can be found here: http://www.statphys25.org/. Several informations about the meeting are available on the website, including those on scientific, organising and advisory committees, where previous and current members of C3 were heavily involved together with internationally known scientists in the field. At Statphys25 both the Boltzmann medal and the Young Scientist Prize of the IUPAP were delivered. A memorial session was held on July 24 honoring Kenneth G. Wilson, the first Boltzmann medalist and Nobel Prize in Physics, who recently passed away: http://www.youtube.com/watch?v=-6LAR1Og4nE.

The Boltzmann Medal

The Boltzmann medal is the most prestigious international prize in statistical physics. It is awarded every three years, with the formal presentation occurring during the Statphys conference. The jury consisted of all the members of the C3 Commission, as well as the previous Boltzmann medalists, the Chairman of the Statphys25 Conference (D. Kim) and the previous Chairman of C3 (H. Orland). For the 2013 round, nominations were due on September 1, 2012, and 17 were received. The jury agreed to award the prize jointly to Gianni Jona-Lasinio from the University La Sapienza (Rome, Italy) and Harry L. Swinney from the University of Texas Austin. Jona-Lasinio receives the award "for his seminal contributions to spontaneous symmetry breaking in particle physics and the theory of non-equilibrium fluctuations", and Swinney is recognized "for his ingenious and challenging experiments which have had a large impact on many areas of statistical physics."

Young Scientist Award in Statistical Physics

The Young Scientist Award in Statistical Physics has recently been established by the C3 Commission on Statistical Physics of the IUPAP. The Prize is aimed at recognizing outstanding achievements of scientists at early stages of their career in the broad field of Statistical Physics. Like the Boltzmann Medal, it is awarded every three years, with the formal presentation occurring during the Statphys conference. In this round 33 nominations were received: The C3 Commission selected Takahiro Sagawa (University of Tokyo) and Kazumasa Takeuchi (University of Tokyo) as the joint 2013 winners. Sagawa is recognized "for developing a comprehensive theoretical framework to characterize the thermodynamics of nonequilibrium systems with feedback control" and Takeuchi wins the award "for his outstanding experiments on fluctuation properties of growing interfaces in turbulent liquid crystals."

Extract from the minutes of the C3 Commission meeting held in Seoul on July 24 2013

The Chairman, Stefano Ruffo, informed the Commission that two bids to organize StatPhys26 were received, one for Lyon and a second one for Barcelona. The proposal to organize StatPhys26 in Lyon was presented by a group of French delegates: There was consensus in the Commission that this was a well-prepared strong bid and the Commission unanimously accepted the Lyon proposal: Hence Statphys26 will be held in Lyon on July 18-22, 2016.

The mandates of the following members will expire in 2014: Ruffo, Yu, Diehl, Hermann, Procaccia, van Beijeren, Woafo. A long and careful discussion on the choice of new members, guided by the goals of realizing a good representation of the various statistical physics communities and their research fields in different geographical parts of the world and of increasing the number of female scientists in the Commission led to the proposal of the following new members: Lucilla **de Arcangelis**, Department of Information Engineering, Second University Naples Aversa, Italy; Jan **de Gier**, the University of Melbourne, Department of Mathematics and Statistics, Australia; Erwin **Frey**, Ludwig-Maximilians-Universität München, Faculty of Physics,Germany; Doochul **Kim,** Korea Institute for Advanced Study (KIAS), Seoul, Korea; José L. **Mateos**, National Autonomous University of Mexico, Department of Complex Systems, Mexico City, Mexico; Lei Han **Tang**, Hongkong Baptist University, Department of Physics, Hongkong, and Beijing Computational Science Research Center, China.

The Executive Committee (Chair, Vice-Chair, Secretary) of C3 will also expire on 2014. After a careful discussion, the officers-elect are: Itamar **Procaccia (Chair)**, Julia **Yeomans (Vice Chair)**, and Rahul **Pandit (Secretary)**.

Moreover, since Africa will no more have a member in C3, it was felt necessary to ask for the addition of an Associate Member: Timoleon Crepin **Kofane** of the University of Yaoundé and a Member of the African Academy of Sciences.

Concerning workshops to take place in 2014, the C3 Commission received two proposals: "Nonequilibrium Statistical Mechanics", to be held at Florence University, Department of Physics and Astronomy may 26-30 2014; "International Conference on Nano Structures (ICNS5)", to be held at Kish Island, Iran march 6-9 2014. The Commission was convinced that absence of discrimination is absolutely indispensable for IUPAP sponsorships of conferences: It seemed doubtful that this condition will be met by the Iranian proposal. Therefore, this sponsorship was not considered. On the other hand, the Florence proposal was well received and put in first priority.

Officers and members of the C3 Commission:

Stefano Ruffo, Chair (Italy)
Yu Lu, Vice-Chair (China)
Hans Werner Diehl, Secretary (Germany)
Henk van Beijeren (The Netherlands)
Jean-Francois Joanny (France)
Hans Herrmann (Switzerland)
Rahul Pandit (India)
Itamar Procaccia (Israel)
Mohammad Reza Ejtehadi (Iran)
Maxi San Miguel (Spain)
Masaki Sano (Japan)
Beate Schmittmann (USA)
Paul Woafo (Cameroon)
Julia Yeomans (UK)
Associate Members: Yu M. Romanovsky (Russia) and F. Alcaraz (Brasil)

Detailed contact info can be found at the Commission website, under
http://www.iupap.org/commissions/c3/members/index.html

Florence, september 21 2014

Stefano Ruffo
Chair of C3

COMMISSION C4

Report from Commission C4 Cosmic Rays
by Johannes Knapp

1 Conferences in 2013

The 33nd International Cosmic Ray Conference (ICRC 2013), http://www.cbpf.br/~icrc2013/
was held at Rio de Janeiro in 2-9 July 2013.

With more than 750 attendants from 54 countries, with contributions on solar activity and space weather and with many young excited scientists presenting their work we easily fulfilled the IUPAP Mission:

"To assist in the worldwide development of physics,
to foster international cooperation in physics, and
to help in the application of physics toward solving
problems of concern to humanity."

Nine plenary review talks, 20 plenary highlight talks 360 oral presentations, and about 820 posters have been presented and were summarised in 7 rapporteur talks. The proceedings of the ICRC 2013 with 979 contributions is online via INDICO website
http://143.107.180.38/indico/contributionListDisplay.py?confId=0

For the first time the conference had a program committee of experts that was largely independent of the local organising committee and a Dark Matter branch in parallel to the four traditional branches cosmic rays, solar and heliospheric physics, gamma rays, neutrinos. The resulting program was greatly appreciated and the commission decided to define the "Rio Template" to be followed at least for the next two conferences.

Scientific highlights of the last year were:
– high-energy (PeV) neutrino events seen with IceCube
which are widely believed to be the first astrophysical neutrinos
– The Fermi gamma-ray satellite discovered:
two big bubbles of gamma ray emission above and below the galactic disk (Fermi bubbles),
a possible 130 GeV line emission from the galactic centre,
and variability and strong flaring from the Crab nebula
– the new 28-m Cherenkov telescope (HESS II) is operational and
the Cherenkov Telescope Array (CTA) is rapidly coming closer to realisation
– Voyager 1 left the Solar system.
– AMS has released first data on cosmic ray spectra
– new LHC data constrain air shower models, and cosmic ray shower models fit better
the LHC forward data than the particle physics models.

The following prizes were presented during the inaugural session of the ICRC 2013:
– O'Ceallaigh medal to Edward C Stone (Caltech; Voyager),
– Yodh prize to Motohiko Nagano (Japan; AGASA),
– IUPAP-TIFR Homi Bhabha medal and prize to Heinz Völk (Germany; Gamma ray theory)
– Duggal award to Rolf Bühler (Germany, Fermi) and the
– IUPAP Young Scientist awards to Aya Ishihara (Japan; IceCube) and Daniel Mazin (Spain; MAGIC).

During the C4 meetings held at Rio during the ICRC 2013, it was decided to organize the 34rd ICRC 2015 at the Hague, Netherlands, in 30 July - 6 Aug 2015. Also, the Commission gave its approval for

organizing the 35th ICRC 2017 in Busan, South Korea.

Further conferences in 2013 with IUPAP support have been:
TAUP 2013: International Conference on Topics in Astroparticle and Underground Physics, 8-13 September 2013 in Asilomar, California, USA. The Proceedings for TAUP2013 will be published by Elsevier B. V. as a Virtual Special Issue, online and open access.

2 Conferences in 2014

Conferences in astroparticle physics who have applied for IUPAP support for 2014 are:

– Amsterdark 2014, Amsderdam: TeV particles and Dark Matter
– ISVHECRI 2014, CERN: Int. Symposium on Very High Energy Cosmic Ray Interactions
– Cospar 2014, Moscow: Cospar Scientific Assembly

While the latter two of them applied only past the deadline, the C4 Commission still supports their applications, as their topic is relevant to C4 and the both series traditionally received some support from IUPAP.

3 Renaming the C4 Commission from "Cosmic Rays" to "Astroparticle Physics"

The commission C4 "Cosmic Rays" is one of the oldest, founded in 1947.
Since then particle physics has split off and become a separate commission, and the area under this commission has widened to include solar and heliospheric physics, gamma ray astronomy, neutrino astronomy and dark matter.

A first proposal to change the name of the commission to "Astroparticle Physics" has been discussed at a national Meeting in 2010 and forwarded to the IUPAP GA in 2011.
The GA referred it to the C4 chair to consult with the commission and the wider community.

The C4 commission and many senior scientists found the name change appropriate and timely to properly reflect the breadth of activities gathered under the C4 umbrella. In many countries the name "Astroparticle Physics" has been established for this area.
IUPAP is in the process of establishing the "Astroparticle Physics International Committee (APPIC)" to advice the Global Science Forum of the OECD and the "Astroparticle Physic International Forum (APIF)"
in matters relating to big international projects in the area largely covered by C4.
Thus, "Astroparticle Physics" would be the best name for the Commission C4.

At this summer's International Cosmic Ray Conference we have extensively discussed the issue in the commission and formally polled the commission members and the ICRC attendants. The result was a 76.5% support for the name change among the commission members and 60% support among the ICRC participants who returned the poll.
In the view of the C4 officers this is a clear enough majority to apply formally to IUPAP for a name change of the commission C4.

Note:
we suggest a different name for C4 that describes better the activities currently under the umbrella of C4. We do not suggest to redefine the topics of C4.
The name of our big bi-annual international conference will remain

“International Cosmic Ray Conference”
but with the subtitle "The Astroparticle Physics Conference".

The change of the Mandate to go along with the name change is minimal:
the old mandate is:

C4 Mandate

To promote the exchange of information and views among the members of the international scientific community in the general field of Cosmic Ray Physics including:

– the nature and characteristics of the electromagnetic, particle and other radiation present in the cosmos;
– the theory and models concerning the origin of this radiation;
– non-accelerator high energy physics;
– the specialized technologies necessary in the field and their application.

the new mandate is proposed to be:

C4 Mandate

To promote the exchange of information and views among the members of the international scientific community in the general field of **Astroparticle** Physics including:

– the nature and characteristics of the electromagnetic, particle and other radiation, **from the lowest to the highest energies, in the heliosphere, the galaxy and the universe**;
– the theory and models concerning the origin of this radiation;
– non-accelerator high energy physics;
– the specialized technologies necessary in the field and their application.

Also the Chairs of C11 (Particles and Fields), C12 (Nuclear Physics) and C19 Astrophysics) have been asked for their views.
Hiroaki Aihara (Chair C11) had no concerns about the name change.
Thanu Padmanabhan (Chair C19) worried whether the chairs of C11 and C12 would agree,
Hideyuki Sakai (Chair C12) personally had no objections, but reported some concerns of his commission members: overlap with C19?, C19 to absorb C4?, Redefine the mandate to avoid overlap with C19?
So, interestingly, C19 members did not express concerns about the overlap with C19, and C12 members did not worry about C12.

The Commission Chair meeting requires some discussion of this issue.

COMMISSION C5

C5 Activity Report for the IUPAP C&CC Meeting - Geneva CERN, October 2013

(submitted by K. Kono, Chair C5, September 2013)

Officers/Members 2011-2014

Chair:	Kimitoshi Kono	Japan
Vice-Chair:	Karen Hallberg	Argentina
Secretary:	John Saunders	UK
Members:	John Beamish	Canada
	Nan Lin Wang	China
	Jukka Pekola	Finland
	Jean-Pascal Brison	France
	Christian Pfleiderer	Germany
	Srinivasan Ramakrishnan	India
	Hu-Jong Lee	Republic of Korea
	Hans Hilgenkamp	The Netherlands
	Alexander Smirnov	Russia
	Alexander Feher	Slovak Republic
	Robert Hallock	USA
Associate Members:	Jacek Kossut	Poland (from C8)
	YoshiChika Otani	Japan (from C9)
	Juhn-Jong Lin	Taiwan

Main Achievements

1. Commission Meeting

C5 holds its major triennial formal meeting in advance of the General Assembly on the occasion of the meeting of International Conference on Low Temperature Physics (LT), our major Type A conference held every three years. The previous meeting was in August of 2011 in Beijing at the time of LT26. In August of 2014 LT27 will be held in Buenos Aires, when we will have a face-to-face meeting. We have conducted business effectively by e-mail in the interim.

2. Sponsored Conference (2012)

Type B

- **International Conference on Quantum Fluids and Solids 2012 (QFS2012)**
  August 15-21, 2012, Lancaster, UK;
  267 registered participants (26 women) from 25 countries;
  9 keynote talks and 55 invited talks (3 by women), and approximately 210 posters;
  Co-chairs: S.N. Fisher and G.R. Pickett

3. Sponsored Conference (2013)

Type B

- **International Conference on Quantum Fluids and Solids 2013 (QFS2013)**
  August 1-6, 2013, Matsue, Japan;
  220 participants (14 women) from 23 countries;
  10 plenary talks and 47 invited talks (1 by women), and 147 posters;
  Chairman: Y. Okuda, Co-Chairman: K. Kono

4. Sponsored Conferences (anticipated for 2014 and beyond)

Type A

- **27th International Conference on Low Temperature Physics (LT27), early approval**
  August 6-13, 2014, Buenos Aires, Argentina;
  about 1,200 participants
  Chair: S. Hernández, Co-Chair: V. Bekeris

Type B

- **International Conference on Ultralow Temperature Physics (ULT 2014), proposition**
  August 16-19, 2014, San Carlos de Bariloche, Argentina;
  200-300 participants
  Organizers: Henri Godfrin, Julio Guimpel, J. Luzuriaga, E. Osquiguil

5. IUPAP Young Scientist Prize in Low Temperature Physics

The following solicitation for the IUPAP Young Scientist Prize in Low Temperature Physics is posted on the C5 website and distributed in the community. Up to three prizewinners will be nominated in early 2014 by C5. The Prize award ceremony will be held at the LT27 Conference in August 2014. All prizewinners will give an invited talk.

CALL FOR NOMINATIONS

IUPAP Young Scientist Prize in Low Temperature Physics 2014

Nominations are being sought for the Young Scientist Prize in Low Temperature Physics, which will be awarded by the International Union of Pure and Applied Physics through the Commission C5 (Low Temperature Physics) in 2014. The prize will be awarded during the 27th International Conference on Low Temperature Physics (LT27) to be held in Buenos Aires, Argentina, August 6—13, 2014. The Prize includes a medal, the sum approved by IUPAP, and an invited presentation to be made at LT27.

The nominee is expected to have made original and outstanding contributions to the field of low temperature physics. If the work was performed in collaboration, the leading personal contribution of the recipient to the achievement must be clearly identifiable. Nominees for the prize should by January 5, 2014 have a maximum of 8 years of research experience (excluding career interruption) following the award of PhD.

Nominations should include:

- A letter of not more than 1,000 words evaluating the nominee's achievements and identifying the specific work to be recognized.
- Curriculum vitae that identifies all publications.
- A brief biographical sketch not to exceed two pages.
- Suggested text for the award citation.

Self-nominations will not be considered. Nominations should be sent to the chair of IUPAP C5: preferably by web upload (http://lt.riken.jp/iupap/young_scientist/prize.shtml), e-mail with attachments (e-mail: kkono@riken.jp), or by regular mail (Dr. K. Kono, Low Temperature Physics Laboratory, RIKEN, Hirosawa 2-1, Saitama, 351-0198 Japan).

Deadline for receipt of nominations is January 5, 2014.

COMMISSION C6

C6 - Commission on Biological Physics

Report from Kenichi Yoshikawa

Activity report of C6:

1) International Conference of Biological Physics, ICBP 2014, has been decided to be held at Beijing, China for the period of June 18-22, 2014.
http://icbp2014.iphy.ac.cn

ICBP2014 belongs to the category A.

The first two days (June 18-19) will encompass training workshops, and the remaining three days (June 20-22) will include research symposia and plenary lectures.

Symposium topics
Principles of Protein Dynamics and Functions
Physics of Folding, Misfolding, Aggregation & Diseases
Physics of Evolutionary Dynamics
Systems Biology and Networks
Biomembranes & Cell Mechanics
Novel technologies and Instrumentation
Single Molecule Biophysics
Genome Structure & RNA Folding
Soft Matter and Biomaterials
Physics of Cancer
Neural Biology & Networks
Physics of Living Cells

2) Cooperation with AC4 (Medical Physics):
Joint symposium between C6 and AC4 was held on the occasion of 20th International Conference of Medical Physics, ICMP 2013, at Brighton, UK, for the period of September 1-4, 2013.
We will have the joint symposium also on ICBP2014. It is also under planning that a joint workshop will be held in Japan as the preconference of ICBP2014.

3) Young Scientist Prize:
Call for nomination,
http://icbp2014.iphy.ac.cn/icbp/Home/youngprize/index/2737336874458

Dead line: November 30, 2013

4) Connection with IUPAB:
Prof. Silvia Morante has been assigned as the representative of C6 for the connectivity with IUPAB, International Union of Pure and Applied Biophysics.

COMMISSION C8

C8 - Commission on Semiconductors

by Robin Nicholas

IUPAP C8 Commission met on 2 July 2013 during EP2DS/MSS conference, Wroclaw

1. Young Scientist Prize in Semiconductor Physics (YSP-SP)

A discussion was held and arrangements agreed for the Young Scientist competition to be held for 2014. It was agreed that the same application and selection procedure should be used as for 2012 and that the timing should be so that the prize winners could present their work as invited talks and receive their prizes during the ICPS2014 conference. A discussion was held about re-naming the prize as an Early Career prize which was not enthusiastically greeted, but without very strong opinions being expressed.

2. Planning and Supervision of ICPS (Int. Conf. on Phys. of Semiconductors) series of conferences

Formal agreement was made to recommend the application for IUPAP sponsorship as a category A conference for ICPS 2014 to be held in Austin, Texas, 10-14/08/2012 which were well in hand. Following consultations with colleagues in Australia, China and France, two full bids were received to host the 2016 ICPS-33 conference in Beijing and Montpelier. Both groups of colleagues made impressive presentations to the committee which were also circulated to the full committee. Following discussion of the bids and further email consultations it was decided to follow the normal conference rotation sequence and award the meeting to the consortium from China.

A discussion was held on possible locations for the 2018 ICPS-34 conference and it was decided to request bids to be submitted for consideration at the next C8 commission meeting which will take place during ICPS2014 in Austin.

3. Supporting Other Conferences

A bid for IUPAP support was subsequently received from the HMFSP conference 2014, which could not be supported as this is a satellite meeting of the ICPS conference and therefore not eligible under IUPAP rules.

4. Raising the profile of IUPAP

This was briefly discussed without any clear ideas other than continuing to promote the Young Scientist Prize, which was viewed as a considerable success. There was no enthusiasm for the production of a commission newsletter.

5. Commission membership

The addition of the co-opted members of the C5 and C17 commissions. Jukka Pekola (Finland) and Jason Petta(US) were noted.

Next meeting:
During ICPS2014 meeting Austin, Texas, 10-14 August 2014.

Commission membership 2011-14.

OFFICERS:		**Country:**	**E-Mail:**
Chair	R. J. Nicholas	UK	r.nicholas@physics.ox.ac.uk
Vice Chair	S. J. Lee	Korea	leesj@dongguk.edu
Secretary	M.Thewalt	Canada	thewalt@sfu.ca
MEMBERS:			
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	G. Borgs	Belgium	borghs@imec.be
	K. Ensslin	Switzerland	ensslin@phys.ethz.ch
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	R.Suris	Russia	suris@theory.ioffe.ru
	S. Tarucha	Japan	tarucha@ap.t.u-tokyo.ac.jp

COMMISSION C9

C9. Commission on Magnetism (1957)

Officers 2011-2013
Chair: Ingrid Mertig (Germany)
Vice - Chair: Ching-Ray Chang **(**Taiwan)
Secretary: Manuel Vazquez **(Spain)**

Members:
Xiaofeng Jin (China)
Carlos Cabal-Mirabal (Cuba)
Nguyen van Dau Frederic (France)
Sharika Nandan Kaul (India)
Stefano Sanvitos (Ireland)
YoshiChika Otani (Japan)
Sung-Chul Shin (Republic of Korea)
Vladimir Ustinov (Russia)
Borje Johansson (Sweden)
Andrew Boothroyd (UK)
Julie Borchers (USA)

Associate Members 2009-2012:
Sergio Rezende (Brazil)
P.H. Kes (The Netherlands)
Abdelwaheb Cheikhrouhou (Tunisia)

Associate Members 2012-2014:
C. Pfleiderer (Germany)

Activities

* One of the most important activities of C9 is to organize the International Conference on Magnetism (ICM), which is held every three years under the auspices of IUPAP. The last one, the 19th ICM, took place in July 2012 in Busan, Korea. The 20th ICM will be held in July 2015 in Barcelona, Spain. The venue of 21th ICM in 2018 has been decided to be in San Francisco, USA.
* The ICM Magnetism Award and Neel Medal, and the IUPAP Young Scientist Awards in the field of Magnetism are presented at ICM. The call for nominations for these Awards has been made in August 2011. The winners have been selected by the C9 Committee and have been presented at the 19th ICM in Korea. The ICM Magnetism Award and Neel Medal was dedicated to Prof. Sadamichi Maekawa (Japan) and to Prof. Yoshinori Tokura (Japan). The IUPAP Young Scientist Award was given to Dr. Suchitra Sebastian (UK).

New Developments in Magnetism

Magnetism is a traditional and broad field of study in physics. It is also familiar in daily life. For example, magnets may be found stuck on the door of a kitchen refrigerator. Magnetic materials are valuable not only as magnets but as electronic materials. In the past, the electron's spin and charge mostly were studied separately. A revolution in magnetism has emerged from the combination of charge and spin properties.

*** Spintronics [1]:**

Nowadays information technology is based on semiconductor and ferromagnetic materials. Information processing and computation are performed using electron charge by semiconductor transistors and integrated circuits. On the other hand, the information is stored on magnetic high-density hard disks by electron spins. Recently, a new branch of physics and nanotechnology, called magneto-electronics, spintronics, or spin-electronics, has emerged, which aims to simultaneously exploit both the charge and the spin of electrons in the same device and describes the new physics raised. One of its tasks is to merge the processing and storage of data in the same basic building blocks of integrated circuits, but a broader goal is to develop new functionality that does not exist separately in a ferromagnet or a semiconductor.

In the field of spintronics, the flow of electrical charges as well as the flow of electron spin, the so-called spin current, are manipulated and controlled together. Whereas charge current flows without decay (owing to the fundamental charge conservation), spin current decays on a length scale of less than a few micrometers. In other words, it exists only on a nanometer scale. Therefore, recent progress in the physics of magnetism and the application of spin current has progressed in tandem with the nanofabrication technology of magnets and the engineering of interfaces and thin films.

*** New quantum phases of matter:**

Discovery of new materials, and purification and microfabrication of materials provide opportunities to study new quantum phases of matter. In the following, some of them which have recently been developed are given.

a) Topological Insulators [2]: Topological insulators are insulating materials that conduct electricity on their surface via special surface electronic states. The surface states are topologically protected, which means that unlike ordinary surface states they cannot be destroyed by impurities or imperfections. Topological insulators are similar to the quantum Hall state in that they exhibit “topological order”. Unlike the quantum Hall state, which is only seen when a strong magnetic field is present, topological insulators occur in the absence of a magnetic field. In these materials the role of the magnetic field is played by spin-orbit coupling. This analogy between spin-orbit coupling and a spin dependent magnetic field provides a way to understand the simplest two-dimensional topological insulator; quantum spin Hall state, which occurs when the spin-up and spin-down electrons, which feel equal and opposite spin-orbit “magnetic fields”, are each in quantum Hall states. Recent measurement of electrical transport in a quantum well structure made by sandwiching a thin layer of mercury telluride between layers of mercury cadmium telluride suggests the possibility of the topological insulating state.

b) Multiferroics [3]: The well-established ferroic orderings, ferroelectricity, ferromagnetism, and ferroelasticity, can be switched by their conjugate electric, magnetic and stress fields, respectively. Cross coupling allows those ferroic oderings to also be tuned by fields other than their conjugates; in magnetoelectric multiferroics, a promising new toroidal ordering of toroidal moments, which should be switchable by crossed electric and magnetic fields. Spiral-antiferromagnetic ground state of Cr_2BeO_4 results in a small ferroelectric polarization. The oxide $BiFeO_3$ is another example of multiferroic materials, which shows an antiferromagnetic order and is ferroelectric. Multiferroics continue to reveal novel and unanticipated physics, and the potential applications now stretch far beyond electrical control of ferromagnetism.

c) Quantum Criticality: The quantum critical point, where the transitions occur, is present only at absolute zero temperature, but its influence nevertheless is felt in a broad regime of “quantum criticality” at nonzero temperatures, and it is the key to understanding a variety of experiments such as quantum spin systems and heavy fermions. The copper oxide compounds (the cuprates) such as $La_{2-x}Sr_xCuO_4$ which display high-temperature superconcuctivity are another example. In the stoichiometric limit, the cuprates are good insulators that display the antiferromagnetic order. By varying the relative concentration of elements, one can dope the materials with mobile charge carriers and turn them into good metals. Along the way, high-temperature superconductivity emerges. More recent examples are the iron-based pnictide compounds such as $BaFe_2(As_{1-x}P_x)$, which display a similar set of phases.

In the recent magnetism, presented are not only a wealth of studies of a variety of magnetic materials but also a new pathway towards the control of magnetism. This paradigm is epitomized by a flood of new concepts, which introduces a new front in the evolution of traditional research in magnetism.

Prefaces:

[1] S. Maekawa: Nature Materials 8, 777 (2009).
[2] C. Kane and J. Moore: Phys. World, Feb. 2011, page 32.
[3] N.A. Spaldin, S. W. Cheong and R. Ramesh: Phys. Today, Oct. 2010, page 38.
[4] S. Sachdev and B. Keimer: Phys. Today, Feb. 2011, page 29.

COMMISSION C10

C10 - The Structure and Dynamics of Condensed Matter

Report submitted by Yasuhiko Fujii, Chair

1. C10 Young Scientist Prize

2014 **Dr. Clarina R. de la Cruz**,
Lead Instrument Scientist, Neutron Sciences Directorate
Oak Ridge National Laboratory, U.S.A.

"For her outstanding achievements in the field of strongly correlated electron systems, specifically in multiferroic materials and unconventional superconductors."

Dr. Cruz received her undergraduate and Master's degrees in National Institute of Physics, University of the Philippines, Philippine in 1996-2003 and Ph.D in Department of Physics, University of Houston, U.S.A. and became a Post-Doctoral Fellow in Neutron Sciences Directorate, Oak Ridge National Laboratory and Department of Physics and Astronomy, University of Tennessee, U.S.A in 2007-2009. She has been a Lead Instrument Scientist at the present position since 2010.

Venue for the Award Ceremony & Prize Lecture

C10 has sponsored some International Conferences such as M^2S and ICSOS, but there is no major premier conference where most of C10 members can attend and hold a face-to-face Commission Meeting like other Commissions. C10 has covered a wide range of condensed matter physics so that a research field of every year's YSP winner is not predictable. Therefore, it is not practical to fix the venue for the annual Award Ceremony and Prize Lecture for C10 YSP at any biennial or triennial international conference.

On the other hand, the American Physical Society has its Division of Condensed Matter Physics (DCMP) which covers most of C10's research fields. Therefore, the annual *APS March Meeting* where some of C10 members usually attend will be a very good opportunity for C10 to cooperate DCMP organizers to celebrate a C10 YSP winner.

By taking such an opportunity, we may encourage C10 members to hold the 1st Commission Meeting at the next APS March Meeting (Denver, Mar. 3-7, 2014).

2. C10-Sponsored Conferences

(2013) No conferences nominated.

(2014) The 11th International Conference on the Structure of Surfaces (ICSOS-11, University of Warwick, UK, July 21-25, 2014) nominated for IUPAP endorsement.

(2015) The 11th International Conference on Materials and Mechanisms of Superconductivity (M^2S 2015, Geneva, Switzerland) to be nominated for IUPAP endorsement.

3. The Issue on "Soft Matter Physics"

(1) The original assignment given at the IUPAP General Assembly (London, Nov. 2011)
German delegates' claim: There is a substantial overlap between the Commissions C5, C8, C9 and C10 all covering aspects of condensed matter physics. It is proposed to dedicate C10 specifically to the emerging field of soft matter physics. The name could be either "Commission on Soft Matter" or "Commission on the Structure and Dynamics of Condensed and Soft Matter".

(2) C10's interim report to the last C&CC (Rio)
C10 has recognized the emerging soft matter physics as an important research field but has opposed such a proposal as C10 will be dedicated to soft matter because C10 has covered important research fields, which are NOT covered by any other Commissions.
C10 members, most, if not all, of whom are solid state physicists, currently favour (partial) inclusion of soft matter physics in C10 by a possible modification of its title and mandate.

(3) More intensive discussion with soft matter physicists and other related Commissions such as C3 (Statistical Physics) , C6 (Biological Physics) and C8 (Semiconductors) will be conducted although a final report is expected at this C&CC (Geneva)

4. IYCr2014 (International Year of Crystallography in 2014)

The General Assembly of the United Nations adopted a text by which it established 2014 as the International Year of Crystallography on July 3, 2012. Introducing the text, the representative of Morocco said that it decided to proclaim the Year considering that crystallography was ever-present in modern life in drug development, nanotechnology, biotechnology and the development of new materials, and that 2014 marked the centenary of the science.

The Assembly, through the text, invited the United Nations Educational, Scientific and Cultural Organization (UNESCO) to facilitate implementation of the Year and encouraged all Member States, the United Nations system and all other actors to promote awareness of the Year and of the importance of crystallography. Morocco's representative said it was hoped that the Year would have a significant educational component, particularly in developing countries where the science was least developed.

C10's mission is closely related to crystallography so that C10 will cooperate with the International Union of Crystallography (IUCr) on possible projects for IYCr2014. Currently one of C10 members, Prof. Claude Lecomte (France), has served as Vice President of IUCr.

COMMISSION C11

Activities of the Commission on Particles and Fields (C11)

October 2012 – September 2013

Hiroaki Aihara C11 Chair

1. Type A conference in past year

We had the International Symposium on Lepton Photon Interactions at High Energies (LP2013) in June 2013 in San Francisco.

2. Commission meeting

C11 meeting was held during LP2013. We have decided on venues for the future IUPAP supported conferences:

- July 2014 in Valencia: International Conference on High Energy Physics (ICHEP)
- August 2015 in Ljubljana, Slovenia: LP
- July 2016 in Chicago: ICHEP

3. Young Scientist Prize

We are calling for nominations for 2014 Young Scientist Prize.

COMMISSION C12

C12 - Commission on Nuclear Physics

Report from Hideyuki Sakai, Chair of C12

The annual meeting of C12 was held at the Villa Vittoria, in Florence during the International Physics Conference (INPC) sponsored by IUPAP on June 3, 2013. 710 participants from 55 nations. 33 invited plenary talks: 8 female speakers.This meeting was followed by the annual meeting of the IUPAP Working Group 9 on International Cooperation in Nuclear Physics which was held at INFN(Frascati). The members of WG.9 were welcome as observers to attend the meeting of C12 and vice versa.

1. IUPAP Young Scientist Prize

Selection for the IUPAP Young Scientist Prize in the field of Nuclear Physics was concluded in March 2013 following a call for nominations which was made in early July 2012. There were 32 nominations (26 males and 6 females). Prizes was awarded to the three winners (2 males and one female) at a special session of the International Conference on Nuclear Physics (INPC2013) sponsored by IUPAP, held in Florence, Italy, on June 5, 2013. The detail selection process is described in the attached document (C12_IUPAP_YSP.zip).

2. Conference recommendations

At the annual meeting of C12, the following recommendations for the IUPAP conference sponsorship were suggested after the oral presentations from each organizer:

Conferences in 2014:
Category A support:
[1st priority]
Quark Matter 2014 (QM2014),
Darmstadt,Germany, May 19-25 2014.

[2nd priority]
Particle and Nucleus International Conference (PANIC2014).
Hamburg, Germany, August 24-29 2014.

Category B support:
[1st priority] Pre-approved last year.
Advances in Radioactive Isotope Science (ARIS2014)
Tokyo, Japan, 1-6 June 2014.

[2nd priority]
Nuclei in Cosmos (NIC2014)
Debrecen, Hungary, 300 participants,7-11 July, 2014.

[3rd priority]
Spin Physics Symposium (SPIN2014)
Beijing, China, 20-24 October, 2014.

[No support]
22nd European Few Body Conference (EFBC2014)
(Regional but not international conference character)

[Future International Nuclear Physics Conference (INPC2016)]
C12 evaluated three bids received for hosting INPC2016 - Adelaide, Australia presented by Anthony Thomas (chair) - Institute of Modern Physics, Lanzhou-HIRFL, China, presented by Gouquing-Xiao (chair) - Tel-Aviv, Israel, presented by Israel Mardor (co-chair) After careful deliberation, the C12 commission selected the site of the next INPC (INPC2016) to be in Adelaide, Australia. It should be noted that the INPC moves around the continents, America, Europe and Asia.

INPC2007 Tokyo, Japan
INPC2010 Vancouver, Canada
INPC2013 Florence, Italy

An application of INPC2016 for the IUPAP conference support will be made next year by the organizers for pre-approval.

3. New IUPAP-IUPAC Joint Working Party

The new IUPAP-IUPAC Joint Working Party (JWP) established in last January 2012 is now considering the claims for the discovery of elements with atomic numbers 113, 115, 117 and 118 or heavier. It was informally announced that the work is progressing steadily.

COMMISSION C13

C13 - Commission on Physics for Development

Report from Paulo Murilo Castro de Oliveira (Chair)

Report on the IUPAP-C13 meeting, August 17, 2013

The annual meeting of the C13 IUPAP commission (physics for development) occurred in Trieste, August 17, 2013, hosted by our traditional partner institution ICTP (International Centre for Theoretical Physics). Present at this meeting were Paulo Murilo Castro de Oliveira (chair), Sandro Scandolo (vice-chair), Ahamadou Wague (secretary), the members Carmen Cisneros, Sekazi Mtingwa, Dénes Nagy, Samuel Mensah, Mourad Telmini and Fernando Quevedo (C13 associated and ICTP director). By skype, member Anatoly Dvurechensky also participated.

C13 has improved a lot its actions during the last decade, good events (congresses and schools) were sponsored in Africa, Asia and Latin America, all of them very well evaluated by the physics community (ASESMA school in Africa, for instance, was awarded last year by ICSU, the IUPAP mother institution). The number of students profiting from these events grew consistently during this period. Now the number of applications for 2014 has exploded, we received 7 good applications. However, the C13 budget is only 21,000 euro per year, with a maximum share of 7,000 euro per each sponsored event (IUPAP type D). Before, the maximum number of received applications was 4, last year. During the meeting, it was a consensus that all 7 applications present very good quality, deserving IUPAP endorsement. We recommend this action to IUPAP council.

The conference application from Romania (Advanced many-body and statistical methods in mesoscopic systems - second edition), however was considered not fitting the scope of IUPAP type D conference. Therefore, C13 decided not recommend financial support.
Also, the conference application from Tunisia (First African Conference on Optics and Applications to Sustainable Development, supposed to occur this year (2013)) should have been sent to IUPAP one year ago. It was accepted by IUPAP administration, probably, by mistake. Anyway, for that reason C13 decided not to recommend financial support.
Concerning the other 5 applications, C13 evaluated that all deserve the full share of 7,000 euro each, due to their quality. However, this would not fit into the current C13 budged. Therefore, we recommend financial support according to the following list of priorities, with the indicated values:

1) conference application from Senegal (LAM10 International conference on Optics and Lasers in Science and Techniques for Sustainable Development), with the full share of 7,000 euro;

2) school application from Nigeria (African School on Electronic Structure Methods and Application 2014, ASESMA 2014), with 6,000 euro;

3) conference application from Mexico (8th International Meeting on Photodynamics and Related Aspects), with 4,000 euro;

4) conference application from Cameroon (COOPERATIVE PHENOMENA IN CONDENSED MATTER PHYSICS: FROM BEC TO NON-LINEAR OPTICS), with 2,000 euro;

5) school application from Senegal (Third Biennial African

School of Fundamental Physics and its Applications), with 2,000 euro.

Another subject treated during the meeting was the possibility of implementing a prize for outstanding individual contributions to physics in developing countries. According to the 2005 IUPAP general assembly decision, each commission has a budget for an annual young scientists prize to be awarded for outstanding scientific contributions. It was already awarded to many young scientists by other commissions, since then. It was a consensus during the meeting that this program does not fit completely into the quoted aim of a would-be C13 prize.

Therefore, C13 consults the IUPAP council about the possibility of considering the already implemented program of young scientists prize in a slightly modified characteristic for C13 in particular, allowing us to award scientists resident in developing countries for their outstanding contributions to physics studies in these countries.

Finally, the last subject discussed in the meeting is a suggestion to IUPAP council. Existing international organisations in physics whose aims and activities are in harmony with those of IUPAP may wish to establish stable and formal link to IUPAP. This is especially important for organisations with significant impact in physics for development like associations on methods that are widely used in developing countries. Such a request was received some time ago from IBAME, the International Board on the Applications of the Mössbauer Effect. IBAME, which has been an Associated Organisation of IUPAC since many decades, asked for establishing similar links to IUPAP. Unfortunately, within the frames of the present IUPAP structure there is no room for a link to another international organisation similar to the IUPAC Associated Organisation. Existing categories like Members, Observers and Working Groups are much different in character. C13 believes that establishing a new kind of links to existing international organisations in Physics could significantly contribute to supporting IUPAP aims and activities and also contribute to the visibility of IUPAP.

Therefore C13 suggests that the IUPAP Executive Council considers setting up a new category of IUPAP Associated Organisations under similar conditions to those of the IUPAC Associated Associations.

COMMISSION C14

C14 - Commission on Physics Education (ICPE)

Report on the Activities 2012-2013

The Commission held its annual International Conference in Prague, in the Czech Republic, 4-10 August 2013. It was organized with the cooperation and support of the Physics Education Division of the European Physical Society and the Faculty of Mathematics and Physics at Charles University. The conference was well attended and was a great success scientifically and organizationally, thanks in no small part to the highly efficient local organizing effort led by the C14 secretary, Prof Leos Dvorak.

At the Conference, the 2013 ICPE Medal was presented to the *International Young Physicists' Tournament* in recognition of IYPT's sustained contribution to international physics education over many years.

Plans for the 2014 ICPE Conference in Cordoba, Argentina were announced.

ICPE held its annual face-to-face meeting immediately after the end of the conference. 13 of the 14 members were present. Prof Zulma Gangoso, the new editor of the greatly valued ICPE Newsletter, described her plans for future editions. Prof Gorazd Planinsic agreed to coordinate ICPE's future efforts regarding the hands-on Physware Workshops, particularly the organization of a 2015 International Workshop at ICTP in Trieste. Prof Nianle Wu agreed to lead the organization of the 2015 ICPE Conference in China, and it was confirmed that the 2016 Conference would be held in Brazil, as part of the Second World Conference on Physics Education.
The tentative hope was expressed that ICPE 2016 would be in Africa.

Robert Lambourne
C14 Chair

COMMISSION C15

International Union of Pure and Applied Physics

To stimulate and facilitate international cooperation in physics and the worldwide development of science.

Commission C15: Atomic, Molecular and Optical Physics

Chair: K. Gebbie, Physical Measurement Laboratory, NIST Gaithersburg, MD, USA. **gebbie@nist.gov**

Vice Chair: D. Mathur, Tata Institute of Fundamental Research, Mumbai, India: **atmol1@tifr.res.in**

Secretary: T. Azuma, Atomic, Molecular & Optical Physics Laboratory, RIKEN, Hirosawa, Wako, Japan **Toshiyuki-azuma@riken.jp**

Report to the IUPAP Council & Commission Chairs meeting CERN, 1-2 October 2013

The two large international conferences in Atomic, Molecular and Optical Physics are the International Conference on Atomic Physics (ICAP) and the International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC), which are held biennially on alternating years.

Commission C15 members met on 26 July 2013 during the XXVIII ICPEAC Conference in Lanzhou, China. Japan, China, Germany, France, Austria and the United States were represented by their Commission members. We were particularly pleased that the two previous C15 Chairs, Joachim Burgdörfer and Burkhard Fricke were able to attend and give us the benefit of their experience.

The meeting included a discussion of how Commission 15 might best contribute to the mission of IUPAP to assist in the worldwide development of physics, to foster international cooperation in physics, and to help in the application of physics toward solving problems of concern to humanity. It was suggested that one approach might be to sponsor Type D Conferences: Workshops in Developing Countries. One model might be the Industrial Physics Forum 2012: *Capacity Building for Industrial Physics in Developing and Emerging Economies*, sponsored jointly by American Institute of Physics (AIP) and the International Center for theoretical Physics (IPST).

The soliciting and ranking of nominations for the Young Scientist Prize in AMO Physics is highly competitive and taken very seriously by all members of the Commission. This year, thanks to our Secretary's efforts, we had an all-time high number of 38 candidates, 24 who were still eligible from previous years and 14 new nominations. The winner is Dr. Till Jahnke from the University of Frankfurt "for his groundbreaking experiments on Interatomic Coulombic Decay – From experimental proof to making a movie".

The proposed change in the name of the IUPAP Young Scientist Prize was also discussed by the Commission members and former Chairs. They generally felt the present name was not a serious problem, and for the prestige and integrity of the prize, the name should remain the same.

Conference support for 2013

27th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC XXVII)
Location: Lanzhou, China
Date: 24 - 30 July 2013
Chair: Toshiyuki Azuma (RIKEN, Tokyo)
Conference Type: A

21st International Conference on Laser Spectroscopy (ICOLS)
Location: Berkeley, CA USA
Date: 9 - 12 June 2013
Co-Chairs: Dmitr Budker and Harmut Haffner (UC Berkekey)

The 2014 Meeting of Commission 15 will take place during the 24th International Conference on Atomic Physics (ICAP), 3-8 August, at the Mayflower Renaissance Hotel in Washington, D.C. USA. The event will be hosted by the Joint Quantum Institute, a partnership between the National Institute of Standards and Technology and the University of Maryland, with support from the Laboratory for Physical Sciences.

COMMISSION C16

IUPAP C16 report 2012-2013

submitted by Robert Bingham (Chair)

I. IUPAP C16 SPONSORED/ENDORSED CONFERENCES

The XXXI International Conference on the Phenomenon in Ionized Gases (ICPIG)
Granada, Spain July, 2013.

II. C16 2012 YOUNG SCIENTIST PRIZE IN PLASMA PHYSICS

Purpose: The IUPAP Commission C16 Young Scientist Prize recognizes exceptional achievement in the study of plasma physics by scientists at a relatively junior stage of their career. The recipient must be no more than eight years post PhD (excluding career interruptions) by the deadline of the competition, and is expected to have displayed significant achievement and exceptional promise for future achievement in an area of plasma physics. The Prize will consist of 1,000 Euro and a Medal and Certificate.

The prize selection committee will consist of C16 commission members.

2013 Award Winner: Peter Bruggeman won the IUPAP C16 Young Scientist Prize.

The citation reads:
For studies that have provided fundamental insights into the nature of plasmas in and in contact with liquids, and of basic phenomena in non-equilibrium atmospheric-pressure discharges.

Peter Bruggeman carried out his research at the University of Eindhoven, NL. He has now taken up the position of Richard and Barbara Nelson Associate Professor of Mechanical Engineering at the University of Minnesota, USA.

The IUPAP C-16 medal and certificate were presented at the XXXI International Conference on the Phenomenon in Ionized Gases (ICPIG), Granada, Spain July, 2013.

IUPAP is considering renaming the Young Scientist Award in the future as the *Early Career Award.*

III. IUPAP C16 COMMISSION MEETINGS

July 2013 – XXXI International Conference on the Phenomenon in Ionized Gases (ICPIG) Granada, Spain.

November 11 – 15, 2013 Annual meeting of the APS Division of Plasma Physics (DPP), Denver, CO.

The C16 meeting is scheduled to take place at the this meeting.

IV. FUTURE MEETINGS

The following conferences have requested IUPAP support.

The International Congress in Plasma Physics (ICPP), 15th -19th August 2014, Lisbon, Portugal. Organised by Professor Tito Mendonca.

ICPP is a category A conference.

The International Conference on the Physics of Dusty Plasmas (ICPDP) 16th -20th May 2014, Dehli, India.
Organised by Avinash Khare, University of Dehli, India.
ICPDP is a category B conference.

V. OTHER C16 COMMISSION ACTIVITIES

Response to the Royal Society Questionnaire: The C16 Commission Chair, Robert Bingham, suggested that the grand challenge in plasma physics is fusion energy, and that the National Ignition Facility (NIF) at Livermore, and The International Thermonuclear Experimental Reactor (ITER), being built in Cadarache, France, are to plasma physics, equivalent to the LHC at CERN.

Footnote: In August the National Ignition recorded the highest yield fusion shot. It is making steady progress towards ignition and gain.

COMMISSION C17

C17 - Commission on Quantum Electronics

Report submitted by Victor Zadkov (Chair)

1. Changing the name of the commission

Under the effort to align the name of the commission with the research topics of modern optics and photonics and following the recommendation of the IUPAP Executive Council a working team of people was composed to discuss and make recommendations regarding the C17 name:

Victor Zadkov (chair C17)
Deborah Kane (vice-chair, C17)
Cristina Masoller (secretary, C17)
Martin McCall (member, C17)
Katharine Gebbie (chair C15) or a replacement from C15 on her recommendation
Duncan Moore (chair AC1) or a replacement from AC1 on his recommendation
John Dudley (EPS associated member of C17, president of the EPS)

2. Associated members of C17

At the last IUPAP Executive Council and Committees Chairs meeting in October 2012 C17 suggested to approve the European Physical Society (EPS) as an associated member of the commission, and this proposal was approved. Two persons from the EPS are named as the representatives:

John Dudley, President of the EPS, former chair of the QEOD/EPS
David Lee, Secretary General, EPS

3. IUPAP C17 Prize for Young Scientists

The selection rules for the IUPAP C17 Prize for Young Scientists were discussed by the C17 commission members and respectively changed in order to allow selection of up to two winners (one for fundamental and one for applied aspects) prior to the award ceremony.

The upcoming 2013 Call for the IUPAP C17 Prize for Young Scientists has been prepared and launched. It was agreed that the Award Ceremony will take place at the Optics & Photonics Taiwan International Conference (OPTIC 2013) to be held in Zhogli, Taiwan, on 5-7 December, 2013. This is an international meeting with up to 1000 participants, covering most of the areas of QE and applications, and in a nice location.

COMMISSION C18

C18 – Commission on Mathematical Physics

Report by Jakob Yngvason (Chair)

In past years, the main activities of the Commission C18 for Mathematical Physics have been connected with the triannual International Congress of Mathematical Physics (ICMP), both the congress itself and the selection of laureates for the IUPAP Young Scientists Prizes, where the prize ceremony is part of the programme of the ICMPs. As already reported at the C&CC meeting in Rio the last ICMP took place in Aalborg, Denmark, August 6-11 2012 and three IUPAP Young Scientists Prizes were awarded.

Besides the ICMP there is another series of regular conferences on general topics in Mathematical Physics, the QMath conferences, that could potentially qualify for IUPAP support. They have, however, so far not fulfilled the IUPAP requirements about the minimum number of participants, the number typically being less than 200. The last conference in this series, QMath 12, took place at the Humboldt University of Berlin September 10-13 this year, but the organizers decided to abstain from an application to IUPAP for the reason mentioned.

The next ICMP will be in Santiago in Chile in August 2015 with Professor Rafael Benguria, Universidad Católica de Chile, as congress convener. It is expected that the organizers will next year apply for IUPAP support. The soliciting process for the next candidates for the IUPAP Young Scientists Prizes has already begun within the C18, but the final selection and decision about the prize winners will only take place during the next year.

COMMISSION C19

C19 - Astrophysics

Activity report submitted by Grazina Tautvaisiene (C19 Secretary)

1) IUPAP Young Scientist Medals in the field of Astrophysics

Call for nominations for the IUPAP Young Scientist Medals in the field of Astrophysics of 2013 was announced in April of 2013. Applications of five outstanding astrophysicists have been received by the 1st of July. A committee of five members was appointed which reviewed the applications and selected the winners.

The IUPAP Young Scientist Medal in the field of Astrophysics of 2013 will be awarded to Alicia Soderberg (Harward University, USA) for discovering of new classes of explosions in the Universe across the electromagnetic spectrum, including the first X-ray flare associated with a shock breakout in a supernovae (SN 2008D), and the first luminous radio emission from a supernova (SN 2009bb) which requires a substantial relativistic outflow powered by a central engine without an observed gamma-ray burst.

Dr. Alicia Soderberg will present her work at the 27th Texas Symposium on Relativistic Astrophysics (December 8–13, 2013 in Dallas, USA), where the IUPAP Medal will be awarded.

2) IUPAP support of international conferences

For the IUPAP support has been selected the 27th Texas Symposium on Relativistic Astrophysics to be held in Dallas on 8–13 December, 2013.

There are no symposia selected for the IUPAP support in 2014.

3) Participation in organizing committees of international conferences supported by IUPAP

Four members of C19 are members of the Scientific Organising Committee of the 27th Texas Symposium on Relativistic Astrophysics to be held in Dallas on 8–13 December, 2013 (Thanu Padmanabhan, Victoria Kaspi, Grazina Tautvaisiene and assoc. member Virginia Trimble).

COMMISSION C20

C20 - Commission on Computational Physics

Report submitted by Alex Hansen (Chair)
Trondheim, September 14, 2013

Conferences:

The Conferences on Computational Physics (CCP) form an international series of conferences which has served as a lively forum for computational physicists from around the world. Since 1998, the CCP conferences rotate yearly between the European/African continents, the Asian/Oceanian continents and the Americas. In 1997, the CCP conference series succeeded the EPS-APS Joint Conferences "Physics Computing" (PC) organized annually since 1989.

The XXV IUPAP Conference on Computational Physics CCP2013 was held in Moscow, Russia on August 20-24 (ccp2013.ac.ru). There were around 200 registered attendees. It was chaired by Professor Lev Shchur of the Landau Institute for Theoretical Physics and C20 member. The conference spans the entire field of computational physics, from astrophysics to nanoscience. *The XXVI IUPAP Conference on Computational Physics CCP2014* will be chaired by Professor Anders Sandvik and will be held at Boston University. The dates are August 11-14, 2014 – but this *may* be adjusted in order to avoid collision with LT-27 – the large C5 conference. *CCP2015* will be organized by Professors Sitangshu Bikas Santra of the Indian Institute of Technology at Guwahati and Purusattam Ray of the Institute for Mathematical Sciences in Chennai at the IIT campus in Guwahati in the state of Assam (India) as venue. At present we are discussing the location of CCP2016 and CCP2017. The most likely venues are Paris (2016) and South Africa (2017).

Young Scientist Prize:

We only received two nominations of the YSP this year. We voted that this number was too low and will award two medals in 2014. We will invest effort in improving the way the medal is announced.
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