

Commission Reports to the IUPAP C&CC Meeting

November 5-6 2010

C2. Commission on Symbols, Units, Nomenclature, Atomic Masses & Fundamental Constants (SUNAMCO)

- **Recommendation of IUPAP to the Consultative Committee for Units (CCU).** Following up on the 2008 IUPAP Resolution on Redefinitions of SI Units, a document with the recommendation of IUPAP was submitted at the CCU meeting in May 2009. At the CCU meeting in September 2010 the recommendation of IUPAP was reaffirmed. A committee attached to C2 to monitor changes in the SI and to consider further recommendations has been formed.
- **Commission C2 Meetings.** Commission C2 held two meetings in 2010. One in conjunction with the Conference on Precision Electromagnetic Measurements, in Daejeon Korea on June 17 and another in conjunction with the meeting of the CCU at the International Bureau of Weights and Measures (BIPM), in Sèvres, France on September 16. The report from the latter meeting is included below.
- **Commission C2 Website.** The C2 web site will no longer be supported at its present location and a new host needs to be found. It is expected that IOP will provide space on the IUPAP website for pages to be maintained directly by the individual Commissions.
- **Red Book.** An update of the Red Book on nomenclature in physics published by IUPAP has been undertaken by C2. This book has been widely distributed since its latest revision in 1987. The revision will be of particular importance when the redefinitions of SI Units are implemented. A committee attached to C2 has been formed to carry out this task.
- **Conference recommendation.** Conference on Precision Electromagnetic Measurements (CPEM 2012). C2 recommends support of this series. The next conference is to be held in Washington DC. This conference has applied for IUPAP support and is recommended for support as a Type A conference by C2.
- **Young Scientist Award.** C2 is recommending changing the time criterion on the Young Scientist Award to refer to the start of the professional career rather than to receipt of the Ph.D. The reason is that not every professional in the fields of interest necessarily holds a Ph.D.
- **Committees attached to C2.** The suitability of commissions forming committees to address specific issues is to be raised with IUPAP. This is of particular interest for C2, because the range of topics covered in the commission is broad and the number of available experts in each area within the commission is limited. Thus it is beneficial to form appropriate committees consisting of experts from C2 together with other experts who are not members. There are people willing to participate and this can considerably enhance the effectiveness of the commission.

Report of the C2 meeting in September 2010

IUPAP Commission C2 – SUNAMCO

Meeting at BIPM, Sèvres

16 September 2010 at 14:00

Present: Peter Mohr (USA, Chair), Christian Bordé (France, Vice-Chair), Stephen Lea (UK, Secretary), Jörn Stenger (Germany, Member), Jeff Flowers (UK, Associate Member), Savely Karshenboim (Russia, Associate Member), Ian Mills (representing IUPAC), Michael Kühne (Deputy Director, BIPM, Observer), Ambler Thompson (NIST, Observer).

Thanks are due the BIPM for providing facilities for this meeting.

1. Formation of a subcommittee to revise the IUPAP Red Book on physics nomenclature.

The provisional list of members proposed at the June 2010 meeting at CPEM was confirmed: Stephen

Lea (Chair), Christian Bordé, Jeff Flowers, Jeremy Frey, Savely Karshenboim, Peter Mohr, Kumar Sharma, and Jörn Stenger. It would be desirable to have input from other IUPAP Commissions as well as other relevant groups and Scientific Unions in addition to IUPAC, e.g. the Particle Data Group, IAU, IUGS. In the light of this the group should be referred to as the Committee for Revision of the Red Book on Symbols, Units, and Nomenclature in Physics, rather than as a subcommittee of SUNAMCO. The possibility of establishing this Committee as an IUPAP Task Group should be raised with the IUPAP Secretariat.

Not all C2 members currently have access to the Red Book either in hard copy or PDF. The stock of hard copies is thought to be distributed among past C2 chairs and others but should be consolidated so that it can be made available on request. The PDF version generated by Jeff Flowers had been available on the C2 website formerly hosted by SP (Sweden); this has been unavailable for the past two years. Copies of the PDF to be distributed to C2 members. Some sections of this PDF version could not easily be compiled from the original TeX files and hence are scanned in from the printed version. Peter Mohr will attempt to solve the TeX issues so that a uniform PDF version can be made available. The most urgent step is to make this PDF available via the proposed IoP-hosted C2 website, with links to related sites e.g. CODATA, PDG, IUPAC Green Book.

The format of a revised Red Book was debated. Whilst it will be convenient to publish revised or additional sections on the website as they are produced, it is considered desirable to publish a definitive hard-copy edition at some appropriate point. This fulfils the desire to have an authoritative, citable document. The PDG's Review of Particle Properties was put forward as a model.

2. Formation of a subcommittee to refine the C2 position on the redefinition of the International System of Units and the timing of the changes. The provisional list of members proposed at the June 2010 meeting at CPEM was confirmed with one addition: Peter Mohr (Chair), Stephen Lea (Secretary), Christian Bordé, Jeff Flowers, Savely Karshenboim, and Jörn Stenger. This group should also seek input from other IUPAP Commissions (e.g. the Commission on Physics Education) and eminent physicists from outside the metrology community. Consequently it should not be designated a subcommittee of C2 but will provisionally be referred to as the SUNAMCO Committee on the Redefinition of the International System of Units. It is recognised that it can have little influence on the timing of changes. It was also noted that the 26th IUPAP General Assembly adopted a resolution (resolution 8) on the SI redefinitions, *i.e.* the proposed changes do have the support of the wider physics community. The initial function of this committee will be to publicise the proposed changes. There is a particular need for 'popular' articles in languages other than English, e.g. in the magazines of national Physical Societies.

A first meeting of this Committee is proposed to coincide with the Royal Society meeting in January 2011.

3. Restatement of the criteria for the Young Scientist Award in order not to set the time limit based on completion of the Ph.D., which is not a requirement, but rather on the metrology career starting date. It was agreed at the June 2010 meeting that reference to the Ph.D. is not relevant. Peter Mohr will raise this at the next Chairs meeting. Possible candidates were mentioned; the committee was reminded that the award is made via a nomination process.

4. Discussion of candidates for the SUNAMCO medal. A number of candidates were mentioned and a list will be circulated to C2 members to stimulate discussion and elicit further suggestions.

5. Formulation of a policy on the representation of physics terminology and vocabulary by organizations that include representation by C2/IUPAP. The Red Book – ultimately in its revised version – is the authoritative document for the IUPAP position on these matters.

6. Reports from C2/IUPAP representatives to other organisations. Peter Mohr gave a verbal report on the outcome of the CCU meeting which directly preceded this meeting. A form of words for redefinition of the SI units has been recommended to CIPM and should then go to the 2011 CGPM.

Savely Karshenboim reported on the activities of the Russian national committee on units in promoting changes to the SI. A meeting is to be held in December at which Peter Mohr is an invited speaker.

Other reports had been received at the June CPEM meeting.

The question of IUPAP representation on bodies concerned with units where we are not already represented, e.g. IAU, was raised. We should be selective, as we do not have the manpower or resources to cover all the requests received.

C2 provides or is requested to provide IUPAP representation to numerous bodies but there appears to be no standard procedure for issuing letters of appointment. Stephen Lea and Peter Mohr to pursue this with the IUPAP secretariat.

7. Formulation of the C2 Web pages on the IOP-IUPAP server in the UK. Provision of these pages by loP has become a matter of urgency as other C2 activities are depending on it. Stephen Lea to pursue this with IUPAP secretariat/loP.

Once the pages are available, the following should go on as a priority:

- The Red Book in its current (PDF) form.
- Information on the proposed changes to the SI.
- Information on the Young Scientist Award and SUNAMCO medal.
- A restricted section for members-only material.

8. Representation of the atomic mass community on SUNAMCO. Savely Karshenboim reminded the meeting that the atomic mass community is now under-represented on the commission and that the chairmanship had formerly alternated between individuals from the fundamental constants and atomic mass communities. Commission meetings were also formerly held at atomic mass conferences as well as at CPEM. The range of candidates for the Young Scientist Award is also affected by the lack of representation of this community. However, as nominations for C2 membership are made by national organizations, this matter is largely out of the hands of the current C2 membership.

9. Next meetings.

The SUNAMCO Committee on the Redefinition of the International System of Units will meet as a satellite to the Royal Society meeting on the new SI, London, 24-25 January 2011.

A full C2 meeting is proposed as a satellite to the next CODATA meeting, which is expected to be held at the BIPM in mid-2011.

Stephen Lea
23 September 2010

C3. Commission on Statistical Physics

The main activity of the C3 Commission since July 2007 has been

i) the organization of the Statphys24 conference ii) the award of the Boltzmann medal, iii) the award of the Young Scientist Prize, iv) the choice of the venue for the Statphys25 conference and v) selection of new members and chairs for the C3 Commission.

Organization of Statphys24

Statphys is the main international conference of the C3 Commission, and is a major meeting point for the international Statistical Physics community.

At the last Statphys 23 conference in Genova, the C3 Commission voted that the venue for the coming Statphys 24 conference would be Cairns Australia.

At the previous Genova meeting (July 2007), the C3 Commission named six of its members to serve on the Steering Committee (SC):

H. Orland (Chairman)
A. Bray
M. Telo da Gamma
S. Ruffo
S. Ramaswamy
M. Wadati

The Australian National Organizing Committee, headed by M. Batchelor, J. de Gier, M. Gould, J. Links, and D. Evans, proposed additional SC members to the C3 commission, and after some discussions, 6 more SC members were added to cover all relevant topics:

E. DOMANY
D. EVANS
E. FRADKIN
A.J. GUTTMANN
V. RITTENBERG
F. SCIORTINO

A large International Advisory Committee (IAC) was selected, together by the C3 Commission and by the National Organizing Committee.

The C3 Commission selected a list of eleven conference topics:

- General aspects of statistical physics
- Mathematical aspects
- Nonequilibrium processes
- Quantum systems
- Fluids and soft matter
- Surfaces and Interfacial phenomena
- Non-linear phenomena
- Disordered and glassy systems
- Biological physics
- Statistical modeling of biological data
- Interdisciplinary topics in statistical physics

The IAC sent out nominations for plenary and invited talks for Statphys 24. The SC met in Paris on July 3 and 4, 2010, and selected a list of 44 speakers for the conference from those proposed by the IAC.

The Statphys24 conference took place from **July 19-23, 2010**, in Cairns Australia. Among the highlights, there were plenary talks by R. Baxter, C.N. Yang (Nobel laureate), M. Freedman (Fields

medalist) and W. Ketterle (Nobel laureate).

There were about 700 participants, and the conference was very successful.

Boltzmann Medal

During its mandate, the C3 Commission is responsible for awarding the Boltzmann Medal. The Boltzmann medal is the most prestigious international prize in statistical physics. The jury consists of all the members of the C3 Commission, as well as the previous Boltzmann medalists.

After the usual three rounds of votes, the Boltzmann medal was jointly awarded to John Cardy (Oxford University) and Bernard Derrida (Ecole Normale Supérieure, Paris). The formal ceremony of the Boltzmann medal took place during the Statphys24 conference.

Young Scientists Prize

During its mandate, the C3 Commission is also responsible for awarding the Young Scientist Prize. The jury consists uniquely of the C3 Commission members. There were eight outstanding nominees, and after the three usual rounds of vote, the Young Scientist Prize was awarded to Davide Marenduzzo (University of Edinburgh). The formal ceremony of the Boltzmann medal took place during the Statphys24 conference.

Venue of Statphys25

The Statphys meeting presents a rare opportunity to organize a full meeting of the C3 Commission. During this meeting of the C3 Commission, we auditioned three proposals for the organization of the next conference Statphys25, which will take place in July 2013. The presentations were made by Seoul, Barcelona and Taipei. After these auditions, it was decided that the next Statphys25 conference would be organized in Seoul, at the Seoul National University.

The organizing committee consists of

Doochul Kim (Seoul National University, Chair)

Hyunggyu Park (KIAS, Vice-Chair)

Moo Young Choi (Seoul National University, Vice-Chair)

Swan Kim (POSTECH, Vice-Chair)

Youngah Park (Myongji University & National Assembly)

Byungnam Kahng (Seoul National University, Secretary)

The C3 Commission has appointed five of its members to be in the Steering Committee, namely Stefano Ruffo (Chair), Lu Yu, Hans-Werner Diehl, Itamar Procaccia and Hans Hermann.

New members and executive committee of the C3 Commission

The meeting of the C3 Commission at Statphys 24 is also the opportunity to choose the new members, which will replace the departing members in 2011, and choose a new Chair, vice-Chair and secretary.

The final list of recommendations for the C3 Commission to be conveyed to IUPAP consists of:

- Stefano Ruffo (Italy) Chairman
- Lu Yu (China) Vice-Chairman
- Hans-Werner Diehl (Germany) Secretary
- Francisco Alcaraz (Brazil)
- Henk van Beijeren (the Netherlands)
- Alan Bray (United Kingdom)
- Jean-Francois Joanny (France)
- Hans Herrmann (Switzerland)
- Rahul Pandit (India) Itamar Procaccia (Israel)

- Maxi San Miguel (Spain)
- Masaki Sano (Japan)
- Beate Schmittmann (USA)
- Paul Wofo (Cameroon)

C4. Commission on Cosmic Rays

The **16th International Symposium on Very High Energy Cosmic Ray Interactions (ISVHECRI 2010)**; <http://indico.fnal.gov/conferenceDisplay.py?confId=2658>), co-sponsored by the IUPAP and Fermi National Accelerator Laboratory (FNAL), Batavia IL, USA, was held from June 28 to July 02, 2010 at FNAL. The proceedings of the Symposium are available online at http://www.auger.org/ISVHECRI2010/ISVHECRI_econf_proceedings.html.

The **22nd European Cosmic Ray Symposium (ECRS 2010)**; <http://ecrs2010.utu.fi/>) was held at the University of Turku, Turku, Finland, during August 03-06, 2010. The papers presented at the meeting are available online at the symposium website and will be published as a special issue of the online-journal, Astrophysics and Space Sciences Transactions (ASTRA).

The **32nd International Cosmic Ray Conference (ICRC2011)**; <http://icrc2011.ihep.ac.cn>) will be organized by the Institute of High Energy Physics of the Chinese Academy of Sciences in Beijing during August 11-18, 2011. The **12th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2011)**; <http://taup2011.mpp.mpg.de/>) will be organized by the Max Planck Institut fuer Physik and Technische Universitaet Muenchen at Munich, Germany during September 05-09, 2011 at Munich, Germany.

Suresh Tonwar
IUPAP Commission on Cosmic Rays (C4)

Tata Institute of Fundamental Research
Homi Bhabha Marg, Navy Nagar, Colaba,
Mumbai 400 005, India

C5. Commission on Low Temperature Physics

OFFICERS 2008-2011:

Chairman: Robert Hallock, USA
Vice-Chairman: Alain Ravex, France
Secretary: Kimitoshi Kono, Japan

Members:

Alexander, Feher, Slovak Republic
Karen Hallberg, Argentina
Mustafa Kamal, Egypt
Peter Kes, Netherlands
Hu-Jong Lee, Korea
Ting-Kuo Lee, Taiwan
Paul Leiderer, Germany
Jukka Pekola, Finland
John Saunders, United Kingdom
Alexander Smirnov, Russia
Nan Lin Wang, China

Associate Members:

Sriram Ramaswamy, India (from C3)
Pawel Hawrylak, Canada (from C8)
Sadamichi Maekawa, Japan (from C9)

MAIN ACHIEVEMENTS

C5 will hold its next formal commission meeting in association with the approved type A conference LT26 (Beijing, August, 2011). It recently sponsored or sanctioned two conferences [Quantum Fluids and Solids, 2010, Grenoble, France (type B); Cyrocrystals and Quantum Crystals, Chernogolovka, Russia (type C)]. Advertisements to solicit proposals to host LT27 (Type A) in 2014 have been placed as has the advertisement to solicit nominations for the C-5 Young Investigator Prize, which will be next awarded in August 2011 at the LT26 meeting (see below for the texts of these solicitations).

COMMISSION MEETINGS

Meeting of C5:

The most recent full commission meeting was held on August 9, 2008, in connection of LT25 in the RAI Congress Center, Amsterdam.

Present: 10 out of 13 members were present

Agenda:

- 1) Review of the minutes of the C5 mid-term Meeting in 2007
- 2) Preliminary report on LT25 by Peter Kes.
- 3) Proposal for organizing LT26 by Li Lu, Chinese Academy of Sciences
- 4) Members of C5 for the 2009-2011 term

- 5) Other C5 matters:
- IUPAP Young Scientist Prize in Low Temperature Physics
 - C5 WEB-page (<http://www.iupap.org/commissions/c5/website.html>)
 - Report on QFS 2007 in Kazan
 - Report on IUPAP Working Group on Nanoscience
 - London Prize and Simon Prize

In addition there has been periodic e-mail communication among the members when that was necessary (e.g. to approve the wording and the deadlines for the solicitations for the Young Investigator Award and the call for proposals to host LT27).

The next formal meeting will be held at the time of the LT26 meeting in Beijing.

COMMISSION SPONSORED CONFERENCES (2009)

Type B

Quantum fluids and Solids 2009

August 5-11, 2009, Evanston, Illinois, USA, Chairman: William Halperin (co-Chairman Harry Kojima), 260 participants attended. (<http://www.qfs2009.northwestern.edu/>)

Type B

5th International School and Conference on Spintronics and Quantum Information Technology

July 7 – July 11, 2009, Crakow, Poland, Chairman: Tomas Dietl (Co-Chairman Daniel Loss)
(<http://info.ifpan.edu.pl/spintech5/>)

COMMISSION SPONSORED CONFERENCES (2010 and beyond)

Type B

Quantum fluids and Solids 2010

August 1 - 6, 2010, Grenoble, France, Chairman: Henri Godfrin (co-Chairman Yuriy Bunkov), 300 participants attended; this was about 15% higher than previous such conferences. A special (and successful) effort was made to enhance the number of women on the committees and invited to deliver talks. A special poster section was devoted to young scientists. Proceedings will be published (with the normal journal review process) in the Journal of Low Temperature Physics.
(<http://qfs2010.neel.cnrs.fr/>)

Type C

Cryocrystals and Quantum Crystals 2010

July 26 – 31, 2010, Chernogolovka, Russia, Chairman; A.F. Andreev (co-chairs A. Levchenko and L.P. Mezhov-Deglin). This was a successful conference (with most attendees from Russia and the former Soviet Union). A school of young scientists was held in conjunction with the conference.
(<http://issp3.issp.ac.ru/cc2010/>)

Type A (approval previously granted)

26th International Conference on Low Temperature Physics (LT26)

Tentative dates: August 10 – August 17, 2011, Beijing, China, Chairman: Li Lu

Type B (comment)

It is anticipated that for the C&C meeting in November 2010 there will be a request for Type B support for an International Ultra-Low Temperature Conference to be held in South Korea immediately following LT26. This conference takes place every three years, and is truly international. The previous such conference was held in London in 2008. At the date this report was prepared (August 23, 2010), that request from the organizer (E. Kim) had not yet reached the C-5 Commission.

Type A (comment)

27th International Conference on Low Temperature Physics (LT27)

Tentative dates: in August 2014

By natural rotation (among the Americas, Asia and Europe) the LT27 conference will come to the Americas. Informal discussions have been held between the C-5 Chairman and several individuals (in four different countries) who might be interested in organizing LT27. Proposals should reach the C-5 Commission in April 2011.

IUPAP YOUNG SCIENTIST PRIZE IN LOW TEMPERATURE PHYSICS

The first IUPAP Young Scientist Prizes in low temperature physics were given at the LT25 conference in August 2008 (and reported in the 2009 C&C report). The recipients were:

- 1) Dr. Dai Aoki from CEA-Grenoble, France, for his contribution in the discovery of co-existence of superconductivity and ferromagnetism in URhGe.
- 2) Dr. Kostya Novoselov from University of Manchester, UK, for his contribution in the discovery of graphene and for pioneering studies of its extraordinary properties.
- 3) Dr. Viktor Tsepelin, from Lancaster University, UK, for the development of new experimental techniques and key discoveries in the fields of ³He crystals and quantum turbulence.

SOLICITATIONS FOR NOMINATIONS AND PROPOSALS

C-5 has now posted (published in the Journal of Low Temperature Physics) the

Solicitation for the 2011 Young Investigator Award:

CALL FOR NOMINATIONS

IUPAP Young Scientist Prize in Low Temperature Physics 2011

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 2011. The prize will be awarded during the 26th International Conference on Low Temperature Physics (LT26) to be held in Beijing, China, August, 2011. The Prize includes a medal, a \$1000 award and an invited presentation to be made at LT26.

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 15, 2011 have a maximum of 8 years of research experience (excluding career interruption) following the 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 e-mail with attachments (e-mail: hallock@physics.umass.edu); or by regular mail (Prof. R.B. Hallock, Department of Physics, 666 North Pleasant St., University of Massachusetts, Amherst, MA, 01003, USA

Deadline for receipt of nominations is January 15, 2011.

C-5 has also posted the call for proposals to host LT27 in 2014 (published in the Journal of Low Temperature Physics):

CALL FOR PROPOSALS

Proposed Sites to Host LT27 (in 2014)

Proposals are now being sought from those who have an interest to host the 27th International Conference on Low Temperature Physics to be held in 2014. By natural rotation, LT27 is expected to be held in North or South America; LT25 was in Amsterdam, Netherlands, in 2008 and LT26 will be held in Beijing China in 2011.

Proposals need not follow a specific format, but should be detailed enough to allow the members of IUPAP C-5 to be adequately informed. (A) It is expected that proposals will propose an overall organization of the program consistent with tradition. (B) It is also expected that proposals will include: (1) information on the proposed conference site, with meeting space details, and the anticipated date span for the conference, (2) comments on the scientific program, including the topical areas of the major parallel sessions, (3) the proposed conference chairperson, with details about the various planned committees, (4) comments on the publication plan for the proceedings, (5) an anticipated budget including the registration fee, likely sources of financial support and the possibility for financial aid, (6) comments on local accommodations, proximity to the meeting site and local travel options, (7) tentative plans for excursions, and (8) other information that proposers may wish to supply.

Proposals should be sent to the chair of IUPAP- C5: preferably by e-mail with attachments (e-mail: hallock@physics.umass.edu); or by regular mail (Prof. R.B. Hallock, Department of Physics, 666 North Pleasant St., University of Massachusetts, Amherst, MA, 01003, USA

Deadline for receipt of nominations is April 15, 2011. The C-5 Committee anticipates that the selection will be finalized during its meeting in Beijing at the time of LT26 (early August, 2011) and announced at the end of that meeting.

C6. Commission on Biological Physics

The main task of the C6 commission has been to organize the 7th International Conference in Biological Physics. It will take place in San Diego in June of 2011

Here is some detailed information:

ICBP2011 will be hosted on the campus of the University of California, San Diego, June 19-24, 2011. The first three days (June 19-21) will encompass training workshops, and the remaining three days (June 22-24) will include research symposia and plenary lectures. All workshop and symposium sessions will occur on the UCSD campus. This conference will bring together physicists working on all aspects of living systems from biomolecules and cells to neural systems and evolution/ecology, continuing on from previous meetings in Montevideo, Uruguay (2007) and Gothenburg, Sweden (2004). The 7th ICBP meeting comes at a time when biological physics is taking its place as a compelling frontier of research with rapidly growing interest in physical sciences departments worldwide. More information is available at the conference website <http://icbp2011.ucsd.edu>.

Symposia Topics

Protein Dynamics, Function & Recognition (C Bustamante, M Gunner, J Onuchic)
Folding, Misfolding and Aggregation of Proteins (C Clementi, H Grubmueller, M Rief, P de los Rios)
Gene Networks and Signaling Pathways (M Caselle, J Garcia Ojalvo, F Jülicher, A Martinez-Arias)
Physics of the Cytoskeleton and Biomembranes (F MacKintosh, K Yee Lee, K Yoshikawa)
New Biophysical Tools (O Dudko, T Hianik, M Rief)
Evolutionary and Ecological Dynamics (E Ben Jacob, H Levine)
Physics of Neural and Sensory Systems (W Bialek, J Garcia Ojalvo)
Synthetic and Reconstituted Biology (J-F Joanny, R Ramaswamy)
Multicellular Dynamics, Applications to Development and Microorganism Colonies (F Jülicher)
Physics of the Living Cell (H Levine, Z Luthey-Schulten)
Excitable and Self-Organized Systems (K Weijer, K Yoshikawa, W Zimmermann)
Molecular Imaging: Bridging Biology, Physics and Medicine (F Nusslin)
Workshops
The Physics of Living Systems (H Levine)
Computational Molecular Biophysics (Z Luthey-Schulten)

Organizing Committees

San Diego/UCSD Program Committee

Olga K. Dudko, University of California San Diego
Herbert Levine, University of California San Diego
Jose N. Onuchic, University of California San Diego
Christopher M. Smith, University of California San Diego

US Program Committee

William Bialek, Princeton Univ
Carlos Bustamante, UC Berkeley
Cecilia Clementi, Rice Univ
Daniel Cox, UC Davis
Daniel Fisher, Stanford Univ
Angel Garcia, Rensselaer Polytechnic Institute
Marilyn Gunner, City Univ New York
Taekjip Ha, Univ Illinois Urbana-Champaign
Ka Yee Lee, Univ Chicago

Andrea Liu, Univ Pennsylvania
David Nelson, Harvard Univ
Phil Nelson, Pennsylvania State Univ
Alex van Oudenaarden, MIT
Rob Phillips, CalTech
Boris Shraiman, UC Santa Barbara
Zaida Luthey-Shulten, Univ Illinois Urbana-Champaign
Chao Tang, UC San Francisco

International Program Committee

Uri Alon, Israel
Alfonso Arias, UK
Marcia Barbosa, Brazil
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Thomas Duke, UK
Jordi Garcia-Ojalvo, Spain
Raul Grigera, Argentina
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Tibor Hianik, Slovakia
Joe Howard, Germany
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Silvia Morante, Italy
Ole G Mouritsen, Denmark
Fridtjof Nüsslin, Germany
Henri Orland, France
ZhongCan OuYang, China
Ramakrishna Ramaswamy, India
Lou Reinisch, New Zealand
Andrei Borisovich Rubin, Russia
Mathias Rief, Germany
Paolo de los Rios, Switzerland
Villy Sundstrom, Sweden
Kenichi Yoshikawa, Kyoto
Laszlo Zimanyi, Hungary

CONFIRMED SPEAKERS

Keynote Speakers

Ada E. Yonath, Weizmann Institute, ISRAEL
John Hopfield, Princeton University

Symposia Speakers

Natalie Balaban, Hebrew University, ISREAL
Wolfgang Baumeister, Max Planck Institute, GERMANY
Andreas Bausch, Technical University of Munich, GERMANY
Michael Cates, University of Edinburg, UK

Jane Clarke, University of Cambridge, UK
Nynke H. Dekker, Delft University of Technology, NETHERLANDS
Winfried Denk, Max Planck Institute, GERMANY
Adrienne Fairhall, University of Washington
Daniel Fletcher, University of California Berkeley
Erwin Frey, University of Munich, GERMANY
Nir Gov, Weizmann Institute, ISRAEL
Helmut Grubmueller, Max Planck Institute, GERMANY
Marilyn Gunner, City College of New York
Lars Hufnagel, EMBL Heidelberg, GERMANY
Terry Hwa, University of California San Diego
Alain Karma, Northeastern University
Kyoung Jin Lee, Korea University, KOREA
Andrew Oates, MPI Dresden, GERMANY
Alan Perelson, Los Alamos National Laboratories
Thomas Perkins, University of Colorado
Matthias Rief, Technische Universität München, GERMANY
Ben Schuler, Universität Zürich, SWITZERLAND
Paul R. Selvin, University of Illinois, Urbana-Champaign
Jerson Silva, Universidade Federal do Rio de Janeiro, BRAZIL
Ben Simons, Cambridge University, UK
Julie Theriot, Stanford University
Dave Thirumalai, University of Maryland
Yuhai Tu, IBM T.J. Watson Research Center
Cornelius Weijer, University of Dundee, UK
Peter Wolynes, University of California San Diego
Xialiang Sunney Xie, Harvard University

C6. Commission on Biological Physics

Officers/Members

Chair: ONUCHIC, JOSE N (2008) (2005) Center for Theoretical Biological Physics and Dept. of Physics 7226 Urey Hall, University of California at San Diego 9500 Gilman Drive, La Jolla, CA 92093-0374 USA Fax: 1 (858)534-7697 Email: jonuchic@ucsd.edu

Vice-Chair: YOSHIKAWA, KENICHI (2008) Department of Physics, Graduate School of Science Kyoto University, Kitashirakawa Oiwake-cho Sakyo-ku, Kyoto, JAPAN Fax: 81 75-753-3779 Email: yoshikaw@scphys.kyoto-u.ac.jp

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C8. Commission on Semiconductors

IUPAP C8 Commission met on 27 July 2010 during ICPS Conf. Seoul

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

YSP-SP Committee (chair: K. von Klitzing) was organized with selection by voting within the commission members. A shortlist of 4 was agreed by voting and the shortlist candidates were asked to give invited presentations at a special session of ICPS, Seoul. Following the presentations the Commission met and agreed the award of two prizes to Pablo Jarillo-Herrero and Yuanbo Zhang, with highly commended certificates to Ian Appelbaum and Jannik Mayer. The prizes were presented at the closing ceremony of the conference.

The YSP session was highly successful with four excellent presentations and was very well attended with an audience of several hundred delegates.

1660€ (2000\$) of commission funds were used to sponsor 4 Young Author Best Paper prizes also presented at the ICPS conference.

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

Reports were given on ICPS 2010 (Seoul), covering attendance, papers submitted, publication and finances and the organizers congratulated on the organization of an excellent meeting.

A report was given on preparations for ICPS 2012 to be held in Zurich which were well in hand.

A bid was presented for ICPS 2014 to be held in Warsaw which was well received, however in the interests of encouraging rotation of the conference between continents it was agreed to try to stimulate a further bid from North America, with a final decision on the location of the conference to be taken by email by the end of 2010.

3. Supporting Other Conferences

QD2010 (Int. Conf. on Quantum Dots, Nottingham 26-30 April, 2010) was sponsored and run successfully with IUPAP support.

Bids for IUPAP support were received from:

EP2DS/MSS (Int. Conf. on Electronic Properties of 2D Systems and Int. Conf. on Modulated Semicond. Struc.) to be held in Tallahassee, 2011.

Optics of excitons in confined systems 12, to be held in Paris 2011.

It was agreed to recommend that both conferences should be recommended for support as category B meetings, with a first preference for the EP2DS/MSS meeting.

4. Commission membership

Two further members were co-opted earlier in the year in order to provide co-ordination with other IUPAP Commissions C5 (Low Temperature Physics, Prof. Paul Leiderer) and C17 (Quantum Electronics, Prof. Michelle Simmons)

New commission formed Oct. 08:

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Vice Chair P. Hawrylak
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Secretary R. J. Nicholas

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	Michelle Simmons	Australia	michelle.simmons@unsw.edu.au

Next meeting:

During EP2DS/MSS meeting Tallahassee 2011.

C9. Commission on Magnetism

International Conference on Magnetism (ICM) is held every three years under the auspices of IUPAP. The last one took place in July 2009 in Karlsruhe, Germany. The next will be in July 2012 in Busan, Korea.

The venue of ICM in 2015 has been decided to be in Barcelona, Spain. During the process of the decision making, the following problem was revealed:
The ICM has not been held in North America since 1985.

One of the reasons is that ICM conflicts with the conferences organized by the Institute of Electrical and Electronics Engineers (IEEE) in size and subjects such as Conference on Magnetism and Magnetic Materials (MMM) and Conference on Applied Magnetics and Information Storage Technologies (Intermag).

On January 17, 2010, the C9 Committee members met a representative of IEEE and discussed a possibility of ICM being coorganized with IEEE. However, we have found many issues to be overcome. Discussion has been continued with IEEE.

C10. Commission on the Structure and Dynamics of Condensed Matter

- We announce the winner of our 2011 C10 IUPAP Young Scientist Prize (YSP):

Professor Marcos Rigol –
Physics Department; Georgetown University, Washington, DC, USA

“For decisive contributions to the understanding of the grand challenge posed by correlated quantum systems far from equilibrium concerning their dynamics and thermalization.”

Professor Rigol received his undergraduate and Masters degrees in physics in Havana, Cuba and his Ph.D. in Stuttgart, Germany before coming to the USA. His theoretical-computational work is of relevance, for example, to experiments with ultracold gases.

The Prize will be awarded at the American Physical Society March Meeting, Dallas, Texas, USA, 22 March 2011. Professor Rigol will present an invited talk at that meeting in a special Prize/Awards session on 23 March.*

This is the second C10 YSP competition. This year we had 14 new nominees plus 3 that rolled over from our prior competition. The 14 new nominees were from institutions in 8 different countries, including Australia, Azerbaijan, Bulgaria, Cuba, Japan, Spain, Switzerland, and the USA. Also, 12 of our Commissioners participated in the scoring of nominees. These statistics represent an increase in our own participation in this major undertaking, as well as an increased international participation. Thus, our Prize is attracting attention.

- We propose one conference for IUPAP endorsement:

Tenth International Conference on the Structure of Surfaces,
August 1-8, 2011, Hong Kong.
Prof. Michel A. Van Hove (organizer)
Estimated 250 onsite participants; 1000 on-line (remote participation)

- Commissioner J. Raynien Kwo from Taiwan suggested that in 2012 the C10 Commission could meet at a Taiwan Synchrotron conference. This would be our first face-to-face meeting.

* Although we do not have our own conference, we have been making our YSP annual presentation at the American Physical Society March Meeting. We will also consider embracing other major meetings (of European and Asian Physical Societies) as well as new facility (synchrotron or neutron source) user meetings worldwide.

C11. Commission on Particles and Fields

On March 30, 2010 proton beams collided at 7 TeV for the first time in the LHC at CERN and a new era for particle physicists began. This year the LHC has been operating at energy three and a half times higher than previously achieved at a particle accelerator. First results from the LHC experiments were presented at an IUPAP C11 sponsored conference, the 35th International Conference on High Energy Physics (ICHEP), in Paris, France from July 22-28, 2010. (www.ichep2010.fr/)

This biennial ICHEP conference is the major conference in the field and served as a showcase for results on Higgs limits from the Tevatron, anomalies from several experiments exploiting neutrino and anti-neutrino beams, some updates on dark matter searches, as well as many new results from the early LHC run at 7 TeV. French President Nicolas Sarkozy addressed the ICHEP participants on July 26 in a well attended plenary session. A transcript is available online¹:

<http://www.elysee.fr/president/les-actualites/discours/2010/35eme-conferenceinternationale-de-la-physique-des.9370.html>

The Paris conference attracted nearly 1100 participants. There was an associated public outreach event, La <<Nuit des particules>>, featuring science and the cinema at the Grand Rex theatre in the centre of Paris that was extremely well attended. The next ICHEP conference will be held in Melbourne, Australia from July 4-11, 2012. (<http://www.ichep2012.com.au/>)

Two IUPAP C11 Young Scientist Prizes were awarded in 2010. The prizes honouring achievement by a young scientist in the fields of experimental and theoretical particle physics were presented to:

Florencia Canelli of the Enrico Fermi Institute, University of Chicago; and Fermilab, for her pioneering contribution to the identification and precision measurements of rare phenomenon through the use of advanced analysis techniques to separate very small signals from large background processes at the Tevatron collider.

Jose Santiago, Departamento de Física Teórica y del Cosmos and CAFPE, Universidad de Granada, for his insight into a number of areas of particle physics including QCD calculations, electroweak physics, gravity theories, extra dimensional models and composite Higgs models.

The winners were announced through a press release by interactions.org in mid-July. The awardees received their medals and citations and gave short presentations at a plenary session during the 2010 ICHEP conference in Paris.

In 2009, C11 sponsored the Lepton Photon Symposium (LP09) in Hamburg. This conference has traditionally been a major meeting for the field, but the attendance at this conference series has decreased due to competing regional conferences in the US and Europe and we are reviewing the format for these meetings. The upcoming Lepton-Photon conference will be hosted by Mumbai, India in late August 2011 and we seek IUPAP sponsorship for this conference. The meeting will have some competition for the spotlight from several major regional conferences planned for this summer: HEP 2011-Europhysics Conference on High Energy Physics in Grenoble in July and the Division of Particles and Fields Meeting in the Providence, Rhode Island in early August. LP09 will be the first major C11 sponsored conference in India and many results from the LHC, Tevatron and the neutrino program are expected to be presented at this meeting.

¹ An English version is also available:

http://www.elysee.fr/president/root/bank_objects/10-07-26-35th_International_Conference_on_High-Energy_Physics.pdf

During the past year, IUPAP C11 sponsored the 1st International Particle Accelerator Conference (IPAC) from May 23-28, 2010 in Kyoto, Japan. The IPAC conference covers accelerator physics and technologies and other topics of interest to many of the IUPAP Commissions. This international conference series replaces the regional conference series (PAC, EPAC, APAC) and is planned to be held annually. The 2010 IPAC conference had more than 1200 participants including 100 supported students and 1545 contributions to the proceedings. The 2011 IPAC conference will be held in San Sebastian, Spain in September 2011. C11 requests continued IUPAP support for the IPAC conference series.

The first Technology and Instrumentation in Particle Physics (TIPP09) was held last year in Tsukuba, Japan. The conference was well attended with many sessions on detector design and development. The second TIPP conference will be held from June 9-14 2011 in Chicago and C11 is requesting IUPAP support for this conference.

C11 also sponsored the international conference "Neutrino 2010", the XXIV International Conference on Neutrino Physics and Astrophysics from June 14-19, 2010 in Greece. The conference attracted nearly 440 attendees including 75 women to Athens to discuss new results from a variety of neutrino experiments. There was an associated Public Lecture given by Boris Kayser on the topic "Neutrinos get under your skin". The next conference in the series "Neutrino 2012" is planned for Kyoto, Japan.

The annual meeting of the IUPAP C11 Commission was held on July 25, 2010 during the conference. At this meeting, the commission reviewed recently sponsored conferences, discussed the upcoming conferences seeking sponsorship and selected the locations for the 2013 and 2014 summer conferences. The 2013 Lepton-Photon conference will be hosted by SLAC National Accelerator Laboratory in northern California and the 2014 ICHEP conference will be held in Valencia, Spain. In the usual rotation, the 2014 conference would have hosted in the Americas, but there was some concern within the group regarding the difficulty of obtaining US visas. More than one commission member was hesitant to consider sponsoring a major conference such as ICHEP with many plenary session in the United States until this concern is addressed.

C12. Commission on Nuclear Physics

1. IUPAP young scientist prize in nuclear physics

At the award session on July 7 during the International Nuclear Physics Conference in Vancouver, 3 young scientist prizes were awarded to the following recipients:

Dr. Kenji Fukushima (Kyoto University):

For his development of the effective chiral model with the Polyakov loop coupling as an effective theory for the quark degrees of freedom. The model incorporates the confinement/deconfinement transition and describes the role of confinement and dynamical breaking of chiral symmetry in hot and dense matter, in situations where numerical lattice simulations are inapplicable.

Dr. Peter Mueller (Argonne National Laboratory):

For his leadership in the development of laser trapping and cooling techniques to make the first precise measurements of the charge radii of the neutron-rich nuclei, ${}^6\text{He}$ and ${}^8\text{He}$, and for highly sensitive trace isotope abundance analysis and for experimental studies of fundamental interactions.

Dr. Lijuan Ruan (Brookhaven National Laboratory):

For her pivotal role in the development of multi-gap resistive plate chamber (MRPC) technology for use in particle identification via the time-of-flight technique and in the installation and commissioning of the STAR Time-of-Flight (TOF) detector and for her forefront, original research on the production and transport of particles containing strange and charm quarks.

The following process was employed for the selection of the winners of the young scientist prizes:

(1) A widely distributed and both nationally and internationally published call for nominations, with a deadline of October 1, 2009.

(2) By the deadline 22 well documented and supported nominations for the 3 prizes were received.

(3) All 14 members of commission C12 actively participated in the process of selecting 3 prize winners from the 22 nominations in 4 steps.

Step 1: For each nominee 3 different members of C12 were assigned for an assessment of his/her merits. By using weighted criteria for each candidate this process converged to a preliminary short list of 10 candidates.

Step 2: Each member of C12 was asked to select 3 nominees from the short list of 10 in priority order, giving 3 points to the first nominee, 2 points to the second and 1 point to the third nominee. This process converged to 4 nominees, whose point sums were clearly larger than those of the remainder.

Step 3: Each member of C12 was asked to enter qualitative arguments in favor of candidates in the secondary short list of 4. This process led to unanimity on two of the 4 nominees on the short list. For the selection of one out of the remaining 2 nominees 6 C12 members gave arguments in favor of one and 4 in favor of the other. These arguments referred to the type of work done by the two candidates, the bibliometrical indices of their published work and the goal of a geographical balance between the prize winners.

A second stage of these email exchanges led to 8 "votes" in favor of the nominee, who received 6 supporting emails in the first stage and 4 in favor of the nominee, who received 4 supporting emails in the first stage. One C12 member abstained in this "step 3" and the chair cast no "vote". As C12 has 14 members, the majority of 8 votes for the first against the minority of 4 for the second nominee, then brought this selection process to conclusion.

2. C12 annual meeting in Vancouver, 5 July, 2010

The annual meeting of the commission C12 was held at the University of British Columbia on 5 July, 2010 in connection with the IUPAP sponsored conference International Nuclear Physics Conference INPC 2010. The minutes are appended to this report.

At the meeting the chair was mandate to activate the formation of the new IUPAP-IUPAC joint working group on the evaluation and adjudication super-heavy elements beyond $Z=112$. The earlier group has continued its work without any clear IUPAP mandate, and has completed reports on elements 114 and 116. The matter will be pursued by IUPAP secretary general Kirby-Harris together with IUPAC executive director Terry Renner.

3. Conference recommendations

At the annual meeting of C12 the following recommendations for IUPAP conference sponsorship were made:

Conferences in 2011:

Category A support:

1. The 22nd conference on ultrarelativistic heavy-ion collisions ("**Quark Matter 2011**"), Annecy, France, May 23-28, 2011,
2. The 19th Particles and Nuclei International Conference ("**PANIC 2011**"), Cambridge, Massachusetts, USA, July 24-29, 2011.

Category B support:

The first International Conference on Advances in Radioactive Isotopes Science ("**ARIS 2011**"), Leuven, Belgium, May 29-June 3, 2011

Category C support:

1. The 9th Latin American Symposium on Nuclear Physics and Applications, Quito, Ecuador, July 18-22, 2011,

2. The 13th Workshop on Nuclear Physics and the 7th International Symposium on Nuclear and Related Techniques (“**WONP-NURT 2011**”), Havana, Cuba, February 2-11, 2011.

Conferences in 2012:

In addition the C12 commission decided to recommend preapproval for the The 20th International Conference on Few-Body Problems in Physics (“**Few Body 20**”), Fukuoka, Japan, 20-25 August, 2012.

C13. Commission on Physics Development

Meetings

A C13 meeting was held Aug 28, 2010 at ICTP. Invited guests included François Piuzzii, Chair of the European Physics Society (EPS) Interdivisional Group on Physics for Development, C14 Chair Pratibha Jolly, ICTP Director Fernando Quevedo, and Barbara Sandow, Chair of the IUPAP Working Group on Women in Physics.

C13 sponsored four Conferences in Developing Countries in 2010

1. **Palestinian Conference on Modern Trends in Mathematics and Physics II**, held at AN-Najah National University in Nablus, Palestine, August 2 - 4, 2010.
2. **African School on Electronic Structure Methods**, held at AIMS in Cape Town, South Africa, July 19-30, 2010.
3. **New Trends in Conducting Materials From Fundamentals to Applications**, to be held at Sousse, Tunisia, November 3-7, 2010.
4. **Sixth International Meeting on Photodynamics**, held in Havana, Cuba Jan 27 - Feb 5, 2010.

African Physical Society

C13 was a sponsor of the January, 2010 LAM9/EBASI7 Conference in Dakar, Senegal that included the launch of the continent-wide African Physical Society. C13 member Ahmadou Wague was the principal organizer of the Conference and is a vice president of the new African Physical Society.

Collaboration with C20 on Computational Physics Schools in Africa

C13 continues to collaborate with C20 on organizing a Computational Physics School Series in Africa. C20 member Nithaya Chetty (Univ of Pretoria) and C13 member Sandro Scandolo (ICTP) have been the lead organizers. The first of these schools, held July 19-30, 2010 in South Africa, was very successful and an article about it has been accepted for publication in the November issue of Nature Physics. Other major sponsors include ICTP, NITheP, SAIP, NRF. APS-DCOMP, and ICMR in Santa Barbara., USA. The International Advisory Panel has begun the groundwork for future schools which will be held biennially in different African Countries. (See the attached report on the inaugural school of this series.)

Visiting Scientist Program

C13 has been working to implement the Visiting Scientist Program. The Program Description is on the IUPAP web site at <http://www.iupap.org/conferences/VisitingScientistDescription.html>.

Article on C13 Published

An article on C13 is being published in the Bulletin of the Federation of Latin American Physical Societies (FELASOFI).

**African School on Electronic Structure Methods and Applications (ASESMA)
Muizenberg, Cape Town 19- 30 July 2010.
The inaugural school in the biennial series planned for 2010-2020**

ASESMA-2010 was not just a two week school. It was the start of an ongoing network for interaction and collaboration. By all accounts, it was a fantastic success. Much of the enthusiasm of the students was due to an innovative program of mentors, motivated young scientists mainly at the post-doctoral level, who worked with the participants one-on-one throughout the school. Since the school they have contacted each, set up web pages, a monthly electronic newsletter (two editions have been posted), and a Facebook page. Links are given below. The participants, mentors and lecturers are enthused and now is the real test – to keep the interactions and collaborations going into the future.

- * There is also enthusiasm for the continuing Series of Schools. An illustrious International Advisory Panel will help the Series stay focused and active. Several countries are possibilities for the hosting the site for the 2012 school, and the choice will be made soon.
- * At the 2010 School there were 45 participants (in addition to the 6 mentors) from many countries in Africa: Cameroon, Congo, Ghana, Ethiopia, Kenya, Nigeria, South Africa and Zimbabwe. Many of the South African students were actually nationals from other African countries, so the school served a large number of graduate students and young faculty. (See photograph below.)
- * The topic of the Series of Schools is theory and computational methods for predicting and understanding properties of materials through calculations at the fundamental level of electronic structure. This is a growing field in which scientists with limited resources can have a large impact. A personal workstation is sufficient for many problems and the internet is making possible productive use of large computational facilities. It is within reach to create electronic structure community in Africa working at the level of forefront international research.
- * The content of the 2010 School was a combination of theoretical background and hands-on calculations using workstations and every student ran a calculation at the Centre for High Performance Computing in Cape Town, a facility meant for all Africans. A great effort was made to have coordinated talks on theory, computation, and on a phase transitions under pressure, a not-so-simple example of problems in minerals and geophysics. The CHPC management invited each participant to apply for a user account which they can use from their home countries.
- * The range of international experts who lectured at the School was impressive. The School schedule can be found at <http://users.aims.ac.za/~sandro/>, which includes a link to the School photos.
- * Support by IUPAP, especially C13 and C20 commissions was essential for international recognition of the series and for financial support of the 2010 School.
- * A key role was played by the International Centre for Theoretical Physics in Trieste. Without their financial support the school could not have occurred. Probably more important were the scientists from Trieste, the ICTP, Democritos Italian Simulation Center, for their tremendous efforts at facilitating the use and easy access of the excellent Quantum Espresso codes, for making these freely available, and for coordinating the lectures.
- * The mentors were funded by the International Center for Materials Research (ICMR) in Santa Barbara with strong support by Prof. Nicola Spaldin. The mentor program was the innovation that helped students on a one-on-one basis. This helped improve the pace of the delivery as the participants were able to work independently. Each participant was able to progress based on his/her own abilities.
- * There was excellent administrative support for the School by Milena Poropat (ICTP) and Linette White (South African Institute of Physics).
- * The Centre for High Performance Computing in Cape Town has given all participants of the School access to their Blue Gene, which was donated by the IBM for African collaborations. The QE computations and collaborations could well be the first truly African-wide research activity on this facility.
- * The African Institute for Mathematical Sciences (AIMS) provided a fantastic venue and backdrop for the hosting for ASESMA2010. The accommodation, catering, lecturing and computing facilities are

excellent. For your information, the Canadian government has recently donated Can\$20m for the establishment of a network of AIMS centres in Africa that will include Ghana, Nigeria, Senegal, Ethiopia and South Africa, which is excellent news.

The next steps:

- * Some participants have projects to work on, and are exploring ways in which Quantum Espresso can be used in their current work. Others are exploring new projects, and the networking and further mentoring and support will assist to accomplish this.
- * Networking and continuing with the work and projects post-School is now a critical issue. A monthly electronic newsletter is underway coordinated by Alison Hatt (ICMR, Santa Barbara) has agreed to act as editor.
- * A more permanent website is being set up, hosted by the ICTP. The current School website is located at <http://www.nithec.ac.za/>
- * A Facebook page has been established
<http://www.facebook.com/?ref=logo#!/group.php?gid=145558648789192>
- * A portrait gallery with contact information has been created.
<https://sites.google.com/site/asesma2010/>
- * Nature Physics has agreed to publish a 2000 word commentary on the School.
- * We are analysing questionnaires and feedback forms from the participants to help us improve on future Schools, and to understand better the needs for Africa.
- * The venue for the 2012 School will be announced by Richard Martin, the chair of the IAP. A number of countries are currently bidding to host the School. Securing further international funds for the 2012 School will be an important challenge for these next two years, and we will count on your assistance in this regard.

There is still a long journey ahead, but the 2010 School has made an excellent start, and the foundations are in place for us to build for the future. Creating an internationally credible electronic structure community in Africa is within our reach. The consequences of this will be extremely important for the development of science in Africa.

Nithaya Chetty (University of Pretoria, South Africa)

Richard Martin (University of Illinois, USA)

Sandro Scandolo (International Centre for Theoretical Physics, Trieste, Italy)

C14. Commission on Physics Education

Conferences organized

Our commission just turned fifty. We celebrated the occasion with a special session on ICPE at the conference *Teaching and Learning Physics today: Challenges? Benefits?* organized at Reims, France, 22-27 August 2010, organized jointly by ICPE, Groupe International de Recherche sur l'Enseignement de la Physique (GIREP) and the Workshop on Multimedia in Physics Teaching and Learning (MPTL). The commission had earlier organized its annual conference *ICPE 2009: Development and Innovation in Physics Education*, at Bangkok, Thailand, 18-24 October 2009. ICPE also provided sponsorship for the X Inter-American Conference on Physics Education on the theme **Teaching of Modern Physics at different levels**, held at the University of Antioquia, Medellin, Colombia from 6-10 July 2009.

Future Conferences

Our next conference *ICPE 2011: Training Physics Teachers and Educational Networks* will be held at Mexico, 14-21 August 2011. A concrete step forward in global cooperation is the realization of a *World Conference on Physics Education* to be organized in Istanbul, Turkey, in July 2012 on the theme *The Roles of Context, Culture and Representations in Physics Teaching & Learning*. Envisaged as a series of conferences with a four year periodicity, we hope the initiative will bring on board all stakeholders and key international organizations.

PHYSWARE Educate the Educator Series of Workshops

PHYSWARE promises to be amongst the most important activities of C14. As a direct follow-up to the World Conference on Physics and Sustainable Development (WCPSD) held at Durban in 2005, the first workshop titled *PHYSWARE: A collaborative workshop on low-cost equipment and appropriate technologies that promote undergraduate-level, hands on physics education throughout the developing world* was organized at ICTP, Trieste in February 2009. Subsequently, IUPAP (on behalf of C14) has signed a 5-year Memorandum of Understanding with ICTP to organize PHYSWARE workshops. The venue will be at ICTP Trieste and a developing country in alternate years. The first workshop will be in Delhi in 2011. C14 is trying to raise sufficient funds.

Publications

The commission continued to publish its newsletter with regularity, twice a year. Grants from IUPAP and UNESCO have enabled us to print in India 2000 copies of our book *Connecting Research in Physics Education with Teacher Education, Volume II*, with Matilde Vicentini and Elena Sassi as general editors.

Medals and Prizes

ICPE Medal for the year 2010 conferred on Gunnar Tibell, Professor Emeritus at University of Uppsala, Sweden. Our commission has decided to institute the *IUPAP Young Scientist Prize in Physics Education*. Research will include educational development such as development of instructional materials as well as Physics Education Research; the impact of research/ development will be judged in local contexts. R&D experiences in informal education will be considered at par with work in formal settings.

Annual Meeting

The Commission members met on the sidelines of ICPE 2009 in October 2009 in Bangkok; and again on the sidelines of the GIREP-MPTL-ICPE Conference in August 2010 in Reims. Both meetings were well attended. The next meeting will be in Mexico in 2011.

Links with other Commissions

The Chair of ICPE was special invitee at the annual meeting of C13 held on 28 August 2010 at ICTP, Trieste. This gave us an opportunity to explore areas of cooperation.

C15. Commission on Atomic, Molecular, and Optical Physics

The Commission C15 has met on July 27, 2010 in Cairns during the International Conference of Atomic Physics 2010 (ICAP).

Our field of Physics is dominated by the two large International Conferences ICAP and ICPEAC which are held successively every 2 years. Unfortunately most members of our Commission have their main activities in only either ICAP or ICPEAC so that the attendance during each of these meetings is not satisfactory. One additional reason in the case of the ICAP in Cairns of course is the high cost for the conference in Australia.

On the other hand the ICAP in Cairns this year was attended by 619 physicists from 37 countries which is extremely high for Australia. A good number of the 250 students have been supported by us. This makes clear that our involvement and support from the side of IUPAP is very valuable. The participants had no problem to receive their visas, maximum time was 10 days which is acceptable.

It was proposed by IUPAP that to provide continuity as commission governances change, all the commissions be encouraged to enhance their web presence and host their web sites at www.iupap.org. Our Commission approves this Hosting Proposal.

Most important for our commission was the selection of the IUPAP Young Scientist Prize in AMO Physics. The overall response with 31 nominations was very good, although only 3 were new this year.

Jeremy L. O'Brien of the University of Bristol's Department of Physics and Electrical Engineering was selected to be the 2010 prize winner "for originating the field of integrated quantum photonics as well as pioneering contributions to quantum information, measurement and metrology". He presented his prize winning talk on "Integrated Quantum Photonics" at ICAP in Cairns. We decided that 25 of those nominated until now are still eligible for the 2011 competition. All nominations are still available at: <http://physics.nist.gov/IUPAP2010>.

It was decided that the Chairman informs all nominees about the outcome of this year's Prize and asks for an update for the coming year.

It was discussed if it is not possible to have 2 Young Physicist Prizes in our field of AMO Physics. The chairman was authorized to put this question up at the C&CC meeting in New Delhi.

The other important part of our meeting was the decision on the support of next year's conferences. The main Conference for 2011 is the "International Conference on Photonic, Electronic, and Atomic Collisions (ICPEAC)" which will be held at Queens University in Belfast, Northern Ireland from July 27 to Aug. 2, 2011. This is a Conference Type A with about 750 participants. Our vote for strong support of this conference is unanimous. The Commission declined to support "Quantum Optics V" in Cozumel, Mexico, 15 – 19 November 2010. The request made in March 2010 failed to meet the deadline of June 1 of the year preceding the date of the proposed conference.

It was decided to have the next Commission meeting during the ICPEAC in Belfast next year in July 2011.

Burkhard Fricke
(Chair of C15)

C16. Commission on Plasma Physics

The 2010 International Congress on Plasma Physics (2010ICPP) in Santiago de Chile was held during the period 8-13 August 2010. This A Category Conference was sponsored by IUPAP, and was attended by large number of delegates from all over the world. The 2010 ICPP scientific program included 15 invited plenary talks, 23 invited topical talks, 45 oral contributions, and 160 poster contributions. The presentations reflected the present status of advancement in basic and applied plasma physics, in low-temperature processing and dusty plasmas, in space and astrophysical plasmas, in fusion plasmas (both the magnetic and inertial confinement fusion), as well as novel aspects of extreme states of plasmas in the universe and dense quantum plasmas, and plasma based charged particle acceleration.

During the ICPP Santiago de Chile, C.16 Chair Prof Shukla delivered a tutorial lecture on "Introduction to Quantum Plasma Physics". He also presented in an official ceremony the IUPAP C.16 Young Scientist Prize and Medal in Plasma Physics to Dr. Matthew Hole (ANU, Australia) for his contribution to the measurement, interpretation, analysis, and understanding of wave phenomena in plasmas, as well as his research leadership to champion an Australian research engagement with ITER.

Dr. Hole was invited to ICPP2010 to deliver a plenary talk dealing with his Prize. Furthermore, IUPAP C.16 business meeting was also held on 12th August during the 2010ICPP. The meeting was attended by many regular and associate members, as well as by Dr. Leopoldo Soto who reported the organization of ICPP2010 and the details of distributing IUPAP conference and travel grants to delegates from the developing countries. The two international conferences (2011 ICPIG Belfast, UK-Category A Conference, and 2011 ICPDP Garmisch-Patenkirchen, Germany; Category B Conference) in the year 2011 were strongly recommended by the members of C.16 for IUPAP financial support.

The IUPAP C.16 Young Scientist Prize and Medal in Plasma Physics will be awarded to a low-temperature plasma physicist during the 2011 ICPIG Belfast.

C17. Commission on Quantum Electronics

At the Chicago council meeting C17 made a proposal that it be re-named as Quantum Electronics & Photonics or Laser Physics & Photonics or simply Photonics. It is expected that this proposal will be processed for discussion within IUPAP for final resolution at the IUPAP Congress in 2011.

It is underlined that this change is seen as an important symbolic means for developing the activities of C17. Specifically it is hoped that such a change may enable C17 to become associated with an appropriate major conference. It is recalled that its present natural flagship conference (the OSA/IEEE International Quantum Electronics Conference) does not meet IUPAP criteria for support.

A disconcerting consequence of the lack of such a forum for its activities is that C17 remains alone amongst IUPAP Commissions in never having awarded a Young Scientist prize. Developing a mechanism for awarding a Young Scientist prize is a key challenge for C17.

Apart from those issues, C17 is grateful to the Chicago Council for approving support for two conferences:

"LAM 9 INTERNATIONAL WORKSHOP, EBASI 7 CONFERENCE, NSBP MEETING ON OPTICS AND LASERS IN SCIENCE AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT" as a category D conference with a grant allocation of € 7,000.

"RIO DE LA PLATA WORKSHOP ON LASER DYNAMICS AND NONLINEAR PHOTONICS" as a category B conference with a grant allocation of € 6,000.

These represent the first activities of C17 for some years.

K Alan Shore
Chair C17
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C18. Commission on Mathematical Physics

The by far most important event was the

ICMP 2009

The International Congress in Mathematical Physics (ICMP) held in Prague, Czech Republic, August 3 - 8. The ICMP is held every three years. This year it was supported by the IUPAP with Euro 12,000.00 with an additional Euro 3,500.00 for travel support for young scientists.

The conference was an unqualified success. There were 618 registered participants, the second largest participation in the history of the congress and this despite the economic downturn. For the participants from the United States one can assume that the stimulus money helped in defraying the costs. The number of participants listed by country are Czech Rep 79, US 77, Germany 68, France 48, UK 38, Japan 30, Italy 28, Russia 24, Poland 21, Switzerland 20, Spain 17, Israel 14, Denmark 11, Ukraine 11, Mexico 10, Austria 9, Brazil 8, Canada 8, Portugal 8, Romania 8, Finland 7, Belgium 6, Turkey 6, Hungary 5, Chile 5, Ireland 5, Netherlands 5, South Korea 5 and smaller numbers from Armenia, Australia, Belarus, Benin, Bulgaria, Bosnia, China, Cyprus, Egypt, Georgia, Greece, Hong Kong, India, Morocco, Norway, Pakistan, Singapore, Slovakia, South Africa, Sweden, Thailand. The conference consisted of 16 plenary talks, 70 invited session talks and 59 contributed talks. Additionally there were 190 posters presented.

Young Researcher Symposium

The Young Researcher Symposium (YRS) was held from July 31 – August 1. This series of events was started in 2003 and is held concurrently with the ICMP. The idea of this event is that the talks were of a more pedagogic nature, addressing researchers on the level of graduate students. In this year's YRS, 6 plenary talks as well as 21 seminars were given.

During this event the Young Scientist Award 2009 sponsored by IUPAP was awarded to:

Rupert L. Frank

for outstanding results in analysis with application to quantum systems including solutions to some longstanding problems.

Benjamin Schlein

for outstanding results in mathematical analysis of many-body quantum systems, in particular, Bose gases.

Simone Warzel

for outstanding results in analysis of problems motivated by condensed matter physics, in particular, spectral and dynamical properties of random Schrödinger operators.

The selections committee consisted of Peter Bouwknegt, Ana Bela Cruzeiro, Pavel Exner (Chair), Antti Kupiainen, and Michael Loss. The committee received nine nominations.

The next conference in this series will be held in July 2012 in Aarhus, Denmark. As for previous conferences IUPAP support is expected. C18 plans to award three Young Scientist Awards at that occasion.

C18 received several applications for support of conferences, including the two highest level applications: 1) QMath 11, Sept. 2010, Czech Republic, and 2) Group Theoretical Methods, July 2010, UK. Level B support was recommended, but unfortunately not approved.

Munich, Sept. 7, 2010

Herbert Spohn
(chair C18)

C19. Commission on Astrophysics

1. YOUNG ASTROPHYSICISTS' PRIZES

Commission 19 (Astrophysics) of the International Union of Pure and Applied Physics announced the decision to present two young scientists' prizes in astrophysics for 2009 and 2010 at the 25th Texas Symposium on Relativistic Astrophysics in Heidelberg in December 2010.

The Committee received 13 nominations for the two awards, all of whom are outstanding young researchers. After long and complex consideration the following decisions were made:

* 2009 award - Dr. Thomas Schweizer of MPI Munich for his work on the MAGIC project and the first Crab pulsar detection at gamma energies above 25 GeV.

* 2010 award - Dr. Poonam Chandra of Royal Military College, Canada, for radio detections of distant gamma ray bursts and supernovae.

PREVIOUS YOUNG ASTROPHYSICISTS' PRIZE LAUREATES:

2008

- * Eiichiro Komatsu - Winner
- * Marta Volonteri - Honorable mention
- * Sarah Gallagher - Honorable mention

2006

- * Marta Burgay

2. CONFERENCES

C19 Commission sponsors two type B conferences in December 2010 at the level of 6000 euros. These are:

- 1) the 25th Texas Symposium on Relativistic Astrophysics, December 6 - 11, 2010, Heidelberg, Germany
- 2) "Tracing the Ancestry of Galaxies (on the land of our Ancestors)"
December 13-17, 2010
Ouagadougou, Burkina Faso.

3. C19 COMMISSION MEETING

We plan to have a C19 Commission meeting during the 25th Texas Symposium in Heidelberg, Germany, December 2010 to discuss our future activities. We expect that at least half of the commission members will be present.

4. SUGGESTION

It has proven impossible ever to assemble more than half of C19 at any one time and place, and we wonder whether the national committees, in putting forward new members, might ask them if they are willing to attend either the Texas Symposia in even-numbered years or the IAU General Assembly in 2012 (Beijing), 2015 (Hawaii), etc.

Maria Victoria Fonseca

September 2010

C20. Commission on Computational Physics

C20's principal activities are the yearly endorsement of an international conference and the yearly awarding of a Young Scientist Prize. This year it also helped start a series of African schools in computational physics. In this reporting year, two of C20's conferences occurred.

The Commission's 2009 meeting, CCP2009, was held in Kaohsiung, Taiwan, from December 16-19, and was organized by Prof. James J. Y. Hsu of the National Cheng Kung University. Sessions on quantum information science, condensed matter physics, nanoscience, plasma physics, soft matter, biophysics, statistical physics, and atomic and molecular orbital physics occurred. The meeting's website is <http://www.ccp2009.tw/>.

C20's 2010 meeting was held June 23-26 in Trondheim, Norway and was organized by Prof. Alex Hansen of the Norwegian University of Science and Technology. Topics of the sessions included high-energy physics, astrophysics/plasma physics, complex systems, biophysics, quantum phase transitions, supercomputing, computational physics education, and computational physics in the Third World. The meeting's website is <http://www.ccp2010.no/>.

CCP2011 will be held October 16-20 in Gatlinburg, TN USA with Dr. Malcom Stocks (Oak Ridge National Laboratory) as the organizer, CCP2012 will be held in Kobe, Japan with Dr. Hideki Takabe (Osaka University) as the organizer, and CCP2013 will be held in Moscow, Russia with Prof. Lev Shchur (Scientific Center in Chernogolovka) as the organizer.

The Commission awarded its 2009 Young Scientist Prize to Dr. Amada Barnard of Australia for computational work on nanomaterials. She received her award at CCP2009. Dr. Philipp Werner of the ETH, Switzerland was the Commission's 2010 Young Scientist Prize winner for his work on algorithms for quantum Monte Carlo. He received his award at CCP2010.

C20 worked with C13 to obtain IUPAP's endorsement of a biennial series of African computational physics schools. C10 and C14 also endorsed this school. The school's theme will be numerical methods for electronic structure calculations. The first school was in Muizenberg, South Africa July 19-30. Prof. Joubert (Witwatersrand) headed the local organizing committee. Prof. Nithaya Chetty (Pretoria), C20 commission member, and Dr. Sandro Scandolo (ICTP), C13 commission member, provided key organization skills. Prof. R. M. Martin (UIUC/Stanford) heads the school's International Advisory Panel. The website for this year's school is <http://www.nithec.ac.za/general/10.php>. It was a huge success. The 2010 school will soon be the subject of a commentary in Nature Physics. The location of the 2012 school will be announced soon. Attached is a brief report of the schools activities, drafted by the organizers.

The commission entered agreement with the Journal of Physics Conference series of the Institute of Physics for it to be the publisher of the proceedings of future CCP meetings. The proceedings will now be freely accessible to anyone who has Internet access.

The commission's web page is at <http://c20.iupap.org/>.

African School on Electronic Structure Methods and Applications (ASESMA)
Muizenberg, Cape Town 19- 30 July 2010.
The inaugural school in the biennial series planned for 2010-2020

ASESMA-2010 was not just a two week school. It was the start of an ongoing network for interaction and collaboration. By all accounts, it was a fantastic success. Much of the enthusiasm of the students was due to an innovative program of mentors, motivated young scientists mainly at the post-doctoral level, who worked with the participants one-on-one throughout the school. Since the school they have contacted each, set up web pages, a monthly electronic newsletter (two editions have been posted), and a Facebook page. Links are given below. The participants, mentors and lecturers are enthused and now is the real test – to keep the interactions and collaborations going into the future.

* There is also enthusiasm for the continuing Series of Schools. An illustrious International Advisory Panel will help the Series stay focused and active. Several countries are possibilities for the hosting the site for the 2012 school, and the choice will be made soon.

* At the 2010 School there were 45 participants (in addition to the 6 mentors) from many countries in Africa: Cameroon, Congo, Ghana, Ethiopia, Kenya, Nigeria, South Africa and Zimbabwe. Many of the South African students were actually nationals from other African countries, so the school served a large number of graduate students and young faculty. (See photograph below.)

* The topic of the Series of Schools is theory and computational methods for predicting and understanding properties of materials through calculations at the fundamental level of electronic structure. This is a growing field in which scientists with limited resources can have a large impact. A personal workstation is sufficient for many problems and the internet is making possible productive use of large computational facilities. It is within reach to create electronic structure community in Africa working at the level of forefront international research.

* The content of the 2010 School was a combination of theoretical background and hands-on calculations using workstations and every student ran a calculation at the Centre for High Performance Computing in Cape Town, a facility meant for all Africans. A great effort was made to have coordinated talks on theory, computation, and on a phase transitions under pressure, a not-so-simple example of problems in minerals and geophysics. The CHPC management invited each participant to apply for a user account which they can use from their home countries.

* The range of international experts who lectured at the School was impressive. The School schedule can be found at <http://users.aims.ac.za/~sandro/>, which includes a link to the School photos.

* Support by IUPAP, especially the C13 and C20 commissions, was essential for international recognition of the series and for financial support of the 2010 School.

* A key role was played by the International Centre for Theoretical Physics in Trieste. Without their financial support the school could not have occurred. Probably more important were the scientists from Trieste, the ICTP, Democratis Italian Simulation Center, for their tremendous efforts at facilitating the use and easy access of the excellent Quantum Espresso codes, for making these freely available, and for coordinating the lectures.

* The mentors were funded by the International Center for Materials Research (ICMR) in Santa Barbara with strong support by Prof. Nicola Spaldin. The mentor program was the innovation that helped students on a one-on-one basis. This helped improve the pace of the delivery as the participants were able to work independently. Each participant was able to progress based on his/her own abilities.

* There was excellent administrative support for the School by Milena Poropat (ICTP) and Linette White (South African Institute of Physics).

* The Centre for High Performance Computing in Cape Town has given all participants of the School access to their Blue Gene, which was donated by the IBM for African collaborations. The QE computations and collaborations could well be the first truly African-wide research activity on this facility.

* The African Institute for Mathematical Sciences (AIMS) provided a fantastic venue and backdrop for the hosting for ASESMA2010. The accommodation, catering, lecturing and computing facilities are excellent. For your information, the Canadian government has recently donated Can\$20m for the

establishment of a network of AIMS centres in Africa that will include Ghana, Nigeria, Senegal, Ethiopia and South Africa, which is excellent news.

The next steps:

- * Some participants have projects to work on, and are exploring ways in which Quantum Espresso can be used in their current work. Others are exploring new projects, and the networking and further mentoring and support will assist to accomplish this.
- * Networking and continuing with the work and projects post-School is now a critical issue. A monthly electronic newsletter is underway coordinated by Alison Hatt (ICMR, Santa Barbara) has agreed to act as editor.
- * A more permanent website is being set up, hosted by the ICTP. The current School website is located at <http://www.nithec.ac.za/>
- * A Facebook page has been established
<http://www.facebook.com/?ref=logo#!/group.php?gid=145558648789192>
- * A portrait gallery with contact information has been created.
<https://sites.google.com/site/asesma2010/>
- * Nature Physics has agreed to publish a 2000 word commentary on the School.
- * We are analysing questionnaires and feedback forms from the participants to help us improve on future Schools, and to understand better the needs for Africa.
- * The venue for the 2012 School will be announced by Richard Martin, the chair of the IAP. A number of countries are currently bidding to host the School. Securing further international funds for the 2012 School will be an important challenge for these next two years, and we will count on your assistance in this regard.

There is still a long journey ahead, but the 2010 School has made an excellent start, and the foundations are in place for us to build for the future. Creating an internationally credible electronic structure community in Africa is within our reach. The consequences of this will be extremely important for the development of science in Africa.

Nithaya Chetty (University of Pretoria, South Africa)

Richard Martin (University of Illinois, USA)

Sandro Scandolo (International Centre for Theoretical Physics, Trieste, Italy)

