

## **C2-Commission Report 2018**

### **Report to IUPAP Council**

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

Chair: Peter Mohr, Vice–Chair: Marc Himbert, Secretary: Michael de Podesta

Members: Xing ZHU, Kazuhiko Sugiyama, Michael Krystek, Alexander Potekhin, Antti Manninen, Anna (Ania) Kwiatkowski, Isabel Godinho, Kyong Hon Kim, Daniel Varela Magalhaes, Dinesh Kumar Aswal, Martin Milton (ex-officio)

### **Activities of Commission C2**

#### **1. Recommendation to the BIPM.**

The International Committee on Weights and Measures (CIPM), through the Consultative Committee on Units (CCU), requested input from IUPAP concerning a possible change of wording in the new edition of the International System of Units (SI) Brochure. The question concerned a controversial change in the definition of units. Members of Commission C2, which is relevant for unit questions, were asked for input and the opinion of the majority was transmitted in reply to the request. The conclusion, not to change the definition for the new edition, agreed with the conclusion of the overwhelming majority of National Metrology Institutes and other international organizations such as IUPAC who were also asked for input.

#### **2. Publicize the new SI.**

It is expected that the International System of Units (SI) will be redefined on 20 May 2019 based on fixed values of certain physical constants. Commission C2 is carrying out a publicity campaign designed to familiarize the wider scientific community with the upcoming changes. Videos for this purpose have been made by former Chair and Vice Chair Vanderlei Bagnato and William Phillips which explain the new SI for a general audience. These videos were presented to the IUPAP General Assembly in October of 2017. These C2 resources are available to members of IUPAP who wish to carry out publicity for the changes. Additional material will be developed and made available to the community.

#### **3. Revise the Red Book.**

The 1987 revision of the SUNAMCO ‘Red Book’ has for nearly a quarter of a century provided physicists with authoritative guidance on the use of symbols, units and

nomenclature. As such, it is cited as a primary reference by the IUPAC ‘Green Book’ (*Quantities, Units and Symbols in Physical Chemistry*, 3rd edition, E. R. Cohen et al., RSC Publishing, Cambridge, 2007) and the SI Brochure (*The International System of Units (SI)*, 8th edition, BIPM, Sevres, 2006). Commission C2 is in the process of revising this publication to bring it up to date. This is particularly timely in view of the upcoming redefinition of the SI which will be taken into account and explained.

#### **4. Continue discussion of the SI, e.g., questions about how to treat the radian and other so-called dimensionless units.**

The SI was originally recommended to be an international system of units by IUPAP in 1960, and Commission C2 has maintained a role in recommending further improvements, including IUPAP General Assembly (GA) resolutions supporting the choice of constants to define the new SI and supporting the decision to proceed with the redefinition in May 2019. Other issues for possible resolutions to be considered by the IUPAP GA include the role of the radian in the SI, the nature of frequency units, and the treatment of counting quantities. These questions have been under discussion by the members of C2 and the discussions will continue in order to arrive at an agreeable resolution of the problems from a physics perspective.

#### **5. Organize in-person or possibly video meetings of C2.**

It has been realized that in-person meetings of the members of Commission C2 would be of considerable value toward reaching the goals of the commission. In the recent past, this has been difficult due to the diversity of the membership which means that there is no natural international conference where many members are likely to attend. One meeting that might be suitable is the *Conference on Precision Electromagnetic Measurements* (CPEM). Another possibility is to hold video meetings where all members can participate if desired. These options are being explored and will be tested as possible ways to interact.

#### **6. Recommend suitable appointments for members of the various committees that seek IUPAP representation.**

Various organizations seek representation of IUPAP on their committees, particularly those associated with the International Bureau of Weights and Measures (BIPM) and certain standards organizations. Many of these committees are concerned with issues that are in close relation to the purview of Commission C2, so traditionally this commission is asked to recommend people to serve as representatives. We expect to continue to provide such recommendations and at the same time, we intend to make such representatives associate members of C2 if they are not already members. This means that there is a good number of such members due to the significant number of organizations requesting IUPAP representation. The associate membership is done to provide lines of communication between the requesting committees and IUPAP.

### **7. Recommend Conferences for IUPAP support.**

Commission C2 has and will continue to recommend conferences that warrant IUPAP endorsement and/or support. C2 recommended conferences taking place in the near future are the conference on *Physics of Simple Atomic Systems* (PSAS) to be held in May 2018 and the *Conference on Precision Electrical Measurements* (CPEM) to be held in July 2018.

### **8. Seek candidates for prize nominations.**

Commission C2 will seek suitable candidates for the early career researcher award and the SUNAMCO medal award.

## **Report for the C3 Commission (Statistical Physics) to the IUPAP submitted on 9 October 2018**

We have mentioned in our last report (late April 2018) that the C3 Commission for Statistical Physics is responsible for running the IUPAP STATPHYS Conference, which has been held 26 times so far; the last such meeting, STATPHYS 26, was held in Lyon, France; the next one, STATPHYS 27, is scheduled from 8-12 July 2019 in Buenos Aires.

As soon as the new C3 Commission was confirmed, its members started working on the plans for STATPHYS 27, with the Chair of STATPHYS 27, Professor Sylvia Ponce Dawson. The International Advisory Committee and the Steering Committee were set up. Professor Dawson then sought nominations for speakers, for both plenary and invited talks, from the members of the International Advisory Committee, the Steering Committee, and the members of the C3 Commission. The excellent nominations (nearly 600) were then discussed in the meeting of the Steering Committee that was held in Buenos Aires from 10-12 April 2018; the C3-Commission Chair, Vice Chair, and Secretary, who are members of the Steering Committee, attended this meeting. During this meeting a list of plenary and invited speakers was drawn up. Professor Dawson sent invitations to them; and most of these invitees accepted the invitation to lecture at STATPHYS 27. [The list of plenary and invited speakers is now available at <https://statphys27.df.uba.ar/speakers.html> .]

The Steering Committee of STATPHYS 27 has taken special care to ensure (a) that at least 20 percent of the speakers are women and (b) that there are speakers from different parts of the world . This Committee has also put together lists of experts who have been asked to serve on Topics Committees (there are 8 Topics in STATPHYS Meetings); these experts are responsible for selecting oral presentations from the contributed abstracts. [The lists of Topics and Topics Committees is now available at <https://statphys27.df.uba.ar/topics.html> .]

During such STATPHYS conferences, the C3 Commission meets and the Boltzmann Medal is awarded to outstanding Statistical Physicists (chosen by votes of the members of the C3 Commission, the former Chair of the C3 Commission, the Chair of the Organizing Committee for the STATPHYS Conference, and previous Boltzmann Medalists). In addition, in the last four meetings, Young Scientists Prizes have been awarded to highly promising young Statistical Physicists. After e-mail consultations with all the members of the C3 Commission, we have sent out calls for nominations for the Boltzmann Award(s) and the Young Scientists Prizes to statistical physicists all over the world. These calls have also been announced on the website of STATPHYS 27 [<https://statphys27.df.uba.ar/boltzmann.html> and <https://statphys27.df.uba.ar/scientist.html> ].

Traditionally, several Satellite Meetings are held near the main STATPHYS meetings, either before or after these meetings. We are happy to report that several such Satellite Meetings have been planned around STATPHYS 27. A list of these Satellite Meetings is now available at <https://statphys27.df.uba.ar/satellites.html> .

Other organizational details, such as abstract-submission deadlines and the Proceedings of STATPHYS 27 were discussed with Professor Dawson and other members of the Local Organising Committee for STATPHYS 27. These details are available on the website of STATPHYS 27 [ <https://statphys27.df.uba.ar> ], which is updated at regular intervals.

After e-mail consultations with all the members of the C3 Commission, we have prepared nominations for four Associate Members for the C3 Commission. These nominations are being submitted separately.

We list below some recent conferences in the area of Statistical Physics that have received support from the IUPAP. The STATPHYS 27 Meeting (8-12 July 2019) has been recommended for the highest level of support from the IUPAP.

### **Sponsored Commission Conferences**

#### **C3: Commission on Statistical Physics**

[Unifying Concepts in Glass Physics \(UCGP 2018\)](#)

11 - 15 June 2018, Bristol, UK

### **Endorsed Commission Conferences**

#### **C3: Commission on Statistical Physics**

- [Active Matter and Non-Equilibrium Statistical Physics \(AMNSP 2018\)](#)  
27 August - 21 September 2018, Les Houches, France
- [Dynamics and thermodynamics of interacting systems from classical to quantum \(DTISCO 2018\)](#)  
7 - 10 May 2018, Trieste, Italy
- [Workshop on Complex Biological Oscillations \(WCBO 2018\)](#)  
9 - 13 September 2018, Buckinghamshire, UK
- [New Trends in nonequilibrium statistical mechanics: classical and quantum systems \(NTNSMCQ 2018\)](#)  
25 - 31 July 2018, Palermo, Italy
- [Conference of Middle-European Cooperation in Statistical Physics, the 43th edition \(MECO-43\)](#)  
1 - 4 May 2018, Krakow, Poland

**Rahul Pandit, Chair, C3 Commission (Statistical Physics) of the IUPAP**

**Maxi San Miguel, Vice Chair, C3 Commission (Statistical Physics) of the IUPAP**

**Lucilla de Arcangelis, Secretary, C3 Commission (Statistical Physics) of the IUPAP**

## C4 Activity Report – October 2018

During the past five months the C4 has been involved in the following issues,

- (1) Three type B conferences have been organized by C4 community that are being supported by the IUPAP during 2018.
  - (a) International Symposium on Very High Energy Cosmic Ray Interactions ISVHECRI-2018 in Nagoya 21-25 May 2018.
  - (b) Identification of Dark Matter 2018 in Brown University 23-27 July 2018.
  - (c) Tera electron Volt Particle Astrophysics TeVPA-2018 in Berlin 27-31 August 2018
- (2) Requests for the IUPAP sponsorship and financial support for type A conference (i) 36th International Cosmic Ray Conference (ICRC-2019) to be held in Madison, Wisconsin, USA 24 July -1 August 2019 has been recommended. The organizers have submitted necessary IUPAP forms. We are working with the LOC ahead of time, to enable scientists requiring USA visa to receive them in time for the ICRC.
- (3) Detailed report from ISVHECRI-2018 has been received and its highlights have been submitted for publication in the December 2018 issue of the IUPAP Newsletter.
- (4) During ISVHECRI-2018, the first face-to-face meeting of C4 was held where nine members participated. It was decided that the IUPAP policy on harassment issues would be a standard component of all future conference circulars.
- (5) For IUPAP centenary in 2022, Veronique Van Elewyck, APC, Paris will support Monica Pepe Altarelli, Chair of Centenary Working Group from C4 side.
- (6) Three scientists have been nominated by C4 to serve on the International Neutrino Panel which will be discussed during upcoming C&CC meeting.
- (7) Names of Steven Barwick and Imre Bartos have been proposed as Associate members of C4 from 1 January 2019.

Sunil K. Gupta

On behalf of C4

## C5 Activity Report for the IUPAP Council and Commission Chairs Meeting October 2017-October 2018

### Officers/Members 2017-2020

Chair	William P. Halperin	USA
Vice-Chair	Pertti Hakonen	Finland
Secretary	Naoto Nagaosa	Japan
Members:	Xianhui Chen	China
	Juhn-Jong Lin	Taiwan
	Hermann Suderow	Spain
	Viktoria Bekeris	Argentina
	Maxim Kagan	Russia
	Philipp Gegenwart	Germany
	Richard P. Haley	UK
	Peter Skyba	Slovakia
	Floriana Lombardi	Sweden
	Ok Hee Chung	Korea
	Pratap Raychaudhuri	India
Assoc. Mem.	Darius Kaczorowski	Poland

### Activity Report

This review covers the period October 2017 – October 2018 with a summary of the immediate previous 12 month period.

#### 1.0 Activity Previous Period April 2017 – October 2017

#### 1.1 Conferences Organized and Endorsed

##### Type A

28th International Conference on Low Temperature Physics (LT28), Gothenburg, 9-16 August 2017. 904 registrants, 800 abstracts submitted, 25 exhibitors, and 2 major sponsors. The demographics for the largest registrations include 270 from Japan, 80 from Germany, 80 from USA, and 65 from Sweden. At least 10% of delegates were women: this fraction was similar for senior delegates and student delegates. 8 Plenary talks (0 women), 25 half-plenary talks (5 women), 64 Invited talks (>9 women). Chair: P. Delsing, Co-Chairs: M. Fogelström, J Bylander, F Lombardi (one woman). For more details see <http://www.lt28.se/> The Programme Committee was 28% women, and the International Advisory Committee 14.5% women. Financial support was received by 13 delegates (4 women). IUPAP C5 also sponsored poster awards at the meeting.

A scientific summary of the meeting was prepared by IUPAP C5 and is included in the conference proceedings: Journal of Physics: Conference Series.

##### Type B

ULT2017, Frontiers of Low Temperature Physics. August 17-21 2017, Heidelberg, Germany.

180 registrants (21 women) from 21 countries. 27 invited talks (2 women), 28 contributed talks (1 woman), 106 posters. Three poster awards (1 woman).

Chair: C. Enss, Heidelberg

This conference, which was a satellite of LT28, brought together a broad community of researchers to forge links between different experimental communities, with a common interest in ultralow

temperature physics, from fundamental science to techniques and applications. Topics included; superfluid  $^3\text{He}$  and topological matter; heavy fermions; disordered quantum systems; low dimensional systems; model systems for quantum turbulence; superconducting quantum technology; nanomechanical systems; cooling nanoelectronics into the microkelvin regime; cryogenic detectors for far-infra-red astronomy, determination of neutrino mass, dark matter searches.

### **Endorsed Conference**

Mesoscopic Transport and Quantum Coherence 2017 (QTC 2017). August 5-8 2017, Espoo, Finland. 175 registrants (14 women) from 20 countries, 22 invited talks (1 woman).

Chair: Mika Sillanpaa.

This conference, which was a satellite of LT28, presented the latest research, ongoing development and applications related to quantum effects in electron transport, superconducting qubits and hybrid circuits, quantum thermodynamics, circuit QED, cavity optomechanics, topological and two dimensional materials.

### **1.2 Commission Meetings**

Commission C5 met at LT28 in August 2017. Subsequent business has been conducted by e-mail and will continue in this mode until the next face-to-face meeting in 2020 at the next Low Temperature Conference. The organisers/site of LT29 in 2020 has been settled and work is in progress to identify the next Low Temperature Conference (LT30, Type A) in 2023.

### **1.3 C5 Sponsored Prizes Awarded**

IUPAP C5 Young Investigator Prize:

Dr. Clifford Hicks (Max-Planck Institute for Chemical Physics of Solids, Dresden, Germany),

Vlad Pribiag (University of Minnesota, Minneapolis, USA)

Fritz London Memorial Prize:

William Halperin (Northwestern University, Evanston, Illinois USA), James Sauls (Northwestern University, Evanston, Illinois USA), Jeevak Parpia (Cornell University, Ithaca, NY USA)

Simon Memorial Prize:

Professor Louis Taillefer (University of Sherbrooke and the Canadian Institute for Advanced Research, Sherbrooke Canada)

## **2.0 Activity Current Period**

### **2.1 Sponsored Conferences this Period**

#### **Type B**

QFS2018, International Symposium on Quantum Fluids and Solids, July 25-31, Tokyo, Japan. This conference was held on the Hongo campus of the University of Tokyo, Ito Center. It was the 23 regular conference in the series on Quantum Fluids and Solids dating back to 1975 in various countries Czech Republic(1), France(2), Germany(1), Italy(1), Japan(3), Russia(1), UK(1), USA(13) in Europe, Asia, and the Americas. For QFS2018, there were 255 registrants, 52 invited talks, and 147 poster presentations with four prizes for best posters. The conference organizers were *Conference Chair*: Hiroshi Fukuyama (Univ. Tokyo), *Conference Vice-Chair*: Makoto Tsubota (Osaka City Univ.); *Organizing Committee*, Hiroshi Fukuyama (chair), Makoto Tsubota (vice chair), Seiji Higashitani, Koichi Matsumoto, Shinichi Ohkoshi, Yutaka Sasaki, Keiya Shirahama, Masaru Suzuki, Takeo Takagi; *Program Committee*, Makoto Tsubota (chair), Hiroki Ikegami, Takeshi Mizushima; *Publication Committee*: Takeo Takagi (chair), Hyoungsoon Choi; *Local Organizing Committee*: Hiroshi Fukuyama (chair), Tomohiro Matsui, Masashi Morishita, Satoshi Murakawa, Sachiko Nakamura.



The 12 main conference topics were: Topological Quantum Fluids, Qubits and Quantum Information, Superconductors, Quantum Turbulence, Superfluid He-3, Superfluid He-4, Quantum Solids, Spin Liquids and Magnetism, Cold Gases, Neutron Stars, Fluids in Nanopores, Novel Techniques

## **2.2 Anticipated Sponsored Conferences**

### **Type A**

29th International Conference on Low Temperature Physics (LT29) August 16-22, 2020, Sapporo, Japan

About 1,200 participants

Co-Chair: Naoto Nagaosa and Yoshiteru Maeno

This proposal was approved by C5 at its meeting at LT28. It will be submitted for approval for Type A sponsorship to IUPAP in due course.

### **Type B**

International Conference on Quantum Fluids and Solids (QFS 2019)

August 7-13, 2019, University of Alberta, Edmonton, Canada

Chairs: John Beamish, John Davis

This proposal was approved by C5 following recommendation by the QFS steering committee (in August 2017) and will receive consideration for support by C5 in due course.

### **Type B**

ULT2020, Frontiers of Low Temperature Physics. August 24-27 2020, Sapporo, Japan.

Chair: Keiya Shirahama, Keio University

This conference, will be a satellite of LT29 (Type A) and will cover topics similar to those listed above for ULT2017 expanded to include new subjects of topical interest, especially on quantum information science. The number of anticipated attendees is ~200.

William Halperin, C5 chair

October 2018

## IUPAP Commission on Biological Physics (C6)

### Report on Activities from March 2018 to October 2018

Ramin Golestanian, C6 Chair

Jeff Gore, C6 Vice Chair

Masaki Sasai, C6 Secretary

#### 1. C6 Membership (2017-2020)

Name	Country	Roles	Terms
Ramin Golestanian	United Kingdom	Chair	(2017)(2014)(2011)
Jeff Gore	United States	Vice Chair	(2017)(2014)
Masaki Sasai	Japan	Secretary	(2017)(2014)
Marcia Barbosa	Brazil	Member	(2017)
Debashish Chowdhury	India	Member	(2017)
Reza Ejtehadi	Iran	Member	(2017)
Hans-Joachim Galla	Germany	Member	(2017)
Ming Li	China	Member	(2017)(2014)
Suliana Manley	Switzerland	Member	(2017)
Vladimir Nekorkin	Russian	Member	(2017)
Juan Manuel Rodriguez Parrondo	Spain	Member	(2017)
Bryan Trevor Sewell	South Africa	Member	(2017)(2014)
Joanna Trylska	Poland	Member	(2017)
Francoise Brochard Wyart	France	Member	(2017)(2014)

#### 2. Associate Membership

We discussed suitable nominations of associate members and agreed on inviting M. Cristina Marchetti from C3 Commission on Statistical Physics, and John Damilakis from AC4 Commission on Medical Physics to the commission as associate members. Ramin Golestanian is asked to be associate member of AC4 commission.

### **3. Joint EBSA-IUPAP ICBP2019 in Madrid, Spain**

Preparation for the 10th IUPAP International Conference on Biological Physics (ICBP2019) is well underway. ICBP is the major event of the Commission on Biological Physics, covering the entire field of Biological Physics. The ICBP2019 is jointly organized with the European Biophysical Societies Association (EBSA) and will take place in 20-24th July 2019 in Madrid, Spain. More than 1000 participants from diverse world-wide areas are expected. Professor Juan Manuel Rodríguez Parrondo from Universidad Complutense in Madrid, who is member of C6, is organizing ICBP2019 together with the EBSA Vice President Prof. Jesus Perez-Gil. Plans for the satellite conferences were also discussed among C6 members. We are currently in the process of finalizing the symposia and finding representative members of both communities to act as chairs, to ensure a good synergy between the two organizations. This is a very exciting development as it is the first time that two historically separated communities that represent different parts of the spectrum of this interdisciplinary field join up forces to have an active participation in bridging the barriers amongst them.

### **4. The IUPAP C6 Young Scientist Prize in Biological Physics**

We are now seeking nominations for the IUPAP C6 Young Scientist Prize, which recognizes exceptional achievements of scientists in the field of Biological Physics 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, is expected to have demonstrated significant scientific achievements and displays exceptional promise for future achievements in Biological Physics. Two winners will be considered for the prize of 2019 (one prize per year 2018–2019), which will be collectively presented at the 10th international conference in biological physics, to be held in Madrid, Spain July 20 – 24, 2019.

**IUPAP Commission on Semiconductor Physics (C8)**  
**Report on Activities in 2018 for the November, 2018 C&CC Meeting**

Chair	Rolf Haug	Germany	haug@nano.uni-hannover.de
Vice-Chair	Amalia Patanè	United Kingdom	amalia.patane@nottingham.ac.uk
Secretary	Young Dong Kim	Korea	ydkim@khu.ac.kr
Member	Qi-Kun Xue	China	qkxue@mail.tsinghua.edu.cn
Member	Gloria Platero	Spain	gplatero@icmm.csic.es
Member	Yasuhiko Arakawa	Japan	arakawa@iis.u-tokyo.ac.jp
Member	Håkan Pettersson	Sweden	hakan.pettersson@hh.se
Member	Maria Grazia Grimaldi	Italy	mariagrazia.grimaldi@ct.infn.it
Member	Mikhael M. Glazov	Russia	glazov@coherent.ioffe.ru
Member	Uli Zülicke	New Zealand	uli.zuelicke@vuw.ac.nz
Member	Yong P. Chen	United States	yongchen@purdue.edu
Member	Rodorigo B. Capaz	Brazil	capaz@if.ufrj.br
Member	Andrew Sachrajda	Canada	andy.sachrajda@nrc.ca
Member	Elvira Fortunato	Portugal	emf@fct.unl.pt
Observer	Michael Thewalt	Canada	thewalt@sfu.ca

The last report about the activities of C8 was submitted in April 2018.

There was a regular email exchange among the members. In addition the commission met in person (9 members were present) in Montpellier, France, on Tuesday, July 31<sup>st</sup> 2018 during the 34<sup>th</sup> International Conference on the Physics of Semiconductors (ICPS).

As IUPAP sponsored conference B the 20<sup>th</sup> International Conference of Superlattices, Nanostructures, and Nanodevices (ICSNN 2018) was held in Madrid from July 23<sup>rd</sup> until July 27<sup>th</sup> 2018. It had more than 200 participants and was a big success in comparison to some of the previous conferences.

As IUPAP sponsored conference A the 34<sup>th</sup> ICPS was held in Montpellier from July 29<sup>th</sup> until August 3<sup>rd</sup>. It had more than 900 participants. Organizers of ICPS 2018 complained that for 1100 submitted abstracts only around 900 participants showed up. They partly blame the large number of satellite conferences for having less participants than expected. C 8 is not able to do something about that but will observe this subject.

The secretary of C8, Young Dong Kim, organized the voting to select the two prize winners for the IUPAP Young Scientist Prizes in Semiconductor Physics during February 2018. It was a difficult task to select the winners among the really strong 11 candidates. The final voting of the commission led to the result that the two YSP winners in semiconductor physics of 2018 are

*Dr. Jean-Christophe Blancon, Rice University, USA, and  
Prof. Heejun Yang, Sungkyunkwan University, Suwon, Korea.*

The prizes were awarded at the end of the 34<sup>th</sup> International Conference on the Physics of Semiconductors (ICPS) in the afternoon of August 3<sup>rd</sup> 2018. After the award session the two prize winners gave plenary talks about their fields of research. Although it was Friday afternoon the lecture hall was nicely full.

After this award session and before the closing session of the ICPS in addition 12 poster prizes which were cosponsored by IUPAP C8 were awarded to students.

During the meeting of C8 in Montpellier the organizers of ICPS 2020 presented their plans. The members of C8 voted unanimously for having ICPS 2020 in Sidney. Within C8 there was a preference for having a Nobel laureates symposium on Sunday afternoon of ICPS. Organizers of Sidney asked for additional suggestions in respect to the lists concerning their International advisory committee, program committee and topics. Via email exchange suggestions of the members of C8 were forwarded to the organizers of ICPS 2020 during August and September 2018.

During the meeting of C8 in Montpellier the bidding for ICPS 2022 was opened by David Snoke presenting preliminary plans for having ICPS 2022 in Pittsburgh. After the C8 meeting a second bid was put forward by Pavel Hawrylak for organizing ICPS 2022 in Ottawa. Before finalizing the decision C8 wants to see more details about the plans, especially detailed budget plans. The final decision of C 8 will take place during the next meeting of C 8 in 2019.

The International Conference on Defects in Semiconductors (ICDS) was approved as an IUPAP sponsored conference B for 2019.

Names of new associate members were discussed at the C8 meeting and via email.

C8 thanked Mike Thewalt for having served for such a long time in different functions in C8 at the end of the C8 meeting in Montpellier.



International Union of Pure and Applied Physics

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

## C9. Commission on Magnetism - Report 2018

### Officers 2018

Chair: **Burkard Hillebrands**, Germany (2014) (2017)  
Vice Chair: **YoshiChika Otani**, Japan (2011) (2014) (2017)  
Secretary: **Kai Liu**, U.S.A. (2014) (2017)

### Members 2018-2020

Elisabetta Agostinelli, Italy (2017)  
Fernando Luís Araujo Machado, Brazil (2017)  
Joël Cibert, France (2014) (2017)  
Luis Miguel García Vinuesa, Spain (2014) (2017)  
Can-Ming Hu, Canada (2014) (2017)  
Jae Il Lee, Korea (2014) (2017)  
Minn-Tsong Lin, Taiwan (2017)  
Nikolay Mushnikov, Russian Federation (2017)  
Arun Kumar Nigam, India (2017)  
Oksana Zaharko, Switzerland (2017)  
Jianhua Zhao, China (2017)

### Meetings

#### 2018:

The C9 Commission Meeting was held on July 16, 2018 during the International Conference on Magnetism (ICM) in San Francisco, California, USA.

1. Minutes of the last Commission Meeting in Barcelona, Spain during ICM 2015 was approved.
2. Current C9 Chair Burkard Hillebrands and former C.9 Chair Xiaofeng Jin provided a report of the IUPAP Council and Commission Chairs meetings.
3. The Chair of the ICM 2015, Amílcar Labarta, provided the final report of the ICM 2015 in Barcelona, Spain.

4. The Chair of the ICM 2018, Allan MacDonald, reported the status of the ongoing ICM in San Francisco. The conference marked the time time ICM was brought back to the USA since 1985. This time the conference was also sponsored by American Institute of Physics Publishing (AIPP) and IEEE Magnetics Society (MagSoc). The Magnetism Commission thanked the Conference Chair and his team for their outstanding efforts in organizing this conference.

5. The Chair of the ICM 2021, Xiaofeng Jin, reported on the preparation of the upcoming ICM 2021 Conference in Shanghai, China. The Conference will be sponsored by IUPAP, National Natural Science Foundation of China, and Fudan University. The Conference venue will be the Shanghai Convention & Exhibition Center of International Sourcing. The Conference Management Committee has been formed.

6. The next conference, ICM 2024, received two strong proposals. Dr. Elisabetta Agostinelli presented the bid from the Italian Magnetism Association (AIMagn), for organizing the conference in Bologna, Italy. Dr. Jan Vogel presented the bid from France Centre National de la Recherche Scientifique (CNRS), Grenoble, for organizing the conference in Lyon, France. The Commission deemed both proposals as strong and viable options, and thanked both groups for their efforts in putting in the bids. At the end, the Commission selected the AIMagn to organize the ICM2024 in Bologna, Italy.

7. The Commission decided to spend its budget allocation from IUPAP on its Commission Meeting at the ICM2018 and the Awards Dinner with recipients of the 2018 IUPAP Magnetism Award and Néel Medal and winners of the 2016-2018 Young Scientist Prize in Magnetism.

8. C9 Chair Burkard Hillebrands initiated discussions on how to enhance connection between IUPAP C9 and IEEE MagSoc, for example, on coordination of Conferences and Summer Schools organized by the different organizations. The Commission welcomed this effort and the C9 Chair agreed to follow up with MagSoc.

## **Conferences**

The main event sponsored by C9 in 2018 was the International Conference on Magnetism (ICM) in San Francisco, July 15-20, 2018 (<http://icm2018sf.org>)

ICM is a major international conference series with over 1500 registrants expected from all over the world. It continues a series of meetings held every three years, most recently in Barcelona, Busan, Karlsruhe, and Kyoto. ICM2018 addresses fundamental and applied research related to magnetism. Conference Chair is Allan MacDonald, Secretary General is Liesl Folks, and Program Chair is Mark Stiles.

Furthermore C9 sponsored the 23<sup>rd</sup> International Colloquium on Magnetic Films and Surfaces (ICMFS-2018), which was held during July 22-27, 2018 on the campus of the University of California in Santa Cruz CA, USA (<https://icmfs2018.physics.ucsc.edu>). Conference Chair was Peter Fischer.

## Magnetism Awards

The **IUPAP Magnetism Award and Néel Medal** is awarded in recognition of outstanding contributions to fundamental and applied magnetism. It is presented every three years at the International Conference on Magnetism (ICM). Recipients of the 2018 Award are:

Dr. Samuel D. Bader, Argonne National Laboratory

*“For outstanding and sustained experimental contributions to the field of magnetic surfaces, films, and nanostructures”.*

Prof. Ramamoorthy Ramesh, University of California, Berkeley

*“For groundbreaking discoveries in novel multiferroic and magnetoelectric materials and their applications in future technologies”.*

Prof. Kang L. Wang, University of California, Los Angeles

*“For the discovery of chiral Majorana fermions and outstanding contributions to topological spintronics”.*

The **IUPAP Young Scientist Prize in the field of Magnetism** is awarded every year to a young scientist for theoretical or experimental work in fields of fundamental or applied magnetism. Recipient of the 2018 Award is:

Dr. Shinichiro Seki, RIKEN

*“For discovery of multiferroic behavior and electrically controllable skyrmions in insulating chiral magnets”.*

The award committee consists of members of the IUPAP Commission on Magnetism, together with past recipients of the Magnetism Award and Néel Medal. All members of the magnetism community were invited to make nominations.

Both the 2018 IUPAP Magnetism Award and Néel Medal and the 2016, 2017, and 2018 IUPAP Young Scientist Prizes in the field of Magnetism were awarded at the ICM 2018 Conference in San Francisco, CA.



**Oct. 17, 2018 DRAFT**  
**C10: The Structure and Dynamics of Condensed Matter**

**Activity Report for the 2018 IUPAP C&CC Meeting**  
**November 1-2, 2018**

(Submitted by Laura H Greene, Chair C-10)

**C10: MEMBERS 2017-2020**

Officers

**Chair: Laura H. Greene** (2011) (2014) (2017)

[lhgreene@magnet.fsu.edu](mailto:lhgreene@magnet.fsu.edu)

**Vice-Chair: Hartmut S. Leipner** (2011) (2014) (2017)

[hartmut.leipner@cmat.uni-halle.de](mailto:hartmut.leipner@cmat.uni-halle.de)

**Secretary: Tae Won Noh** (2014) (2017)

[twnoh@snu.ac.kr](mailto:twnoh@snu.ac.kr)

Members

**Shuyun Zhou** (2017)

[syzhou@mail.tsinghua.edu.cn](mailto:syzhou@mail.tsinghua.edu.cn)

**Dominik Schaniel** (2014) (2017)

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**Vladimir Kulakovskii** (2014) (2017)

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**Li-Chyong Chen** (2017)

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**Youichi Murakami** (2014) (2017)

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**Ulrike Diebold** (2017)

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**Maria Antonietta Ricci** (2017)

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**Wilson A. Ortiz** (2017)

[wortiz@df.ufscar.br](mailto:wortiz@df.ufscar.br)

**Peter Svec B** (2017)

[fyzisvec@savba.sk](mailto:fyzisvec@savba.sk)

**Graeme M Luke B** (2017)

[luke@mcmaster.ca](mailto:luke@mcmaster.ca)

**Umesh V WAGHMARE** (2017)

[waghmare@incasr.ac.in](mailto:waghmare@incasr.ac.in); [umeshkruti@gmail.com](mailto:umeshkruti@gmail.com)

### Activity report:

1. The C 10 YSP 2019 award will be determined by Friday, October 19, 2018. I will report on that at the C&CC meeting. It will be awarded at the 2018 APS March Meeting in Boston and the winner will present an Invited Talk. We had 16 new qualifying nominations and 5 rollovers. All were outstanding.
2. Given the diversity of fields in C 10, the commission members have rarely been able to meet face to face. We have met at the "*Materials and Mechanism of Superconductivity*" conference, which has been a C 10 sponsored conference, but this year we did not have members attending: The meeting is discussed below.
3. Our commission sponsored the "*Materials and Mechanism of Superconductivity*" conference, held 19-24 August 2018 in Beijing (<http://m2s2018.medmeeting.org/>). We have not received the conference report so I worked out some demographics from the web site. There were 13 plenary talks, all men, and primarily from the US. Of the 242 invited speakers, 12 were women, so 5 %. I was in close contact with the organizers and they were working to amend this. I will report any revised numbers to IUPAP. I note that this conference was granted sponsorship before the demographics of % women invited speakers went into affect. Of the invited speakers, 25 courtiers were represented with 70 from China and 67 from the US. I will work closely with any future C10 sponsored IUPAP conferences on demographics.
4. The US National Academy of Science, Engineering, and Medicine will roll out the Decadal Survey of Materials Research by the end of 2019. Greene, the C10 Chair is a co-chair of this Survey and when released, will notify the relevant IUPAP Commissions. <http://sites.nationalacademies.org/DEPS/materials-decadal/index.htm>
5. The US National Science Foundation report: "Midscale Instrumentation for Quantum Materials" ([https://www.nsf.gov/mps/dmr/MIQM\\_report\\_v15.pdf](https://www.nsf.gov/mps/dmr/MIQM_report_v15.pdf)) was just released. Greene was a co-chair.
6. Repeating from the last report, the C10 Commission will discuss a name change. From "Structure and Dynamics of Condensed Matter Physics" to "Quantum Materials." which is closer to what the Commission actually does. Note there are five Commissions that encompass condensed matter physics:
  - C 5: Low Temperature
  - C6: Biological
  - C 8: Semiconductors
  - C 9: Magnetism
  - C 10: Structure and Dynamics of Condensed Matter

We believe such a name change will more accurately reflect C 10 and will not impinge on the other condensed matter commissions. We will keep Council and other Commissions abreast of our discussions and progress.

## **C11 Report to IUPAP Commission Chairs and Executive Committee**

*October 2018*

*Heidi Schellman, Chair IUPAP-C11 Commission*

### **C11 Officers:**

**Chair: Heidi Schellman** (2011) (2014) (2017) United States

**Vice-Chair: Mihoko Nojiri** (2014) (2017) Canada

**Secretary: Florencia Canelli** (2014) (2017) Switzerland

### **C11 Members:**

**Zhi-Zhong Xing** (2014) (2017) China

**Srubabati Goswami** (2017) India

**Dezso Horvath** (2014) (2017) Hungary

**Azwinndini Muronga** (2017) South Africa

**Johan Rathsman** (2014)(2017) Sweden

**Antonio Zoccoli** (2017) Italy

**Raymond Volkas** (2014) (2017) Australia

**Marie-Helene Schune** (2017) France

**Sergio F. Novaes** (2011) (2014)(2017) Brazil

**Alexander Sorin** (2017) Russian Federation

**Brigitte Vachon** (2017) Canada

### **C11 Associate members:**

Sunil Gupta (C4), Eugenio Nappi (C12, continuing), co-chair of neutrino panel still to be decided

Since the General Assembly in October 2017, the Commission has concentrated on 3 efforts.

- 1) Selection of the recipients for the C11 Young Scientist Prize
- 2) Engagement with conference organizers to implement the motions on diversity enacted at the General Assembly
- 3) Formation of the Neutrino Panel mandated by the General Assembly.

The Commission has met multiple times by phone and met in person at the ICHEP2018 meeting in Seoul, Korea the week of July 4-11, 2018.

## **Selection of Young Scientist Prize Recipients**

The Young Scientist Prize competition was run by incoming Commission Secretary Florencia Canelli with substantial technical assistance from CERN. Thanks to the existence of an efficient web interface and advertising to national and international organizations, we received 65 applications, up from 32 two years ago. Two young scientists, Heather Gray and Jaroslav Trnka, were selected and gave short presentations at the awards session of ICHEP2018 in July.

The Commission suggests some changes to the nomination procedure to make the selection and award process more efficient. Nominations should include a list of 5-10 most significant papers (which should be standard practice in CV's from large collaborations but is not) and the nominator should suggest a 1-2 sentence citation.

## **Implementation of General Assembly Resolution on Diversity**

The ICHEP2016 conference set a benchmark for our field, with 50% of plenary speakers being female and an extremely well attended session on inclusion in HEP. This and the General Assembly resolution have been communicated to the organizers of future conferences, along with recommendations on best practices. In particular, proper reporting on gender and national balance requires that that data be acquired at registration.

Conferences are now also expected to have a posted anti-harassment policy. It is important that the policy and procedures be clear and communicated to participants.

## **Implementation of the General Assembly Resolution Implementing a Neutrino Panel**

The 29<sup>th</sup> General Assembly RESOLVED to establish the Neutrino Panel, composed of nominees of C4, C11, C12, WG1, WG9 and WG10, under the supervision of those Commissions and Working Groups and coordinated by C11. The Neutrino Panel has a 3-year mandate “ to promote international cooperation in the development of an experimental program to study the properties of neutrinos and to promote international collaboration in the development of future neutrino experiments to establish the properties of neutrinos.” The Commissions and working groups have met by phone and composed a roster of neutrino physicists spanning the full range of neutrino physics. 3 co-chairs, Nigel Smith, Takaaki Kajita and Manfred Lindner are assembling a committee representative of all aspects of neutrino physics with input from the commissions and working groups.

## **Upcoming Conferences**

### **Category A:**

- Lepton Photon 2019 (Toronto, Canada – August 5-10, 2019)

- International Conference on High Energy Physics (Prague, Czech Republic, July 30-August 5, 2020)

**Category B:**

- LHC Physics (LHCP) Conference (Puebla, Mexico – May 20-26, 2019)

We also expect future proposals from several other conference series. The Neutrino conference and the Baldin Seminar occur biannually and have been sponsored by C11 for many years. Technology and Instrumentation in Particle Physics (TIPP) occurs every 3 years while the International Conference on Particle Physics (IPAC) occurs annually. They are usually endorsed but do not receive financial support. LHCP was supported for the first time this year as a Category B conference. It cannot be supported every year but will likely alternate with Neutrino.

The Lepton Photon Conference in Toronto in 2019 will be the first to have parallel as well as plenary sessions. Attendance at this conference, particularly by younger scientists, has been low in recent years as funding agencies often require a presentation to fund attendance. The addition of parallel sessions should allow subjects to be pursued in greater depth and encourage younger scientists to attend.

## **IUPAP COMMISSION ON NUCLEAR PHYSICS C12**

### **Report to IUPAP Executive Committee and Commission Chairs**

**September 2018**

***Claes Fahlander, Chair of C12***

#### **Annual meeting of C12 September 7 2018**

The latest annual meeting of C12 took place in Bologna in Italy on September 7 2018. It was held in connection to the European Nuclear Physics Conference, EuNPC2018. The C12 meeting was held on the premises of the Academy of Sciences of Bologna, and it was followed the day after by the annual meeting of the IUPAP Working Group 9 on International Collaboration in Nuclear Physics. The participants of WG9 were invited, as usual, to participate in the C12 meeting as observers, and vice versa. All 14 members of C12 were present.

The major discussions and decisions of the C12 meeting is reported here.

#### **IUPAP Young Scientist Prize in Nuclear Physics**

The IUPAP Young Scientist Prize in Nuclear Physics is awarded every third year. The award ceremony takes place at the International Nuclear Physics Conference, INPC, a tri-annual conference, the largest in nuclear physics, which until now have been sponsored by IUPAP as category A. The last time the Young Scientist Prize was awarded was at the INPC meeting in Adelaide in Australia in 2016. Next time will be at the INPC conference in Glasgow in Scotland in 2019, where three prize winners will be presented.

The deadline for nominations was September 1 2018. Thirty nominations were received at that date. Five nominees are women, 25 are men. They represent most fields of nuclear physics: nuclear reactions, nuclear structure, nuclear astrophysics, nuclear instrumentation, hadron physics and QCD matter physics. The geographical distribution of the nominees are: 6 from Asia, 6 from North America, and 18 from Europe.

The evaluation will be performed by the C12 members.

The timetable is as follows:

- a) March 2018: call for nominations via relevant e-mail lists. **Finished.**
- b) September 1 2018: deadline to receive nominations. **Thirty nominations received.**
- c) September 7 2018: first discussion of incoming nominations at the C12 meeting in Bologna. **Finished.**
- d) September 7 2018: discussion of the evaluation procedure at the C12 meeting in Bologna. **Decided.**
- e) September – December 2018: evaluation of the nominees. **By the C12 members.**
- f) Spring 2019: IUPAP Secretary-General to approve the suggested winners and the citations.
- g) Spring 2019: inform the winners.
- h) July 2018: award of the prize to the winners at the INPC conference in Glasgow.

## **IUPAP Neutrino Panel**

A report of the status of the neutrino panel was delivered. Nigel Smith, who has been appointed as one of the co-chairs of the panel, was present at the C12 meeting. He reported that the full list of members of the panel will be presented to the C&CC meeting in October 2018 in Vilnius.

## **Issues related to the discovery of new superheavy elements**

The new document "*IUPAC and IUPAP Procedures for Validating Claims for the Discovery of New Elements and Naming those Elements*" was discussed. It was found that there are many important changes that will make the process more transparent. It is also obvious from the document that the C12 commission of IUPAP will be involved as an expert committee to a larger extent than before, which is much appreciated by the C12 members.

The new document "*On the Discovery of New Elements*" by the 2017 Joint Working Group of IUPAC and IUPAP was also mentioned. It has recently been accepted as a publication in "Pure and Applied Chemistry". C12 is looking forward to its immediate publication.

## **International Year of the Periodic Table – IYPT**

IYPT will give us the possibility to increase the visibility of nuclear physics when it comes to superheavy elements; to clarify the notion of these very heavy elements and the production and identification of them, which mainly is by means of nuclear physics methods and techniques.

Actions how to increase the visibility was discussed such as:

- Advertise the IYPT at nuclear physics conference webpages.
- Organize public lectures at nuclear physics conferences.
- Encourage nuclear physicists to make public lectures on the subject.
- Encourage nuclear physicists to write popular science articles on the subject.
- Suitable nuclear physics events in 2019 should be linked to the IYPT.
- Set up of activities, such as exhibitions, possibly jointly with chemists.

## **IUPAP sponsorship of nuclear physics conferences**

Requests for IUPAP sponsorship from five conferences in nuclear physics were reviewed. Two of the conferences ask for category A support, two ask for category B support, and one conference ask for endorsement. Representatives from the local organising committees were given 10 minutes each to make their case. They were:

- **INPC2019**: 27th International Nuclear Physics Conference, to be held in Glasgow in Scotland, July 29 – August 2 2019. Presented by David Ireland, chair of the organising committee. Asking for category A support.
- **Quark Matter 2019**: XXVIII International Conference on Ultrarelativistic Nucleus-Nucleus Collisions, to be held in Wuhan in China, November 3-9 2019. Presented by Joachim Stroth representing the organising committee. Asking for category A support.
- **LASNPA2019**: XIII Latin American Symposium on Nuclear Physics and Applications, to be held in Costa Rica, October 14–19 2019. Presented by Débora Menezes, representing the organising committee. Asking for category B support.

- **SQM2019**: International Conference on Strangeness in Quark Matter to be held in Bari in Italy, June 10–15 2019. Presented by Domenico Elia, chair organising committee. Asking for category B support.
- **TAN19**: 6th International Conference on the Chemistry and Physics of the Transactinide Elements, to be held in Wilhelmshafen, Germany August 25– 30 2019. Presented by Claes Fahlander representing the organising committee. Asking for endorsement.

The C12 Commission decided to recommend that IUPAP support be granted as follows.

### **INPC 2016 – category A support**

The INPC 2019 conference is the next in the series of international conferences in nuclear physics which brings together some 700 participants from around the world on a three year cycle. It is the only international conference covering all the subfields of nuclear physics both at the experimental and theoretical level. It is the main conference in the field of nuclear physics and has been rotating amongst the various continents, INPC2007 in Tokyo, INPC2010 in Vancouver, INPC 2013 in Firenze, INPC2016 in Adelaide, INPC2019 in Glasgow. It is the venue at which the three IUPAP young scientist prizes in Nuclear Physics are awarded every three years.

The local program committee and the international advisory committee will both have almost 30% female members. Registration fee will be set at £480, and for students £370.

The C12 commission reviewed the plans and budgets as submitted by the organising committee and is satisfied that they meet the requirements set by IUPAP, in particular with regards to open access, participation of women on committees, targets for female invited speakers and participation of young investigators and students.

It has received IUPAP support as category A conference in the past. The C12 commission recommendation is that INPC 2019 be given **category A support** with highest priority.

### **Quark Matter 2019 – category A support**

This is the major international conference on ultrarelativistic heavy-ion collisions and will take place in November 2019 in Wuhan, China. This conference takes place on a 1.5 year cycle and it rotates amongst the continents, 2014 in Darmstadt, 2015 in Kobe, 2017 in Chicago, 2018 in Venice, 2019 in Wuhan. This will be the 28<sup>th</sup> edition of this major conference which attracted more than 750 participants in its last two instances. The aim of this conference is to bring together theoretical and experimental physicists from around the world to discuss new developments in high energy heavy-ion physics. The focus of the discussions is on fundamental understanding of strongly interacting matter at the extreme conditions formed in ultra-relativistic heavy-ion collisions, which relates to the state of the early universe.

The local program committee and the international advisory committee will both have about 20% female members, and the number of female speakers is targeted to more than 30%. Registration fee will be set at \$650, which will cover lunches, coffee breaks, reception, conference dinner and conference proceedings.



Quark Matter has received IUPAP support as category A conference in the past. However, for 2018 they only received endorsement. It was discussed at the C12 meeting in 2017 in Tokyo that it was difficult to recommend category A support to QM every time considering the fact that it takes place more frequent than most other conferences. It was suggested that we alternately should suggest category A and endorsement every second time.

Therefore, the C12 commission recommendation is that Quark Matter 2019 should be given **category A support** with high priority.

We are aware that it may be difficult for IUPAP to support two category A conferences to one and the same commission, but we considered that it was particularly pressing this year within C12, and we therefore ask for support in category A for both INPC2019 and QM2019.

### **LASNPA2019 – category B support**

This is a regional conference that brings together a large segment of the nuclear physics community from South America and it has attracted participation also from North America, Europe, and Asia. The invited speakers have a broad international distribution. It moves around South America with a two year cycle and for the first time it will be held in San José in Costa Rica. It attracts ~300 participants from all over South America and is seen as a key promotional event for the rapidly developing countries on the continent. The program has a strong component of applications of nuclear techniques. It was supported as a category B topical conference in 2015 and 2017. It is an important element for the growth of the nuclear physics community in South America.

The local program committee and the international advisory committee will both reach the IUPAP target of 20% female members. Expected number of participants is between 250 and 300. Registration fee will be set at \$250, and covers conference proceedings, coffee breaks, welcome reception, and the conference dinner.

The C12 commission recommendation is that LASNPA 2017 be given **category B support** with high priority.

### **SQM2019 – category B support**

This is a topical conference that brings together a large segment of the strange quark gluon plasma community. The main topic of the conference is concerned with strangeness and heavy flavour production in heavy-ion collisions. Of particular interest are heavy-quark production and hadronic interactions, hadron resonances in the strongly-coupled quark-gluon plasma, bulk matter phenomena associated with strange and heavy quarks, the QCD phase structure, and strangeness in astrophysics. SQM is among the main and largest conferences on heavy ion physics after QuarkMatter. The first edition of SQM was held in Aarhus Denmark in 1991, and since then it has taken place all over the world on a 1.5 year cycle. The most recent editions are SQM2013 in Birmingham, SQM2015 in Dubna, SQM2016 in Berkeley, and SQM2017 in Utrecht. From now on it has been decided that the 1.5 year cycle should be changed to a 2 year cycle.

The local program committee and the international advisory committee will both reach the IUPAP target of 20% female members. Expected number of participants is between 250 and 300.

Registration fee will be set at €380 for senior participants, and to €300 for students. The fee covers conference proceedings, coffee breaks, lunches, the conference dinner and an excursion.

The C12 commission recommendation is that SQM2019 be given **category B support** with high priority.

### **TAN19 – endorsement**

This is a topical conference that brings together nuclear physicists and nuclear chemists involved in the search of new superheavy elements. It is the main conference series in the field of superheavy element research. The scope of the conference will cover experimental and theory aspects of the heaviest-element synthesis. It will cover the topics of nuclear reaction studies, nuclear structure and spectroscopy, atomic physics studies, chemical properties of transactinide elements, and it will also discuss new technical developments and present and upcoming large-scale facilities in the field of superheavy element research. The first TAN conference took place in 1999 in Seeheim near Darmstadt, Germany. Since then the meetings of this series have been organised every 4 years. In 2003 in Napa in USA, in 2007 in Davos in Switzerland, in 2011 in Sochi in Russia, and in 2015 in Urabandai in Japan.

The local program committee reach the IUPAP target of 20% female members. The number of invited female speakers come to 17 %. However, for the international advisory committee there is a problem with only one women among the 17 members, which thus only come to 6 % female participation in this committee. I have asked the organisers to add at least one more woman to the international advisory committee.

Expected number of participants is between 100 and 120. Registration fee will be set at €500, and covers coffee breaks, lunches, dinners, and a social program. The fee for students will be reduced by 50%.

A few more important aspects on this conference.

TAN19 is a regular conference dealing with the search and discoveries of superheavy elements. It is a conference that over the years has been endorsed by IUPAC, and they endorse it also for TAN2019. Thus the IUPAC logo is already on the TAN19 website. During the conference there will a special focus on the periodic table since 2019 is the International Year of the Periodic Table, and both the President of IUPAC and the President of IUPAP has ben invited, and they will attend the conference to give welcome addresses. From that point of view it would be desirable to have both unions logo on the TAN19 webpage. It is maybe also the only conference where it would be fitted to have both logos on a conference website signalling the friendship between the two unions.

Special events at TAN19 recognising the International Year of the Periodic Table in 2019 will be a special public lecture by Professor Gisela Boeck from the University of Rostock on the history of the Periodic Table, and there will be talks by living discoverers on the discoveries of elements 112, 113, 114, 115, 116, 117, 118. And as mentioned above, both the presidents of IUPAC and IUPAP will attend TAN19 to give welcome addresses. This will give also IUPAP visibility at this important conference dealing with new elements of the periodic table, and we believe that it is important for IUPAP to be represented there considering the recent debate about chemists contra physicists in the hunt for new elements.

Since the conference organisers do not reach the minimum women participation in the international advisory committee the C12 felt that they could not recommend endorsement, although some of the members of C12 considered it very important to maybe overrule that particular IUPAP requirement in the present case. We will leave it to IUPAP to decide whether it finds the present other circumstances outlined above important enough such that the gender requirement of the international advisory committee could be relaxed somewhat in this particular case.

### **Associate members to other commissions and working groups**

C12's commitment to other commissions and working groups were discussed. The present engagement of C12 commission members is in the following groups:

C11 Particle Physics – Eugenio Nappi.

C13 Physics for development – Claes Fahlander.

C19 Astrophysics – Weiping Liu.

WG10 – Astroparticle Physics International Committee – Ani Aprahamian.

It was decided that it would be most valuable for C12 to remain as associate to C11 and C19, but instead of C13 and WG10, it would be more valuable to get associated with C14 – Physics Education and WG14 – Accelerator Science. We have more interests in common with both of them, and we believe we can be of help and collaborate with them on many common matters.

The new appointments for associate membership that we would like to suggest to the IUPAP Council in October 2018 are thus:

- C11 - Particle Physics - Eugenio Nappi.
- C14 - Physics Education - Yanlin Ye.
- C19 - Astrophysics - Iris Dillman.
- WG14 – Accelerator Science – Ani Aprahamian.

A separate report is sent to the IUPAP secretariat about this topic.

# **IUPAP C13 COMMISSION REPORT**

**Prepared by Sekazi K. Mtingwa (C13 Chair)  
for the October 2018  
Meeting of the IUPAP Executive Council and  
Commission Chairs**

**August 2018**

## **Officers**

*Chair:* **Sekazi Mtingwa**, United States

*Vice-Chair:* **Kuijuan Jin**, China

*Secretary:* **Joseph Niemela**, Italy

## **Members**

**Carlo Saverio Iorio**, Belgium

**Mmantsae Diale**, South Africa

**Aba Bentil Andam**, Ghana

**Kevin McGuigan**, Ireland

**François Piuzzi**, France

**Dmitri Wiebe**, Russia

**Michael Steinitz**, Canada

**Samia Charfi Kaddour**, Tunisia

**Andreas Buchleitner**, Germany

**Ajith Kumar Parambath**, India

**Jose Daniel Muñoz Castaño**, Colombia

## **Associate Members**

**Kennedy Reed**, United States

**Gorazd Planinsic**, Slovenia

**Claes Fahlander**, Sweden

**Lilia Mesa-Montes**, Mexico

## **Observers**

**Fernando Quevedo**, Director of Abdus Salam ICTP

**Galileo Violini**, Director Emeritus of Centro Internacional de Física,  
in Bogota, Colombia



### **Group Photo of C13 Commission at Annual Meeting, Trieste**

(Left-to-right: Joe Niemela (Sec’y), Michael Steinitz, Mmantsae Diale, Sekazi Mtingwa (Chair), Carlo Iorio, Fernando Quevedo (ICTP Director, Observer), Kuijuan Jin (Vice-Chair), Andreas Buchleitner, François Piuze, Samia Charfi Kaddour, Ajith Kumar B.P.)

#### **I. *LAAAMP* Midterm Workshop**

The C13 Commission convened a half-day *LAAAMP* Midterm Workshop on 24 August 2018 at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy. Professor Fernando Quevedo, Director of ICTP, welcomed the participants to open the Workshop. Table I displays the Agenda. From the presentations and subsequent discussions came the following recommendations:

1. Pursue crowd funding in addition to standard sources of funding.
2. Utilize Facebook and other social media.
3. Translate the *LAAAMP* Brochure (already in English, French and Spanish) into Arabic.
4. Encourage *LAAAMP*'s advanced light source partners to begin training young researchers from the developing world in the same way that Leon Lederman did in the early days of Fermilab in Latin America, which was highly successful in growing the number of high energy accelerator users.
5. Partner with other Scientific Unions.

# **LAAAMP** *midterm workshop*

**Trieste, Italy, 24 August 2018**

**Location:** Abdus Salam International Centre for Theoretical Physics  
Giambagi Lecture Room, Adriatico Guesthouse

**Moderator:** Sekazi Mtingwa (Chair, *LAAAMP* Executive Committee)

<b>Welcome</b> Fernando Quevedo Director, Abdus Salam ICTP	<b>13:30</b>
<b>Greetings from IUPAP C13 Commission</b> Sekazi Mtingwa Chair, IUPAP C13 Commission on Physics for Development	<b>13:40</b>
<b><i>LAAAMP</i> Overview</b> Sandro Scandolo Member and Former Chair, <i>LAAAMP</i> Executive Committee	<b>13:50</b>
<b><i>LAAAMP</i> Brochure</b> Ernie Malamud, Editor	<b>14:10</b>
<b>Elettra: Present Status and Future Plans</b> Alfonso Franciosi, President and CEO	<b>14:30</b>
<b>Visit to Dr. Heide Hackmann, Executive Director</b> International Science Council, Paris Ernie Malamud, Fermilab and University of Nevada-Reno	<b>15:00</b>
<b>SESAME: Present Status and Future Plans</b> Giorgio Paolucci, Scientific Director	<b>15:20</b>
<b><u>Group Photo</u></b>	<b>15:50</b>
<b><u>Coffee Break</u></b>	
<b>Siam Photon Source: Present Status and Future Plans</b> Prapong Klysubun, Deputy Director for Operations	<b>16:20</b>

<b>Mexican Synchrotron Radiation Project</b> <b>Matías Moreno, Chair</b>	<b>16:50</b>
<b>African Light Source Initiative</b> <b>Sekazi Mtingwa, Member, AflS Steering Committee</b>	<b>17:20</b>
<b>Discussion/Recommendations</b>	<b>17:50</b>
<b>Closing Summary</b> <b>Sekazi Mtingwa</b>	<b>18:20</b>
<b>Dinner at Principe di Metternich</b>	<b>19:30</b>

**Agenda of the LAAAMP Midterm Workshop**  
**TABLE I**

**II. Establishment of Group on Affordable Scientific Equipment**

The C13 Commission considered the following proposal from François Piuzzi, and supported by Ajith Kumar B.P. and Michael Steinitz, on affordable scientific equipment:

**The Case for Establishing a Scientific Instrumentation Group  
for the IUPAP C13 Commission**

**François Piuzzi, Chair of the Physique sans Frontières Commission of the French  
Physical Society**

**Introduction**

Scientific instruments are the basic tools for characterizing developments in Health, Energy and the Environment. However, we face a serious problem in making them widely available since their costs are too high for most countries. Furthermore, research in instrumentation leads to increased sophistication, resulting in improved performance but also in additional costs, making democratization of instrumentation even more necessary.

The basic procedures of science – measuring and quantifying – are followed by modeling, simulation and theory. We can divide science into **high-level science**, dealing with fundamental issues and increase of knowledge, and **science close to everyday life**, taking into account the solution of societal problems. We need to give access to science to the biggest number of people and enable the sharing of scientific culture, requiring a democratisation of scientific instruments (among other things).

Until recently this could be seen as a **utopia** but now, due to the **digital revolution**, diverse tools, methods, technologies and digital workshops (Fab Labs) have emerged that make it possible to design, prototype and manufacture instruments at a sustainable cost. This has been accompanied by the emergence of **collaborative methods**, such as the **Open Source movement**. In parallel, the Open Access management of scientific literature has been developed, facilitating the sharing of information and expertise.

### **State of the Art**

Experimental sciences need instruments, and there is a shortage of these in many countries, especially in Africa:

1. For high-school science teaching
2. For practical training at universities
3. For research
4. For measuring important parameters for addressing societal problems.

Development of *in silico* or *in Internet* (including the MOOCS approach) experiments is important and necessary, but cannot replace the essential training taking into account:

1. Difficulties related to the local situation
2. Calibration and reproducibility
3. Comparison with well-defined standards
4. Sensitivity and selectivity
5. Design and construction of scientific instruments, leading to independence.

**The Open Source, collaborative, and sustainable cost approach will bring solutions to this problem but will not cover the entire physics and science domain...**

### **Recent Evolution and Breakthroughs**

The following developments have been important steps forward for the development of sustainable cost instruments:

1. Arduino platform for “*simple*” electronics, making it possible to share programs (strong Open Source database of programs – e.g.: driving stepper motors, used by the micro-actuator imbedded on the board (UNO: 25 € - Nano: 5€)
2. The **Expeyes** (experimental eyes) system developed by Ajith Kumar at New Delhi is a very good alternative to Arduino.
3. Microcomputers such as **Raspberry Pi** (40 €) and Raspberry Zero (2016 5 €) using the Python language
4. **Recycling** and **reuse** of high-tech components (such as those in the photonics domain) that can be found in consumer devices such as computer peripheral, printers, scanners, CD and DVD drives, hard disks, cars, ... This need to break the black box syndrome and the components and systems found may be used for other purposes.



5. **Technological shortcuts**, e.g. the web cam, making it possible to take an image with immediate transfer to the computer. Also, **LEDs and laser pointers** are valuable miniaturized sources of light, which can be used in new miniaturized instruments, enabling their use in the field. Use of **smartphones** in numerous types of measurement is also being developed.
6. Democratisation of **3D printing and** other digital tools, such as laser CNCs and 3D scanners, enables quick prototyping and an easy exchange of projects, leading to better instruments.
7. The development of **numerical modelling** tools
8. The rapid exchange and circulation of information through the **Internet** (such as Wikipedia) enables trans- and multidisciplinary.
9. New **Open Source hardware patents** (CERN, creative commons)
10. Availability of **Open Source or Open Access software**, such as Image J (Image processing) and Linux.

Concurrent use of these breakthroughs helps to unleash creativity and to design scientific instruments with affordable cost. This is not applicable to all domains of science and requires first-rate scientific and technological experience.

#### Proposed Action Items for the C13 Commission

1. Create a study group on sustainable-cost scientific instrumentation and laboratory hardware. This would be the first opportunity to lobby together for sustainable-cost instrumentation and laboratory hardware.
2. Create a thematic repository for Open Source projects in instrumentation and associated tools.
3. Assemble the main experts in the field through dedicated Hackathons.
4. Investigate the possibility of rewarding some excellent projects on the IUPAP web site.
5. Launch collaborations between developing countries. Contests.
6. Create a “Cost action” within the EU framework, which could be very useful since it would enable funding travel costs for meetings.

#### **ACTIONS OF THE C13 COMMISSION**

To get the ball rolling, the C13 Commission made the following decisions:

1. C13 approved the establishment of new *Group on Affordable Scientific Equipment* and approved the following persons to serve on the Group:

**Chair:** François Piuzzi  
**Members:** Samia Charfi Kaddour  
Mmantsae Diale  
Carlo Iorio  
Ajith Kumar B.P.  
Joseph Niemela  
Michael Steinitz.

2. Each conference co-sponsored by C13 should invite one of the members of the new Group on Affordable Scientific Equipment, or another person approved by C13, to offer a Parallel Session at the conference that provides demonstrations of prototype low-cost equipment. Furthermore, part of the C13 funds to the conference should be allocated to pay for the travel costs of the person offering the Session.

### **III. Establishment of a Group on Physics in Africa**

In order to identify programs and activities to promote and enhance physics on the continent of Africa, an ambitious new project has been launched called the Physics in Africa project. Those collaborating on the project include the American Physical Society, the U.K. Institute of Physics, European Physical Society, Abdus Salam International Centre for Theoretical Physics, and the South African Institute of Physics.

Joseph Niemela, who is Secretary of the C13 Commission, is one of the leaders of the Physics in Africa project.

### **ACTION OF THE C13 COMMISSION**

To support the Physics in Africa project, the C13 Commission approved the establishment of a new *Group on Physics in Africa* and approved the following persons to serve on the Group:

**Chair:** Joseph Niemela  
**Members:** Aba Andam  
Andreas Buchleitner  
Samia Charfi Kaddour  
Mmantsae Diale  
Fernando Quevedo  
Michael Steinitz.

### **IV. Establishment of a Group on Doctoral Student Recruitment**

The C13 Commission considered the following proposal from Sekazi Mtingwa on Doctoral Student Recruitment, starting with the Scuola Internazionale Superiore di Studi Avanzati (SISSA) located in Trieste:

#### **Student Recruitment for SISSA (<http://www.sissa.it>)**

The day before last year's (2017's) Annual C13 Meeting, we visited Scuola Internazionale Superiore di Studi Avanzati (SISSA), which translated into English is

International School for Advanced Studies. While there, we had a fruitful discussion with the Director, Professor Stefano Ruffo, and some of his colleagues. SISSA is an international state-supported, post-graduate teaching and research institute located in the City of Trieste. It offers training in mathematics, physics and neuroscience. SISSA has approximately 70 professors, 100 postdocs, and 300 PhD students. It admits approximately 70 PhD students annually, runs master programs in the same areas, and collaborates with Italian and other European universities.

During our discussions, we learned that a large fraction of their international students came from China, but there were few from developing regions of the world. It would be advantageous for C13 to launch an initiative to assist SISSA in recruiting students from Africa, the Middle East, Central America, and Southeast Asia. Aside from identifying outstanding students who are graduating from undergraduate programs in those regions, it may be possible to utilize existing programs from which to recruit students, such as the academic programs offered by the Abdus Salam ICTP and the African Institutes for Mathematical Sciences (AIMS) located in several African countries.

See <https://www.ictp.it/programmes/degree-programmes.aspx>  
<https://www.nexteinstein.org>.

C13 should discuss whether this is a possible new initiative and if so, who should lead it.

#### **ACTION OF THE C13 COMMISSION**

To support the effort to recruit doctoral students, starting with SISSA and subsequently other universities, the C13 Commission approved the establishment of a new *Group on Doctoral Student Recruitment* and approved the following persons to serve on the Group:

**Chair:** Sekazi Mtingwa  
**Members:** Aba Andam  
Andreas Buchleitner  
Mmantsae Diale  
Carlo Iorio  
Kuijuan Jin  
Samia Charfi Kaddour  
Sandro Scandolo.

#### **V. Conference Sponsorships**

The C13 Commission received fourteen (14) conference applications for funding, several of which were ineligible since they were not from Type D (developing) countries. According to IUPAP Guidelines, only Type D countries are eligible for funding by the C13 Commission. See <http://iupap.org/sponsored-conferences/conference-policies/>. Type D countries are defined by IUPAP as those in the World Bank's most recent list of "low income" and "lower middle income" countries. The two lists can be found at <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

**At the urging of Buchleitner, C13 discussed at length and decided to request that the Council modify the template of the Conference Application to enhance the quality of the applicants' responses and make it clearer what is being requested. Buchleitner will suggest some changes for consideration, and they will be submitted to the Council for deliberation. (Refer to Appendix 1) Also, applicants not from Type D countries should be made more aware of the fact that they are not eligible to apply.**

### **ACTIONS OF THE C13 COMMISSION**

The C13 Commission made the following decisions:

1. The C13 Commission approved funding in the amount of 7,000 Euros for each of the following conferences:
  - a. Conference title: Biophysical approaches to macromolecules and cells: integrated tools for life sciences and medicine  
Location: Kenyatta University, Nairobi  
Start date: 09/09/2019  
End Date: 20/09/2019  
Name of organizer/contact person: Loredana Casalis  
Phone number: +39 3930288458  
Email: [loredana.casalis@elettra.eu](mailto:loredana.casalis@elettra.eu)
  - b. Conference title: SECOND REGIONAL CONFERENCE ON WOMEN IN PHYSICS 2019  
Location: Nepal  
Start date: 27/03/2019  
End Date: 29/03/2019  
Name of organizer/contact person: NILAM SHRESTHA PRADHAN  
Phone number: ++977 9841221611  
Email: [nilamspradhan@gmail.com](mailto:nilamspradhan@gmail.com)
  - c. Conference title: ICO & IUPAP-C17 Topical Meeting on OPTICs and Applications to SUSTAINABLE Development (OPTISUD)  
Location: Carthage, Tunisia  
Start date: 01/09/2019  
End Date: 05/09/2019  
Name of organizer/contact person: Mourad Zghal  
Phone number: (+216) 71857000 / (+216) 98521757  
Email: [mourad.zghal@supcom.tn](mailto:mourad.zghal@supcom.tn).
2. As already noted above, each conference funded by C13 should invite one of the members of the new C13 Group on Affordable Scientific Equipment, or another person approved by C13, to offer a Parallel Session at the conference that provides demonstrations of prototype low-cost

equipment. Furthermore, part of the C13 funds to the conference should be allocated to pay for the travel costs of the person offering the Session.

3. Where possible, the person offering the Parallel Session on affordable equipment should also offer a presentation on *Ethics in Scholarly Communications*.

## **VI. Appointment of Selection Committee for the IUPAP Medal for Outstanding Contributions to the Enhancement of Physics in Developing Countries**

The selection of the next awardee of the IUPAP Medal should occur during the next Annual Meeting of the C13 Commission. In preparation for that selection, the C13 Commission made the following decision:

### **ACTION OF THE C13 COMMISSION**

The C13 Commission appoints the following persons to serve for the next year on the IUPAP Medal Selection Committee:

**Chair:** Mmantsae Diale  
**Members:** Aba Andam  
Carlo Iorio.

## **VII. Establishment of a new Group on the Ethics of Scholarly Communication**

The C13 Commission discussed the following memorandum and proposal to C13 from Michael Steinitz:

.....I have just returned from a lecture tour in Canada, speaking on the subject of "The Ethics of Scholarly Communication," dealing especially with questions of plagiarism in publication. I have given short courses on this topic and aided graduate students in their work in Mexico and have lectured on the topic in Zambia. I have lectured in South Africa, as well.

Two items of interest have come up just recently.

1. A report of cheating on exams in an ethics class in Canada!
2. As Editor of the Canadian Journal of Physics, I have to deal with a large number of plagiarized submissions. Over 10% of the submissions we receive are either self-plagiarized (submission of a paper that has already been published elsewhere, in an attempt to pad one's resume), or blatantly "cut and paste" from work already published by others (this is just plain theft).

I recently received a letter from an author, from which I have extracted the following quote:

*I am terribly embarrassed to be in connection with such a situation... Since I never had an adviser as it should be in my post graduate education, I had to learn*

*the scientific discipline on my own and it seems that I missed learning such a point on my own. So, I would be very grateful if I was given a chance to revise it.*  
Assist. Prof. Dr. \_\_\_\_\_.

This has motivated me to think about whether it would be appropriate for the C13 Commission to engage with this problem, perhaps with an educational campaign made available to students in developing countries, on a similar basis to that undertaken at the National University of Mexico (UNAM).

#### **ACTION OF THE C13 COMMISSION**

The C13 Commission approved the establishment of a new *Group on the Ethics of Scholarly Communication*, chaired by Michael Steinitz. Additional members are yet to be decided.

#### **VIII. Contributions of C13 to IUPAP Centenary Celebrations and International Year of Basic Sciences for Development**

The C13 Commission discussed the following memorandum and proposal to C13 from François Piuzzi:

...The C13 commission should discuss the IUPAP Centenary and the C13 contributions to it, especially as regards experimental science, since up to now, lobbying has essentially been on behalf of huge instrumental structures. We should be the voice of small labs from low resource countries that struggle in teaching physics and performing research. We should search for solutions in cooperation with the local scientists.

It would be interesting to discuss how to develop experimental physics (together with experimental science) knowing that physics is ubiquitous in the making and operation of scientific instruments.

First, I should express my concern that at the C13 meeting, we should have scientists from all continents present in order to have meaningful discussions. Tentatively, I think that Ajith Kumar from India, founder of the Expeyes system; Paul Woafu from Cameroun, founder of the Cameroon Physical Society and chair of the challenge for experimental sciences; and Jose Daniel Munoz Castano from Colombia should join us. ...

As part of the Centenary celebrations, I propose the following:

1. We should promote the *LAAAMP* project.
2. We should highlight the IUCr-UNESCO-*LAAAMP* OpenLabs project in crystallography as an example to follow.
3. We should present actions done in humble basic physics to improve things such as the challenges in experimental science in developing regions of the world.

4. We should point out that training is mandatory for the making of instruments and the use of them and that more funds should be dedicated to them. This is essential for experimental physics development.
5. We should try to improve relationships between researchers from big labs and their counterparts in small labs in low resource countries in order to mitigate isolation felt by the latter. Why not consider an “Adopt-a-lab” approach?
6. We should publicize the new possibilities brought by the digital revolution and associated new technological developments, such as 3D printing, open source electronic platform Arduino, Rapsberry Py micro computer, etc. This could be a big opportunity for low resource countries but needs a strong development in associated trainings.
7. The creation of a web site acting as a repository for sustainable cost instruments, sustainable cost practicals and open access software, which could be of tremendous interest for many countries. The management of this web site could tentatively be localized in four or five low resource countries, each being responsible for a given domain. Information should be sent to them by every scientist interested in the “Physics for Development” domain.
8. Last but not least, we may suggest the organization of a new conference on "Physics for Development," which may tentatively convene in Brussels during the same year as the IUPAP centenary, but with less “politics” and more young PhDs.

C13 discussed Michael Steinitz’s requests that the C13 Commission take an active role in preparing for the upcoming International Year of Basic Sciences for Development. Since it coincides with the IUPAP Centenary in 2022, C13 decided to combine the efforts.

#### **ACTION OF THE C13 COMMISSION**

C13 made the following decisions:

1. The C13 Commission approved the establishment of an Ad Hoc Committee to plan for the IUPAP Centenary celebrations and IUPAP’s contributions to the UNESCO-designated International Year of Basic Sciences for Development celebrations, both of which will occur in the year 2022. The Ad Hoc Committee will consist of the following:

**Chair:** François Piuzzi  
**Vice-Chair:** Carlo Iorio (Centenary Celebrations)  
**Vice-Chair:** Michael Steinitz (IYBSD Celebrations)  
**Members:** To be decided.

2. François Piuzzi and Carlo Iorio should join the IUPAP Working Group 16 (WG16) to assist with the plans for the IUPAP Centenary. Michael Steinitz should join any equivalent IUPAP effort for the IYBSD.

### **IX. Appointment of Associate Members to the C13 Commission**

After careful deliberations, the C13 Commission decided to request that the following persons join as Associate Members starting 1 January 2019:

1. Sandro Scandolo, Abdus Salam ICTP, Italy
2. Lilia Meza-Montes, Benemérita Universidad Autónoma de Puebla, Mexico
3. Ernst van Groningen, International Science Program, Sweden
4. To be decided.

Each person will be contacted to confirm her/his willingness to serve as a C13 Associate Member.

### **X. Summary**

To pursue the broad range of activities discussed at its Annual Meeting, the C13 Commission has established the following new entities:

1. *Group on Affordable Scientific Equipment*
2. *Group on Physics in Africa*
3. *Group on Doctoral Student Recruitment*
4. *Group on the Ethics of Scholarly Communication*
5. *Selection Committee for the IUPAP Medal for Outstanding Contributions to the Enhancement of Physics in Developing Countries*
6. *Ad Hoc Committee on the Year 2022 Celebrations of the IUPAP Centenary and the International Year of Basic Sciences for Development.*

C13 will continue its co-leadership of *LAAAMP* with its counterpart at the International Union of Crystallography.

The C13 Commission made decisions on three persons to request that they join as Associate Members, with a fourth person yet to be decided.

Finally, the C13 Commission decided to support three international conferences in Kenya, Nepal and Tunisia, with the stipulation that each conference funded by C13 invite one of the members of the new Group on Affordable Scientific Equipment, or another person approved by C13, to offer a Parallel Session at the conference that provides demonstrations of prototype low-cost equipment. Part of the C13 funds to the conference should be allocated to pay for the travel costs of the person offering the Session. Furthermore, where possible, the person offering the Parallel Session on affordable equipment should also offer a presentation on the *Ethics of Scholarly Communication*.



## Appendix 1

Suggestion for reformulated application form as accessible under <http://iupap.org/sponsored-conferences/application-for-conference-sponsorship/> - Andreas Buchleitner, 10 Sept 2018

colour code: **comments**,

### **Suggested amendments/additions of text**

#### **1. Basic information**

- Name of IUPAP Commission
- Conference title
- Location
- Start date
- End date
- Name of organiser/contact person
- Gender of organiser/contact person
- Phone number
- Email
- Website
- Address
- Select a Choice [General - Topical - Special - Workshops in developing countries]

^^^**THESE “CHOICES” NEED A CLEAR DEFINITION EACH**

(Note that all workshops in developing countries must select IUPAP commission C13 above!)

- Number of expected participants
- Have you submitted information to the liaison committee of the host country?
- Total estimated budget (in Euros)
- Is there a registration fee?
- Registration fee (in Euros - **please indicate whether there are reduced fees, if so, under which conditions**)
- If the fee is not yet defined, can you make (...)
- Is an IUPAP grant requested?
- If so, how much is requested (in Euros)

Budget structure (Justify the requested IUPAP grant by listing the specific funding requirements, e.g. travel and/or accommodation support for participants/speakers, catering, conference equipment, etc. Also indicate whether and which other funds can be made available.)

#### **2. Scientific value of the conference and committees**

A) Ongoing series: (...) **Elaborate on why there is** a clear need for the proposed conference. **Justify** why the series should be continued. **Provide a list of speakers of**

the last two conference editions.

OR

**New conference:** (...)

In both cases: Provide a tentative program structure for the here proposed event, including tentative titles of the talks to be given by invited speakers, if applicable.

Conference scope - please state clearly the conference's specific purpose(s), and how the program structure and the selection of participants and invited speakers will help to accomplish this (these).

### **Scientific quality, international character and diversity**

B) The composition (...)

Please provide a list of the targeted Advisory and/or Program Committee members, in the following format: Family name, first name, gender, home institution, country

BOX FOR INPUT HERE - DELETE "Scientific quality, international character and diversity" (SINCE REDUNDANT)

Indicate how the proceedings (...) published, if applicable

C. Acceptance (...)

DELETE REDUNDANT LINE "Please indicate ... issues."

Please indicate how (...)

Indicate how this conference adequately represents applied aspects

D. IUPAP (...)

Please indicate (...)

### **3. Please indicate the number of:**

- Number of expected female participants
- Number of expected speakers
- Number of expected female speakers
- Number of expected members of the Advisory/Program Committee
- Number of expected female members of the Advisory/Program Committee

### **4. Conference Cycle**

- What is the frequency of the conference?
- Has this conference previously had IUPAP sponsorship?
- If so, in which years?
- Which country?

### **5. International participation**

To qualify for IUPAP sponsorship:

1. The meeting must be open to scientists regardless of (...)

Please list (...)

At least (...) country. Please **give plausible evidence** that this requirement will be fulfilled.  
Please confirm that (...)

## **6. Organisation**

If you know (...)

DELETE “Please note that all Type D... IUPAP Commission”.”, SINCE THIS INFO SHOULD COME AT THE TOP OF THE FORM (I PUT A SUGGESTION IN)

suggestion for reformulated application form as accessible under <http://iupap.org/sponsored-conferences/application-for-conference-sponsorship/> - Andreas Buchleitner, 22 Sept 2018 - color code: **comments**, **suggested amendments/additions of text**

## 1. Basic information

Name of IUPAP Commission

Conference title

Location

Start date

End date

Name of organiser/contact person

Gender of organiser/contact person

Phone number

Email

Website

Address

Select a Choice [General - Topical - Special - Workshops in developing countries]

**^^THESE "CHOICES" NEED A CLEAR DEFINITION EACH**

**(Note that all workshops in developing countries must select IUPAP commission C13 above!)**

Number of expected participants

Have you submitted information to the liaison committee of the host country?

Total estimated budget (in Euros)

Is there a registration fee?

Registration fee (in Euros - **please indicate whether there are reduced fees, if so, under which conditions**)

If the fee is not yet defined, can you make (...)

Is an IUPAP grant requested?

If so, how much is requested (in Euros)

**Budget structure (Justify the requested IUPAP grant by listing the specific funding requirements, e.g. travel and/or accommodation support for participants/speakers,**

suggestion for reformulated application form as accessible under <http://iupap.org/sponsored-conferences/application-for-conference-sponsorship/> - Andreas Buchleitner, 22 Sept 2018 - color code: **comments**, **suggested amendments/additions of text**

**catering, conference equipment, etc. Also indicate whether and which other funds can be made available.)**

## **2. Scientific value of the conference and committees**

**A) Ongoing series:** (...) **Elaborate on why there is** a clear need for the proposed conference. **Justify** why the series should be continued. **Provide a list of speakers of the last two conference editions.**

OR

**New conference:** (...)

**In both cases: Provide a tentative program structure for the here proposed event, including names of targeted invite speakers, if applicable. As far as possible, please indicate whether invited speakers already have signalled their interest to contribute, and tentative topics of their contributions.**

Conference scope - **please state clearly the conference's specific purpose(s), and how the program structure and the selection of participants and invited speakers will help to accomplish this (these).**

### **Scientific quality, international character and diversity**

B) The composition (...)

Please provide a list **of the targeted Advisory and/or Program Committee members, in the following format: Family name, first name, gender, home institution, country**

**BOX FOR INPUT HERE - DELETE "Scientific quality, international character and diversity" (SINCE REDUNDANT)**

**Indicate how the proceedings (...) published, if applicable**

C. Acceptance (...)

**DELETE REDUNDANT LINE "Please indicate ... issues."**

**Please indicate how (...)**

**Indicate how this conference adequately represents applied aspects**

D. IUPAP (...)

suggestion for reformulated application form as accessible under <http://iupap.org/sponsored-conferences/application-for-conference-sponsorship/> - Andreas Buchleitner, 22 Sept 2018 - color code: **comments**, **suggested amendments/additions of text**

**Please indicate (...)**

### **3. Please indicate the number of:**

Number of expected female participants

Number of expected speakers

Number of expected female speakers

Number of expected members of the **Advisory/Program Committee**

Number of expected female members of the **Advisory/Program Committee**

### **4. Conference Cycle**

What is the frequency of the conference?

Has this conference previously had IUPAP sponsorship?

If so, in which years?

Which country?

### **5. International participation**

To qualify for IUPAP sponsorship:

1. The meeting must be open to scientists regardless of (...)

**Please list (...)**

**At least (...) country. Please **give plausible evidence** that this requirement will be fulfilled.**

**Please confirm that (...)**

### **6. Organisation**

**If you know (...)**

**DELETE “Please note that all Type D... IUPAP Commission”.”, SINCE THIS INFO SHOULD COME AT THE TOP OF THE FORM (I PUT A SUGGESTION IN)**



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# IUPAP

INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS

C<sub>14</sub> COMMISSION – PHYSICS EDUCATION

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## REPORT

2nd C&CC Meeting – Vilnius, Lithuania,  
31<sup>st</sup> Oct – 2<sup>nd</sup> November 2018

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**PROF. DR. ROBERTO NARDI**  
**C14 Commission – Chair (2018-2020)**  
UNESP – State University of São Paulo, School of Sciences  
Education Department - Bauru Campus  
São Paulo, Brazil

**Brazilian Society of Physics (SBF)**  
São Paulo, 10/10/2018.





## INTRODUCTION

This document is a report of the main activities in which Prof. Dr. Roberto Nardi, chair of the C<sub>14</sub> Commission – Physics Education, and representing the Brazilian Society of Physics (SBF) in this Commission, participated in the year 2018.

The main subjects of this report are:

1. The C<sub>14</sub> Commission and its members
2. International Conferences and events organized by the Commission and held in 2018
3. Participation in the 1<sup>st</sup> C&CC IUPAP Meeting
4. Other events participated not officially as C14 chair
5. Publications of the ICPE Newsletter
6. Looking forward

# C14: PHYSICS EDUCATION

<http://iupap.org/commissions/>

The C14 Commission is one of the 20 IUPAP's commissions. It was established by the IUPAP in 1960, to promote the exchange of information and views among the members of the international scientific community in Physics Education. The officers in the period 2018-2020 are:

POSITION	NAME	GENDER	COUNTRY	EMAIL
Chair	Roberto Nardi	M	Brazil	<a href="mailto:r.nardi@unesp.br">r.nardi@unesp.br</a>
Vice-Chair	Deena Naidoo	M	South Africa	<a href="mailto:Deena.Naidoo@wits.ac.za">Deena.Naidoo@wits.ac.za</a>
Secretary	David Sands	M	United Kingdom	<a href="mailto:d.sands@hull.ac.uk">d.sands@hull.ac.uk</a>
Member	Mayank Vahia	M	India	<a href="mailto:vahia@tifr.res.in">vahia@tifr.res.in</a>
Member	Eilish McLoughlin	F	Ireland	<a href="mailto:eilish.mcloughlin@dcu.ie">eilish.mcloughlin@dcu.ie</a>
Member	Jenaro Guisasola	M	Spain	<a href="mailto:Jenaro.guisasola@ehu.es">Jenaro.guisasola@ehu.es</a>
Member	Julio Benegas	M	Argentina	<a href="mailto:jbenegas@unsl.edu.ar">jbenegas@unsl.edu.ar</a>
Member	Naoshi Takahashi	M	Japan	<a href="mailto:naoshi@ed.kagawa-u.ac.jp">naoshi@ed.kagawa-u.ac.jp</a>
Member	Nathalie Lebrun	F	France	<a href="mailto:nathalie.lebrun@univ-lille1.fr">nathalie.lebrun@univ-lille1.fr</a>
Member	David Sokoloff	M	United States	<a href="mailto:sokoloff@uoregon.edu">sokoloff@uoregon.edu</a>
Member	Manjula Sharma	F	Australia	<a href="mailto:manjula.sharma@sydney.edu.au">manjula.sharma@sydney.edu.au</a>
Member	Zuzana Jeskova	F	Slovakia	<a href="mailto:zuzana.jeskova@upjs.sk">zuzana.jeskova@upjs.sk</a>
Member	Tetyana Antimirova	F	Canada	<a href="mailto:antimiro@ryerson.ca">antimiro@ryerson.ca</a>
Member	Ian Bearden	M	Denmark	<a href="mailto:bearden@nbi.ku.dk">bearden@nbi.ku.dk</a>

The Associate Members (mandate finishing in 2018) are:

Sarojiny Saddul-Hauzaree  
Department of Science Education - Mauritius Institute of Education,  
Mauritius

Mehmet Fatih Taşar  
Gazi Üniversitesi - Gazi Eğitim Fakültesi – Ankara  
Turkey

Alex Mazzolini  
Australia

# International Conferences and events

Organized by the C<sub>14</sub> Commission (2018)

## The International Conference on Physics Education (ICPE-SAIP-WITS 2018)

(1 – 5 October 2018) – Misty Hills Hotel and Conference Centre – Muldersdrift - Johannesburg – South Africa

<http://events.saip.org.za/conferenceDisplay.py?ovw=True&confId=93>



### Local Organising Committee

Professor Deena Naidoo – Chair, University of the Witwatersrand, South Africa  
Mr Brian Masara, South African Institute of Physics Office, South Africa  
Professor Jonathan Kearthland, University of the Witwatersrand, South Africa  
Dr Sam Ramaila, University of Johannesburg, South Africa  
Professor Saalih Allie, University of Cape Town, South Africa  
Professor Cedric Linder, Uppsala University, Sweden  
Professor Sarojiny Saddul-Hauzaree, Mauritius Institute of Education, Mauritius  
Professor Aletta Zietsman-Thomas, University of the Witwatersrand, South Africa  
Dr Femi Otulaja, University of the Witwatersrand, South Africa  
Professor Andrew Forbes, University of the Witwatersrand, South Africa  
Dr Douglas Clerk, University of the Witwatersrand, South Africa  
Dr Jeanne Kriek, University of South Africa, South Africa  
Dr Miriam Lemmer, North-West University, South Africa  
Dr Mahomed Moolla, University of the Witwatersrand, South Africa  
Dr Colleen Henning, St John's College, South Africa  
Dr Elsa Lombard, Education and Training Coordinator, CT LAB (PTY) LTD, South Africa  
Dr Kevin Govender, IAU Office of Astronomy for Development, South Africa  
Dr Krish Reddy, University of Johannesburg, South Africa  
Professor Alan Cornell, University of the Witwatersrand, South Africa  
Mr Itumeleng Phage, Central University of Technology, South Africa

### Conference Logistics Management

CARLAMANI CONFERENCES AND EVENTS

## Programme Committee

Professor Deena Naidoo – ICPE 2018 Chair, University of the Witwatersrand, South Africa  
Mr Brian Masara, South African Institute of Physics Office, South Africa  
Professor Jonathan Kearthland, University of the Witwatersrand, South Africa  
Dr Sam Ramaila, University of Johannesburg, South Africa  
Professor Saalih Allie, University of Cape Town, South Africa  
Professor Cedric Linder, Uppsala University, Sweden  
Dr Douglas Clerk, University of the Witwatersrand, South Africa  
Professor Jeanne Kriek, UNISA, South Africa  
Dr Krish Reddy, University of Johannesburg, South Africa  
Dr Femi Otulaja, University of the Witwatersrand, South Africa

## Scientific Advisory Committee:

Professor Roberto Nardi (UNESP/FC - Campus de Bauru, Brazil)  
Professor Leos Dvorak (Charles University, Czech Republic)  
Professor Hideo Nitta (Tokyo Gakugei University, Japan)  
Professor Priscilla W. Laws (Dickinson College, USA)  
Professor Ian G. Bearden (University of Copenhagen, Denmark)  
Professor Gorazd Planinsic (University of Ljubljana, Slovenia)  
Professor David Sokoloff (University of Oregon, USA)  
Professor Eilish McLoughlin (Dublin City University, Ireland)  
Professor Zulma Gangoso (Argentina)  
Professor Manyank Vahia (India)  
Professor Jenaro Guisasalo (Spain)  
Professor Julio Benegas (Argentina)  
Professor Naoshi Takahashi (Japan)  
Professor Natalie Lebrun (France)  
Professor Manjula Sharma (Australia)  
Professor Zuzana Jeskova (Slovakia)  
Professor Tetyana Antimirova (Canada)

ICPE 2018 was a truly International Conference!! with delegates from around the globe: South Africa, Botswana, Nigeria, Congo, Australia, USA, Brasil, UK, India, Argentina, Sweden, Norway, Thailand, Spain, Italy, Canada, Switzerland, Japan, China, Czech Republic, Germany, Uganda comprising of physics educators, postgraduate students, teachers, researchers and policy makers working in physics education research and in physics education, from schools, colleges, universities and governments.

**Scientific Programme:** 100 Single Oral Presentations, 25 Poster Presentations, 8 Invited Plenary Talks, 4 Workshops.

**Social Events:** Welcome Reception, Carnivores Dinner, Tour to the University of the Witwatersrand, Lion and Safari Park, Lesedi Cultural Village and Conference Banquet.

**Meetings/Interactions:** C14 meeting, IoP, IUPAP and Women in Physics, C13.

**Summary:** In addition the highlight of conference was the constant interaction between delegates resulting in potential network and collaborators.

## CONFERENCE PROGRAMME OUTLINE

### Sunday 30 September 2018

15h00 – 18h00 Registration

### Monday 1 October 2018

07:30 onwards Registration  
09:00 – 10:00 Opening Ceremony  
10:00 – 18:00 Full day conference programme

19:00 – 21:00 Welcome Function

**Tuesday 2 October 2018**

08:30 – 18:00 Full day conference programme

19:00 – late Carnivores Dinner

**Wednesday 3 October 2018**

08:30 – 17:00 Conference site visits to Wits University, Lion & Safari Park

18:00 - 21:00 Off-site dinner at Lesedi Cultural Village

Transport will return delegates to Misty Hills Hotel +- 21:00

**Thursday 4 October 2018**

08:30 – 18:00 Full day conference programme

19:00 – late Conference Banquet

**Friday 5 October 2018**

08:30 – 14:00 Half-day conference programme and Closing Ceremony

# **The GIREP-MPTL INTERNATIONAL CONFERENCE - 2018**

**(ICPE-SAIP-WITS 2018)**

**San Sebastián, Spain, 9-13 July 2018**

**C14 Chair's participation in the Scientific Committee and presenting research outcomes. The report below was prepared by the chairs of this meeting and was published in the ICPE Newsletter # 67.**

**Jenaro Guisasola and Kristina Zuza**

(On behalf of the local organizing committee of the GIREP-MPTL 2018 Conference)

The GIREP-MPTL 2018 international conference offered the opportunity for 257 delegates from 42 countries to come to San Sebastian, 9 - 13 July, to share their knowledge and experiences under the theme of "Research and Innovation in Physics Education: two sides of the same coin".

The Conference was organized by the Donostia Physics Education Research Group (DPER) at the University of the Basque Country (UPV/EHU) in cooperation with: the Conference of the International Research Group on Physics Teaching (GIREP), Multimedia Physics Teaching and Learning (MPTL) and Cursos de Verano-Udak Ikastaroak at UPV/EHU.

The Conference was sponsored by: Real Sociedad Española de Física, European Physics Society-Physics Education Division (EPS-PED), City Hall of San Sebastian, the Provincial Council of Guipuzcoa and the International Conference on Physics Education (ICPE) of the Commission C14 of the International Union of Pure and Applied Physics (IUPAP). The Conference organizers gratefully appreciate the patronage received from the Department of Education of the Basque Government for this conference.

Altogether, there were 181 oral presentations, 49 poster presentations, 10 workshops, six plenary sessions, two plenary dialogues, and five GIREP Thematic Group contributions - across the seven conference topics:

1. Physics teaching and learning at Primary and Secondary Education
2. Physics teaching and learning at University
3. Pre-service and in service physics teachers education
4. Physics education in non-formal settings
5. Physics into STEM teaching and learning
6. ICT and multimedia in Physics Education
7. Nature of Science, gender and socio-cultural issues in physics education

Participants came from the following countries:

Argentina (5), Australia (4), Austria (5), Belgium (4), Brazil (14), Canada (2), Colombia (1), Czech Republic (14), Denmark (2), Ecuador (2), Finland (4), France (3), Germany (19), Greece (2), Hungary (6), Ireland (6), Israel (12), Italy (24), Japan (2), Malta (3), Mexico (11), Netherlands (12), New Zealand (1), Norway (1), Poland (7), Portugal (3), Romania (2), Russian Federation (1), Slovakia (2), Slovenia (3), South Africa (1), Spain (38), Sweden (2), Switzerland (3), Thailand (2), Turkey (5), United Kingdom (11), United States (10), Chile (1), Uruguay (3), Venezuela (1), Vietnam (1).

The Conference provided an opportunity to recognize outstanding individuals in Physics Education. Professor Gorazd Planinšič from the University of Ljubljana (Slovenia) received the GIREP medal for his relevant contributions in Physics Education.

57 PhD, Masters degree and undergraduate students participated in the conference, presenting posters and oral presentations. A “Best PhD Student Oral Presentation Prize” was awarded by the Real Sociedad Española de Física and a “Best PhD Student Poster Prize” was awarded by the European Physical Society.

The six invited speakers were:

- Dr. Gorazd Planinšič
- Dr. Claudio Fazio
- Dr. Terhi Mäntylä
- Dr. Trinh Ba Tran
- Dr. Antxon Santamaria
- Dr. Mila Kryjevskaja

The idea of a “Dialogue” involves two experts with a leader who gives a brief feedback on the subject and proposes to the two experts questions for the discussion. The two invited dialogues were:

Dialogue 1: Primary, Secondary and University pre-service physics teacher Education. Leader: Marisa Michelini. Invited speakers: Knut Neumann and Gabriela Lorenzo.

Dialogue 2: The actual and potential impact of physics education research in students’ learning. Leader: Mieke De Cock. Invited speakers: Jaume Ametller and Paula Heron.

The Conference included seven workshops, two invited by GIREP, one invited by EPS and one invited by MPTL. The Conference program also included three symposiums and one workshop from the GIREP Thematic Group (GTG) organized through international cooperation. The Conference also provided an opportunity for the international exchange focus at two sessions: European Projects Corner and Early Career Topical Discussions. In the “European Projects Corner”, on going European projects and ideas to find synergies and possible partners were presented. In the “Early Career Topical Discussion”, postdocs, new faculty, and other junior Physics Education Research (PER) members were invited to this topical discussion to meet and discuss common issues.

The second and third day of the Conference were dedicated to celebrating the teachers of physics and included two plenary presentations, two dialogues, 61 oral presentations, six symposiums and six workshops on classroom teaching ideas and practices.

### **Proceedings**

The conference papers will be published in two formats. Keynote papers and some selected conference papers will be published in a printed form, with ISBN code, by Springer. Other presentations which pass the reviewing process, will be published in an electronic form by the Institute of Physics (IOP), under the Journal of Physics Conference Series (JPCS).

We would like to thank all contributors, especially the Invited Speakers, symposium Leaders and all individuals without whom the organization of the conference would not have been possible.



More information can be found at: <https://www.girep2018.com/en/home>



## MRPE - Meeting of Research on Physics Education in Brazil

Campos do Jordão, São Paulo - 27 to 31 August 2018

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(Reported by the Organizing Committee of the MRPE 2018)

The Meeting of Research on Physics Education (MRPE) is one of the main conferences for the Brazilian Society of Physics (SBF). It is the most important meeting on Physics Education in Brazil, bringing together nearly 300 Brazilian researchers.

In 2018, in its 17th edition, the Meeting was held from August 27 to 31 in Campos do Jordão, in the State of São Paulo. It covered 11 research areas, including a new one 'Equity, inclusion, diversity and cultural studies on Physics Education', ranked fourth based on the number of submitted papers.

280 full papers were submitted and 191 of them were approved to be presented at the Meeting. The Meeting included two plenary talks, six round tables, 30 oral sessions, and nine poster sessions.

The Meeting also included; a training school for young researchers, a book release, community meetings, and the MRPE assembly. At the assembly, we discussed, among other subjects, the role of the community of Physics Education researchers in the face of the problems that affect the current Brazilian educational policy.





More information can be found at:

<http://www.sbfisica.org.br/~epef/xvii/index.php/pt/>

<https://www.facebook.com/EPEF-569625386751329/>

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## Publication of the ICPE Newsletter

The  $C_{14}$  Commission publishes its newsletter with regularity, twice a year, primarily in electronic form. A small number of copies are printed and distributed at conferences. Professor Manujula Sharma (Australia) is the actual editor.

The Newsletter is published twice a year Issues back to 1995. The three last editions are available in the following links:

<https://mailchi.mp/04489a02108d/icpe-newsletter-issue-67-september-2018>

The # 67 issue (first link above) was edited during the ICPE 2018, at Johannesburg. Prof. Manujula Sharma (Australia), Editor, introduces in this number 67 the new Assistant Editor, Dr. Vicky Tzioumis.

This issue brings also a new section: recent master's and PhD thesis abstracts.

# **IUPAP - C14 Committee Meeting - Friday Oct 5, 2018, South Africa - Agenda**

The last C14 Commission' Annual Meeting was held at Johannesburg, South Africa, right after the GIREP- Conference, on 7<sup>th</sup> of July 2017. Below is the agenda of this meeting held las week (1-5 October 2018). The minutes will be concluded and sent to the officers by the C14 ICPE Secretary, David Sands (U.K.) in the next weeks.

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## **IUPAP - C14 Committee Meeting Friday Oct 5, 2018, South Africa Agenda**



**Location: Meeting Room, Pelindaba, Misty Hills Hotel, Muldersdrift, Gauteng Province, South Africa,**

**Time: Friday 5, October, 3:30 pm**

- 1. Welcome and apologies**
  - 2. Approval of minutes from C14 July 2017 meeting, Dublin (Attached)**
    - 2.1. Matters arising
  - 3. Chair's Report**
    - 3.1. ICPE 2015-2017 report prepared by Hideo (Attached).
    - 3.2. ICPE budget
    - 3.3. Council and Commission Chairs Report (Attached)
  - 4. Conferences**
    - 4.1. ICPE 2018 - South Africa
    - 4.2. GIREP-ICPE-MPTL 2019 – Budapest, Hungary
    - 4.3. WCPE 2020 – Vietnam
    - 4.4. Future conferences
  - 5. C14 Associate Members**
  - 6. ICPE Newsletter**
  - 7. ICPE Medal**
    - 7.1. Normal medal
    - 7.2. Young Scientist Medal
  - 8. Activities**
    - 8.1. Physics education panorama (Attached draft)
    - 8.2. State of the Art Physics Book Series
  - 9. Corporation of ICPE with other associations and bodies, financial support**
    - 9.1. Dublin 2017 – GIREP-ICPE-EPEC
    - 9.2. South Africa 2018 - ICPE
    - 9.3. Budapest, Hungary 2019 – GIREP-ICPE-MPTL
    - 9.4. Vietnam, 2020 - WCPE
  - 10. A.O.B.**
  - 11. Date of next meeting**
-

## Looking forward

During the ICPE 2018 in Johannesburg the commissioners decided to nominate as Associate Members to the IUPAP C & CC Meeting to be held in Vilnius, Lithuania, next November, the following researchers.

**Dr. Pornrat Wattanakasiwich**

Physics Education Research Laboratory Department of Physics and Materials Science Faculty of Science Chiang Mai University, Thailand

**Professor Mohammed Usman Degereji**

Physics Department Federal College of Education, Yola Adamawa State, Nigeria

**Professor Zulma Gangosa**

Physics Department, University of Cordoba, Cordoba, Argentina

The next meeting, sponsored by the ICPE Commission will be held in Budapest, Hungary (July 2019) and in Hanoi, Vietnam (2020). Announcement of the ICPE-2019, are below. During the ICPE 2018, in Johannesburg, ICPE in Thailand (2011) and Australia (2012) were scheduled.

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Prof. Dr. Roberto Nardi  
UNESP – State University of São Paulo – Bauru Campus  
ICPE Commission Chair  
Brazilian Society of Physics  
Bauru, São Paulo, October 10<sup>th</sup>, 2018.

## **Commission C15: Atomic, Molecular and Optical Physics**

Report (May 2018 – October 2018) to the IUPAP Council & Commission Chairs meeting

Submitted by Roberto Rivarola (Chair)

### **C15 officers:**

#### **Chair:**

Roberto Rivarola  
Instituto de Física Rosario (IFIR), Oficina 205,  
Bv. 27 de Febrero 210 Bis Rosario Santa Fe 2000, Argentina  
Email: [rivarola@ifir-conicet.gov.ar](mailto:rivarola@ifir-conicet.gov.ar)

#### **Vicechair:**

Dominique Vernhet  
Institut des NanoSciences de Paris, Sorbonne University – Campus Pierre et Marie Curie  
B840, 4 place Jussieu, 75252 Paris cedex 05, France  
Email: [dominique.vernhet@insp.jussieu.fr](mailto:dominique.vernhet@insp.jussieu.fr)

#### **Secretary:**

Wonho Jhe  
Seoul National University  
599 Gwanak-ro, Gwanak-gu, Seoul 151-742, Korea  
Email: [whjhe@snu.ac.kr](mailto:whjhe@snu.ac.kr)

### **C15 Activity:**

The major activities from May 2018 to October 2018 are categorized into the following items.

#### **1. IUPAP C15 Young Scientist Prize**

The IUPAP Young Scientist Prize in Atomic, Molecular, and Optical (AMO) Physics, corresponding to the year 2018, was presented during the 26<sup>th</sup> International Conference on Atomic Physics (ICAP 2018) held in Barcelona, Spain from July 22<sup>nd</sup> – 27<sup>th</sup>, 2018. The scientist selected by the Commission C15 was Alexey Gorshkov, who obtained his Ph.D. degree from Harvard in 2010 and is at present a staff scientist of NIST and at same time a fellow of the Joint Quantum Institute and of the Joint Center for Quantum Information and Computer Science from the University of Maryland, in USA. The prize was awarded “for his outstanding contributions on quantum properties of interacting cold atoms, cold dipolar matter, quantum optics, quantum transduction, and quantum simulation”. We should mention that a total of 36 eligible candidates of very high level, from all around the world, have been nominated for the prize.

#### **2. Conference Support**

The following conferences were supported by IUPAP in 2018:

Type- A conference:

**The 26<sup>th</sup> International Conference on Atomic Physics (ICAP 2018)**

Location: Barcelona, Spain

Date: 22<sup>nd</sup> – 27<sup>th</sup> July 2018

Local Chair: Maciej Lewenstein (The Institute of Photonic Sciences (ICFO), Spain)

Type- B conference:

### **The 19<sup>th</sup> International Conference on the Physics of Highly Charged Ions**

Location: Lisboa, Portugal

Date: 3<sup>rd</sup> - 7<sup>th</sup> September 2018

Local Chair: José Paulo Santos (Universidade Nova de Lisboa, Portugal)

### **3. The presence of IUPAP in ICAP 2018**

IUPAP had a relevant presence in ICAP 2018, with its participation in different activities. We should mention that 6 Nobel Prizes attended this conference.

- On Monday 23<sup>rd</sup>, Dr. Alexey Gorshkov, the above mentioned 2018 IUPAP YSP winner, gave a lecture on his recent scientific contributions on “Information propagation and entanglement generation with long-range interactions”, after a brief introduction of the YSP 2018 winner by the C15 Chair. A video of this presentation has been posted on the ICAP 2018 webpage: <https://www.youtube.com/watch?v=FL7JQoamR74>.
- On Wednesday 25<sup>th</sup>, as a part of the conference dinner a medal and a certificate were offered by the C15 Chair to the YSP 2018 winner. An amount of 1,000 euros had been received by the winner before this date. Photos on this ceremony are registered in the Gallery of the Section Media of the ICAP 2018 webpage.
- On Thursday 26<sup>th</sup>, a meeting of the C15 took place with members attending ICAP 2018. The Chair of the Local Organizing Committee, Dr. Maciej Lewenstein, was invited to participate. Different items considered in the C&CC meetings hold in Sao Paulo and Singapore were discussed, in particular on the conditions and rules applied for the organization of future conferences, with emphasis on the necessity to increase the women participation as invited speakers and in Advisory, Program and Local Committees. Furthermore, it was commented that the gender subject should be considered in the future selection of IUPAP Commission Chairs and Officers. The C15 Chair expressed that applications of type B conferences for IUPAP support are welcome in years where only one C15 conference is held. Also, it was decided that all information related to nominations for YSP calls must remain under a confidential character. The ICAP 2018 Chair gave a report informing on how the IUPAP support was used for the conference.
- We should mention that also on Thursday 26<sup>th</sup> an IUPAP Lecture Public was given on “The New International System of Units (SI)” by Professors William D. Phillips (Nobel Prize 1977) of National Institute of Standards and Technology and Wanderlei Bagnato from University of Sao Paulo.

### **Future schedule:**

- An application for IUPAP support was received:

Type- A conference:

### **XXXI<sup>st</sup> International Conference on Photonic, Electronic and Atomic Collisions**

Location: Deauville, Normandy, France

Date: July 23<sup>rd</sup> -30<sup>th</sup>, 2019

Local Chair: Dominique Vernhet (Institut de NanoSciences de Paris, France)

- The YSP prize has been awarded annually alternating between the two major “flagship” conferences of the AMO Physics field regularly supported by IUPAP, ICPEAC (International Conference on Photonic, Electronic, and Atomic Collisions) or ICAP (International Conference on Atomic Physics). At the beginning of next year, the C15 commission will start with the process of selection of the 2019 YSP. It is planned that the YSP winner, following the tradition, will give a lecture at the XXXI<sup>o</sup> ICPEAC to be held in Deauville and will receive a medal and a certificate at the banquet of the conference. Also, a check of 1,000 euros will be sent to the awarded.

## C16 report

Since the C&CC held in Singapore, C16 held two meetings in the fringe of the ICPP in Vancouver and the EPS Plasma Physics meetings in Prague with those members who attended the meeting. The topics of the discussion cover mainly how the Commission may increase its internal relationship and to improve further the way the selection of the YSP winner is performed.

At the ICPP, the Chair of the C16 gave a short welcome note at the beginning of the meeting. He also gave the YSP 2018 award to Prof. E. Viezzer. A note about the conference appeared in the IUPAP Newsletter.

At the EPS Plasma Conference, IUPAP co sponsored 3 Best Poster Awards:  
<http://www.epsnews.eu/2018/09/epsiupapppcf-plasma-poster-prize-winners-announced/>

Nominations for 2 two Associate Members were submitted to IUPAP for decision at the November C&CC.

Ranking of conferences submitted for support by IUPAP was also submitted for decision by the C&CC.

## Report to IUPAP Council and Commission Chairs Meeting

IUPAP C17: Commission on Laser Physics and Photonics

Vilnius, Lithuania, 1 - 2 November 2018

### 1. ACTIVITIES SINCE THE LAST C&CC MEETING (MAY 2018)

#### 1.1. Nobel Prize in Physics 2018

The Nobel Prize in Physics was announced on the 1 Oct., awarding three researchers "for groundbreaking inventions in the field of *laser physics*", Prof. Arthur Ashkin "for the optical tweezers and their application to biological systems", and Prof. Gérard Mourou and Prof. Donna Strickland "for their method of generating high-intensity, ultra-short optical pulses". This announcement has thrilled our Commission's community, not just for it recognizing their accomplishments in Laser Physics, but also for the Physics Prize being awarded to a woman since it last went to Maria Goeppert-Mayer in 1963, and only the third winner, with the first awarded to Marie Curie in 1903. Our Commission believes that this is evidence that women remain underrepresented and underrecognized in STEM fields.

#### 1.2. Articles to the IUPAP Newsletter

To promote visibility of young scientists in Laser Physics & Photonics, C17 has asked the winners of the 2017 IUPAP Young Scientist Prizes (YSP) to contribute articles to the IUPAP newsletter. For the June 2018 issue, Dr. Mohsen Rahmani (Australian National University, Canberra, Australia) (Fundamental Aspects), who was awarded C17's YSP 2017 "for his outstanding contributions to light-matter interactions at nanoscale, particularly nonlinear nanophotonics via metallic, dielectric and semiconductor nanostructures and metasurfaces, which have paved the road for extending nonlinear optics to the nanoscale", provided us with a short article on his research (see Appendix B).

For the September 2018 issue, two articles on the International Day of Light (IDL, 16 May) was contributed, by Prof. Parinda Vasa and Prof. Cather Simpson of our commission (see Appendix C). Prof. Vasa described in her article the student photo contest "Light and Life" held at IIT-Bombay, showing beautiful photographs taken by the students. Prof. Simpson gave an overview of the opening activities of IDL in Paris.

#### 1.3. Predatory conferences

In Sep. 2018, our Commission received an application for IUPAP endorsement from a conference to be held in Nov. 2018. After having a look at the conference website and doing some on-line research, it has turned out that this conference is one of the recently frequent predatory ("fake") conferences (see, for example [this article in Physics Today](#)). Naturally, our Commission unanimously did NOT support IUPAP endorsement of this conference. In addition, discussions among our Commission members started, noting that protecting scientists from such predatory conferences and journals is one of the important missions of IUPAP. Ideas about how this could be accomplished was also discussed. Proposals included the IUPAP maintaining a list of conferences and journals that are NOT predatory, or IUPAP having a different category that recognizes a conference as legitimate (without the need for the conference organizers to request endorsement and provide conference reports. However, this may be confused with or perturb applications for IUPAP endorsement). Given the recent increasing number of predatory conferences and journals, our Commission proposes that IUPAP discuss methods to shield physics researchers from such predatory conferences and journals.



#### **1.4. C17 Meeting**

On the 9 Oct. 2018, we held a meeting of C17 members to discuss future directions and to exchange ideas. The C17 meeting was held in Vilnius, Lithuania, hosted by one of our members, Prof. Gintaras Valušis of the Center for Physical Sciences and Technology (FTMC), Lithuania, one day before the start of the Conference on Advanced Properties and Processes in Optoelectronic Materials and Systems (APROPOS 16, 10-12 October 2018). We summarize below some outcomes of this C17 Meeting.

##### **1.4.1. IUPAP Conference support**

Information was distributed that the deadline for IUPAP support for conferences to be held in 2020 would be the 1 June 2019. Several conferences that we could target for the next deadline were discussed, which included the APROPOS conference and CLEO-Europe (where the award ceremonies for the C17 YSP will be held in 2019). It was agreed that each member will contact organizers of conferences that we see fit for support from IUPAP, to encourage applications.

##### **1.4.2. Articles for Newsletter**

Discussions on future contributions to the IUPAP newsletters from C17 were held. The most natural would be on the 2018 Nobel Prize in Physics, and contributions were proposed both from the perspective of the science for which it was awarded, and a reflection upon the fact that this year marks only the third in Physics by a woman. Articles were also proposed for announcements on the plans for IDL 2019, reports on photonic science and industry in specific countries (such as Lithuania), and for obituaries, such as that of Prof. Charles Kao, pioneer of fibre optics in telecommunications.

##### **1.4.3. Associate Members**

Associate Members of our Commission have been nominated and voted. For the 2019-2021 period, the next two Associate Members were chosen to be recommended:

- Prof. John Dudley (representing the International Day of Light)
- Prof. John Harvey (representing the International Commission for Optics)

We have also nominated Prof. Nicholas P. Bigelow (representing the Joint Council on Quantum Electronics), and have requested his short CV, but we have not received it to date. As such, his recommendation has been put on hold. We are communicating with OSA to understand the situation. Aside from these three candidates, we also discussed other potential candidates. Given the lack of involvement of researchers from industry to our Commission, it has been proposed that a representative from industry would be appropriate. Several possibilities have been discussed, including a representative from the American Institute for Manufacturing Integrated Photonics (AIM Photonics), an industry driven public-private partnership in photonics in the USA.

##### **1.4.4. Preparations for the C17 Young Scientist Prize (YSP) in 2019**

Information on the C17 YSP for 2019 was distributed, including eligibility criteria, and discussions were held on how the applications should be graded.

##### **1.4.5. IDL 2019**

Preparations for IDL 2019, and events/activities that C17 could be involved in were discussed. Further follow-up will be performed in collaboration with our Associate Member representing IDL, Prof. J. Dudley.

##### **1.4.6. C17/IUPAP-ICO Collaborations and Workshop 2019**

Potential collaborations between our Commission and ICO were discussed, including the C17-ICO Joint Workshop in 2019, proposed to be held in Tunisia.

## APPENDICES

### Appendix A - Officers and Members of C17 (as of October 2018)

#### Officers:

**Chair:** Tsuneyuki Ozaki (2014) (2017)

Email: ozaki@emt.inrs.ca

**Vice-Chair:** Qihuang Gong (2011) (2014) (2017)

Email: qhgong@pku.edu.cn

**Secretary:** Roberto Pini (2014) (2017)

Email: roberto.pini@cnr.it

**Past Chair: Deborah Kane** (2011) (2014)

Email: deb.kane@mq.edu.au

#### Members:

Kai-Mei Camilla Fu (2017)

Email: kaimeifu@uw.edu

Alexey Kalachev (2017)

Email: a.a.kalachev@mail.ru

Kathy Lüdge (2017)

Email: kathy.luedge@tu-berlin.de

Andre Luiten (2017)

Email: andre.luiten@adelaide.edu.au

Kevin F. MacDonald (2017)

Email: kfm@orc.soton.ac.uk

Ci-Ling Pan (2011) (2017)

Email: clpan@phys.nthu.edu.tw

M. Cather Simpson (2017)

Email: c.simpson@auckland.ac.nz

Yoshiro Takahashi (2017)

Email: yitk@scphys.kyoto-u.ac.jp

Gintaras Valušis (2017)

Email: gintaras.valusis@ftmc.lt

Parinda Vasa (2017)

Email: parinda@iitb.ac.in

Arkadiusz Wójs (2014) (2017)  
 Email: arkadiusz.wojs@pwr.edu.pl

**Associate Members** (mandate until end of 2018):

Nicholas P. Bigelow (representing the Joint Council on Quantum Electronics)

John Harvey (representing the International Commission for Optics)

John Dudley (representing the International Year of Light legacy)

**Appendix B - Contribution by Dr. Rahmani (2017 C17 YSP winner) to the IUPAP Newsletter (June 2018)**

**NONLINEAR OPTICS AT NANOSCALE**

**Dr. Mohsen Rahmani** (2017 C17 YSP winner)

Nonlinear optics describes the behaviour of light in nonlinear media, whereby light is directly controlled by light. It holds a great potential to eliminate the need for electronics altogether. This is the heart of modern photonic functionalities, including diversifying lasers and light, material interactions and more importantly information technology. The non-linear optical response of a material is generally very weak; therefore, non-linear optical interactions in end-user devices are generally based on large anisotropic crystals that gradually accumulate a strong effect.

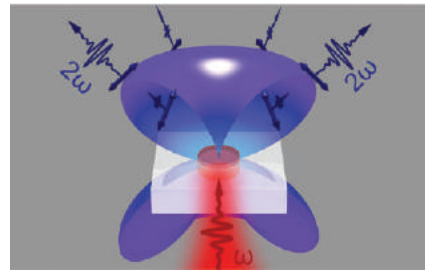


*Dr. Mohsen Rahmani*

Unfortunately, such crystals are not compatible with the size requirements of cutting-edge miniaturized systems. Together with advancements in nano-technology, the quest to realize nonlinear optics with enhanced optical nonlinear response at nanoscale has become very active in the last decade. My research is focused on developing efficient nonlinear optics from tailored nanostructures, whose thicknesses are typically a few hundred times less than a human hair, including metallic and high-index dielectric, semiconductors and hybrid nanostructures. Metallic (plasmonic) nanostructures are powerful tools due to their capabilities for light localization at the nanoscale. However, low damage threshold and Ohmic losses of metals have guided the attentions to high-index dielectric nanostructures. The negligible resistive losses of dielectric nanoantennas avoid heating problems and allow excitation at much-higher light intensities, which is of

paramount importance for the efficiency. However, most of the dielectrics, e.g. silicon and germanium do not exhibit bulk quadratic optical nonlinearity because of their centro-symmetric crystal structure.

Currently, the group is focused on exploiting materials with non-centro-symmetric crystal structures, such as III-V semiconductors, e.g. GaAs and AlGaAs, with high nonlinear properties. Such nanostructures not only increase the conversion efficiency due to their lower-order nonlinearity, but also provide a unique opportunity to employ and/or control the polarization states of fundamental and/or nonlinear signal. This research opens new avenues for novel nonlinear imaging, bright fluorescent markers for bioimaging, as well as constituent elements for efficient nonlinear holograms.



*Forward second harmonic generation by an AlGaAs nanocrystal*

**Appendix C - Contribution by Prof. Parinda Vasa and Prof. Cather Simpson to the IUPAP Newsletter (September 2018)**

# LIGHT AND LIFE: A STUDENT PHOTO CONTEST

## International Day of Light Celebration at IIT Bombay

Parinda Vasa (C17 Member, Indian Institute Of Technology Bombay, India)



Remya K P (First Prize)



Srinivasulu Grandhi (First Prize)



Shashi Ranjan (Second Prize)



Sujit Udupa (Second Prize)

Starting this year, the International Day of Light (IDL) will be held on May 16<sup>th</sup> every year, to mark the anniversary of the first successful operation of the laser in 1960 by physicist and engineer, Theodore Maiman. Invention of laser is an ideal example of how light and light related technologies can revolutionize several fields like communications and healthcare and bring benefits to society. Every year, IDL activities will be celebrated worldwide with the help of UNESCO and several other partner institutions and sponsors. This year, over 600 events were held in 87 countries, in which hundreds of thousands of people celebrated the vital role of light and associated technologies in various aspects of life like science, culture, art, and education.

At the Department of Physics, Indian Institute of Technology Bombay, Mumbai, India we organized a student photo contest, "Light and Life" to celebrate IDL. The theme of this contest was the importance of light and light based technologies in life on earth. Along with IDL, we also celebrated Diamond Jubilee of IIT Bombay. This event was also supported by, the International Union of Pure and Applied Physics' (IUPAP) Commission on Laser Physics and Photonics (C17). The contest "Light and Life" was available nationwide to students of all ages and all backgrounds. It promoted equality among different student sectors of society. Students from various departments and institutes enthusiastically participated in the contest. Winning as well as some selected photographs were displayed in Physics Department, and the winners were awarded with book vouchers. Some of the winning photos are shown below. We look forward to celebrate IDL again in coming years.

## INTERNATIONAL DAY OF LIGHT, OPENING CEREMONIES IN PARIS

Cather Simpson, Member, Commission on Laser Physics (C17)



The Eiffel Tower lights up the sky. Headquarters Paris Ouverture de la journée mondiale de la Lumière; Copyright:UNESCO/Nora Houguenade



Over 600 people from around the world congregated in Paris to celebrate; Photo Credit: Prof Cather Simpson

On May 16, 1960 Theodore Maiman successfully demonstrated the operation of the ruby laser for the first time. Fifty-eight years later, on May 16, 2018, over 600 artists, scientists, industry leaders, politicians and others gathered at UNESCO Headquarters in Paris, France to celebrate the first International Day of Light. New Zealand played a central role in establishing the International Day of Light in a joint proposal to UNESCO with Ghana, Mexico, and the Russian Federation. I attended as a representative of New Zealand's science community, and it was a brilliant event.

Like the International Year of Light and Light Based Technologies in 2015, the International Day of Light marks and celebrates the importance of light in all facets of our lives today, and inspires us to improve our future through light. It's not just about high-tech

physics – lighting in our houses seems commonplace now, but this seemingly mundane advance transformed our society every bit as much as has the light-driven internet. Access to lighting is changing people's lives for the better today in remote, poor parts of our planet – remedying light poverty is a key initiative of many who celebrate the International Day of Light.

The opening ceremonies featured talks by Nobel Prize winners Claude Cohen-Tannoudji (Physics, 1997) and Kip Thorne (Physics, 2017). A "science show" by a group of young Belgian students entertained us all. New Zealand's Sir Peter Gluckman participated in a panel focused upon how science should inform and influence policy and policy makers. I was fascinated by the international viewpoints – every continent except Antarctica provided some illumination.

It wasn't just science though. Khaled Toukan spoke about SESAME, the Synchrotron-light for Experimental Science and Applications in the Middle East project that he directs. This facility based in al-Balqa Jordan is inspirational and it provides a powerful example of how light can unify across a very troubled region. Other presentations informed us about light and culture and toured us through the universe and our exploration of it. Sometimes the absence of light is every bit as important as its presence.

The cultural events and artistic displays were amazing. A heart-stopping highlight was the soprano soloist, Katerina Mina, whose performances at the beginning and the end immersed and uplifted us. The day ended with a stunning light show by Kari Kola, a video of which can be seen here: <http://karikola.com/productions/international-day-of-light-flagship-event-2018>

Woven through the event were the United Nations Sustainable Development Goals and how light and light-based technologies will help achieve them. The Director-General of UNESCO, Audrey Azoulay, opened the topic with her address at the start



*Prof. John Dudley, Chair of the IDL Steering Group. Photo Credit: Prof Cather Simpson*

of the ceremony. Professor John Dudley, who led the massively successful 2015 International Year of Light and Chair of the IDL Steering Committee, touched upon them as well.

The International Year of Light saw thousands of events across the globe, run by students and teachers, artists and musicians, politicians and museums, Nobel Prize winners and PhD candidates. The International Day of Light is shaping up to have even more impact. For the first IDL in 2018, over 600 events were run in 87 countries – New Zealand led the way with the first event to mark the day with a light show on the Auckland Harbour Bridge (<https://www.vector.co.nz/about-us/sponsorship/lights/light-events/unesco-international-day-of-light>). The inspirational success of IDL 2018 means we're all looking forward to what we can achieve for IDL in 2019.

# C18 - Mathematical Physics

## Report to the Council & Committee Chairs (Fall 2018)

Bruno Nachtergaele, Chair

### 1 Summary

The main periodic IUPAP sponsored event associated with the Commission on Mathematical Physics (C18) is the triannual International Congress on Mathematical Physics (ICMP). The 2018 ICMP took place this summer in Montreal, Canada. The International Scientific Committee of the congress invited an impressive slate of speakers for the plenary and public talks and broad representation of organizers of the thematic sessions. In the course of its deliberations, the International Scientific Committee kept itself well aware of the continuing underrepresentation of women in the field of mathematical physics and has tried hard to make progress on this issue. With the 2018 program ICMP is approaching the 20% mark for women plenary speakers and session organizers at this years congress. See <https://icmp2018.org> for details of the program. A detailed report is given in a separate section of this report.

At the ICMP in Montreal, through C18, three researchers were recognized by a IUPAP Young Scientist Prize. A subcommittee of the previous commission, chaired by Manfred Salmhofer, reviewed the nominations, solicited the input of outside reviewers, and selected three winners. The selection was approved through an email vote by the current membership of the commission. The three winners of the 2018 Young Scientist Prize are Wei-Kuo Chen (University of Minnesota, USA), Phan Thanh Nam (Ludwig-Maximilian University, Germany), and Vadim Gorin (MIT, USA). A brief bio and description of their work appears in a separate section of this report.

One member of the Commission, Olga Rossi, resigned for personal reasons. We are currently considering candidates to nominate for her replacement.

### 2 2018 Conference support

The International Congress of Mathematical Physics (ICMP), on its three year cycle, is the most important conference of the International Association of Mathematical Physics. The XIXth ICMP was held in Montreal, July 23-28, 2018. This was the first time since 1983 that the Congress is being held in North America (in 1983 the Congress was held in Boulder, Colorado). Following a tradition started in London

in 2000, the ICMP 2018 was preceded by the Young Researchers Symposium (July 20 and 21, 2018). Seven satellite meetings have been organized in Banff, Toronto, Montreal, and Perimeter Institute either a week before or a week after the ICMP 2018.

The ICMP was attended by 574 registered participants, out of which 95 are women. The organization of the ICMP followed the traditional route, with sixteen plenary speakers and twelve topical session. Three plenary speakers are woman. Each topical session had six speakers, selected by two organizers, who themselves were selected by the International Scientific Committee of the ICMP. Four session organizers and ten session speakers are women. In addition, ten prize lectures were presented at the ICMP. There were no women among prize lectures.

The distribution of the registered participants per country was: AE: 3, AT: 17, AU: 7, BE: 6, BR: 2, CA: 114, CH: 19, CL: 4, CN: 3, CO: 2, CR: 1, CZ: 6, DE: 58, DK: 18, DZ: 1, ES: 2, FI: 3, FR: 64, GB: 21, IE: 1, IL: 7, IN: 8, IR:1, IS:1, IT: 26, JP:17, KR:5, KZ:1, LB:1, LR:1, MA:2, ML:1, MX:2, MY:1, NL:2, NZ:1, OM:1, PL:4, PT:3, RU:1, SA:2, SE:5, US:129.

One novelty of the ICMP 2018 were two highly successful public lectures. The first was given by Rainer Weiss (MIT, Nobel Prize in Physics 2017) on Gravitational Wave Astronomy and Ligo's experimental discovery of gravitational waves. The second one was given by Elliott Lieb (Princeton University) on the topic of entropy. Many members of Montreal's scientific community attended these two lectures.

Another novel aspect of the ICMP 2018 was a large number of contributed talks (119), which were given in ten parallel evening sessions on July 24 and 27. Combined with Young Researchers Symposium, where 66 talks were given by junior participants, the total number, variety, and quality of contributed talks significantly added to the success of the ICMP.

The organizational aspects of the ICMP were very successfully handled by the Canadian Mathematical Society (CMS).

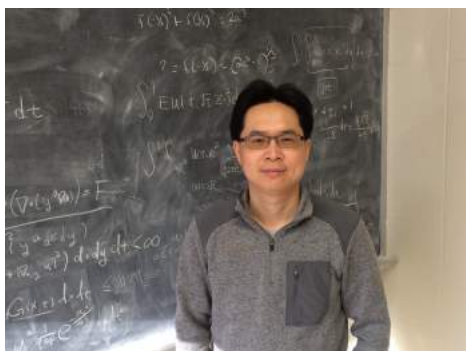
The ICMP 2018 was a considerable international success. This success has reflected very positively on Montreal's and Canada's mathematical physics community, the CMS organizational capacities, and the entire Canada Mathematical Institutes system (these three institutes were major sponsors of the ICMP and its satellites).

The XXth ICMP will be held in Geneva, Switzerland, in August 2021.



### 3 2018 Young Scientist Prize winners: Wei-Kuo Chen, Phan Thanh Nam, and Vadim Gorin

**Wei-Kuo Chen** earned his B.Sc. and M.Sc. in Math from Taiwan. In 2009, he received his Ph.D. degree in math at the University of California, Irvine. From 2012 to 2015, he was a L.E. Dickson instructor in the department of mathematics at the University of Chicago. Since then, he has been serving as an assistant professor in the school of mathematics at the University of Minnesota.



Dr. Chen's research interest generally lies on the probability theory and its applications with a special focus on the field of spin glass models. They are disordered spin systems introduced by theoretical physicists in order to understand some strange magnetic behavior of certain alloys. Mathematically, spin glass models exhibit several crucial features, such as quenched disorder and frustration, that are commonly shared in various disordered systems with high complexity.

Dr. Chen's work has been focused on establishing mathematically rigorous results for the famous Sherrington-Kirkpatrick (SK) model as well as its generalization, the mixed p-spin model, following the groundbreaking works of G. Parisi in late 70s. By adopting stochastic optimal control methods, Chen solved a number of fundamental problems in the mixed p-spin model. In particular, he (jointly with Antonio Auffinger) established the uniqueness of the functional order parameter in the Parisi formula for the thermodynamic limit of the free energy and additionally he (jointly with Antonio Auffinger and Qiang Zeng) showed that the SK model exhibits the full-step replica symmetry breaking solution at zero temperature. Lately Dr. Chen's research interest has been extended to some emerging applications involving randomized combinatorial optimization problems arising from computer and data sciences by means of spin glass methodologies including the positive semi-definite programming and signal detection and recovery problems.

**Phan Thanh Nam** was born in 1985 in Phu Yen, Vietnam. He graduated from Vietnam National University at Ho Chi Minh City in 2007 and obtained his PhD in Mathematics from University of Copenhagen in 2011. Afterwards, he was a Post-doc at CNRS and University of Cergy-Pontoise until 2013, a Post-doc at IST Austria until 2016, and an Assistant Professor at Masaryk University until 2017. Currently, he is a Professor of Mathematics at LMU Munich. Nam's work concerns the mathematical treatment of many-body quantum systems from first principles. In this research line, the general difficulty lies on Schrödinger's equation for many particles, which is easy to write down but very difficult to analyze.



A large portion of Nam's work is devoted to the theory of interacting Bose gases, which has been a hot topic since the first realization of the Bose-Einstein condensation in 1995. He has derived a novel approach to prove the condensation by means of quantum de Finetti theorems (joint with M. Lewin and N. Rougerie), and a general strategy to justify Bogoliubov's approximation for the excitation spectrum (joint with M. Lewin, S. Serfaty and J.P. Solovej). Some tools developed in these works have become standard in current studies.

Another favorite problem in his research is the ionization conjecture. Despite convincing experimental evidence that a neutral atom can bind at most one or two extra electrons, justifying this fact rigorously from quantum mechanics is notoriously difficult. In his PhD thesis, Nam proved a universal bound for the excess charge, which remains the best known up to now. Then he successfully proved the ionization conjecture in Thomas-Fermi-Dirac-von Weizscker theory (joint with R. Frank and H. Van Den Bosch), an approximation used widely in computational quantum physics and chemistry but poorly understood mathematically for a long time.

**Vadim Gorin** was born in Moscow, Russia. He became a candidate of sciences in mathematics at Moscow State University in 2011, and at the same year he earned his PhD in mathematics from the Utrecht University. Vadim spent the Spring of 2012 at Mathematical Sciences Research Institute at Berkeley and then joined the mathematics department of the Massachusetts Institute of Technology. He has been working at MIT since that time: first as a CLE Moore Instructor and currently as an assistant professor.



Vadim Gorin works on asymptotic representation theory, studying various properties of representations of groups linked into series (such as unitary groups, orthogonal groups, or symmetric groups) as the rank tends to infinity. In a related work on mathematical statistical mechanics, Gorin focuses on 2-D lattice models, random matrices, and interacting particle systems.

The central tool of his research is the use of symmetric functions of representation-theoretic origin for the delicate asymptotic analysis of large stochastic systems of particles. Among the main results is the analysis of the macroscopic fluctuations for a class of discrete random stepped surface models leading to the Gaussian Free Field. In another direction, Vadim (with several collaborators) discovered a surprising appearance of random matrix distributions in the local limits of statistical mechanics systems such as the six-vertex model and random sorting networks.

## 1. Commission membership 01/2018 - 12/2020

Chair: Gerry Gilmore [*United Kingdom*]  
Vice-chair: Andreas Burkert [Germany]  
Secretary: Julie McEnery [USA]

Members: **Conny Aerts** (2017)  
Email: [conny.aerts@ster.kuleuven.be](mailto:conny.aerts@ster.kuleuven.be)

**Michel Rieutord** (2014) (2017)  
Email: [Michel.Rieutord@irap.omp.eu](mailto:Michel.Rieutord@irap.omp.eu)

**Chanda J Jog** (2014) (2017)  
Email: [cjjog@physics.iisc.ernet.in](mailto:cjjog@physics.iisc.ernet.in)

**Markus Bottcher** (2017)  
Email: [Markus.Bottcher@nwu.ac.za](mailto:Markus.Bottcher@nwu.ac.za)

**Jun'ichi Yokoyama** (2017)  
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**Josep M. Paredes** (2017)  
Email: [jmparedes@ub.edu](mailto:jmparedes@ub.edu)

**Sabine Schindler** (2014) (2017)  
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**Pietro Ubertini** (2014) (2017)  
Email: [pietro.ubertini@iaps.inaf.it](mailto:pietro.ubertini@iaps.inaf.it)

**Sung-Won Kim** (2014) (2017)  
Email: [sungwon@ewha.ac.kr](mailto:sungwon@ewha.ac.kr)

**Vibor Jelic** (2017)  
Email: [vibor@irb.hr](mailto:vibor@irb.hr)

**Susana Lizano** (2017)  
Email: [s.lizano@irya.unam.mx](mailto:s.lizano@irya.unam.mx)

## 2. IUPAP support of international conferences

The main meeting sponsored was the [29th Texas Symposium on Relativistic Astrophysics](#) 3-8 December 2017, Cape Town, South Africa.

The next meeting C19 will co-sponsor is the 30<sup>th</sup> Texas Symposium, to be held in December 2019.

## 3. IUPAP Young Scientist Medals in the field of Astrophysics

Medals are awarded in cycle with the Texas Symposium, and presented with a talk at the Symposium. The next medal nomination/selection and presentation cycle will take place in 2019.

## **Report of the C20 Commission on Computational Physics**

### **XXX IUPAP International Conference on Computational Physics CCP2018**

The XXX IUPAP International Conference on Computational Physics CCP2018 was held on the campus of the University of California, Davis from July 29 – August 2, 2018. The Conference Chair for CCP2018 was Prof. Barry Klein, and the full program is still available on the Conference website: <http://ccp2018.physics.ucdavis.edu/> . The purpose of this annual conference series is to bring together computational scientists working in diverse sub-fields of physics and closely related areas to exchange the latest developments in computational techniques and their applications. CCP2018 featured plenary and invited speakers who were diverse from the perspective of disciplinary sub-area, geography and gender. In addition, contributed talks as well as posters in a wide number of subject areas of active interest to the computational physics community were presented. A C20 Commission meeting also took place during CCP2018.

### **2018 Young Scientist Prize in Computational Physics**

The 2018 Young Scientist Prize in Computational Physics was awarded at the CCP2018 Conference to Prof. Noa Marom of Carnegie-Mellon University. The citation read: *For advancing the prediction of the structure and properties of molecular crystals from first principles by developing algorithms for configuration space exploration, combined with many-body perturbation theory methods for electronic excitations.*

### **Future IUPAP International Conference on Computational Physics**

The XXXI IUPAP International Conference on Computational Physics CCP2019 will be held in Hong Kong on the campus of the Chinese University of Hong Kong from July 28-August 1, 2019. (Note the change of dates and venue from my earlier report.) The Conference Chair will be Prof. Junyi Zhu of the Chinese University of Hong Kong will be Chair and Prof. Rui-Qin Zhang of the City University of Hong Kong will be co-Chair. At the C20 meeting at CCP2018 the proposal from the University of Coventry, UK was approved for the XXXII IUPAP International Conference on Computational Physics CCP2020.

Respectfully submitted,  
David P. Landau  
Chair, C20 Commission  
September 27, 2018