



President: **Kennedy Reed** • Editor-in-Chief: **Kok Khoo Phua** • Editors: **Maitri Bobba; Sun Han**
IUPAP Office hosted & supported by: **NANYANG TECHNOLOGICAL UNIVERSITY, SINGAPORE**

Message from the President



This Newsletter comes at a time of transition for IUPAP. Just slightly over a month ago, the 29th General Assembly was held in Sao Paulo, Brazil — the first IUPAP General Assembly held in South America. New Officers were elected at the GA, and they are introduced in this edition of the Newsletter. It can be seen that the five newly-elected Vice-Presidents at Large have designated responsibilities connected with the positions to which they have been elected. This new feature is the result of a decision of the Council in 2016, that Vice-Presidents at Large should have portfolio responsibilities.

The resolutions passed by the General Assembly are also listed in this Newsletter. With the passing of resolution 14, we will begin the task of establishing a Working Group on Physics in Industry. This is a new direction for IUPAP, and likely, will not be accomplished quickly. But this Working Group may eventually lead to the creation of a new IUPAP Commission on Physics in Industry.

IUPAP was founded in 1922, and in accord with resolution 15, we have started the process of establishing a new Working Group on the Centenary. This new Working Group will work closely with the new Vice-President at Large with Responsibility for the Centenary Celebrations, on developing plans for the Centenary of the founding of IUPAP in 2022, and the Centenary of the first IUPAP General Assembly in 2023.

Very soon after our GA in Sao Paulo, the 32nd General Assembly of the International Council for Science (ICSU) began in Taipei. This was a particularly important meeting for IUPAP because the agenda included a vote on a merger between ICSU and the International Social Science Council (ISSC). The merger could have significant implications for IUPAP. The ICSU-ISSC merger and its ramifications are discussed in this Newsletter. (See article by IUPAP President-Designate, Michel Spiro.)

Another article in this newsletter covers the announcement of the 2017 Nobel Prize in Physics, which was awarded to Rai Weiss, Barry Barish and Kip Thorne for their contributions to LIGO and the observation of gravitational waves. IUPAP congratulates all three recipients. Barry Barish served on the U.S. Liaison Committee for IUPAP in various capacities and was Chair of that committee from 2003 to 2006.

We are very saddened by the unexpected death of our colleague Francis K.A. Allotey, on November 2nd in Accra, Ghana. Professor Allotey's final term as IUPAP Vice-President at Large was completed at the end of the General Assembly in Sao Paulo. He could not join us there because of a UNESCO Executive Board meeting in Paris, which coincided with the GA. The UNESCO Executive Board was slated to consider Ghana's request for designation of AIMS-Ghana as a Center of Excellence in Mathematics and Allied Sciences. As President of AIMS-Ghana, Professor Allotey was asked to lead a Ghanaian delegation to the meeting. The UNESCO Executive Board approved their request on October 13th.

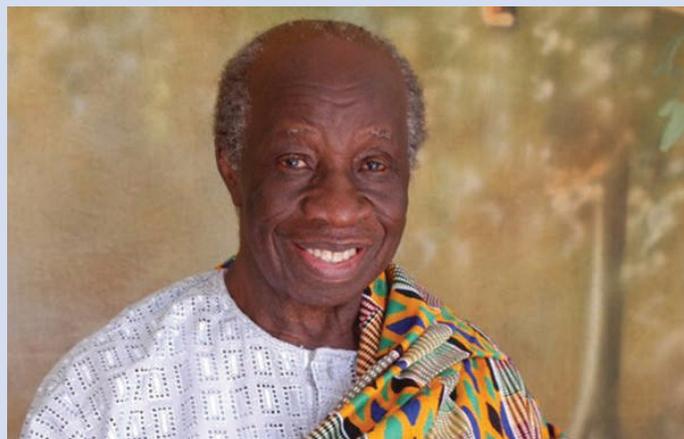
Professor Allotey's remarkable career and achievements are commemorated in an article in this newsletter. On a personal note, I have fond memories of times with him when I was an ICTP Visiting Scholar in Ghana, and during many other visits to his home country. There was a certain reverence in the way his students and colleagues talked with him and about him – usually referring to him somewhat affectionately as "Prof". I noticed similar respect and admiration for him in other countries in Africa, and I found that he was also highly regarded in other parts of the world. I will miss him — as will his many other friends and colleagues in the global scientific community.

Francis K A Allotey (1932–2017) In Memoriam

IUPAP is deeply saddened to learn of the passing of Francis Kofi Ampenyin Allotey on Nov. 2, 2017. Francis Allotey has served as the Vice President-at-large since 2011. His absence at the recent General Assembly was deeply felt.

Francis Allotey, nicknamed Ghana's Einstein, was an internationally-renowned physicist and mathematician. One of his most renowned work arose from groundbreaking research on soft x-ray spectroscopy that he had done as a student at Princeton.

Born in 1932 in Saltpond, Ghana, to a general merchant and



dressmaker. His early interest in the sciences was ignited via biographical books on scientists found in his father's store. He received his early education at Ghana National College and he was a member of the 1952 pioneer group from the College. He subsequently pursued further studies at the University Tutorial College, London Borough Polytechnic and the London Imperial College of Science and Technology where he obtained the coveted Diploma of Imperial College (London) in 1960. It was here that he met his future mentor, Professor Abdus Salam, founder of ICTP, who taught him more salient aspects of mathematics and science.

He then returned to Ghana to teach at the Department of Mathematics at Kwame Nkrumah University of Science and Technology (KNUST). In 1962, he began his PhD studies in mathematical physics at Princeton University, during which time, he met and worked with many eminent scientists of the time – Robert Dicke, Val Fitch, Robert Oppenheimer, Paul A.M. Dirac and C.N. Yang. He then obtained his Masters and PhD from Princeton in 1966 and returned in the same year to take up a position as a lecturer at the Department of Mathematics at KNUST. In 1974, he became the first full professor of Mathematics at KNUST and he soon rose to be the head of the department and later the Dean of the Faculty of Science. He was also the founding director of the KNUST Computer Centre before he assumed his position as the pro-vice chancellor of the university. He held many other prestigious positions, including the President of the Ghana Institute of Physics and the Ghana Academy of Arts and Sciences, and he was the founding president of the African Physical Society. Ghana awarded him the Millennium Excellence Award in 2005, and dedicated a postage stamp to him.

Besides being a member of and honorary fellow in many international scientific organizations like the African Academy of Sciences, International Center for Theoretical Physics, Institute of Physics and Nigerian Mathematical Society and so forth, he also held numerous leadership positions at national and international level. He was a consultant for many international institutions like the UN, UNESCO, IAEA, IBI and UNIDO. In 2004, he became the only African among the 100 most eminent physicists and mathematicians in the world to be cited in a book titled, "One hundred reasons to be a scientist."

In 2009, the Professor Francis Allotey Graduate School (AGS) was established at the Accra Institute of Technology. The institute provides tertiary degrees, ranging from Masters in Business Administration and Software Engineering to PhD programs in Information Technology and Philosophy.

He was instrumental in getting Ghana to join the IUPAP, making it one of the first few African countries** to join the Union. He worked closely with IUPAP and ICTP in encouraging Physics education in developing countries and organizing workshops and conferences in creating awareness in the region. The African Science community, the world at large and IUPAP have lost one of their most exemplary inspirers and legendary figures.

***The first African country to join IUPAP (in 1923) was South Africa.*

IUPAP Executive Council Officers 2018–2020



President: Kennedy Reed

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Kennedy Reed's field of research is theoretical atomic physics. His work has primarily focused on theoretical studies of atomic processes in high temperature plasmas. He worked in the Physics Division at Lawrence Livermore National Laboratory, and has also been involved in promoting physics research and education in Africa.



Past-President: Bruce McKellar

Email: bhjmckellar@mac.com

Bruce McKellar is an Emeritus Professor of the University of Melbourne, School of Physics. His recent work has included emphasizing the importance of neutrino-neutrino interactions in understanding the oscillations of neutrino species in a dense neutrino background, as occurs in the early universe and in supernovae, studying CP violation in atoms, nuclei and the B meson system, and in understanding the observation and applications of the He-McKellar-Wilkins phase.



President-Designate: Michel Spiro

Email: mpiro@admin.in2p3.fr

Michel Spiro's field of expertise is Experimental Particle and Astroparticle physics: he was active at CERN, and performed experiments in deep underground laboratories and observations at La Silla telescopes in Chile.



Secretary General: Kok Khoo Phua

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Kok Khoo Phua is the Founding Director of the Institute of Advanced Studies (IAS) at Nanyang Technological University (NTU) and Adjunct Professor of Department of Physics at National University of Singapore (NUS). He received his DIC from Imperial College, London University. He received his Ph.D. and D.Sc. from Birmingham University. He is a fellow of the American Physical Society (APS) and Singapore National Academy of Science (SNAS). He is an advisory board member of University of Nottingham Ningbo China. He holds honorary doctoral degrees from Nankai University and University of Nottingham Ningbo China. As a theoretical high energy physicist, he did some interesting and useful work in particle physics, particularly in the field of phenomenology in high energy collisions.



Associate Secretary General: Rudzani Nematudi

Email: rudzi@tlabs.ac.za

Rudzani Nematudi's fields of interest include mesoscopic semiconductor devices fabricated using proximal probe microscopic techniques such as AFM (Atomic Force Microscope) and STM (Scanning Tunneling Microscope), surface science and accelerator-based ion beam analysis. He is the Deputy Director of iThemba LABS (Laboratory for Accelerator Based Sciences) in South Africa.



Deputy Secretary General: Leong Chuan Kwek

Email: cqtklc@nus.edu.sg

Leong Chuan Kwek is a Principal Investigator at the Center for Quantum Technologies, NUS since its inception and the Deputy Director at IAS at NTU, Singapore. He works on quantum information science and atomtronics and has published more than 200 refereed papers on the subject. He is an elected Fellow of the American Association for the Advancement of Science (AAAS), the Institute of Physics (UK) and the Institute of Physics (Singapore). He currently serves as the Regional Representative of Organization of Chinese Physicists and Astronomers (USA), Secretary General for the South East Asian Theoretical Physics Association and IUPAP WG5 (Women in Physics). He is also an editorial member of the Association of Asia Pacific Physical Societies Bulletin Board. LC Kwek was a co-recipient of the Singapore National Science Award (Team) in 2006, the IPS Premier Research award (2006) and the IPS President Medal (2016). He was the Fujitsu Visiting Professor at the University of Cambridge in 2004 and the former President of the Institute of Physics Singapore [IPS] (2008-2012). He is currently the President of the Asian Physics Olympiad and a steering committee member of the Asia Pacific Conference of Young Scientists.

Elected Vice-Presidents at Large



Vice-President at Large (Finance): Enge Wang

Email: egwang@iphy.ac.cn

Enge Wang is the Vice President, Chinese Academy of Sciences (CAS), President Emeritus, University Chair and Professor of Physics, Peking University. His main research accomplishments include the fundamental understanding of the kinetics involved in the formation and decay of surface-based nanostructures, development of chemical vapor deposition of light-element nanomaterials, and study of water behaviors in confinement system. He is also a member of the World Academy of Sciences (TWAS), and a fellow of the American Physical Society.



Vice-President at Large (Centenary): Monica Pepe-Altarelli

Email: Monica.pepe.altarelli@cern.ch

Monica Pepe Altarelli is an experimental particle physicist working at the LHCb experiment at CERN. Her current main scientific interest is the search for New Physics beyond the Standard Model through the study of very rare decays of charm and beauty-flavoured hadrons and precision measurements of CP-violating observables.



Vice-President at Large (Outreach): Vitaly Kveder

Email: kveder@issp.ac.ru

Vitaly Kveder works in experimental physics of semiconductors, in particular, the study of electronic properties of defects in semiconductors and “defect engineering” for solar cells applications.



Vice-President at Large (Gender Champion): Silvina Ponce Dawson

Email: silvina@df.uba.ar

Silvina Dawson’s field of research is Biological Physics. In particular, she looks into the mechanisms by which cells communicate with their environment. To this end, she combines optical experiments with mathematical modeling and theoretical analyses.



Vice-President at Large (New Members): Nithaya Chetty

Email: nithaya.chetty@up.ac.za

Nithaya Chetty is a computational solid state physicist, working on 2-dimensional systems using density functional methods. He has been one of the drivers for the IUPAP-sponsored African School for Electronic Structure Methods and Applications (ASESMA), which is a series of workshops held every two years in different sub-Saharan countries, designed to foster a collaborative network for research and higher education in the areas of Computational Materials and Biological Sciences.

Elected Vice-Presidents from Commission Chairs



C3: Rahul Pandit

Email: rahul@physics.iisc.ernet.in



C8: Rolf Haug

Email: haug@nano.uni-hannover.de



C10: Laura H Greene

Email: lhgreene@magnet.fsu.edu



C12: Claes Fahlander

Email: claes.fahlander@nuclear.lu.se



C14: Roberto Nardi

Email: nardi@fc.unesp.br

Commission Chairs



Commission on Symbols, Units, Nomenclature, Atomic Masses & Fundamental Constants (C2): **Peter Mohr**

Email: mohr@nist.gov

Peter Mohr's primary area of research is in Quantum Electrodynamics theory and its application to bound states. He is also involved with work on the CODATA least-squares values for the fundamental constants, which they recommend every four years. Another area of involvement is with developments in the International System of Units and its redefinition in terms fundamental constants that will take place in the near future.



Commission on Statistical Physics (C3): **Rahul Pandit**

Email: rahul@physics.iisc.ernet.in

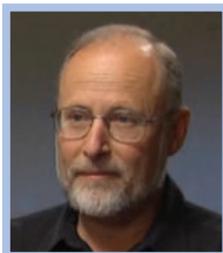
Rahul Pandit works on a variety of problems in Statistical Physics, Condensed-Matter Physics, and Computational Science. Over the past few decades, he has studied Turbulence, in Fluids, Plasmas, Superfluids, Multi-phase flows, and Complex Fluids, Electrical-wave Turbulence and Cardiac Arrhythmias, and Cold-atom Systems.



Commission on Astroparticle Physics (C4): **Sunil Gupta**

Email: gupta.cr@gmail.com

Sunil Gupta is a senior Professor at the Tata Institute of Fundamental Research, Mumbai. Expertise in high energy cosmic rays including air shower phenomenon, high energy interactions etc., multi-TeV gamma ray astronomy, and space weather studies. Currently, PI of GRAPES-3, an India-Japan collaboration, located at Cosmic Ray Laboratory in Ooty, India.



Commission on Low Temperature Physics (C5): **William P Halperin**

Email: w-halperin@northwestern.edu

William Halperin is an experimental condensed matter physicist whose research on unconventional superconductivity and superfluid ^3He takes place at the extremes of ultra-low temperatures and very high magnetic fields.



Commission on Biological Physics (C6): **Ramin Golestanian**

Email: ramin.golestanian@physics.ox.ac.uk

Ramin Golestanian is a theoretical physicist at Oxford University with a background in non-equilibrium statistical physics, soft matter, and biophysics. He has been a strong advocate for the type of biological physics that regards biological systems as living matter, and aims to address new physical questions in these systems.



Commission on Semiconductors (C8): **Rolf Haug**

Email: haug@nano.uni-hannover.de

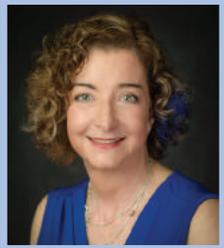
Rolf Haug's group studies quantum effects in low-dimensional semiconductor structures which includes transport experiments with quantum dots, with quantum Hall effect systems, and with 2D materials.



Commission on Magnetism (C9): Burkard Hillebrands

Email: hilleb@physik.uni-kl.de

Burkard Hillebrands is an experimental magnetism physicist. His special interests are in spin dynamics and magnonics, and in material properties of magnetic films and nanostructures. He is particularly interested in the fundamental properties and applications of magnons (quanta of spin waves), while his technical interest is in the development of space-, time- and phase-resolved Brillouin light scattering spectroscopy and time-resolved Kerr effect techniques.



Commission on Structure and Dynamics of Condensed Matter (C10): Laura H Greene

Email: lhgreene@magnet.fsu.edu

Laura Greene's research is on quantum materials, focusing on fundamental studies to determine the mechanisms of unconventional superconductivity by planar tunneling and point contact electron spectroscopies and developing methods for predictive design of new families of superconducting materials.



Commission on Particles and Fields (C11): Heidi Schellman

Email: Heidi.Schellman@oregonstate.edu

Heidi Schellman is an experimentalist working on the interface between electroweak and strong interactions physics. She has measured proton structure functions and the mass of the W boson; her most recent research is a study of nuclear effects in quasi-elastic anti-neutrino scattering.



Commission on Nuclear Physics (C12): Claes Fahlander

Email: claes.fahlander@nuclear.lu.se

Claes Fahlander's field of interest is studies of the structure of the atomic nucleus, a unique many-body quantum system. The research is performed at leading accelerator laboratories around the world, and it focuses on nuclei far from the line of beta-stability, close to the proton drip line, and more recently towards studies of super heavy elements.



Commission on Physics for Development (C13): Sekazi K. Mtingwa

Email: mtingwa@mit.edu

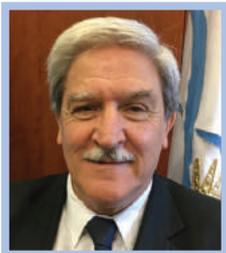
Sekazi Mtingwa is a theoretical physicist who specializes in accelerator beam dynamics and high energy physics. He shared the American Physical Society's 2017 Robert R. Wilson Prize with James Bjorken and Anton Piwinski for their work on a phenomenon called intrabeam scattering, which has empowered major discoveries in a broad range of disciplines by a wide variety of accelerators, including hadron colliders, damping rings/linear colliders, and low-emittance synchrotron light sources.



Commission on Physics Education (C14): Roberto Nardi

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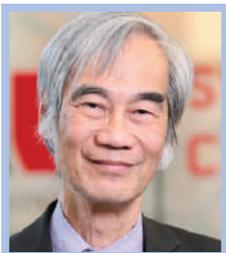
Roberto Nardi is an Associate Professor at the School of Sciences (FC), Education Department, at the State University of São Paulo (UNESP), Brazil. He graduated in Physics at UNESP (1972), earned his master's at the Temple University (USA) (1980) and PhD in Education (Physics Teaching) at São Paulo University (1990). He is now a level I-A researcher at CNPq at the Brazilian National Research Council. He was a member of the Physics Education Research Commission of the Brazilian Society of Physics (SBF, 2008-2012) and Coordinator of the Science and Mathematics Education Division in the Post Graduate Evaluation System at CAPES (2006-2010). He was also former President (2003-2005), Vice President (2001-2003) and founder of the Brazilian Association for Research in Science Education (ABRAPEC) and the editor of the *Ciência & Educação* Journal.



Commission on Atomic, Molecular, and Optical Physics (C15): Roberto Rivarola

Email: rivarola@ifir-conicet.gov.ar

Roberto Rivarola's professional interest is focused on the theoretical description of the dynamical interaction of beams composed by atomic particles impacting on atoms and molecules, including biological ones.



Commission on Plasma Physics (C16): Minh Quang Tran

Email: minhquang.tran@epfl.ch

Minh Quang Tran works on Heating and Current Drive of magnetically-confined fusion plasma. He is presently Project Leader for the Work Package Heating and Current Drive of the DEMO project within European Consortium EUROfusion.



Commission on Laser Physics and Photonics (C17): Tsuneyuki (John) Ozaki

Email: ozaki@emt.inrs.ca

Tsuneyuki Ozaki works on the generation and application of intense ultrafast radiation sources, covering a wide spectrum from X-rays to terahertz. Applications of interest to him, include atomic and molecular physics, condensed matter physics, biology and medicine.



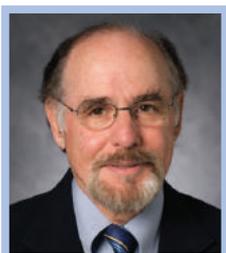
Commission on Mathematical Physics (C18): Bruno Nachtergaele

Email: bxn@math.ucdavis.edu

Bruno Nachtergaele is a Distinguished Professor of Mathematics at the University of California, Davis. His general research area is Mathematical Physics with an emphasis on equilibrium and non-equilibrium statistical mechanics, quantum spin systems, quantum information theory, and applications of these fields in condensed matter physics.



Commission on Astrophysics (C19): Chair of C19 is under negotiation



Commission on Computational Physics (C20): David P Landau

Email: dlandau@physast.uga.edu

David Landau works on computer simulations of models in hard and soft condensed matter. Methodologies used include Monte Carlo, Monte Carlo renormalization group, molecular dynamics, and spin dynamics.

The IUPAP 29th General Assembly (Sao Paulo, Brazil, 11- 13 October 2017)



For the first time, the General Assembly (GA) of IUPAP was held in South America. The event, the 29th in the series, ran from 11 to 13 October 2017 in Sao Paulo, Brazil. The delegates from 36 countries were wonderfully hosted by the University of Sao Paulo (USP). The hosts were excellent in their planning and organization of the entire event, leading in part to a successful and productive General Assembly. Even before the start of the actual business of the GA, all participants were invited to a welcome concert, performed by the Orquestra Sinfônica da USP (OSUSP), followed by an extremely well-attended public lecture by the Nobel Laureate for Physics (1997) and the Vice-chair for C2, Prof William Phillips.

The IUPAP GA is generally known as a 'business' meeting. This year, aside from the usual business of the GA, the organizers planned a Workshop on 'New Challenges in Pure and Applied Physics' each afternoon, for the very first time. The workshop comprised of many 20-minute presentations, each delivered by an IUPAP commission chair who highlighted the cutting-edge physics in each field. The talks were generally very well-received by the public – many of whom found them very enriching and insightful. The format of workshops in conjunction with the GA is now being seriously considered as a regular feature for future GAs.

The GA began on 11 October, 2017, with several introductions and welcome messages from the Presiding President, Prof Bruce McKellar, local organizing committee Chair, Prof Vanderlei Bagnato and Vice-Chair of the Sociedade Brasileira de Física (SBF), Prof Rogerio Rosenfeld. These were followed immediately by the adoption of the agenda as well as the recognition of previous officers and the approval of the last GA minutes. Following reports by the President and Secretary General, the decisions made by the Executive Council were ratified by the GA. The financial reports and budgets were presented and approved, with a lengthy discussion on membership dues. The latter half of the morning session was filled with discussion on the nomination slates for the 2018-2020 Executive Council and commissions.

The first IUPAP Medal for outstanding contributions to the enhancement of Physics in developing countries was presented to Prof Jorge Flores Valdes under the Commission on Physics for Development (C13). The citation for Prof Jorge Flores was read

by the Chair for Commission C13 (Physics for development), Prof Sandro Scandolo. Prof. McKellar then presented the winner with the medal. More details on the winner can be found in the article, 'IUPAP medal', later in this newsletter.

Day 2 of the GA began with discussions on approved conferences and proposed resolutions and recommendations of the council. For more details on each of the resolutions, please refer to the webpage:

http://iupap.org/wp-content/uploads/2017/02/Resolutions-of-the-29th-General-Assembly_v1.pdf

- Resolution 1.** Ratification of the Decisions of Council regarding the Shares of Members
- Resolution 2.** Ratification of Decisions made by Council on retiring commission members
- Resolution 3.** Membership Dues for 2018 to 2020
- Resolution 4.** Special Resolution regarding the Chair of C2: SUNAMCO
- Resolution 5.** Continuation of Working Groups
- Resolution 6.** Working Group 5, Women in Physics
- Resolution 7.** Neutrino Physics Panel
- Resolution 8.** Working Group 15, Soft Matter
- Resolution 9.** Terms of Office for new Commissions
- Resolution 10.** New Mandate for C17
- Resolution 11.** The International Year of Basic Science for Development
- Resolution 12.** The ICSU-ISSC merger
- Resolution 13.** To establish a Working Group on Physics and Industry
- Resolution 14.** To establish a Working Group on the Centenary of IUPAP

Resolution 15: SESAME

Resolution 16: Redefinition of SI Proposed by the Chair and Vice Chair of C2

Resolution 17: Funding of Science, especially in Brazil

Resolution 18: Physics in Africa

Re-nominations were requested for the proposed nominations slates and 3 commissions requested for a change in final slates for their commissions. It was decided that voting for the final 14 members of these commissions would be conducted on the last day of the GA.

Prof Barbara Erasmus, Treasurer of ICSU outlined the proposed ICSU-ISSC merger and there was almost unanimous support for going ahead with the merger from members of IUPAP.

The concluding day of the GA was equally exciting. It began with some introductory words from Prof Michel Spiro, who was nominated and elected as the President-Designate for 2018 – 2020. This was followed by the voting of commission members for C11, C14, C16 and C17. While the counting of the ballot was in progress, updates on the UNESCO MoU, the ICSU grant, SESAME and the proposal for the 2022 International Year of Basic Sciences for Development were presented. Voting on the resolutions was also conducted smoothly and efficiently. The counting of the votes for the commissions reconfirmed the original nomination slates and the final slates for the new executive council and commissions were finalized and approved by the GA.

The incoming President, Prof Kennedy Reed, closed the GA with heartfelt thanks to the outgoing members and a warm welcome for his new team!

ICSU-ISSC Merger News

Michel Spiro (President of the French Physical Society ; President-Designate of IUPAP [in charge of the IUPAP-ICSU liaison])

At a historic joint meeting in Taipei on October 26th, members of the two leading international science councils, ICSU (the International Council of Scientific Unions) and ISSC (the International Social Science Council) voted to merge, launching a process that will see the formation of a single global entity called the International Science Council (ISC) that unites the scientific community, including all social and natural sciences.

The new International Science Council brings together the current members of ISSC and ICSU, including 40 international scientific unions and associations, and more than 140 national and regional organizations such as academies and research councils.

The importance of scientific understanding to society has never been greater, as humanity grapples with the problems of living sustainably and equitably on planet Earth. The Council will defend the inherent value and values of all science at a time when it has become harder for the scientific voice to be heard. It will strengthen international, interdisciplinary collaboration and support scientists to contribute solutions to complex and pressing matters of global public concern. It will advise decision makers and practitioners on the use of science in achieving ambitious agendas such as the Sustainable Development Goals (SDGs) adopted by world leaders in 2015. And it will encourage open public engagement with science.

The vision of the Council is to advance science as a global public good. Scientific knowledge, data and expertise must be universally accessible and its benefits universally shared. The

practice of science must be inclusive and equitable, also in opportunities for scientific education and capacity development.

The mission is to act as a global voice of science. That voice must be powerful and credible. The core values to be upheld in the Council's work, governance and partnerships will be:

- Excellence and professionalism;
- Inclusivity and diversity;
- Transparency and integrity; and
- Innovation and sustainability.

IUPAP subscribes to these values, and to the goals of the new Council.

In the ICSU General Assembly, in Taipei, on October 26th, 2017, IUPAP noted that the merger could bring new opportunities and many challenges and decided to vote in favour of the merger. It wishes now to contribute to the success of this new international Science Council.

References:

The high-level strategy document of the merger organization, the ICSU press release and Prof Spiro's personal views and recollection.

2017 Nobel Prize in Physics to Rai Weiss, Barry Barish, and Kip Thorne

Eric Poisson (President, International Society on General Relativity and Gravitation)

It is February 11, 2016, and the world is watching the LIGO/Virgo press conference, live on the worldwide web. LIGO Executive Director David Reitze comes on stage: "We have detected gravitational waves. We did it!" Goosebumps. Tears of joy. Cries of victory. The scientific world will never be the same again. We have entered the age of gravitational-wave astronomy.

Fast forward to October 3, 2017. The Royal Swedish Academy of Science announces that this year's Nobel Prize in Physics is awarded to Rai Weiss (who gets half the prize) and Barry Barish and Kip Thorne (who share the other half), "for decisive contributions to the LIGO detector and the observation of gravitational waves." Goosebumps and tears of joy all over again.

The community is thrilled beyond measure. While the paper reporting the discovery had more than a thousand authors, it is fitting that the foundational contributions of Weiss, Barish, and Thorne are singled out, but the Nobel prize also honours the decades-long work of all those who participated in the effort.

Rai Weiss is Professor of Physics (emeritus) at the Massachusetts Institute of Technology. In the late 1960s, he conceived the fundamental idea of using laser interferometry to measure the tiny motions of suspended masses in response to a passing gravitational wave. He then worked out a detailed design study, published in a classic 1972 MIT internal report. This later formed the basis of the Laser Interferometer Gravitational-wave Observatory (LIGO).

In the 1970s, Weiss teamed up with Kip Thorne and Ron Drever, who had initiated a similar gravitational-wave effort at the California Institute of Technology, and the current-day incarnation of LIGO was born. Drever contributed important modifications to the interferometer's original design. Tragically, he died before the Nobel Prize was awarded. After early studies on prototypes, the team submitted a full-fledged proposal to the National Science Foundation, and this eventually led to a pair of working detectors, one in Hanford, Washington, the other in Livingston, Louisiana.

The joint MIT-Caltech project was one of several efforts worldwide. Additional interferometers were built in Japan (TAMA), Germany (GEO600), and Italy (Virgo). While GEO600 plays a key role in the elaboration of new technologies for gravitational-wave detection, Virgo is now an active participant in the detection of gravitational waves, having joined LIGO in an integrated LIGO-Virgo collaboration. TAMA was succeeded by KAGRA, now being commissioned. And there are plans to build a third LIGO site in India.

Barry Barish, Linde Professor of Physics (Emeritus) at the California Institute of Technology, assumed the role of LIGO Director between 1994 and 2005. This was a critical time during which LIGO went through the final stages of its design, obtained funding approval from the National Science Foundation, and underwent construction and commissioning. In Barish's capable hands, LIGO began operating by 1999. LIGO's initial configuration

had a mind-boggling sensitivity, being able to detect changes in optical path length of one part in 10^{21} , but it was still insufficient to detect gravitational waves from distant astronomical sources. Between 2010 and 2015, the instrument was upgraded to an advanced configuration that soon delivered the first direct detection of a gravitational wave.

Kip Thorne, Richard Feynman Professor of Theoretical Physics (Emeritus) at the California Institute of Technology, provided key theoretical support to the experimental effort. This includes the modeling of astrophysical sources and the waves they produce, the elaboration of data-analysis techniques to extract the waves from detector noise, and the design of baffles to control light scattering in the LIGO beam tubes. Thorne was also instrumental in the early days of the LIGO project, working with Weiss and Drever on the early designs, and chairing the committee that steered LIGO through the 1980s.

Back to February 11, 2016. What was it that was announced on this most auspicious day? The first gravitational wave to be detected directly came from the collision and merger of two black holes, each one of approximately 30 solar masses. The waves took 1.3 billion years to reach Earth, arriving on September 14, 2015, days *before* the first observation run of Advanced LIGO was officially scheduled to begin. Weiss likes to tell the story that he almost ruined this event for us: he was planning to make adjustments on one of the detectors at that time, until he was convinced to postpone the work. This first detection was quickly followed by observations of additional black-hole mergers: one on December 26, 2015, another on January 4, 2017, and a third one on August 15, 2017, which was observed simultaneously by both LIGO and Virgo.

And then another watershed event: On October 16, 2017, LIGO and Virgo measured the gravitational waves produced during the collision of two neutron stars, an extremely violent event that was also observed in gamma rays and other parts of the electromagnetic spectrum. Nature is kind: gravitational and electromagnetic waves are pairing up to bring us news of the distant reaches of the universe. We have entered the age of multi-messenger astronomy.

IUPAP MEDAL

2014-2017 IUPAP MEDAL FOR OUTSTANDING CONTRIBUTIONS TO THE ENHANCEMENT OF PHYSICS IN DEVELOPING COUNTRIES (C13) – Inaugural Prize



Jorge Flores Valdes

“For his outstanding work over 50 years towards the development of Physics and scientific institutions and the popularization of science in Mexico.”

He is considered ‘the towering figure in Mexican physics of his generation’. He has excelled in all academic activities: research, teaching, outreach and the creation and consolidation of institutions.

As a researcher he has many major contributions in nuclear physics, and as an important contribution, he has the Brody, Flores et al. paper in *Reviews of Modern Physics* (1981) that has received close to 2,000 references in specialized literature.

He is one of the most motivating teachers and has directed 30 theses at different levels. Many of his students are now key players in Mexican science. He was one of the first important researchers who that started emphasizing the importance of popularization and outreach at a time (the 1970s) when these activities were considered to be more of a liability than an asset, in Mexico. He has given a large number of lectures and published several popular books that have reached a vast non-specialized audience.

Special emphasis should be given to his role in the development of physics in Mexico. He was Director of the Institute of Physics of the National University of Mexico (UNAM) from 1974 to 1982, consolidating the role of this most important institution while performing as one of its most energetic and creative functionaries. After serving in this position, he accepted the position of Education Undersecretary in the Government of the Republic. Science in Mexico was then (1982) experiencing a very difficult time; salaries were very low and many young people were moving abroad or simply not returning to Mexico. Dr. Flores came up with the key idea of creating a system of additional salaries for the most productive researchers. His idea was realised in 1984 with the creation of the Sistema Nacional de Investigadores (SNI) by the President of the Republic. The SNI began to provide scholarships to scientists after a careful examination of their scientific achievements. It is not an exaggeration, to say that this initiative saved science in Mexico. Now, the SNI provides a complementary salary for nearly 15,000 researchers and helps to create much more attractive working conditions.

He later accepted the compromise of starting inside the National University a science museum that could compete with private museums already working successfully in Mexico. He was the founder and first Director of the Science Museum “Universum” that continues to operate inside the Mexico City facilities of UNAM and receives, annually, tens of thousands of visitors, especially students of all levels, from primary school to high school and college.

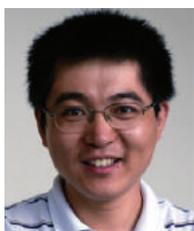
Decentralization was another key problem of Mexican science. Most of it was located in Mexico City. He was founder and the first Director (1998) of the Center of Physical Sciences in the city of Cuernavaca that later became the Institute of Physical Sciences of UNAM. Dr Flores has been recognized through all major Mexican awards, including the National Award of Sciences (1994).

He continues his work as a persuasive force in the world of Mexican physics, always trying to take Mexican science to higher levels.

http://www.fisica.unam.mx/noticias_Otorgan_medalla_a_Jorge_Flores_062017.php

IUPAP YOUNG SCIENTIST PRIZES

2017 IUPAP YOUNG SCIENTIST PRIZE IN MAGNETISM (C9)



Luqiao Liu

“For the pioneering demonstrations of the spin Hall effect excitation of ferromagnetic resonance, and of the surprisingly large spin Hall angles of particular heavy metals as determined by spin-torque ferromagnetic resonance, for seminal experiments and analysis of magnetic switching and auto-oscillation driven by that spin Hall effect, and for continuing research advancing the understanding and applicability of spin-orbit torques”.

Dr. Luqiao Liu has been a tenure-track Assistant Professor of Electrical Engineering at the Massachusetts Institute of Technology since September 2015. He received his Ph.D. degree in Applied Physics from Cornell University in 2012. He spent three years as Research Staff Member at the IBM Watson Research Center before joining the MIT faculty. Dr. Liu’s current research focus is on advancing new materials and novel device structures for spintronics, including spin-based memory, logic and communication applications. Dr. Liu is the recipient of the 2017 William L. McMillan Award in Condensed Matter Physics.

The award will be presented to Dr. Liu at the next International Conference on Magnetism (ICM), which will take place in San Francisco, July 15-20, 2018.

2018 IUPAP YOUNG SCIENTIST PRIZE IN STRUCTURE AND DYNAMICS OF CONDENSED MATTER (C10)



Michele Ceriotti

“For his work on the development of novel and original algorithms to extend the scope and accuracy of molecular dynamics simulations, and to rationalize and predict the structure-property relations in complex materials”.

After receiving an undergraduate degree in Materials Science from the University of Milano, Bicocca, he achieved a Ph.D. in Physics from ETH Zürich. He spent three years in Oxford as a Junior Research Fellow at Merton College, funded by a Royal Society Newton Fellowship and a Marie Curie Fellowship. Since 2013, he works as an assistant professor at the Institute of Materials at EPFL, leading the laboratory for Computational Science and Modeling.

His research interests focus on the development of methods for molecular dynamics and quantum simulations of hydrogen-bonded materials, machine-learning study of complex systems at the atomic level, and on their application to problems in chemistry and materials science. Previously, he was awarded the IBM Research Forschungspreis in 2010, the Volker Heine Young Investigator Award in 2013, and an ERC Starting Grant in 2016.

UPCOMING SUPPORTED CONFERENCES (JANUARY–JUNE 2018)

10–13 April 2018 San Carlos de Bariloche, Argentina
XXIII Latin American Symposium on Solid State Physics
(SLAFES 2018)

9–10 May 2018 Quy Nhon, Vietnam
Science for Development (SFD 2018)

14–18 May 2018 Vienna
International Conference on Precision Physics of Simple Atomic
Systems (PSAS 2018)

21–25 May 2018 Nagoya, Japan
20th International Symposium on Very High Cosmic Ray
Interactions (ISVHECRI 2018)

3–8 June 2018 Praha, Czech Republic
World Congress on Medical Physics & Biomedical Engineering
(WCMP-BE 2018)

4–8 June 2018 Vancouver, Canada
International Congress on Plasma Physics (ICPP 2018)

4–9 June 2018 Heidelberg
XXVIII Conference on Neutrino Physics and Astrophysics
(NEUTRINO 2018)

4–9 June 2018 Bologna
Large Hydron Collider Physics Conference (LHCP 2018)

11–15 June 2018 Bristol, UK
Unifying Concepts in Glass Physics (UCGP 2018)

17–30 June 2018 Addis Ababa, Ethiopia
African School on Electronic Structure: Methods and Applications
(ASESMA 2018)

24–29 June 2018 Italy
15th International Symposium on Nuclei in the Cosmos
(XV-NIC 2018)

24 June–14 July 2018 Namibia
The African School of Fundamental Physics and Applications
(ASFPA 2018)

25 June–31 July 2018 Tokyo, Japan
International Symposium on Quantum Fluids and Solids (QFS2018)

UPCOMING ENDORSED CONFERENCES (JANUARY–JUNE 2018)

1–4 May 2018 Krakow, Poland
Conference of Middle-European Cooperation in Statistical Physics,
the 43rd edition (MECO-43)

7–10 May 2018 Trieste, Italy
Dynamics and thermodynamics of interacting systems from
classical to quantum (DTISCQ 2018)