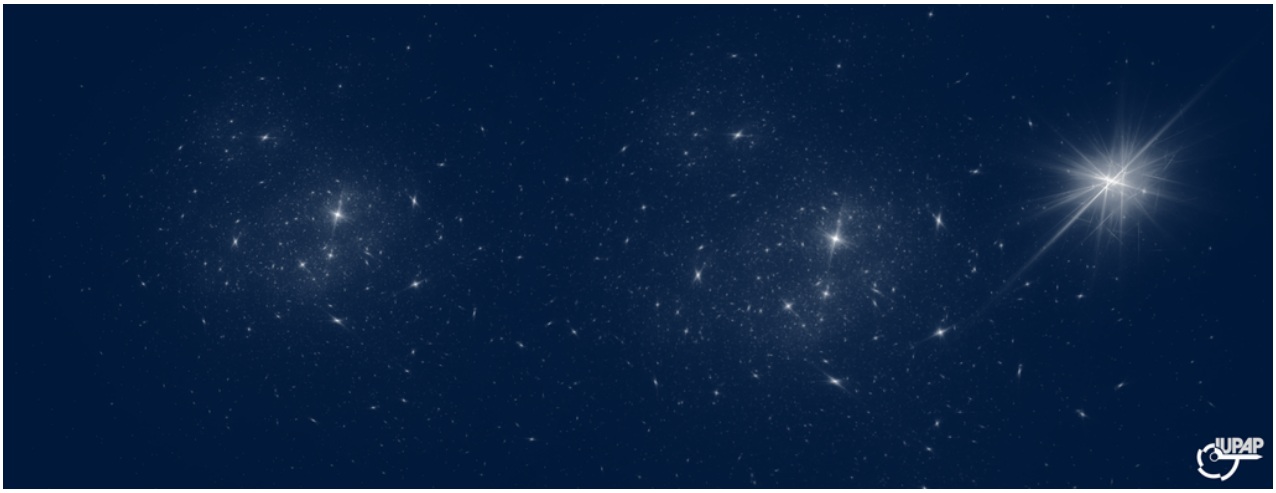
What's new
March - June 2022



Dear Readers,
you can see that the IUPAP agenda is particularly busy these days. These are exceptional times for IUPAP.
1. The IUPAP association with its articles and internal rules, under Swiss law has been set up together with its bank account. IUPAP can now be fully recognized is now properly constituted as a Non-Governmental Organization.

2. The main activity of IUPAP is to sponsor and endorse global inclusive conferences in Physics. This is particularly difficult these times because of the difficulties and climate footprint of travelling (we are recommending hybrid format for our sponsored or endorsed conferences) and because of the sanctions against Russia and Belorussia, linked to the Russian military offensive in Ukraine, offensive that we condemn (nevertheless we encourage Russian and Belorussian scientists to attend conferences with an IUPAP affiliation provided that they sign that they are not supporting the war and that they consider that conflicts have to be solved in a democratic and peaceful way). This subject is covered in detail in this issue.

3. We are on the way of attracting new territorial members (Ukraine is the last most recent one!) and discussing with members to better understand their wishes. We are also considering the possibility of creating a new category of Territorial Associate Members to be more inclusive to include as members territories those which have difficulty becoming members under the existing conditions. We are also starting to attract Corporate Associate Members. Your help will be instrumental to advance with these goals.

4. We will have our next Executive & Commission Chairs meeting July 5th to 8th followed by the IUPAP Centenary Symposium July 11th to July 13th, in Trieste, followed by our annual normal IUPAP General Assembly on July14th. The Centenary Symposium is covered in details in this issue.

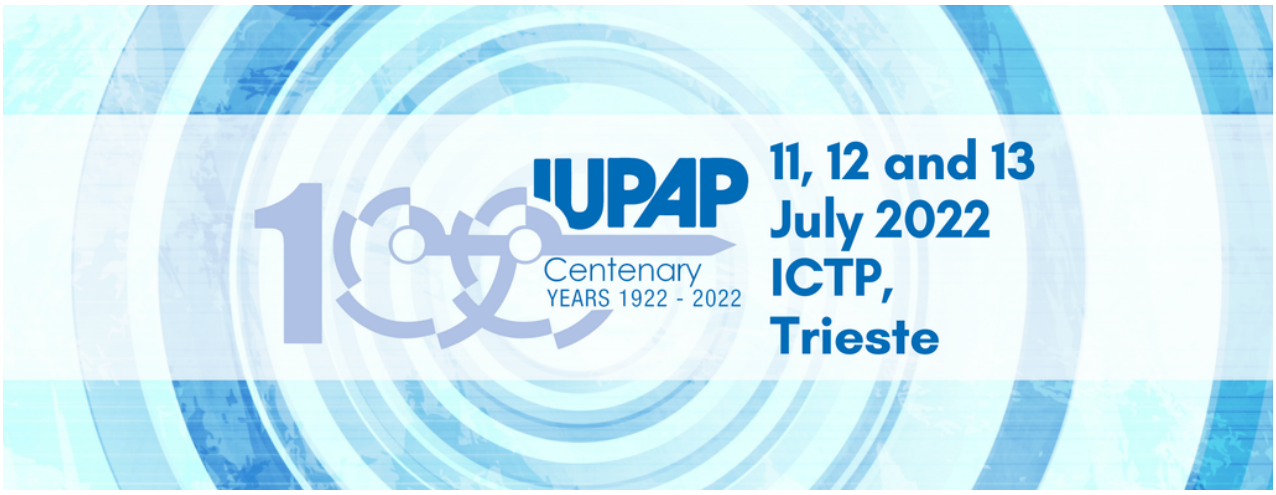
5. The jury of the IUPAP100 Photo Contest has finalized analyzing the entries that were received in its two categories. The winners will be announced soon.

6. Last but not least, on July 8th will be the date of the Opening ceremony of the International Year of Basic Sciences for Sustainable Development (IYBSSD) will be held at UNESCO Headquarters in Paris. Three entries of our IUPAP100 Photo Contest will be displayed in this venue. IUPAP is the leading Union of the Year IYBSSD. We use this opportunity to remind you of the rationale behind it.
“Basic sciences are driven by sheer curiosity but can also serve as a model for sustainable development.
Fired up by the desire to understand our world, each generation throughout history has added to the well of knowledge built up by previous generations, from which subsequent generations are able to draw the inspiration they need to solve the problems they face. It is the exact opposite of what we are currently doing with our planet’s natural resources.

Basic sciences, curiosity driven, are the foundations of education and the sources of discoveries which turn into applications which serve an inclusive sustainable development which all together (education, discoveries, applications, and inclusive sustainable development) must boost collaborative and open Basic Sciences. This is the virtuous circle that we want to promote during the International Year of Basics Sciences for Sustainable Development and after. This should involve teachers, scientists, private sector, decision makers and the society at large.
Finally, Basic Sciences and Curiosity constantly re-enchant our world to us and inspire us to make it worth to be sustainable for us."

We invite you to visit the IYBSSD website, to organize events during the International Year, to enter them on the website, so that all together we can at the end evaluate the outcome of the International Year of Basic Sciences for Sustainable Development. The closing ceremony is foreseen to be at CERN end of September or beginning of October 2023 in the new Science Gateway building designed by the famous architect Renzo Piano. This ceremony will coincide with an IUPAP special General Assembly celebrating the 100th anniversary of the first IUPAP General Assembly!

Long life to IUPAP
The three Presidents
Silvina Ponce Dawson
Michel Spiro
Bruce H. J. Mckellar



IUPAP Turns 100!

The Union will celebrate its centennial with an international symposium and a number of other satellite events. The Centenary Symposium will take place at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, from 11 to 13 July. The deadline to register for in-person or online participation is 30 June.

Among the keynote speakers who have already confirmed their attendance in person at the symposium is Nobel Prize laureate William Phillips (former vice-chair of Commission C2, Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants). Other confirmed guests include Laura Greene, a member of US President Joe Biden's Council of Advisors on Science and Technology (and IUPAP Vice-President at Large), and other world-renowned scientists such as Tim Palmer of the University of Oxford, who will deliver a speech on climate change. Nobel laureates Takaaki Kajita, Donna Strickland and Giorgio Parisi will deliver their contributions online.

Panels and other sessions will cover a broad range of themes including the history of IUPAP, disarmament, promotion of women and other underrepresented group, scientific careers, physics for development, education, and links with industry. "Regional" panels will focus on physics in Latin America, Asia, Africa and the Middle-East.

The conference will also be an opportunity to welcome Ukraine as a new member of the Union. Plasma physicist Anatoly Zagorodny, President of the Ukrainian Academy of Sciences, has agreed to address online the participants of the Centennial event.

The full programme of the event is available **here**. More information is available at the **IUPAP Centenary website**

Report on the 7th IUPAP International Conference on Women in Physics, ICWIP2021

Physics is often about making connections, between ideas, between data. It's also about physicists connecting with other scientists. So it is extremely important that physicists who are underrepresented and isolated are given the opportunities to meet other physicists and make those connections. The International Conference on Women in Physics (ICWIP) has been doing just that for women physicists for the last 20 years. But how do you replicate the experience and opportunities of in-person networking when going online, as ICWIP2021 was forced to do?

The conference, originally due to take place in Melbourne in July 2020, took place online in July 2021. Still hosted by Australia, co-chaired by Cathy Foley and Sarah Maddison, they with the local organising committee did a fantastic job to ensure that the 300 or so scientists from over 50 countries who attended had a meaningful conference, retaining those aspects that make ICWIP such a special and unique conference. They and we benefitted greatly by being able to call on the expertise and research of The Future of Meetings, a project set up pre-pandemic to look at online meetings and conferences.

The format of ICWIPs has always been such that it seeks and enables women from developing countries to attend. Being online had the advantage that more were able to attend, with technology grants given (rather than the usual travel grants) that would assist their participation. Having the flexibility to address the variety of delegates needs is crucial: needs varied from subscriptions for higher internet speed and improved computer hardware, some of which provided accessibility for more than one delegate and benefits for longer term.

Where possible talks were pre-recorded for delegates to watch at a time to suit, leaving the core conference hours for interactive activities. And although time zones and accessibility to people in those regions was challenging, the start and end times were varied throughout the week so that no one time zone was disadvantaged all the time. The workshops, seen as the heart of the conference, were scheduled to be at the least inconvenient time for all. These gave delegates the opportunity to share and discuss issues of importance and relevance to them, within the given topics of education, entrepreneurship, data gathering, intersectionality and developing countries.

There were the usual plenary talks by eminent women physicists, which are always a fascinating mix of cutting edge research and personal experiences, and also a couple of panel discussions: on men as allies and on what IUPAP is doing for gender equality with President (Acting) Michel Spiro and President-Elect (Acting) Silvina Ponce-Dawson. ICWIPs have impacted and benefitted IUPAP over the years, so it was a good opportunity for direct interaction between ICWIP delegates and the IUPAP Executive.

The conference website with its virtual game like environment encouraged informal interaction. There were sessions with "tables" where discussions could take place (and quizzes held). The poster sessions were, perhaps surprisingly, particularly effective with many good discussions and exchange. Social activities were also included for delegates to get to know one another. Particularly memorable was learning some dance moves with the Djirri Djirri dancers who had performed the very moving Acknowledgement of Country at the opening session. All those skills we use as scientists to make connections in creative and innovative ways, should be brought to bear to make sure that physics is as inclusive as we would like it to be.

IUPAP's Vice-President at Large and Gender Champion and Lilia Meza-Montes,
Chair Working Group on Women in Physics, WG5
Gillian L. Butcher,.

IUPAP resolution regarding international conferences in this time

IUPAP, during the darkest days of the cold war, apartheid and many other difficult political eras over the past 100 years, has always been able to do two things with care and responsibility:

i) Kept open the channels for scientific cooperation across all political and other divides in the hope and expectation that enhanced scientific collaborations are an important means to develop improved understandings between different peoples that contributes to world peace, and

ii) Expressed its concerns about any activity or intervention, including war, that impacts negatively on our ability to engage scientifically on a global scale and hence impacting negatively on (i) above.

IUPAP has issued its statement on the Russian invasion of Ukraine in accordance with (ii) above. It will be inappropriate for IUPAP to bar any scientist, especially from a member nation, from any scientific activity in accordance with (i) above. So long as the work upholds the ethics and principles of science in its highest ideals, for example, does not contribute to weapons capabilities, IUPAP can see no reason to disallow Russian scientist participation in the affairs of the Union.

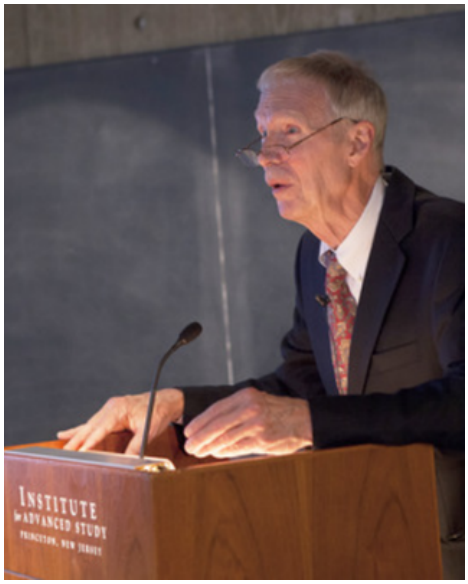
The IUPAP Executive Council

The Boltzmann Medal - 2022

Deepak Dhar

For his seminal contributions to several areas of statistical physics, including exact solutions of self-organized criticality models, interfacial growth, universal long-time relaxation in disordered magnetic systems, exact solutions in percolation and cluster counting problems and definition of the spectral dimension of fractals.

Deepak Dhar obtained his B.Sc. Degree from the University of Allahabad, Masters from IIT Kanpur, and PhD in Physics from California Institute of Technology. From 1978-2016, he was in the Department of Theoretical Physics at T. I. F. R. Mumbai, and he has been at IISER Pune since November 2016. Dhar is an elected fellow of all the three major Indian science academies - Indian Academy of Sciences, Indian National Science Academy and National Academy of Sciences, India - as well as of The World Academy of Sciences. The Council of Scientific and Industrial Research awarded Dhar the Shanti Swarup Bhatnagar Prize for Science and Technology.



John J. Hopfield

For extending the boundaries of statistical physics to encompass the phenomena of life, from kinetic proofreading in the transmission of information at the molecular level to the dynamics of neural networks creating a new language for thinking about computation in the brain.

John Hopfield received his A.B. from Swarthmore College in 1954, and a Ph.D. in physics from Cornell University in 1958. He spent two years in the theory group at Bell Laboratories, and subsequently was a faculty member at University of California, Berkeley (physics), Princeton University (physics), California Institute of Technology (Chemistry and Biology) and again at Princeton, where he is the Howard A. Prior Professor of Molecular Biology, Emeritus. He was awarded the Dirac Medal of the ICTP in 2001 and the Oliver Buckley Prize of the American Physical Society in 1969. Hopfield was elected as a member of the National Academy of Sciences in 1973.

IUPAP Early Career Scientist Prize in Statistical Physics - C3, 2022

Camille Scalliet

For her outstanding work in a broad variety of topics in the physics of hard and soft glasses, in particular, for locating two-level systems and demonstrating their properties in low temperature glasses and for identifying both highly localized and collective excitations in the Potential Energy Landscape.

Camille Scalliet currently holds an independent research position in the Department of Applied Maths and Theoretical Physics at the University of Cambridge. Dr Scalliet defended her PhD in September 2019 at the University of Montpellier after graduating from Ecole Normale Supérieure de Lyon in 2016. Her research focuses on challenging statistical physics problems involving the physical properties of disordered materials, such as colloidal and granular assemblies and molecular glasses. Her work combines the use of smart algorithms for computer simulations with theoretical methods based on advanced statistical mechanics including both replica calculations and liquid state theory.

Kyogo Kawaguchi

For his outstanding and unique achievements on multiple topics in experimental and theoretical statistical physics and biophysics, which include the fluctuation analysis of hidden variables, uncovering statistical physics behind homeostasis, and identifying the role of topological defects in the cell's collective dynamics.

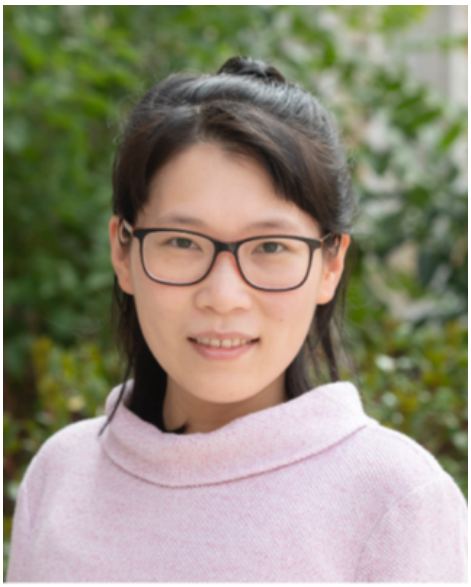
Kyogo Kawaguchi is currently Team Leader of a Hakubi Research team at Riken BDR and Visiting Associate Professor in Kobe University. Dr Kawaguchi defended his PhD in 2015 at the University of Tokyo, where he graduated in 2012. His research is characterized by expertise as both a biophysicist performing wet-lab experiments and a theoretical statistical physicist. His work has focused on multiple topics in statistical physics, in particular non-equilibrium physics of living matter, and, recently, on linking cell biology to quantum physics and machine learning.

Suraj Shankar

For his outstanding theoretical contributions to soft matter and nonequilibrium statistical physics, particularly active matter and extreme mechanics, distinguished by a singular eye for connecting ideas from different fields.

Suraj Shankar is currently a Junior Fellow at Harvard University. Dr Shankar defended his PhD in 2019 at the Syracuse University after graduating from the Indian Institute of Technology Madras, Chennai in 2014. His research interests range from active matter and physical biology to fluid flow and extreme mechanics, focusing on geometric or topological aspects. His work combines a variety of tools, involving elasticity, continuum hydrodynamics and stochastic dynamics, together with topological and geometric techniques, along with field theoretic renormalization group methods and large deviation theory.

IUPAP Early Career Scientist Prize for the Commission on Low Temperature Physics - C5, 2022



Dr. Qiong Ma, Boston College, USA

For her outstanding contributions to the discovery of the nonlinear Hall effect related to the quantum geometry of Bloch electrons.

Dr. Qiong Ma is now an assistant professor at Boston College. She received her Ph.D in physics from the Massachusetts Institute of Technology in the United States in 2016. She played a key role in the experimental discovery of the nonlinear Hall effect at zero-magnetic field in a 2D semiconductor, bilayer WTe2 in the 1T′ structure. She revealed the nature of this unconventional Hall effect: the current-voltage characteristic is quadratic instead of linear and the Hall voltage is measured at twice the frequency of the input current, clearly demonstrating the second-order nature of the Hall response; and the nonlinear Hall response shows multiple peaks and sign reversals as a function of carrier density. These features were also analyzed by DFT calculation of the Berry curvature dipole in bilayer WTe2. The agreement between experiment and theory provided compelling evidence of the quantum geometrical origin of the observed nonlinear Hall effect, and has stimulated much further research.

Dr. Xiaolong Liu, Cornell University, USA

For his contributions to the visualization electronic properties of superconductors and magnetic topological insulators using scanning tunnelling microscopy.

Dr. Xiaolong Liu is now working as a Kavli Postdoctoral Fellow at Cornell University. He received his Ph.D in Applied Physics from Northwestern University in the United States in 2018. Dr. Liu has been studying quantum materials using scanning tunnelling microscopy. He has studied the effect of disorder in the quantum Hall state of a three-dimensional magnetic topological insulator, determining the spatial dependence of the Dirac mass gap. He has also contributed to the development of Josephson scanning microscopy, unveiling a Cooper pair density wave and visualizing the superfluid density and velocity of the flowing electronic fluid in superconducting NbSe2.

Dr. Matthias Saneyuki Ikeda, Stanford University, USA

For the invention of sensitive means to measure the ac elastocaloric effect, and for revealing its relevance to the study of quantum materials.

Dr. Matthias Ikeda is a Research Scientist at the Geballe Laboratory for Advanced Materials and the Department of Applied Physics at Stanford University. He received his Ph.D from Vienna University of Technology in 2015. Dr. Ikeda uses thermodynamic and transport measurements of quantum materials at low temperatures to advance the understanding of correlation phenomena. His invention, development and use of new measurement techniques enabled him to make a number of impactful discoveries. For instance, his strain-tuning experiments have provided strong evidence for a nematic quantum critical point in iron-based superconductors, while his sensitive ac elastocaloric effect measurements have revealed new insights to nemato-elastic coupling in the same materials.

Dr. Matthew Yankowitz, University of Washington, USA

For his transformative contributions to the field of moiré quantum materials including pressure-tuning of superconductivity in twisted bilayer graphene.

Dr. Matthew Yankowitz is now an assistant professor at the Department of Physics at the University of Washington and also a WRF Innovation Assistant Professor in Clean Energy at the University of Washington. He received his Ph.D in physics from the University of Arizona in the United States in 2015. Dr. Yankowitz has been working on scanning probes, transport, and pressure-tuning to explore the electronic properties of two-dimensional materials. As a graduate student, he studied the Hofstadter physics of graphene sheets. Recently Dr. Yankowitz has discovered that superconductivity and correlated insulator states can be induced in twisted bilayer graphene by applying pressure. He extended his research to related bilayer/bilayer and monolayer/bilayer graphene systems, which are new important platforms to realize novel phenomena including the quantum anomalous Hall effect

IUPAP Early Career Scientist Prize In The Field Of Magnetism - C9, 2022

Chunhui Du, University of California, San Diego

For fundamental contributions to the understanding, detection and control of spin dynamics and spin currents in magnetic oxides.

Dr. Chunhui Du is an Assistant Professor of Physics at the University of California, San Diego (UCSD). She received her B.S. in physics from East China Normal University in 2010, and Ph.D. in Physics from the Ohio State University in 2015. She worked as a postdoctoral fellow at Harvard University before joining UCSD in March, 2019. Du's research focuses on developing state-of-the-art quantum metrology to investigate spin transport and dynamic behaviors in emergent condensed matter systems at the nanoscale. Du is a recipient of the National Science Foundation Career Award, the Air Force Young Investigator Award, and the Harold and Suzy Ticho Endowed Faculty Fellowship (UCSD).

IUPAP Early Career Scientist Prize in Structure and Dynamics of Condensed Matter - C10, 2022

Dr. Alexander McLeod, University of Minnesota

For his contributions to nano-imaging and -manipulation of correlated electron phase transitions, and for fundamental studies of polaritons at low temperatures.

Dr. Alexander S. McLeod has pioneered the application of optical nano-probes and multi-messenger nano-imaging to explore inhomogeneous quantum matter, including correlated electron systems and van der Waals materials. His recent interests include harnessing hybrid excitations of light and matter – so-called polaritons – as real-space probes of electronic structure, and tailoring nano-scale light-matter interactions to realize new states of matter. Previously, McLeod was a Director's Postdoctoral Fellow with the Columbia Nano Initiative at Columbia University (2017-2021). He holds a BA in Physics and Astrophysics (2009) from the University of California Berkeley and a PhD in Physics (2017) from the University of California San Diego."

IUPAP Early Career Scientist Prize in Particles and Fields- C11, 2022

Adi Ashkenazi, Tel Aviv University

For conducting and leading new experiments to study nuclear-physics effects that take place in neutrino interactions and implements them in simulation. These efforts are crucial for fully utilizing the potential of current and future high-statistics neutrino experiments around the world.

Dr. Adi Ashkenazi is a senior lecture in the high energy physics department at the Tel Aviv University. Ashkenazi's research plan is focused on estimating the impact of nuclear effects in neutrino experiments, coordinating an effort to leverage electron scattering data to benchmark models and improve neutrino event generators. Ashkenazi is an active member of MicroBooNE and DUNE, a spokesperson of a dedicated electron scattering experiment at JLAB, and a Monte Carlo developer. Her lab plans to produce a series of novel measurements that will improve current models used for neutrino interaction simulations to support the
needs of the future DUNE experiment for oscillation precision measurements and New Physics searches. Before arriving at her current position, Dr. Ashkenazi was a postdoctoral researcher in Physics at the Massachusetts Institute of Technology and was based at Fermilab. She received her undergraduate degree from the Hebrew University of Jerusalem, a Master and a PhD from Tel Aviv University.

Ahmed Almheiri, New York University in Abu Dhabi

For substantial and impactful contributions to the understanding of black holes and quantum gravity, specifically related to the information paradox and its connection to quantum information theory and quantum error correction.

Ahmed Almheiri is an incoming assistant professor of physics at New York University in Abu Dhabi and an affiliate member at the Center for Cosmology and Particle Physics at New York University in New York. His research is on the interface of quantum information and quantum gravity. He had a leading role in revealing this connection by demonstrating that gravity implements a quantum error correcting code, and by addressing the information paradox through calculating the information content of the Hawking radiation emitted by black holes. Ahmed was awarded the 2021 New Horizons in Physics Prize and is the recipient of the Pride of the Emirates medal. He has a B.Sc. from the University of Toronto and a M.Sc. and Ph.D. from the University of California at Santa Barbara, and completed a postdoc at the Stanford Institute for Theoretical Physics at Stanford University, and recently finished a long term membership at the Institute for Advanced Study in Princeton, NJ.

IUPAP Early Career Scientist Prize In Atomic, Molecular And Optical Physics - C15, 2022

Dr Ana Asenjo-García

For her outstanding theory contributions to the understanding of fundamental physics associated with light-matter interactions in cold and ultracold atoms, the role of many-body optical phenomena, and their applications to quantum technologies.

Ana Asenjo-García received her Ph.D. degree from Universidad Complutense de Madrid in 2014. She was a Marie Curie postdoctoral fellow at the Institute of Photonic Sciences (ICFO) in Barcelona, and an IQIM Fellow at the Institute of Quantum Information and Matter at Caltech. She joined Columbia University as an assistant professor of physics in 2019. Her research focus is on theoretical quantum optics and its intersection with atomic physics, quantum information science and many-body physics. In particular, the research program of her group is centered at understanding out-of-equilibrium physics of large quantum systems in open environments, with the aim of developing scalable and efficient applications in quantum information storage and processing, non-linear optics, and metrology. Besides her research activities, Prof. Asenjo-García is committed to making science a more inclusive and diverse environment. To serve that purpose, she founded "Coding Club" at Democracy Prep Harlem High School, and actively participates in outreach and mentoring activities for under-represented communities in STEM.

Upcoming Sponsored Commission Conferences:

C3: Commission on Statistical Physics

- The 28th IUPAP International Conference on Statistical Physics
- 08 - 12 August 2022, Tokyo, Japan

C4: Commission on Astroparticle Physics

- 27th European Cosmic Ray Sympossium
- 24 - 29 July 2022, Jijmegen, The Netherlands

C5: Commission on Low Temperature Physics

- The 29th International Conference on Low Temperature Physics (LT29)
- 18 - 24 August 2022, Hokkaido, Japan
- ULT2022 - Frontiers of Low Temperature Physics - (International Conference on Ultralow Temperature Physics 2022)
- 25 - 28 August 2022, Otaru, Japan

C9: Commission on Magnetism

- The 24th International Colloquium on Magnetic Films and Surfaces (ICMFS-2022)
- 03 - 08 July 2022, Okinawa, Japan

C10: Commission on Structure and Dynamics of Condensed Matter

- International Conference on Materials and Mechanisms of Superconductivity & High Temperature Superconductors
- 17 - 22 July 2022, Vancouver, Canada

C11: Commission on Particles and Fields

- International Conference on High Energy Physics (ICHEP)
- 06 - 13 July 2022, Bologna, Italy

C13: Commission on Physics for Development

- Quantum Materials in the Post Covid-19 era
- 10 – 16 July 2022, Quy Nhon, Vietnam
- Development Workshop with Gender Perspective for Early Career Scientists and Students
- 26 – 29 July 2022, Honduras, Tegucigalpa

C14: Physics Education

- International Conference on Physics Education (ICPE)
- 18 – 23 July 2022, Sydney/Australia/Thailand/Indonesia
- International Conference of Physics Students
- 09 – 16 August 2022, Universidad Iberoamericana Puebla, Mexico

C15: Commission on Atomic, Molecular, and Optical Physics

- The 27th International Conference on Atomic Physics
- 17 – 22 July 2022, Toronto, Canada
- ATTO VIII: 8th International Conference on Attosecond Science and Technology
- Orlando, Florida, USA

C16: Commission on Plasma Physics

- ESCAMPIG 2022 – EurophysicS Conference on Atomic and Molecular Physics of Ionized Gases
- 11 – 15 July 202, Paris, France

C18: Mathematical Physics

- The 34th International Colloquium on Group Theoretical Methods in Physics
- 18 – 22 July 2022, Strassbourg, France

C20: Computational Physics

- IUPAP Conference in Computational Physics
- 31 July – 04 August 2022, Austin, Texas, USA

AC2: International Society on General Relativity and Gravitation (ISGRG)

- 23rd International Conference on General Relativity and Gravitation
- 03 – 08 July 2022, Beijing, China

Thank you