

# What's new April - September 2023



## **Editorial**

Science for Society: from the International Year of Basic Sciences for Sustainable Development (IYBSSD, 2022-2023) to an International Decade embracing all sciences and knowledge, including ancestral (IDSSD, 2024-2033)

We are approaching the end of the International Year of Basic Sciences for Sustainable Development 2022 - 2023 (IYBSSD). This International Year was proclaimed on December  $2^{nd}$  by the UN General Assembly, placed under the auspices of UNESCO and led by IUPAP. More than 50 Unions and Organizations and more than 100 Academies and Associations participated with more than 300 events worldwide. The main rationale was that:

- Basic Sciences and curiosity driven research construct the pool of knowledge that future generations will use for their development and to face their challenges.
- Basic sciences are not always considered as they deserve, especially in the discussions concerning societal, environmental, and economic development.
- Curiosity-driven sciences re-enchant our world and inspire new vocations enlarging the communities that will help advance towards the goals of sustainable development.
- Basic sciences explore the soul of the Universe!

Basic sciences, however, although essential for sustainability, are not enough. The experience gained during IYBSSD led to the following conclusions:

- Advancing with the goals of sustainable development requires that all sciences be involved, as well as all knowledge, including ancestral.
- Sciences for Sustainability are in the rise, but are very fragmented thematically, geographically, and organizationally.
- Equitable, peaceful and planet friendly circular economy fuelled by decarbonated energy could be the application target of Sciences for Sustainability. Advancing towards this target will require a lot of innovations and new practices where **Physics will certainly play a major role**.
- It is necessary to mobilize, to interconnect from local to global, to structure, in order to co-transform efficiently.
- A spirit for Sustainability Sciences and open and international collaboration is needed. Large collaboration in Physics and Astrophysics could be an inspiration for this.

Based on these conclusions, the organizers of IYBSSD decided to promote the proclamation by the UN General Assembly of an International Decade of Sciences for Sustainable Development 2024 - 2033 (IDSSD). The resolution was brought up by Serbia with the active support of Argentina, Cuba, Equatorial Guinea, Guatemala, Honduras, Hungary, South Africa, Spain and Viet Nam. It was proclaimed by consensus on August 25<sup>th</sup>, 2023. It is again placed under the auspices of UNESCO. It will embark all the unions, organizations, academies, and associations of IYBSSD with the addition of similar organizations related to applied, formal, social and human sciences. IUPAP is part of it and will play a major role at least in the transition from IYBSSD to IDSSD.

## Michel Spiro - IUPAP President Silvina Ponce Dawson - IUPAP President-Designate

## 8th IUPAP Conference on Women in Physics India, July 10-14 2023



The IUPAP International Conference on Women In Physics (ICWIP) is organised every 3 years since 2002. The conference covers several topics related to the status of women in Physics and discusses strategies for improvement. It consists of plenary talks by outstanding female physicists, panel discussions addressing specific topics and workshops on specific important topics. The deliberations culminate in various proposals to improve the situation of women in physics and these are taken back to IUPAP, individual countries and physics societies. The country posters, depicting the progress and status of female physicists in their nations is a major part of the conference. Additionally, scientific posters are also invited to foster collaboration. Regional meetings, cultural and social activities are organized to promote networking and mentoring. The proceedings of the conferences are made available in openaccess mode. The conference series has been very successful and has made a significant impact, resulting in the improved participation of women at international level and has paved the way for different local initiatives worldwide.

ICWIP2023, organised by the Gender in Physics Working Group of the Indian Physics Association and Tata Institute of Fundamental Research was held in an online mode during 10-14 July 2023 and was hosted by the Homi Bhabha Centre for Science Education of TIFR. The conference was attended by nearly 500 delegates from 70 countries, including about 200 participants from India. The plenary talks presented an overview of some of the latest developments in quantum computation, astronomy, collider physics, laser and plasma physics, and climate education. Discussion also encompassed geographical and gender biases in publications and measures to overcome the same. Studies related to institutional racism and sexism were presented. Participants got the opportunity to interact with eminent women scientists and social scientists in workshop sessions on Physics education, data analysis, intersectionality, leadership and development. Additionally, the workshops organised by Indian team members on combating biases and on equity in digital space, highlighted timely challenges experienced by physics communities in India and abroad.

Recommendations emerging from the discussions include- hybrid meetings for wider access, enhanced networking, focussed programs for mentoring, targeted support for developing countries, showcasing women achievers, setting up of resource sites for dissemination of information, and maintaining a gender balance in decision making bodies.

To summarise, it is important to remember that diversity contributes to excellence in science and equity is a collective responsibility.

Lilia Meza Montes and Gillian Butcher - Co-Chairs, International Advisory Committee Srubabati Goswami and Vandana Nanal - Co-Chairs, Local Organizing Committee

## Meet our team



## Francesca Zavino

## **IUPAP Communications**

• Could you please introduce yourself? I was born in Naples, spent my childhood in the beautiful mountains of Friuli Venezia Giulia, and have lived in Trieste for 15 years now. I graduated in Philosophy and attended a master's degree in Science Communications. It was hard at first, because science had never had a place in my Philosophy studies. But I discovered a wonderful world, full of exciting topics and passionate people. The extraordinary mysteries of physics captivated me most of all. In my life I work in Communications and Social Media Management, for a number of companies, some of which operate in the scientific field.

• What is your role within the IUPAP? In my work with IUPAP, I am responsible for updating the website, writing newsletters and creating content for social media.

• What did you enjoy most in your collaboration with IUPAP? What I love most about this collaboration is the great multiculturalism. One moment I am talking to a colleague from Trieste, the next I receive an email from India, the next from Geneva, and so on. For a moment my small city becomes infinite, immense, borders do not exist, only people exist, and a community united by the same passions.

• What do you think is the greatest potential of IUPAP? I think the greatest strength has to do with my previous answer: the fact that IUPAP is a community made up of people who are far apart, but united by similar interests. Another thing I really like is the focus on young scientists and the support for their research. And again: attention and support for scientists living in countries with difficult conditions, attention to the inclusion of women and support for conferences as a meeting point and exchange of ideas between various scientists.

## StatPhys29 - Florence (Italy), July 13-18 2025



Statphys28, the triennial conference of the C3 Commission (Statistical Physics) of IUPAP has been successfully held in Tokyo from august 7 to august 11. During the last session of the Conference, it has been announced that the 29th edition of this prestigious event, StatPhys29, will be held in Florence (Italy) July 13-18. The chairman of the Conference will be Stefano Ruffo of SISSA, Trieste. Several satellite meetings have already been scheduled in many European countries and at Kigali, Rwanda. The world community of Statistical Physics is kindly invited to participate in the Conference, which will also host the ceremonies of the Boltzmann Medal and of the Early Career Award of IUPAP.

## The African School of Fundamental and **Applied Physics (ASP)**



International cooperation forms the common denominator of the today's culture of scientific activities. However, in many scientific disciplines and especially in fundamental and applied physics, the cooperation among African countries and between them and the rest of the world is not well developed. This is especially the case for sub-Saharan Africa, which is one of the most rapidly developing regions in the world with great educational needs. In order to extend the existing international scientific ties to this geographical zone, we have established the African School of Fundamental and Applied Physics, also known as <u>African School of Physics</u> (ASP), with a focus on fundamental and applied physics.

ASP is a collection of activities to support academic growths of African students. One activity is a three-week biennial event organized in different African countries. This event consists of a 2-week intensive school, complemented with a one-week African Conference on Fundamental and Applied Physics (ACP). ASP started in 2010 in South Africa, then Ghana (2012), Senegal (2014), Rwanda (2016), and Namibia (2018). The Africa, then Ghana (2012), Senegal (2014), Rwanda (2016), and Namibia (2018). The 2020 edition of ASP was planned in Morocco; however, because of the COVID-19 pandemic, it was organized online in July 2021. In 2022, ASP took place in South Africa. At the time of writing, we are preparing for ASP2024, planned July 2024 in Morocco. The host countries of ASP and ACP are selected two and a half years earlier, through a bidding process, and invited to join the organization of current activities [1-6]. For example, the host country of ASP2026 will be selected by December 2023 and encouraged to participate in the organization of ASP2024 to gain experience experience

About eighty students are selected from all over Africa, from upwards of four hundred applications in each edition. International scientists are invited to prepare and deliver lectures according to the proposed topics considering the diverse levels and backgrounds of the students, and the research interests of the host country. Selected students must have a minimum of three-year university education, with the majority at the level of a Master's Degree in physics. The duration of the school allows for extensive networking between participants. A one-week training workshop for about seventy high school teachers and a one-week outreach for over fifteen hundred high school pupils are included in the program.

For broader participation in fundamental fields and related applications, the scientific program includes the major physics areas of interest in Africa:
Particles and related applications: nuclear physics, particle physics, medical physics, (particle)astrophysics and cosmology, fluid and plasma physics,

- complex systems;
- Light sources and their applications: light sources, condensed matter and materials physics, atomic and molecular physics, optics and photonics, physics of earth:
- Cross-cutting fields: accelerator physics, computing, instrumentation and detectors;
- Societal engagements: topics related to physics education, community engagement, women in physics, early career physicists and engagements with African policymakers in research and education.

After each school, ASP alumni may apply for the mentorship program where they are paired with international lectures, in consultation with their academic advisors, for additional support. A subset of the mentees is selected for the short-term visit for research program where they spend three to six months at BNL in various research groups. The short-term visit program is expected to grow with placements of ASP alumni at other international laboratories. ASP activities are complemented with topical online lectures, seminars, colloquia or discussions. Support ASP comes from international institutes worldwide.

Since its inception in 2010, and thanks to the support of IUPAP, ASP has grown to be much more than a school; it has become a series of actions with physics as an engine for development in Africa.

Dr. Kétévi A. Assamagan Brookhaven National Laboratory (BNL)

### References

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**IUPAP Early Career Scientist Prize 2023** 



## <u>C9 - Commission on</u> <u>Magnetism</u>

## Dr. Alannah Hallas, University of British Columbia, Canada

"For outstanding contributions to the discovery of magnetic quantum materials through advanced synthesis methods."



## <u>AC6: Affiliated</u> <u>Commission on the</u> <u>History and Philosophy of</u> <u>Physics</u>

### Dr. Jean-Phillipe Martinez, RWTH Aachen University, Germany

"For his insightful and diverse range of scholarly publications that combine the understanding of the development of physics concepts and mathematical formalism, the analysis of scientific practices in their local and institutional contexts, and transnational historical perspectives examining international channels of communication and science diplomacy."



## <u>C15 - Commission on</u> <u>Atomic, Molecular And</u> <u>Optical Physics</u> Prof. Hong-Guang Duan, Ningbo University, China

"For his outstanding contributions to the field of biomolecular lightharvesting and excitation energy transfer, to understand the role of quantum coherence in the exciton



## <u>C16 - Commission On</u> <u>Plasma Physics</u> Dr Jannis Teunissen, Centrum Wiskunde & Informatica, Netherlands

"Development of a suite of numerical codes to simulate streamer discharges in full 3D with their intricate inner structure, including their interactions and branching transfer dynamics and refine of the tools of nonlinear femtosecond spectroscopy."

statistics, in agreement with experiments, as well as for contributions to codes and predictions for relativistic MHD in astrophysics, and to machine learning for space weather."



<u>C20 - Commission on</u> <u>Computational Physics</u> Dr. Sinéad Griffin, Lawrence Berkeley National Laboratory, University of California, USA

"For her significant achievements in computational materials physics, expanding our understanding of topological quantum materials and establishing new paradigms for dark matter detection."



## <u>C4 - Commission on</u> <u>Astroparticle Physics</u> Lu Lu, PhD, University of Wisconsin, USA

For "her contributions to the development of high energy neutrino astronomy in the PeV energy region".

### **IUPAP Open Calls** Find out what calls for nominations are currently open!

Let me have a look



## **IUPAP**

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