Forum on INTERNATIONAL PHYSICS

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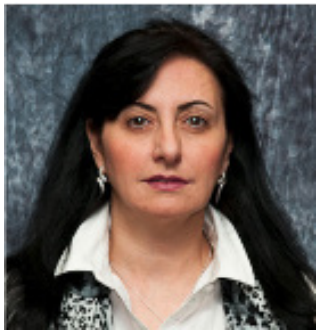
From the chair line

Marcela Carena (Perimeter Institute), FIP Chair 2025



Dear FIP Members,

The APS Forum on International Physics (FIP) works to bring the global physics community together by supporting programs that promote scientific exchange across countries. Over the past year, FIP has helped members participate in major scientific meetings, encouraged international collaborations, and highlighted the work of physicists around the world.

The APS Global Physics Summit, held in Anaheim, CA, in March 2025, gathered more than 14,000 physicists from around the world (Joint March Meeting and April Meeting: Global Physics Summit 2025). This summit, the largest physics research conference in the world, provided an important opportunity for FIP to highlight international collaboration and the strength of the global physics community. The summit's theme 'Quantum Science' was aligned with the United Nations' declaration of 2025 as the International Year of Quantum Science and Technology (IYQ).

FIP activities at the APS Global Physics Summit featured a wide range of international discussions on science. A key session, co-sponsored with the Forum on Physics and Society (FPS), was entitled "Building Bridges through International Collaboration." This multidisciplinary session brought together speakers from different regions of the world to discuss successful international experimental collaborations and shared research efforts, offering insights into how cooperative work can advance science across borders.

Another FIP session, aligned with the summit's theme, focused on "Physics at the Quantum Frontier Across the Americas." Co-sponsored with the Division of Quantum Information (DQI), the session brought together experts in quantum science from Argentina, Brazil, Canada, and Mexico.

A third session concentrated on education and training across borders, featuring "The Global University: Expanding the Reach of Science Education through Satellite Campuses Across the World." This session, co-sponsored with the Forum on Education (FEd), highlighted the importance of international cooperation in training the next generation of scientific talent worldwide.

FIP also hosted the Wheatley Prize Session, honoring recipients for their contributions to advancing light source infrastructure and scientific development in Africa, the Middle East, and the Americas. In addition, a session co-sponsored with the APS Division of Particles and Fields (DPF) was dedicated to "The Future of Particle Physics in Asia."

Another central moment was the FIP & FPS Evening Reception, which provided an informal setting for networking among physicists from around the world. The reception also celebrated community building and highlighted exceptional young researchers through the Distinguished Student (DS) Program. For the past decade, APS and FIP have partnered to support this program, which provides financial assistance for distinguished non-U.S. young researchers to attend the APS Global Physics Summit. FIP is also partnering with the APS Forum of Early Career Scientists (FECS) to extend DS support to postdoctoral fellows.

Overall, FIP's presence at the Global Physics Summit highlighted international cooperation, recognition of global scientific leadership, and inclusive dialogue within the physics community. These activities reflect the Forum's ongoing commitment to connecting physicists worldwide and promoting collaborative research that addresses shared scientific and societal challenges.

Throughout the year, the Physics Matters online colloquia series continued to spotlight important global initiatives, including the International Year of Quantum Science and Technology (IYQ 2025) and the International Decade of Sciences for Sustainable Development. These monthly webinars are presented live to APS members and the wider public, and recordings are made available online.

As we begin 2026, we would like to thank our outgoing leaders: Patricia McBride, past FIP Chair, and Executive Committee members Andreas Adelmann and Kaitlin Jennifer Cook. Their dedication has strengthened FIP and advanced our mission around the world.

We are pleased to welcome Carlos Henrique de Brito Cruz as FIP Chair for 2026 and look forward to his leadership in continuing to foster international collaboration in physics. We would also like to welcome our newly elected Vice Chair, Federico Rosei, and incoming members-at-large Ying-Jer Kao and Dimitris Nektarios Gkavakos, as well as our re-elected Councillor William Barletta.

We wish all FIP members a successful and inspiring 2026, full of new discoveries and fruitful collaborations. We hope that FIP activities will continue strengthening the physics community around the world.

Best regards,

Marcela Carena, FIP Chair 2025

From the Outreach and Communication Committee (OCC)

A Year of Quantum Reflection, Societal Impact, and Global Perspectives

Christine Darve, European Spallation Source

The OCC has primarily focused on preparing the 2025 Physics Matters colloquium series, held in the context of the International Year of Quantum Science and Technology (IYQ 2025). The series offers a rich programme that combines the scientific depth of quantum physics with societal relevance, global collaboration, and the development of emerging regions, particularly Africa. Across eleven colloquia, it highlights both the historical foundations and future directions of physics, while addressing applications in healthcare, industry, education, and sustainable development.

Quantum physics was the defining theme of 2025. The series opened with Philippe Chomaz, who explored the transition from classical physics to the first quantum revolution, tracing how early discoveries such as photons and electron wave behavior led to technologies like transistors and lasers. He framed today's ambitions for the "second quantum revolution," emphasizing superposition, entanglement, and quantum computing as the frontier of modern physics. Malik Maaza continued the quantum narrative, presenting precision studies on cold neutron trapping. His work, combining wave–particle duality, total reflection, and nanostructured resonators, addressed persistent discrepancies in neutron lifetime measurements, illustrating how neutron science probes the Standard Model and cosmology.

The future of quantum science in Africa was highlighted by Yaseera Ismail, who described efforts to strengthen research capacity, develop human capital, and create infrastructure, including the continent's first quantum satellite link. Her talk underscored the importance of international collaboration to ensure Africa's role in the global quantum ecosystem. The quantum series culminated in a reflective lecture by Ana María Cetto, who reviewed a century of quantum theory in the context of IYQ 2025. She emphasized that, despite extraordinary technological advances, fundamental questions in quantum foundations remain unresolved. Drawing on the breadth of activities across the year, she concluded that the IYQ has not only showcased the success of quantum technologies but also highlighted the need for renewed investment in fundamental theoretical and experimental research to deepen our understanding of quantum phenomena, setting the stage for the next hundred years of discovery.

Physics applications beyond the laboratory formed another core theme. Maurizio Vretenar (CERN) demonstrated how particle accelerators now serve medicine, industry, environmental monitoring, and energy, directly contributing to sustainable development. Similarly, Prof. Rajaâ Cherkaoui El Moursli showcased how nuclear physics expertise can generate tangible societal benefits, particularly in medical physics education and capacity building in Morocco, while highlighting gender equity in science. Raffaella Geometrante emphasized the role of industry–research partnerships in accelerating innovation, illustrating how strategic collaboration ensures that scientific breakthroughs in accelerator science and other areas translate into real-world value.

The series also addressed critical scientific disciplines for development. Thierry d'Almeida explored materials science as a driver of socioeconomic growth in Africa, focusing on the need for local skills and infrastructure to transform raw resources into economic and technological value. Paul Woafo presented nonlinear science and chaos theory, demonstrating applications across biology, medicine, engineering, cryptography, and security, highlighting how fundamental concepts can address real-world challenges.

The broader impact of physics on education and global engagement was highlighted by Joyful Mdhluli, who showed how astronomy can support sustainable development through education, data skills, and cultural initiatives, drawing on the work of the International Astronomical Union's Office of Astronomy for Development. The perspective of young scientists was brought forward by Niloofar Jokar, presenting the International Association of Physics Students (IAPS). She highlighted student-led initiatives that foster international collaboration, inclusivity, and engagement with global scientific efforts, including IYQ 2025 and the International Decade of Sciences for Sustainable Development.

Together, the 2025 PHYSICS MATTERS colloquia provided a coherent journey through the past, present, and future of physics. From foundational discoveries to applied research, from international collaborations to emerging African initiatives, the series demonstrated physics as a powerful driver of knowledge, innovation, and sustainable progress worldwide, with Ana María Cetto's concluding lecture offering a reflective synthesis of the IYQ, emphasizing both the achievements and the unresolved questions that will guide quantum science into the future.

From the editor

Stephane Kenmoe

Photo credit: UDE/Bettina-Engel-Albustin

Dear readers

We are pleased to present the latest issue of your newsletter. As usual, it provides a summary of FIP activities over the past year and an outlook for the current year. We also present the exciting program of sessions dedicated to the FIP at the upcoming Global Summit of the American Physical Society. You can participate in these sessions either in person or online. Our speakers will address topics that include several aspects of global engagement for better education, international collaboration, and scientific diplomacy for greater social impact. This issue is even more interesting as we meet exceptional scientists, women, young and experienced, whose exemplary commitment transcends national and regional barriers; a true incursion into the power of women in physics in the engineering of nations, youth, and tomorrow.

NYU Abu Dhabi at ACP 2025: NYU Abu Dhabi, a beacon of research, teaching and culture in the Middle East

Marta Losada, New York University Abu Dhabi

The African Conference on Physics 2025 (ACP 2025) brings together scientists, educators, students and policymakers to promote physics and interdisciplinary research across the continent. NYU Abu Dhabi's contribution at this event showcased the accomplishments of the institution and its thriving community of students, faculty, and researchers as well as underscored the power of international partnerships and cutting-edge research and education in driving discovery and innovation.

At the conference the presentation by NYU Abu Dhabi highlighted how global collaboration, academic excellence, and inclusion are transforming opportunities for the global population in STEM. With the presentation "Global University and Women in Science," NYUAD's vision of connecting cultures through education and research was shared.

A Truly Global University

Founded in 2010 as a strategic partnership with the Emirate of Abu Dhabi, NYU Abu Dhabi (NYUAD) is a pioneering institution that bridges East and West. With students from over 120 countries speaking 100+ languages, it is an integral part of New York University with degree-granting campuses across New York, Shanghai, and Abu Dhabi plus 13 other global sites across all continents. The university's mission is to educate global citizens, promote human understanding, and foster knowledge that benefits society. Its 370+ faculty members represent more than 50 nationalities, reflecting NYUAD's commitment to global diversity, research excellence, and inclusion.

NYU Abu Dhabi stands as a model for how universities can merge world-class research with global access and engagement with a global flow of ideas. Students outcomes have surpassed all expectations having for example the highest number of Rhodes scholars per capita globally.

NYUAD's research ecosystem features research labs and centers, high research productivity and significant intellectual property, with particular strength in astrophysics, AI, biomedical sciences, and environmental research. In particular, the quality and complexity of the experimental research facilities is one of a kind in the region and in some cases included into the select specialized research infrastructures that exist around the world. One recent highlight is the development of NYUAD's PhD in Astrophysics and Space Systems, providing an international environment which connects research between Abu Dhabi and New York to train scientists in space technologies and strengthen ties with the UAE's growing space program.

Women in Science: Progress and Potential

In the presentation it was emphasized that while women's participation in tertiary education has grown significantly in the Middle East and North Africa (MENA) region, their representation in research careers remains uneven, with an improvement in early-stage research careers. Data shared from UNESCO showed that women make up less than one-third of researchers worldwide, nevertheless, there have been important progress particularly in regions such as Central Asia, Latin America and the Arab world towards parity, although in an

inhomogeneous way at the country level. Partnerships between institutions like NYU Abu Dhabi and the global academic community can redefine what global access and engagement in science looks like—not just in numbers, but in impact.

Engineering a Nation: a Physicist at Work in Democratic Republic of Congo (DRC)

H.E Raissa Malu, state minister in charge of Education and new citizenship in DRC opens up about her transition from science to politics and the challenges she faces.

H.E. Raissa Malu and Stephane Kenmoe

Since her appointment, H.E. Raissa Malu (R.M) has made impressive reforms in the ministerial department she heads in DRC. In a conversation with Stephane Kenmoe (S.K), she discusses her transition from science to politics, the progress made in her ministerial sector, and the challenges she faces.

S.K: Eighteen months after joining the government, it is safe to say that you are successfully carrying out the mission entrusted to you by the government. You have several innovative actions and implemented ideas to your credit. Can you briefly outline the highlights of your term in office so far?

R.M: Eighteen months into this mandate, our primary achievement was the strategic definition of our vision through the development of a comprehensive **Five-Year Plan (2024-2029)**. This roadmap, which was our first major innovation, focuses on stabilizing the administrative backbone of our education system while modernizing its core. One of our most visible successes in this modernization effort has been the **integration of Artificial Intelligence into the national state exam (EXETAT) grading process** and the launch of the **e-diploma secured by blockchain technology,** ensuring unprecedented speed, security, and transparency while eliminating the long-standing issue of academic fraud.

Furthermore, we have fundamentally shifted the legal landscape by signing a specific **Decree to organize and regulate distance learning,** supported by the publication of clear implementation measures to ensure educational continuity across the country. This structural progress is reinforced by **several key national policies and strategies**—ranging from school feeding programs to education in emergency contexts—and complemented by creative pedagogical tools like our newly published series of educational comic books. Finally, we have placed values at the heart of our mission by instituting the '**Citizen's Oath**,' a daily commitment that anchors the spirit of the 'New Citizenship' in every student, preparing them to be dedicated Congolese patriots.

Figure 1: H.E. Raissa Malu during center her visit to Mwanga High School in Kolwezi, Lualaba Province, January 2025. (Photo credit: Ministry of Education and New Citizenship).

S.K: When you were appointed, many voices around the world welcomed your appointment as a source of hope and light for the entire African continent. This is particularly because you are responsible not only for education but also for new citizenship. How are you shaping the future Congolese citizen, knowing that your success could be the epicenter of a continental wave of reforms in education throughout the continent and finally in line with the dynamics of contemporary citizenship?

R.M: Shaping the future Congolese citizen is a responsibility we embrace with both humility and determination, as we believe that a transformed Congo can indeed serve as a catalyst for educational renewal across Africa. Our approach is not merely academic; it is a holistic transformation centered on the concept of 'New Citizenship,' which we have integrated into the very heart of our educational system.

We are shaping this future citizen through three strategic pillars. First, by anchoring values in daily life: we have introduced the **'Citizen's Oath'** (Serment du Citoyen), a daily commitment recited in schools to instill patriotism, integrity, and a sense of duty from the earliest age. This is supported by our **'New Citizenship' pedagogical kit,** providing teachers with concrete tools to foster real character building.

Second, we have launched a major curriculum reform specifically designed to align with the dynamics of contemporary citizenship. By updating subjects such as History and integrating critical themes like **GENOCOST** (genocide for economic gains), we are ensuring that our youth develop a profound understanding of our national memory and the resilience of our people. This duty of remembrance is essential to forge a strong national identity and to empower students to become active defenders of our country's dignity.

Finally, we are promoting a culture of exemplarity and accountability. Through the use of AI for exam transparency and the systematic publication of our activity reports, we are showing the next generation that merit, transparency, and public accountability are the foundations of a strong nation. By combining this renewed historical consciousness with a deep-rooted sense of civic responsibility, we are building a model of the 'Complete Citizen'—one who is technically skilled, historically aware, and ready to lead the DRC toward a brighter, more sovereign future.

S.K: I would like to return to an aspect that I think is really relevant: the digitization of education and the recent introduction of e-diplomas. How could you achieve this in a country as vast as the DRC? It's simply incredible in a country where the majority of schoolchildren are located in rural areas, most often isolated, without electricity, cut off from the internet, and sometimes even in war zones.

R.M: Achieving the digitization of education and launching the e-diploma in a country with the DRC's unique challenges is indeed a bold step, but it is one rooted in a pragmatic and resolutely inclusive strategy. Our approach does not rely on an idealistic vision of 'high-speed internet for all,' but rather on a multimodal model designed specifically to ensure that no child is left behind, whether they are in a remote village without electricity or in a conflict zone.

To succeed in this challenge, we have structured our Distance Learning (EAD) implementation measures around solutions adapted to the realities of the field. Where connectivity is lacking, we utilize traditional but powerful levers such as educational radio and television broadcasts, as well as the distribution of physical pedagogical kits and printed materials. This means that while the content management and administrative backbone are digitized, the delivery of learning adapts to the local resources available to the student. This organization is supported by an effective decentralization through local resource centers that act as relay points for materials and evaluation standards.

As for the introduction of the e-diploma secured by blockchain, it is actually a major solution for territorial equity. It allows a student in a rural area to obtain an unfalsifiable and instantly verifiable certification, saving them from the long delays or the costly and difficult travel previously required to reach major urban centers. By combining cutting-edge technological management in the back-end with adapted local delivery in the front-end, we are transforming the vastness of our territory into a testament to our resilience and our commitment to every Congolese child.

S.K: Another technical point. In this age of artificial intelligence, what measures have you taken to link the teaching of physics and mathematics to it?

R.M: To effectively link the teaching of physics and mathematics with artificial intelligence, we have moved beyond theoretical concepts to practical, data-driven applications. This journey began with the PEQPESU (Education Quality and Relevance Improvement Project) (2016-2021), a foundational initiative supported by the World Bank that aimed at improving the quality and relevance of secondary education. Under this framework, we distributed over 20,000 science kits and 10,000 computers, while renovating laboratories and training tens of thousands of teachers to ground science education in experimentation and modern tools.

Building on this infrastructure, we integrated the Whizz Education experience, which represents our most direct application of AI in the classroom. Through the 'Maths-Whizz' virtual tutor, we deployed an AI-powered platform that provides personalized learning pathways for each student. This system acts as a digital tutor, diagnosing individual learning gaps in real-time and adjusting the difficulty and pace of mathematical exercises accordingly.

The results have been transformative: schools reported a doubling of enrollment in scientific options and a significant increase in student engagement. By using AI not just as a subject to study, but as a tool to master mathematics and physics, we are creating a feedback loop where student data allows for immediate pedagogical adjustment. This approach ensures that our youth are not only learning science but are also becoming fluent in the digital and algorithmic environments that define the modern world.

This successful pilot experience with PEQPESU is now being scaled up and institutionalized through our new flagship project, PAAF (Girls' Learning and Empowerment Project) (2024-2028). A central component of this project is the establishment of a robust national digital education platform and the massive deployment of technology in schools. We are installing 'Smart Labs' in approximately 388 schools, equipped with digital devices, projectors, and—crucially—solar charging systems to ensure functionality in non-electrified areas. These labs are pre-loaded with digital textbooks and virtual science laboratories, allowing students to conduct complex physics and chemistry experiments digitally. For schools without full Smart Labs, we are equipping 'digital classrooms' with mobile devices for teachers to enhance interactive learning. Furthermore, we are digitizing our administrative and pedagogical oversight by providing inspectors and school heads with digital tablets for real-time monitoring. This transition from a pilot phase to a system-wide digital ecosystem ensures that the modernization of mathematics and physics teaching becomes a permanent and inclusive reality across the Democratic Republic of Congo.

S.K: We have long hoped to have people of your caliber in these strategic positions so that they can promote the ideas of sustainable development supported by science. How do you think your mandate will be useful to your scientific community, that of physicists in Africa and around the world?

R.M: Being a physicist in such a strategic position is both a privilege and a responsibility. I believe my mandate serves the scientific community, particularly physicists in Africa and beyond, by demonstrating that science is not just a subject for the classroom, but a powerful framework for decision-making and sustainable development.

First, we are promoting a culture of evidence-based governance. By applying the analytical rigor of physics to public policy, we are proving that scientific methods can solve complex societal challenges. This elevates the role of scientists in the eyes of the public and policymakers alike.

Second, we are actively securing the future of the scientific pipeline. Through the scale-up of projects like PEQPESU and now the PAAF, we ensure that the next generation of African physicists has the tools to compete globally, regardless of their location.

Finally, we are placing the New Citizenship at the heart of scientific training. We want to remind current and future scientists that they are, first and foremost, citizens. By integrating national history and contemporary challenges like GENOCOST into a modernized curriculum, we are training 'Complete Citizens' who do not just work in labs, but who use their scientific expertise to defend our nation's interests, manage our resources, and safeguard our sovereignty. My mandate is a call to the scientific community: your expertise is essential, but it must be driven by a deep sense of responsibility toward your society.

S.K: Is there a disconnect between your educational and scientific vision and the realities of politics? The former is sometimes forward-looking and long-term, while the latter very often demands short-term results for purely political reasons.

R.M: There is often a perceived disconnect between the long-term nature of scientific progress and the short-term demands of politics, but my approach is to treat them as complementary rather than contradictory. In physics, we understand that a powerful final result depends on the precision of every intermediate step; I apply this same logic to my mandate.

Our Five-Year Plan is the expression of our long-term scientific vision—it is our roadmap for structural change. However, we satisfy the political need for immediate results by delivering 'quick wins' that are actually building blocks of that long-term vision. For example, the integration of AI in EXETAT grading provided an immediate political victory in terms of transparency and speed, but it also served the long-term scientific goal of digitizing our national data infrastructure.

Furthermore, the New Citizenship serves as the bridge between these two timelines. By instilling the Citizen's Oath and updating the curriculum, we are achieving an immediate shift in school culture while simultaneously preparing a generation that will only bear fruit in a decade.

Ultimately, I do not see my role as choosing between the laboratory and the cabinet. Instead, I use the urgency of politics to accelerate the scientific reforms that the DRC has needed for decades. By systematically publishing our activity reports and showing progress through projects, we prove to the public that rigorous, long-term planning is the only way to deliver reliable, short-term results. We are not just managing a ministry; we are engineering a nation.

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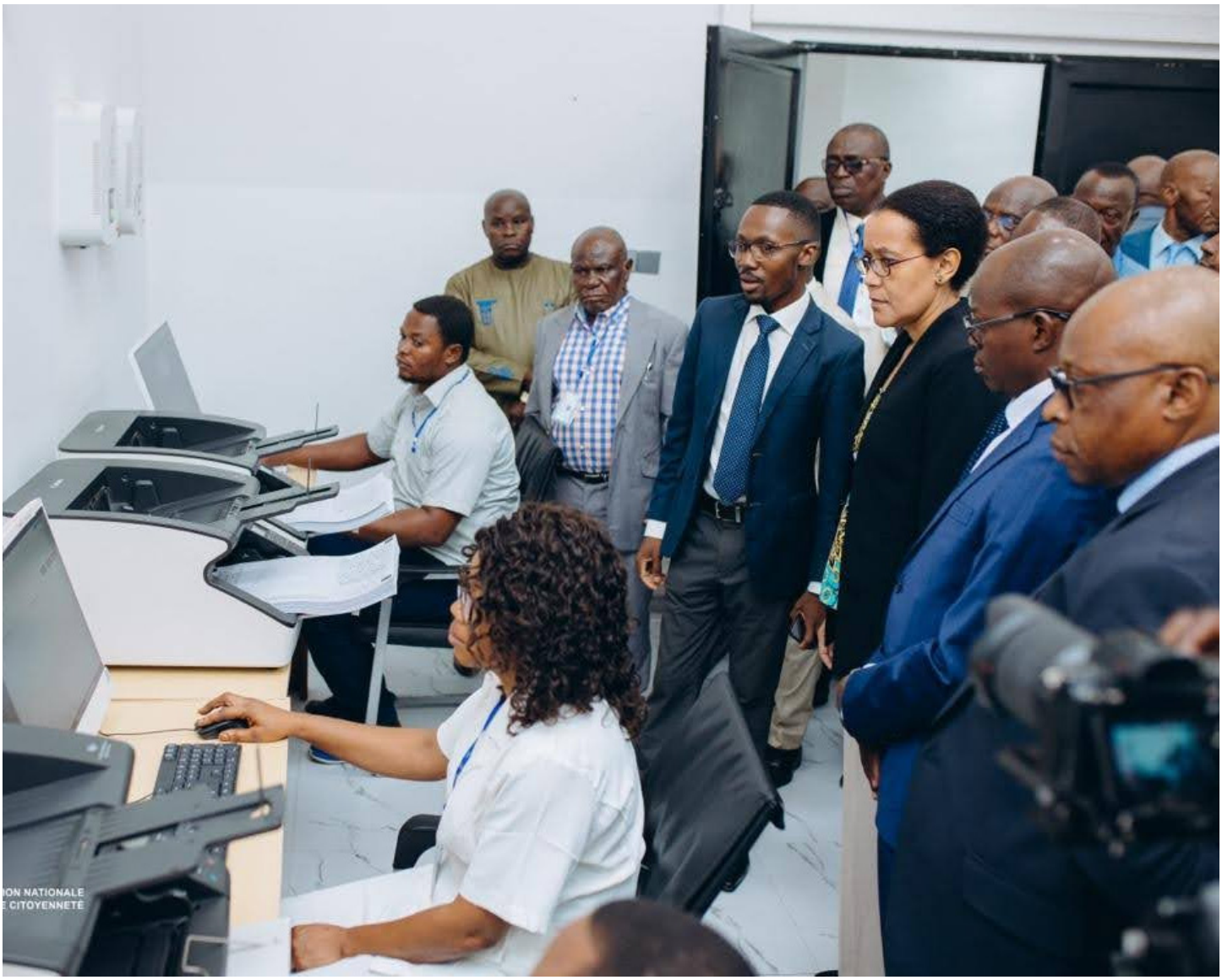

Figure 2: H.E. Raissa Malu the new state exam copy processing center (Photo credit: Ministry of Education and New Citizenship). Visit to Mwanga High School in Kolwezi, Lualaba Province, January 2025.

The African Strategy for Fundamental and Applied Physics (ASFAP)

by Stephen Inkoom, Ghana Atomic Energy Commission

ASFAP is a continent-wide initiative to define a 10-year roadmap for physics research and education, with a 20-year vision, for Africa. It connects experts internationally to set priorities, drive collaborations, and make practical recommendations for the future. The ASFAP process was launched in 2020 with a mandate from the African Physical Society. Since then, it has received endorsements from many institutes worldwide [1]. The Open Symposium focused on reviewing and improving the draft ASFAP Report for publication readiness. The report contains many chapters in physics research, education and societal engagements important for development and growth in Africa. These chapters were prepared after years of work—since the launch in 2020—in various working groups convened by experts in the fields. The symposium received 313 registration interests from 60 countries worldwide, of which 36 were African. It proceeded in a hybrid format with over 72 daily online connections and 36 in-person participants. Dr. Sandro Scandolo of ICTP, Italy, and Dr. Kétévi Adiklè Assamagan of Brookhaven National Laboratory (BNL), USA, gave the opening addresses. Dr. Amal Kasri of the United Nations Educational, Scientific and Cultural Organization (UNESCO) also gave a presentation entitled "UNESCO—The African Strategy of Fundamental and Applied Physics: A Groundbreaking Roadmap for Scientific Transformation", among other speakers. To better inform the development of ASFAP, invited experts presented physics roadmap developments in their region or country. For example, Prof. Fernando Quevedo of New York University Abu Dhabi (NYUAD) presented the Landscape of High Energy Physics in Latin America, and Dr. Emmanuel Tsesmelis of the European Organization for Nuclear Research (CERN), Switzerland, presented The European Strategy for Particle Physics. The ASFAP group conveners and contributors presented details on the report chapters, followed by expert discussions and open feedback from participants. The content review of the ASFAP report consisted in a series of presentations, supported by discussions and open feedback aimed at improving the final report. These exchanges consistently underscored the importance of finalizing the report in a timely manner.

An interview with Radio France Internationale (RFI) featuring Dr. Assamagan, conducted in the context of the symposium, reiterated the call for increased investment in fundamental and applied research in the physical sciences in Africa [2].

I was excited to attend the symposium. As a co-convener of the medical physics working group of ASFAP, I presented the chapter on Medical pPhysics in Africa and received useful feedback. With my co-conveners, we have implemented the comments received. Similarly, conveners of other ASFAP working groups have improved their chapters with the comments received during the symposium. Though focused on the ASFAP report, the symposium enabled new collaborations; personally, it offered an opportunity to meet international experts from other physics disciplines, and network while making new professional connections.

The report is expected to be finalized in early 2026 after addressing the comments received at the symposium. Then, UNESCO will publish and distribute the report to its member states. Subsequently, the implementation of the recommendations detailed in the report will become the next focus, with discussions and consultations involving the African Union, African governments, the African Academy of Sciences (AAS), the Network of African Science Academies (NASAC), UNESCO, and other institutes interested in improving physics education and research in Africa.

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International competition for e-posters in STEM for students

Sultana N. Nahar, The Ohio State University, USA

One innovative pathway to bring research ideas together that emerged during the closings of COVID-19 pandemic by our inquisitive minds is use of zoom or going online. I have full implementation of it for my global research training course "Atomic Astrophysics and Spectroscopy with computational workshops on the R-matrix and SUPERSTRUCTURE codes" (APS Newsletter, June 2022, Vol 31, No. 6, page 1) which has continued with 125 participants joining from 17 countries in 2025. We have just introduced another innovative scope for students activities under the Indo-US STEM Education and Research Center of the Ohio State University in the USA and Aligarh Muslim University (AMU) in U.P. in India. It does not cost any money for the participants.

When Physics Ph.D. student Adiba of AMU presented her idea of engaging female students with an e-poster competition for forming a network, I saw the beauty and value of it right away

These images show the event and presentations.

and set to formalize the best out of it. We wanted to engage undergraduate students, who often do not have any research experience in most part of the world, along with Ph.D., Master and other students carrying out research for their degrees. So, we introduced two categories of e-posters, i) research that students are carrying out for their degrees, ii) concept of research projects with possible solutions largely for the undergraduate students. Since we have limited experts to all areas of STEM, we decided that the audience and participants would be the judges and put their scores based on the skill of presentation with clarity and importance of the project, and quality of the research indicated by presenter or the knowledge of the audience. We prepared the google doc files for poster submissions, registration, and to collect the score. We advertised the announcement poster at the STEM Center and electronically circulated the announcement to all personally known female students in various campuses and to International Society of Muslim Women in Science (ISMWS) network of females in STEM in 33 countries to participate and spread the notice.

We received 50 posters submitted from Egypt, India, Saudi Arabia, and USA, surprisingly about 20 from the research group and more, about 30, from the idea group of undergraduates. Their topics sampled as "UTILIZING SAUDI INDUSTRIAL WASTE: IMPACT OF K AND ZrO2 SEQUENTIAL ADDITION ON RED MUD-BASED CATALYSTS FOR CO2 HYDROGENATION" from the research group and "BIOCHEMICAL ADAPTATIONS OF EXTREMOPHILES : HEAT SHOCK PROTEINS IN EXTREME ENVIRONMENTS" from the idea group. Names of the presenters were replaced by coded names to avoid any partiality and each received 3 minutes to present. Participants joined on the zoom very enthusiastically during the day to nighttime depending on their location. We selected three winners from each category from the voting points. Our Center needed to bear some expenses for the recognition certificates for all and plaques for the winners. The event, which we plan to continue at the Center, revealed how eager female students are for STEM research and how the undergraduates are looking forward to it. We need to ignite this desire for scientific advances and international e-poster competition is one more convenient way for it.

Dr. Sultana N. Nahar is a professor of astronomy at the Ohio State University, co-author of the textbook Atomic Astrophysics and Spectroscopy, creator of the NORAD-Atomic-Data, co-director of the STEM Education and Research Center, and honorary professor at University of Jordan, adjunct professor of physics at Wayne State University and Cairo University

The Impact of an Early-Career Physicist

by Rajaâ Cherkaoui El Moursli, Mohammed V University

Dr. Mounia Laassiri, a post-doctoral researcher at Brookhaven National laboratory (BNL) and a Visiting Scientist at the University of Johannesburg (UJ), was awarded the prestigious 2025 UNESCO-Al Fozan International Prize for young scientists in STEM, for the Arab States. Dr. Laassiri was among five early-career scientists honored with the prestigious prize, the others for Africa, Asia, Europe & North America, and Latin America. Dr. Laassiri was "Recognized for her leadership in technology development within large, international collaborations focusing on high energy physics as well as science education on the African continent."

Figure 1: Dr. Laassiri receiving the 2025 UNESCO-Al Fozan Prize for the Arab States.

At BNL, her focus is on the development of the ATLAS strip tracker upgrade (ITk) where she is responsible for all ITk strips barrel module testing. This responsibility involves the technical expertise to operate data acquisition (DAQ) and coldbox software and a strong understanding of the associated hardware to train newcomers and troubleshoot problems. Part of the ITk strips barrel module quality control (QC) process involves the use of a coldjig—a setup that includes temperature control, DAQ, and hardware monitoring. She is also responsible for implementing interlock systems to ensure the safe thermal cycling of silicon strip modules, thereby enhancing operational safety and reliability. Additionally, she serves as the U.S. contact for the coldjig software—this work requires innovative strategies in the testing, quality control and production of these detector elements, and training of new staff. In physics research, she has been studying quantum entanglement in semileptonic final states of Higgs boson decays to pairs of W-bosons, H -> WW -> lvqq.

Dr. Laassiri also developed Position-sensitive detectors for nuclear fuel imaging by studying a passive gamma emission tomography (PGET) device that makes use of state-of-the-art 3D position-sensitive semiconductor gamma-ray detectors. She set up the Monte Carlo simulation framework and validated it in experiments at Helsinki Institute of Physics and the University of Uppsala. The benefit of 3D position-sensitive detectors for PGET includes applications such as the imaging of spent fuel, fuel irradiated in the context of the development of new reactor designs, fuel pin containers and nuclear waste management.

At the Instrumentation Division of BNL, she studied, fabricated and tested pixelated Position-Sensitive Virtual Frisch-Grid (CZT) Detectors for gamma-ray detection. This constitutes an improvement of 3D imaging technologies by employing two-sided event reconstruction with Compton imaging capabilities.

With the Electronics Detector Group of BNL, she developed a dedicated system to calibrate the field response functions for the wire-readout-based single-phase Liquid Argon Time Projection Chamber (LArTPC), enhancing TPC signal processing for automated event reconstruction. The project was a significant contribution to the MicroBooNE data analysis and provided critical inputs for protoDUNE and DUNE experiments—worldwide scientific collaborations for well over one thousand and two hundred scientists, with Madagascar a participating African country. In this project, she constructed a LabVIEW-based DAQ program for LArFCS using commercial VME modules, from CAEN, avoiding the complexity of the existing MicroBooNE NEVIS FPGA readout system, thus facilitating detector calibration strategies for future generations of particle physics detectors.

In collaboration with UJ, she developed a Geant4 modelling Ubuntu Reactors, through a stochastic Monte Carlo simulation of a High Temperature Gas Cooled Reactor (HTGCR) using the Geant4 framework. She implemented basic neutronics, geometric discretization, time slicing, and intra-slice persistence for studying spatial variations of physical parameters. She integrated thermal hydraulics via workflow scheduling and validated thermal macroscopic cross-section behavior, fission, burn, decay, and differential energy deposition processes. She carried out validation of Xenon effects on neutronics, criticality, and core behavior over multiple time steps.

Dr. Laassiri's PhD thesis research concentrated on neutron/gamma Discrimination using Nonnegative Tensor Factorization (NTF) Algorithms. She applied NTF algorithms to extract independent components from signals recorded at the fission chamber preamplifier's output, achieving neutron/gamma discrimination; she simulated neutron flux in the TRIGA Mark II reactor using Monte Carlo methods with Geant4 and Garfield++ to model the fission process, energy deposition, and ionization in the fission chamber. She integrated Magboltz and Heed within Garfield++ for analysis of electron-ion drift lines and induced signals, providing a detailed simulation of stochastic events and detector response. She processed output signals using the NTFLab toolbox in MATLAB and identified NTF1 and NTF2 as the most effective algorithms for data analysis, achieving separation of neutron and gamma-ray signals. She demonstrated successful neutron/gamma

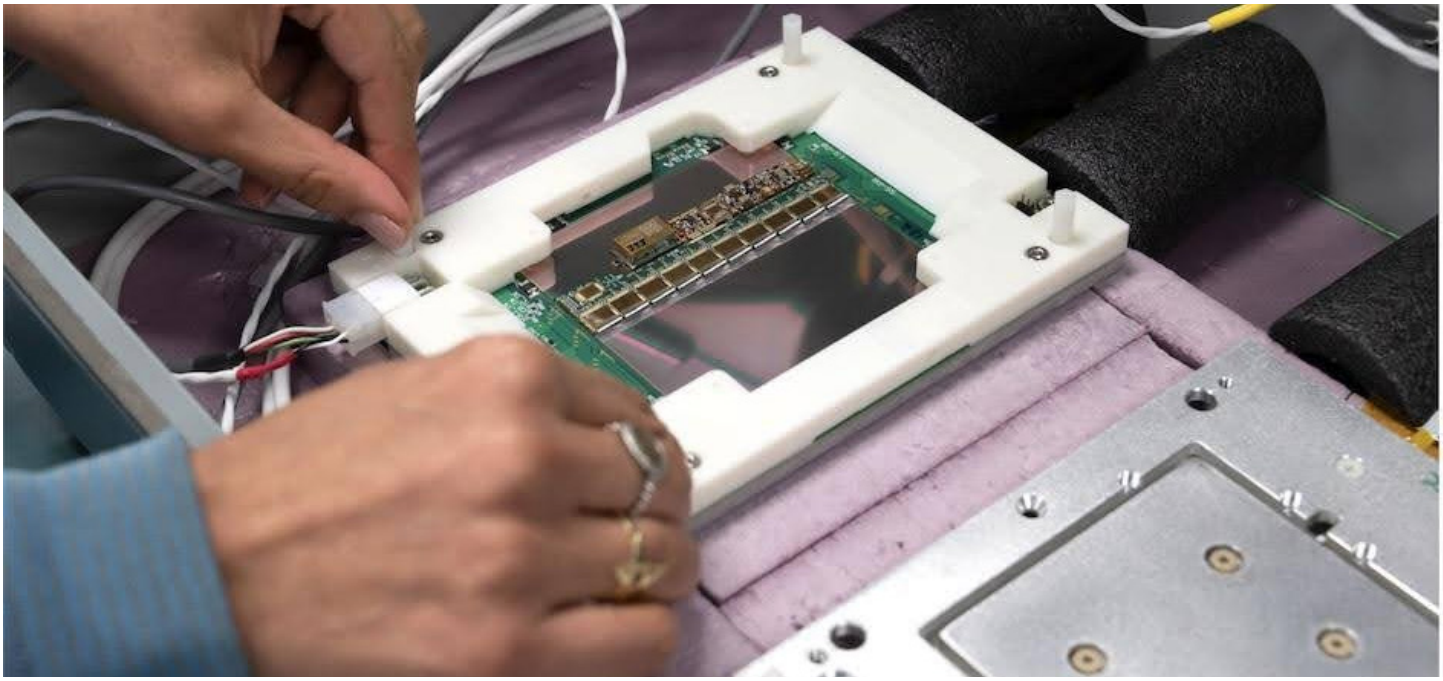

Figure 2: Dr. Laassiri testing detector elements for the ATLAS Inner Tracker upgrade

discrimination without prior knowledge of signal mixture, validated by analyzing signal-to-noise ratio and normalized correlation functions between pure neutron and gamma-ray signals.

Dr. Laassiri has maintained high-level and impactful engagements in physics education, communication and outreach throughout her aforementioned technical contributions. Among the salient ones, we mention the following. Dr. Mounia Laassiri is a convener of the Young Physicists Forum (YPF) of the African Strategy for Fundamental and Applied Physics Strategy (ASFAP), with the objective to develop a pan-African physics roadmap, at grassroots level to impact strategic directions in physics research and education in Africa. Sixteen research areas and four societal engagement areas are developed in ASFAP, with over six hundred physicists from Africa and beyond. ASFAP was launched in 2020 and is expected to conclude in 2026 with a strategy report for African policymakers and the international community. ASFAP is fully endorsed by many international institutes who will disseminate the ASFAP report. In ASFAP, Dr. Laassiri promotes career growth and development for young Africans by providing forums for discussing and seeking solutions for career development problems facing young Africans. There are over a hundred early careers benefitting from her activities in YPF.

She is a Senior Editor of the African Physics Newsletter (APN), published quarterly by the American Physical Society (APS), where she was elected to the Executive Committee of the Forum on International Physics (FIP). As APN Editor, she promotes the visibility of physics education and research by encouraging, soliciting, and editing contributed articles for APN. APN has been disseminated to over forty African countries.

She is also a member of the Governing Council of the Arab Physical Society (ArPS), where she drives the strategic planning and leadership to advance physics research, education, and collaboration among Arab physicists. ArPS organizes period research and physics education activities in Arab countries. Dr. Laassiri develops the scientific program and provides mentorship and supports early-career Arabs (students and faculties).
She is a member of the International Organizing Committee (IOC) the African School of Physics (ASP). In this role, she manages ASP through its various activities to support university students, high school teachers, high school learners, and research faculties from African countries. These activities include schools, conferences, seminars, colloquia, panel discussions (in-person in Africa or online), structured mentorship, and three to six months research visits to USA research institutes.

In 2016, Laassiri was among eighty students selected to attend the fourth African School of Physics at the University of Rwanda. In 2019, she was among nine alumni of ASP selected for the inaugural short-term visits for research program where she spent about six months at BNL; during that research visit, she was selected to speak about ASP at the American Physics Society, Division of Particles and Fields, in Boston. In 2022, she was invited to ASP again, but as a lecturer; soon after ASP2022, she was appointed to the IOC. She is a trustee of the Friends of the African School of Physics, a US-based NGO, with the objectives to raise funds for the continuity and maintenance of ASP. In this role, Dr. Laassiri writes proposals to various agencies of governments, education and research institutes, foundations and private citizens to seek financial support to meet the budgetary requirements for impactful ASP events.

In the US, she extends physics outreach to various institutes. The ATLAS Experiment, where Dr. Laassiri is carrying out fundamental research, offers opportunities to promote diverse communities. Dr. Laassiri has engaged these communities to support physics outreach and research training to develop capacity and promote the inclusion into large international research collaborations.

Laassiri's journey started in Sale in Morocco, where she obtained her doctorate degree at Mohammed V University in Rabat.

Figure 3: (Left) Dr. Laassiri, demonstrating physics concepts to high school learners during an event organized by the African School of Physics. (Right). Performing a detector simulation tutorial in Geant4 for university students.

She says her journey had a humble beginning and is marked by Ubuntu, "I am because you are". It has been a journey marred with various challenges: cultural in the expected roles of women, educational in the limited access to quality training, professional in scientific fields with so few women, Arabs and Africans, and societal in the difficulties in re-integrating trained African scholars. Yet, her scientific progression is a testament to the support of family, community, mentors, and her determination to achieve more than the cultural expectations of a "good wife". From her mother, a Moroccan woman, without formal education, but with dedication, passion, and courage, Laassiri learned to face challenges and received the encouragement to pursue her dreams resiliently. She is proud of the education that she received in Morocco; it gave her the foundation to be competitive at the international stage. She says she is fortunate for the opportunity to do post-doctoral studies outside her country; she has learned a lot by working in the international atmosphere of physicists. Lassiri's efforts in physics education, communication and outreach are her ways of developing research collaborations, motivating future talents, erasing stereotypes and being a role model. She was moved when, in one event, a high school girl told her, "I did not know you are a physicist. I thought physicists are male with funny hairs and dusty lab coats. You, you are a woman, you dress well, and you don't need a lab coat."

NEWS AND UPCOMING EVENTS

APS 2026 sessions: Fostering Global Collaboration Across Continents

Monday, March 16 : 08:00a - 10:24a, Convention Center, Mile High Ballroom 2A/3A

Navigating Grad School Internationally

- 08:00a - 08:36a, Phong Quoc Dang (presenter)
  Invited: Carrying Strengths across Borders: What I Learned Navigating Grad School as an International Young Scholar
- 08:36a - 09:12a, Son T. Nguyen (presenter)
  Invited: Navigating Graduate School in Physics as an International Student
- 09:12a - 09:48a, Dolly Nambi (presenter)
  Invited: Navigating Academia and Life as International Students
- 09:48a - 10:24a, Mario U. Gaimann (presenter)
  Invited: Simulations, Seminars, and Sauerkraut: An Insider's Guide to a Physics PhD in Germany

Tuesday, March 17: 08:00a - 11:00a, Convention Center, Mile High Ballroom 2A/3A

International Physics in Today's World: Overcoming Barriers and Finding Opportunities

Deniz Aybas, Nathan Jacob Berkovits, Grace E Cummings, Maria Longobardi

- 08:00a - 08:36a, Maria Longobardi (presenter)
  Invited: Navigating Borders: The Realities of International Physics Mobility
- 08:36a - 09:12a, Grace E Cummings (presenter)
  Invited: From Member to Leader: Building Your Voice in Global Physics Collaborations
- 09:12a - 09:48a, Deniz Aybas (presenter)
  Invited: New Physics, All Together: Global Networks of Table-Top Experiments

- 09:48a - 10:24a, Deniz Aybas (presenter)
  Invited, New Centers of Excellence: How International Physics is Reshaping Globally

- 10:24a - 11:00a
  Panel Discussion

Tuesday, March 17 06:45p - 07:45p, Convention Center, Mile High Ballroom 2B/3B

FIP Unit Business Meeting

Wednesday, March 18 10:30a - 11:54a, Hyatt Regency, Capitol 2

Confronting Long-Existing Social Problems

- 10:30a - 10:42a, Juhee Lee (presenter), Jae Young Kwon
  Policy Implications Derived from Analyzing Conference Data in the Field of Quantum Technology

- 10:42a - 10:54a, A. Baris Ozguler (presenter)
  Quantum Strategy Framework for Nuclear Verification: A Computational Public Policy Approach to Hedging and Latency

- 10:54a - 11:06a, Jeff Y Tsao (presenter)
  Donald Stokes' Un-Named Quadrant

- 11:06a - 11:18a, Prajval Shastri (presenter)
  The Earth-Humanity Coalition and the International Decade of Sciences for Sustainable Development

- 11:18a - 11:30a, Emily Elaine Foreman (presenter), Curtis T Asplund
  Assessing the impact of physicists on the development of new nuclear weapons

- 11:30a - 11:42a, Evangeline J Downie (presenter)
  Being a Physicist in Challenging Times

- 11:42a - 11:54a, Javier M Duarte, Lavanya Arora (presenter), Mario Affatigato, Wen-fai Fong, Lydia Kisley, Catherine Kealhofer, Katherine Aidala, Ryan Trainor, Mark Ilton, Gail Zasowski, Steve Yin, Katie Grace Ameku, Selina Zhang
  Hidden Figures in Physics and Astronomy Database

Wednesday, March 18 :06:30p - 08:30p, Hyatt Regency, Centennial D

FIP/FPS Reception

Please attend this reception if you are interested in international physics or the impact of physics on society.

Thursday, March 19: 08:00a - 11:00a//MAR-S01, Convention Center, Bellco Theatre 1-2

International Scientific Collaboration and Science Diplomacy

- 08:00a - 08:36a, Brendan Karch (presenter) Invited: Science Diplomacy and Internationalization for the Swiss Quantum Ecosystem

- 08:36a - 09:12a, Elmer William W Colglazier (presenter)
  Invited: Science Diplomacy for the Future

- 09:12a - 09:48a, Joaquim Nassar (presenter), Didier Marty-Dessus Invited: Science Diplomacy in changing times : French framework and practice

- 09:48a - 10:24a, Patricia L McBride (presenter)
  Invited: The role of CERN in science diplomacy and in international research cooperation

- 10:24a - 11:00a, Daniel d Moraes (presenter)
  Invited: International Scientific Collaboration and Science Diplomacy

Thursday, March 19: 10:30a - 12:18p, Virtual-Only, Virtual Platform - Room 4

History, Philosophy, Education, & International Engagement

- 10:30a - 10:42a, Rahmat Rahmat (presenter) Empowering Students Through Interactive Physics Simulations: Integrating Replit for Hands-On Computational Learning

- 10:42a - 10:54a, Lori A Rebenitsch (presenter) A review of Mixed Reality Technologies to Increase Physics Comprehension

- 10:54a - 11:06a, Scott S Gordon (presenter) Why are we, the physicists of the modern world, not able to find the theory of everything?

- 11:06a - 11:18a, Peter Cameron (presenter) Two Core Organizing Principles Lost in the History of Physics: How it happened and why it matters

- 11:18a - 11:30a, Tchanche F Bertrand (presenter) Small-scale optical particle counters for actionable air quality data in resource-limited settings

- 11:30a - 11:42a, Joyful E Mdhluli (presenter), Charles M Takalana, Azasiwe J Mancwatela, Dominic G Vertue, Ramasamy Venugopal, Kevin Govender
  Astronomy for a Better World: How the IAU Office of Astronomy for Development Uses Astronomy to Drive Global Development

- 11:42a - 11:54a, Angela Kelly (presenter), Erin Aji Graduate Teaching Assistant
  Experiences in Remote Asynchronous and In-Person Introductory Physics Laboratories

- 11:54a - 12:06p, Samuel Safran (presenter) Introducing physics students to biophysical reactions

- 12:06p - 12:18p, Douglas M Snyder (presenter) Logic, Human Perception, and Cognition Are at the Heart of the Principle of Relativity

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