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PHYSICS OUTREACH & ENGAGEMENT

Letter from the Chair

Dear FOEP Community:

For those of us in academia yet another semester will soon end. Nevertheless, this complex world moves on. Since the last FOEP newsletter came out AI has gotten scaringly more intelligent. Geo-politics and attacks on venerable scientific institutions and the funding of science itself have taken more ugly turns. Yet, we must persist.

It was great meeting many of you at the Global Physics Summit in Denver. The two FOEP contributed sessions were a blast. The room was full and the presentations delivered enthusiastically were of high quality. I enjoyed the one I chaired on Tuesday and Paul Halpern (Saint Joseph's University) who chaired the first one on Monday came away with similar feelings. The FOEP invited session which was on Wednesday afternoon was poorly attended (though the talks were excellent!). So was the FOEP business meeting which was scheduled for immediately after. I think we should move both these latter events further ahead in the week to ensure proper attendance in the future. Attending meetings and planning the sessions to go to I know requires a good deal of effort. Starting the travel process early helps and can also enable one to take advantage of non-standard or one-time outreach events at the Global Physics Summit.

In this regard I had the good fortune of being able to attend the colossal outreach event -"Quantum Jubilee" (which FOEP partly supported) – in Anaheim last year. This event was held on a Saturday. In Denver this year I had the opportunity to participate in "Science in Community", a round table type discussion between APS members and volunteers at the Denver Science Museum on Sunday afternoon prior to formal meeting sessions. Sunday was also when "Squishy Science"

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was happening at the museum. As many of you know FOEP has been a sponsor of this widely popular outreach event, superbly managed by Shubha Tiwari (University of Massachusetts, Amherst) and her team, for many years. It is difficult for most of us to spare an extra day but if you can plan ahead, there is always an outreach activity you can find worth participating.

I hope you will enjoy and also be educated from this newsletter. A year ago, I wrote about the IYQ opening ceremonies at the UNESCO headquarters in Paris. This time we have a report from Claudia Fracchiolla, Head of Public engagement at APS who attended the IYQ closing ceremonies in Ghana. Claudia in her report makes many salient points. It is important to sustain the momentum built up during IYQ and ensure that the next phase of quantum benefits all humanity globally.

There is a different responsibility, particularly relevant today that we all have as physicists. Professionally we are very adept at technical understandings and working with abstract ideas and theories. All of us can explain what nuclear fission and fusion are and can describe the working mechanism of atomic bombs. All of us will also emphatically state that such a weapon should never be used again no matter what the circumstances are. But we are very little aware of what the issues "on the ground' are when it comes to nuclear non-proliferation. To this effect I was very pleased when invited Adam Scheinman, the head of the US delegation to the NPT organization, agreed immediately to contribute a brief write-up. Adam is a career diplomat with 28 years of experience in this field and held the rank equivalent of an ambassador under various administrations. He served as Special Representative of the President for Nuclear Nonproliferation within the Bureau of International Security and Nonproliferation at the State Department.

There is also a notable essay on communicating science in Africa by Stephane Kenmoe who held a workshop in Africa with support from a FOEP grant in 2025. Finally, congratulations to the 2025 Nicholson Medal winner, Matt O'Dowd, Lehman College of the City University of New York, for his work on PBS' online portal "SpaceTime". Congratulations also to Bronson Messer, ORNL, for being elected an APS Fellow, recognizing his outreach work to underserved Appalachia.

Last, but not least, my immense gratitude and appreciation for all the help from my fellow members on the executive committee. Your advice and contributions have been invaluable.

Bellave Shivaram, University of Virginia

Bellave Shivaram
University of

Letter from the Chair, continued

Forum on Outreach & Engaging the Public
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Spotlight on Outreach and Engaging the Public

"Imagining the Future: An Encounter with Quantum Technologies"

at O'Hare International Airport

Devoted to collaborations among scientists and artists, STAGE—Scientists, Technologists and Artists Generating Exploration—is a Center within the University of Chicago's Pritzker School of Molecular Engineering (PME). The STAGE Center's distinct research focuses on merging scientific and artistic inquiry. We conduct this research through the creation and development of film, theatre, games, exhibits, and other artistic endeavors inspired by science and technology. STAGE harnesses the power of storytelling, emotional engagement, and entertainment to translate complex scientific and technological ideas into relatable human experience, promoting understanding of the sciences in the public arena

Taking a cue from STAGE student Charlotte Quintanar's suggestion of a quantum exhibit in the lobby of the PME's research building, we decided to "go big." With the generous support of an APS Innovation Fund Grant and UChicago's PME, and in collaboration with IBM and United Airlines, STAGE and its students created an exhibit of a superconducting quantum computer at Chicago O'Hare International Airport, currently the busiest airport in the United States (most flights per day). "Imagining the Future: An Encounter with Quantum Technologies" offers a meaningful, entertaining, and thoroughly accessible encounter with quantum information science and engineering (QISE), bringing quantum technology out of the lab and into peoples' lives in a public, heavily-trafficked area: O'Hare's United Airlines Terminal 1, with an average of approximately

43,000 total departing passengers per day (as of July 2025). It also presents the opportunity to feature Chicago and the Illinois region's strengths in QISE.

Understanding that not everyone can or will fly, or fly through O'Hare, a team of five STAGE students created a dynamic website, flyquantum.stage.uchicago.edu, to bring the exhibit to an even wider swath of the population. We hope you'll have a chance to see the beautiful, gleaming "chandelier" and the brief video that accompanies it next time you fly through O'Hare, and/or to experience the equally beautiful website, the latter of which also offers a chance to offer your own reflections on quantum.

Working on the exhibit reinforced some of the most important things we've learned from every STAGE project we've undertaken:

> Engaging people on an emotional level is what gets them interested in anything, and that holds true for science, as well. It's not enough to tell people something is interesting or important. You have to grab them "where they live," so to speak, by offering something aesthetically beautiful or captivating, or a reason to care, or a story that moves them in some way or makes them laugh, or all of the above and more. Knowing that people are working on quantum sensors that may one day make it possible to detect disease in a single cell, before it spreads throughout the body, makes quantum relevant to everyone.
>
> Getting scientists and artists to collaborate in the same room at the same time gets them to think in new ways and work in new ways. Additionally, it's the recipe for making science accessible, interesting, and meaningful to non-scientists and even to those who fear or dislike science.
>
> Making science simple means making it even simpler than one might expect—and then making it simpler still. That doesn't mean one is "dumbing it down" or being inaccurate. On the contrary—it takes inventiveness and imagination to come up with understandable phrasing to convey multifaceted concepts. It's usually quite challenging, but it's worth the effort to get society to comprehend the importance of scientific discovery, because without their support, science ultimately cannot advance.

I'll take this occasion to acknowledge the superb undergraduate and graduate students who created the O'Hare exhibit website: Jeffrey Li, Avery Linder, Reet Santosh Mhaske, Charlotte Quintanar, and Rohan Venkat. Thanks must also go to STAGE Center team members Dr. Sunanda Prabhu-Gaunkar and Sonja Coates, and to the APS Innovation Fund, IBM, United Airlines, the University of Chicago, the PME, and the Chicago Quantum Exchange,

—Nancy Kawalek

Professor and Distinguished Fellow in the Arts, Sciences and Technology;

Director, STAGE Center Pritzker School of Molecular Engineering, University of Chicago

Closing a Year, Opening a Responsibility

In February 2026, we gathered in Accra, Ghana, to close the International Year of Quantum Science and Technology (IYQ). It felt, in many ways, less like an ending and more like a moment of reflection, a chance to take a look at what we had built together, and what still needs to be done.

Over the course of 2025, quantum science and technologies stepped into the global spotlight. More than fifteen hundred activities happened across continents, reaching classrooms, research labs, industry spaces, and public audiences. The Year succeeded in many ways by raising awareness, creating connections, and positioning quantum science as central to our shared future. As one scientist from Egypt shared with me, *"thanks to IYQ, we were able to bring this conversation to our government and begin discussions around building a national quantum strategy."*

But in Accra, the conversations were more than celebration. Again and again the phrase"quantum science is universal, but access to it is not" came out from multiple speakers.

UNESCO's first global survey on quantum research made this visible in concrete terms, many institutions still lack the infrastructure, facilities, and training needed to participate fully. This "quantum divide" is not new, but IYQ gave it language, data, and urgency.

What stood out most over the two days was a shift in tone. IYQ was never only about celebrating a century of quantum mechanics but about responsibility. Responsibility to ensure that the next phase of quantum does not repeat the patterns of past technological revolutions, where benefits concentrate and participation narrows.

Speakers returned to the same idea from different angles: the future of quantum is not just a technical challenge. It is human on. It is about who has access to education and training, who can build careers and livelihoods in quantum, who has the infrastructure to move from ideas to application,

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and ultimately, who gets to shape the direction of the field.

What became clear is that if quantum is to fulfill its promise, we need to think differently about how we build the ecosystem around it. Education, workforce development, and collaboration are not secondary but are core infrastructure.

The closing discussions pointed toward what comes next: moving from visibility to durability. Building training pathways that start early. Creating shared models of infrastructure. Designing collaborations that are not exclusive but genuinely reciprocal, i.e. is not about brain drain but about brain and resource circulation.

Hosting the closing in Ghana made that message tangible. It was a reminder that the global quantum community is broader, more diverse, and more interconnected than it has often been and that its future depends on recognizing that reality.

As the ceremony came to a close, one idea lingered: the real measure of IYQ will not be the number of events it inspired, but what continues because of it.

The Year created momentum. The work now is to turn that momentum into something that lasts.

For a summary of the year's global impact, see the UNESCO IYQ final report: International Year of Quantum Final Report

Claudia Fracchiolla
Head of Public Engagement, APS
IYQ Global Coordinator

Science communication: the forgotten piece of capacity building in Africa

Communicating science to the general public is something that few scientists enjoy doing or are able to do. However, at a time when society's trust in science is eroding, it is important for scientists to engage with the general public. Even in developed countries, where various initiatives and active engagement platforms already exist, scientists struggle to make a visible connection between scientific research results and social progress in the eyes of the average citizen. What can be said about the African continent? Its scientific and technological lag raises questions and concerns, as it contrasts with its rapidly growing population. What would a continent populated by several billion young people in a few years' time look like, without a scientific culture aligned with its needs and cultural context ? Africa is driven by an urgent need to innovate, and to innovate cheaply, in order to meet its most pressing needs: balanced nutrition, access to basic healthcare and electricity, to name but a few.

Yet there are brilliant African scientists and good scientific output on the continent. One might wonder why this output does not feed into the innovation chain. One part of the answer to this question lies in the glaring lack of scientific culture. Yet it is the piece of 'energy' that binds together knowledge producers, decision-makers who give it social or economic value, and finally young people who ensure the continuity. These two protagonists are important component of what is called 'the public'. Every African scientist should contribute to building a solid scientific culture, to bringing science within everyone's reach. This is the only guarantee of science-driven development. It is with this in mind that, for almost ten years, we have undertaken several initiatives to transfer knowledge, build capacity, and popularize the physical sciences in sub-Saharan Africa, centered around the Central African School on Electronic Structure Methods and Apllications (CASESMA). In addition to the technical training in physics, we also focus on soft skills, namely training sessions of young learners by professionals of communication and the film industry, and discuss scientific topics to be disseminated through various formats: scientific writing, radio and television appearances, and film.

Participants at Casesma 2025

After coaching by invited media professionals, participants take part in radio and television interviews that are broadcast to the general public. This exercise, which began in 2018, has borne fruit. We are seeing more and more young people facing the media and speaking freely and confidently, turning their research to more digestible information for the public. They are even increasingly invited as young consultants on television channels. Although this has not yet led to programs entirely dedicated to science, it does nevertheless give science a place in the media space. Scientific writing for the general public, on the other hand, is more difficult as the readership could be diverse. With the young participants, we produce articles about their resaerch or their experiences for the general public that we publish in the African Physics Newsletter. Some participants have gone on to become regional editors of this newsletter. In this way, we are helping to build an African network of science writers. After all, who better than scientists themselves to do this?

Poster of the movie series "science in the city" produced in 2020

The film workshops focus on fiction, cinematic storytelling, and documentaries. We emphasize the stages of the pre-production, from the basic idea to the scriptwriting. The production itself is done by a professional team that we founded in 2019. In 2020, we produced the popular science series Science in the City, which highlights science denialism in Africa but also the possible triumph of scientific ideas in such environment. After discussions with several scientists at various institutions, we disseminated via a series african fictions and cinematographic storytelling topics related to energy, agriculture, health, food but also sharp technology as CRISPR or water splitting... The celebrities who act in our productions are involved in outreach campaigns across the continent. This has taken us to several countries for science and society events that we have co-organized: in the DR Congo, Congo, Burkina Faso, Togo, Ivory Coast, and Benin. During these events, the high popularity of our actors always attract large crowds. The popular series has been well received on several local television stations and is available on YouTube. After years of training, several young scientists are already proposing captivating scenarios. We are currently producing a drama written by a young physicist from northern Cameroon, highlighting her struggle as a young girl in this landlocked regioned, destined for early marriage who was able to make her voice heard in her village thanks to female engagers, networking and role models. Her role in the film will be played by a young high school female student whom we met during a campaign and who intends to pursue a career in science and scientific cinema.

Dr. Stephane Kenmoe
University of Duisburg-Essen, Germany

FEATURE ARTICLE

Holding the line on nuclear proliferation

Adam M. Scheinman

From the time of nuclear fission's discovery in the late 1930s, scientists, politicians and generals have grappled with the implications of this energetic reaction older than the earth itself. Whether by luck or sound policy, nuclear weapons have been used only once in war, bringing WW2, the deadliest military conflict in history, to a close. While American-Soviet nuclear arms racing and fears of nuclear war were defining features of the first half of the Cold War, by the mid 1960s Washington and Moscow had begun looking for ways to soften their rivalry, including through bilateral nuclear arms control and shared support for a new treaty to prevent the further spread of nuclear weapons. The resulting Nuclear Nonproliferation Treaty (NPT) is among the least known but most successful international agreements of the nuclear age. Since the treaty's entry into force in 1970, the total number of states in the world with nuclear weapons is what it was three decades ago; the global total of nuclear weapons held by the five 'nuclear haves' has come down substantially thanks to U.S. and Russian reductions; and the treaty's verification requirements help ensure that attempts to divert civilian nuclear energy to weapons will not go undetected. Iran learned this lesson the hard way when in 2011 international inspectors confirmed reports of Tehran's covert nuclear bomb program.

The Iran case highlights a central challenge for the NPT: enforcing compliance on treaty violators. In 2015, the Obama administration reached a landmark deal with Iran to dismantle its uranium enrichment infrastructure and cap uranium stocks at levels not useable in weapons in exchange for sanctions relief. That bargain collapsed after President Trump withdrew from the deal in 2018 and reimposed economic sanctions, setting the stage for the present crisis, one that reveals the limits of 'de-proliferation' through military air strikes. While the recent U.S. and Israeli attacks clearly set back Iran's program, the enriched uranium stocks (enough for scores of nuclear weapons) remain unaccounted for and inaccessible to inspectors, and a U.S. military operation to recover them would be met with fierce Iranian resistance and possibly trigger a wider regional war. There is no doubt that an Iran armed with nuclear weapons would present a significant threat to Israel and the Gulf states and to U.S. interests in the region. Yet, short of Iran volunteering to dismantle its nuclear programs (as South Africa did in 1990 with the transition to a post-apartheid government), patient diplomacy that delays a proliferation decision and returns Iran to compliance with the NPT would seem a smarter approach than attempting – or worse failing – to bomb Iran into submission. With the global system in tumult and confidence in the United States flagging, the best outcome is one in which Iran agrees to remain nuclear-weapon free. The alternative could be a cascade of proliferation, setting in motion the societal dangers foreseen by the early giants of nuclear physics.

Adam M. Scheinman is former Special Representative to the President for Nuclear Nonproliferation, with rank of Ambassador, 2021-2024 and 2014–2016. Over his 30 year career in government, Mr. Scheinman held positions at the State Department, National Security Council, and the Department of Energy.

ANNOUNCEMENTS and NEWS

IMPORTANT ! DEADLINE **JUNE 25** ! Please Take the time to Nominate!

All members of FOEP, please hurry up and nominate candidates for the 2026 Nicholson Medal and the APS-FOEP Fellowships. The deadline is June 1, 2026 and all details can be found on the links at:

- Nicholson Medal
- Fellowship

Physicists-to-Go Program from APS

Are you interested in sharing your love of physics with the next generation? Sign up to learn more about our Physicists To-Go program and **virtually** visit classrooms across the country to present on topics related to physics, the nature of science, and your career path! Inspire student to explore science while expanding their view of who "does physics"?

Physicists To-Go will join classrooms **virtually** to discuss topics chosen by you and the host K-12 educator. Sign-ups will officially begin in August 2026, but get on the APS Public Engagement mailing list to learn more (click All Public Engagement Offerings or K–12 Resources & Opportunities options for notifications on this opportunity)

Physicists Coalition For Nuclear Threat Reduction

June 8-10 is D.C. Engagement Days 2026 organized by the coalition. The two days involve training to assist you to meet with Congressional members involved with non-proliferation.

- Register here for the June Engagement Days

A Note from Chair, APS Committee on Public Engagement

The Committee on Public Engagement (CPE) is an appointed council committee that exists to make advisory recommendations about strategic approaches to public engagement to APS leadership and staff through the Council. FOEP is a member-governed unit supporting members with public engagement through conference sessions, community building opportunities, and other programming. While the work of these two bodies is closely related, it's also fundamentally different within the structure of APS. This is a CPE update to share what we've been working on with the members of FOEP.

The APS Statement on Public Engagement was started in 2020 and finally adopted by the APS Council in November 2024. With that statement formally in place, the focus of the CPE Chair has been on implementing the statement — and the work is moving well.

Advisory Recommendations and Working Groups - After meeting in person in August '25 and leading a discussion with the 70 members of the Council in October, CPE drafted our advisory recommendations to support the implementations of the APS statement on public engagement. These are organized around three directions: building clearer and more accessible PE infrastructure for members; embedding PE into professional culture through honors, awards, and technical session integration; and strengthening community by amplifying diverse voices and developing international partnerships. In March '26, these recommendations were presented, along with a proposal for two

CPE working groups, to the APS Council Steering Committee. The response was enthusiastic — both working groups were formally approved. One focuses on integrating PE into the profession of physics, examining career assessment structures and honors criteria; the other on maximizing utilization of existing APS PE resources.

Global Physics Summit 2026 - At the APS Global Physics Summit in Denver, CPE held an invited panel discussion "Statement on Public Engagement: From Aspiration to Implementation." A live audience polling was conducted. Even among a self-selected audience motivated enough to attend a public engagement session, two-thirds were unfamiliar with or only vaguely aware of the Statement. Dissemination cannot be treated as a one-time announcement — it has to be a long-term activity.

Participants' responses about the barriers to public engagement were clear: 52% cited lack of recognition in promotion and hiring as the primary obstacle to doing PE work, with insufficient institutional support following at 43%. Attendees aren't primarily asking for skills training. They're asking for professional legitimacy.

The discussion converged on genuinely important issues: the field doesn't need more arguments for why PE matters. It needs visible role models, shareable success stories, and institutional templates that others can replicate. International voices in the room pushed this further, with specific calls for APS engagement with the Korean Physical Society and a formal APS liaison role at International Particle Physics Outreach Group (IPPOG) — both tractable, relatively low-cost moves that CPE will discuss pursuing at our May meeting.

What's next - For the remainder of 2026 and beyond, CPE is focused on dismantling the barriers to PE. The goal — within reach — is a physics community where public engagement is a recognized professional contribution, not a volunteer activity layered onto research roles. As part of this CPE is testing a pilot program of integrating PE talks into technical sessions at APS events. If you would be willing to work with any Unit you're a member of on this, please contact Michelle Randall, CPE Chair, randall.michelle@qns.science.

The Essential Einstein: Public Writings

Released a few months ago by Princeton University Press is Einstein's public writings on everything from religion and art to pacifism and the atomic bomb. For those interested in a personal copy it is 50% off right now.

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FOEP Membership – Join Today

To join FOEP at no cost prior to renewing your APS membership, you can get your ID badge scanned at a meeting, send an email to membership@aps.org with your request to add FOEP to your membership, or send a letter requesting membership to APS membership department.