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Message from the FIP Chair 2023
Chair Introduction – Christine Darve

Dear FIP members,

Retrospectives on 2023: What an engaging year! From collaborations, to challenges and discoveries, the Forum on International Physics (FIP) has engaged in further Scientific Expeditions! In this FIP Newsletter edition, we are capturing elements of those destinations. Although the world stability may be compromised, the values of Physics still Matter!

Built on the shoulders of giants, in 2023 the FIP team has served the communities at its best by enlarging its diversity and spread of activities. First, we recall that the FIP Executive Committee is a voluntary association of APS members who are interested in advancing the knowledge of physics and its diffusion, by fostering cooperation and communication among physicists of all countries.

Our program, accessible on the “FIP channel”, has opened new innovative gates by connecting developing communities and multidisciplinary activities [CERN Accelerating News]. During the 2023 March and April APS meetings, FIP proposed six in-person sessions aimed at exchanging international scientific Savoir-Faire across generations and borders and stimulating synergies among APS members.

For instance, the March APS FIP sessions drew attention to early career scientists [SIF APS] as well as VIPs, including (but not limited to) Laura Greene (Mag-Lab Scientific Director and member of President’s Council of Advisors on Science and Technology (PCAST)), Eliezer Rabinovici (CERN Council president and SESAME Council), and Sekazi Mtingwa (AfLS coordinator). In a session co-chaired by Frances Hellman (former APS President) and well-attended by APS governance, we have shone a spotlight on the International Union of Pure and Applied Physics (IUPAP), with IUPAP Vice-President Monica Pepe-Altarelli and her colleagues.

During the APS April session, other outstanding speakers like Rolf Heuer (former CERN Director-General and SESAME Council president), and Bernard Amadei (founding President of Engineers-Without-Borders (EWB) USA, shared their vision on scientific diplomacy. FIP has also joined forces with the Division of Physics of Beams (DPB), to solve environmental challenges using accelerators, as presented by Hamid Aid Abderrahim (MYR-RHA Director General), and many other exceptional speakers. More details of those 2023 sessions can be found at:

- Perspectives of the IUPAP: The International Union of Pure and Applied Physics (K52)
- Large-scale Scientific Facilities and Diplomacy (N36)
- International Perspective for Young Physicists from Particles to Materials (Q50)
- No Frontiers when Physics Matters (C05)
- Extending Frontiers in Physics (H05)
- Accelerate Solving Energy Crisis: From fission to fusion (M06)

FIP has enjoyed immensely collaborations with other APS units, and shared experiences with DCMP, FPS, FECS, and DPB. In addition, Satellite meetings were organized in South-Africa, Rwanda, Jordan, and India [Virtual], raising the attendance by at least 20%. To complement this, the Committee on International and Scientific Affairs (CISA) has encouraged more developing communities’ participation, thanks to reduced registration fees for conferences and APS membership [Matching Membership].

Beyond those events, our Physics Matters Colloquia series has continued its vibrant program across continents, including capturing the celebration of the 100th anniversary of the IUPAP with Silvina Ponce-Dawson. You can find all recordings available on our web page [PM].

Thanks to the Physics Matters LIVE colloquia series, our FIP audience has been able to take advantage of a spotlight on the Middle-East, and SESAME-related activities. By the end of 2023, we will have navigated between more than 38 destinations, transcending geographical borders and stimulating the frontiers of knowledge. A more exhaustive description of this inspiring LIVE Is available here [SIF].

The Distinguished Student (DS) program was coordinated by the FIP team. More than 100 students applied, and 19 were offered to attend the March or April Meetings. The DS program has been augmented thanks to the Alfred P. Sloan Foundation, raising up to 25k USD to be distributed to selected graduate students and postdocs impacted by the Russian invasion of Ukraine, and to fund their travel to APS meetings, APS-endorsed meetings, and IUPAP-sponsored conferences.

With a similar purpose, FIP and the Sloan Foundation supported the APS International Research Travel Award Program (IRTAP) to promote international research collaborations between physicists in developed and developing countries, by financially supporting travel and lodging expenses while visiting a collaborator abroad.

We are delighted to resume the FIP Outreach and Communication Committee (FIP-OCC) with plans to use a variety of platforms and video formats to reach out to a broader public and amplify the work that fosters collaboration and knowledge across continents. To achieve this, we have gathered a friendly and active team (Luisa Cliffarelli, Stephane Kenmoe, Paola Catapano, Joe Niemela, and Christine Darve) who will propose new initiatives that will complement the Physics Matters and the FIP Newsletters.

This Committee will help facilitate our reach out to a broader public, using various platforms and methods, including video clips.
Stephane Kenmoe will replace Maria Longobardi as chief editor of the FIP Newsletter. After 7 years, Maria is leaving for new adventures and we are all very grateful for her contributions to our mission.

We have prepared this Newsletter edition, to enlighten you with a focus on the IUPAP, the EWB and concluding with the Closing Ceremony of the International Year of Basic Sciences for Sustainable Development (IYBSSD) that was held on December 15th at the newly inaugurated CERN Science Gateway, while entering the International Decade of Science for Sustainable Development (IDSSD).

Hence, we conclude this fruitful year with exciting perspectives for the entire world of Physics and physicists, to inspire future generations to innovate sustainably, and to work with us in our quest to engage international communities openly but wisely!

References

1. [SIF APS] “An epic journey across the quantum landscape to the APS March Meeting”, by C. Darve - Societa Italiana di Fisica, SIF Prima Pagina, 4 April, 2023
2. [Virtual] “APS March Meeting Satellite Sites Increase Virtual Meeting Attendance by Nearly 20%” – APS News, 2 June 2023
3. [Matching Membership] Matching Membership Program, CISA
4. [PM] Physics Matters Monthly colloquium series, APS/FIP
5. [SIF] “When Physics Matters!” by C. Darve - Societa Italiana di Fisica, SIF Prima Pagina, 31 January, 2024

FIP Invited Sessions at March Meeting 2024

Tuesday, March 5, 2024

6:00PM–8:00PM
FIP & FPS Reception
Room: Hyatt - Greenway A

Wednesday, March 6, 2024

8:00AM–11:00AM
M44: Live Streamed Partnership for Education Across Continents
Room: Auditorium 2
Sponsors: FIP, FECS
Chairs: Christine Darve, European Spallation Source; Yuan Zhang, Old Dominion University
Invited Speakers: Azwinndinii Muronga, Kétévi A Assamagan, Nathan J Berkovits, Sinead M Griffin, Francesco Petruccione

Thursday, March 7, 2024

11:30AM–1:55PM
T06: Science Communication and International Public Impact
Room: L100FG
Sponsors: FIP, FECS
Chair: Patricia McBride, Fermilab
Invited Speakers: Carsten P Welsch, Raïssa Malu, Christine Darve, Clara Nellist

FIP Invited Sessions at April Meeting 2024

Wednesday, April 3, 2024

5:30AM–7:30AM
AA01: Virtual Science Communication to Bridge Communities
Room: SAFE Credit Union Convention Center Virtual Room 01
Chair: Joe Niemela, ICTP
Invited Speakers: Sascha Schmeling, Silvana Westbury, Mmantsea Diale

10:45AM–12:33PM
B02: Live Streamed Education to Bridge Communities
Room: SAFE Credit Union Convention Center Ballroom A2-3, Floor 2
Chair: Patricia McBride, Fermilab
Invited Speakers: Jesper Bruun, Joseph J Niemela, Petra Rudolf

3:45PM–5:33PM
D04: The Increasing Danger of Nuclear Weapons: How Physicists Can Help Reduce the Threat
Room: SAFE Credit Union Convention Center Ballroom A5-6, Floor 2
Sponsors: FIP, FPS
Chair: Dylan Spaulding, Union of Concerned Scientists
Invited Speakers: Lindsay Rand, Igor Moric, Curtis T Asplund

Thursday, April 4, 2024

5:30AM–7:30AM
starting at 12:30 (Casablanca time, GMT+1)
Virtual Satellite Meeting Live from Marrakech
Topic: “The Physics of the Two Infinities” (particle physics and astrophysics), with 2 seniors and select talks given by 5 PhD students.
Letter from the Editor

Maria Longobardi

Dear FIP Members,

As I step down as the editor of the FIP newsletter, a role I have served since 2017, I am closing a significant chapter in both my personal and professional journey. This role has been more than a responsibility; it’s been an honor and an adventure that I will forever cherish.

I am pleased to introduce Stephane Kenmoe as the new editor. His enthusiasm is immense, and I am confident that under his leadership, the newsletter will continue to be a crucial platform for our community.

Reflecting on my journey with FIP, I am particularly proud of being the first early career member serving on a FIP Executive Committee, elected as a Member-at-Large from 2014 to 2017. This pioneering role not only paved the way for more early-career scientists to engage and contribute to our community but also laid the groundwork for me to found the Forum on Early Career Scientists (FECS) in 2016. My gratitude extends to the FIP Executive Committees from 2017 to 2024 for their support and collaboration, which have been instrumental in our newsletter’s success. Special thanks to Ernie Malamud, my predecessor as newsletter editor, for his foundational work, and to Christine Darve, FIP current Past Chair, for her significant contributions to the growth of FIP in the last year. I also wish to extend my best wishes to Patricia McBride as she takes on the role of FIP Chair in 2024, confident that she will continue to drive our community towards greater heights.

As I transition to a new role as Chair of the Forum on Industrial and Applied Physics (FIAP) for the next four years, I look forward to exploring collaboration opportunities between FIAP and FIP. The synergy between our forums is vital for advancing our shared goals and supporting the physics community in innovative ways.

I extend heartfelt thanks to Cherrell Spencer for initiating the Distinguished Students (DS) program, which has become a cornerstone in recognizing and nurturing young physics talent. As the current chair of the DS program for many years, I am proud of its immense growth, now receiving more than 100 applications annually. I am grateful for the legacy Cherrell has established for future generations.

Additionally, I would like to express my appreciation to Luisa Cifarelli, FIP Chair in 2020 who initiated the Quantum Matters Program, recently elected as APS International Councilor, and to Amy Flatten, Director of International Affairs at APS. Amy has been a steadfast supporter of international physics, the young researchers’ community, and the DS program. Her guidance and mentorship have been invaluable to me at APS, from both personal and professional perspectives.

As I bid farewell to this role, I am filled with gratitude for the experiences I’ve had and the relationships I’ve built. I am proud of what we have achieved together and confident that the newsletter will remain a valuable source of information and collaboration.

My commitment to the international physics community remains unchanged.

Serving as FIP’s editor has been an enriching experience, filled with shared passion. I look forward to contributing to FIP again soon in another capacity.

Warm regards,

Maria Longobardi
FIP Newsletter Editor
Incoming Newsletter Editor

Stephane Kenmoe

Dear Subscribers,

I recently had the unique opportunity to be admitted to the American Physical Society’ s Forum on International Physics (FIP), and it is with great pleasure that I join the newsletter’s editorial team. The newsletter has established over the recent years as an international tribune for sharing knowledge, information and opportunities as well as for networking.

As the incoming editor-in-chief, I hope, in the footsteps of my predecessors, to continue the work of awakening young generations, empowering minority communities and building bridges for the sharing and dissemination of knowledge; to continue to pave the way for new horizons in communication and engagement for physics across the world.

This responsibility is both an honor and a challenge to keep the newsletter relevant and attractive to physicists worldwide. But moving forward, the future of the FIP seems bright. Recent initiatives are reaching maturity and efficient practices of communication and engagement are widely expanding. I can’t wait to see where we go in the coming years, and I look forward to sharing this with all of you.

Sincerely,

Stephane Kenmoe

New FIP Members

Welcome to the new FIP Executive Committee

Carlos Henrique de Brito Cruz
Campinas, Brazil
Vice Chair
(01/24–12/24)

Kétévi Assamagan
BNL, USA
Member-at-Large
(01/24–12/26)

Albina Tropina
Texas A&M, USA
Member-at-Large
(01/24–12/26)

How to Join FIP

In the APS homepage aps.org:

- Select Membership in the blue upper bar and select APS Units from the menu list
- Once you’re on the APS Units webpage, click on the blue “Join an APS Unit” in the right-hand corner
- To Add a Unit Current members: Log in to your APS member profile to join a unit(s).

Join an APS Unit Online

- Need APS Web Username? Create an APS Web Account
- Having trouble? Email: membership@aps.org
IUPAP: a Balance of the First Year Since the Union’s Centenary Celebration

Michel Spiro, IUPAP’s President and Silvina Ponce Dawson, IUPAP’s President Designate

IUPAP is the only international scientific union devoted to all areas of physics. Run and organized by physicists from all over the world, it is the hub of a network of physics communities. As such its actions try to help build communities, to exchange useful information, to promote good practices, to nurture collaborations and to engage individuals and organizations in the propagation of IUPAP’s efforts and views. IUPAP’s actions include the sponsorship of conferences and awards, for which there are requirements that express the viewpoints of the Union, in particular, its commitment to guarantee that the practice of physics is free of any sort of discrimination and that knowledge is openly shared. IUPAP also runs a Travel Grant program for women physicists from developing countries through its Working Group on Women in Physics and participates in the LAAAMP project together with the International Union of Crystallography and the ICTP in Trieste, Italy, to enhance Advanced Light Sources and crystallographic sciences in Africa, Mexico, the Caribbean, South America, Central and Southeast Asia, Middle East and the Pacific Islands. Faculty-student travel grants are also awarded within the framework of this project.

IUPAP celebrated its first centenary in 2022. For the occasion, a central symposium was held in Trieste, Italy, in July 2022 and numerous satellite activities took place all over the World. The activities served IUPAP to reflect on its past, analyze its present and discuss its future. They marked the starting point for a series of actions which we expect will renovate the Union, increase its impact, and fulfill its mission “to assist in the worldwide development of physics, to foster international cooperation in physics, and to help in the application of physics toward solving problems of concern to humanity.

The actions carried out by the Union since the centenary celebration were also affected by unexpected events, like the passing of its former President, Kennedy Reed, who was remembered at the 32nd General Assembly that was held in October 2023. We give in what follows a brief glimpse of some of the Union’s most recent actions and reflections.

The 32nd General Assembly, an example of worldwide collaboration and respect.

Under its new Articles and Internal Regulations, IUPAP’s General Assemblies (GAs) are now held yearly, in hybrid mode or in person, with in-person GAs organized triennially. The 32nd IUPAP General Assembly was held in hybrid mode in October 2023, with in-person participants at CERN in Geneva, Switzerland. The GA exemplified the spirit of international scientific collaboration and innovation. It reaffirmed IUPAP’s commitment to fostering physics, supporting early-career scientists, and addressing critical global challenges, including sustainability and climate action.

Tribute to Kennedy Reed

A poignant start to the 32nd General Assembly was a ceremony in memory of Kennedy Reed who passed away earlier this year. Reed served IUPAP for a total of 17 years and was President of the Union from 2017 to 2019. His long-standing involvement in improving the participation and recognition of minority groups, particularly women and black physicists, was a focus of his work for IUPAP. To honor Reed’s memory, one of the IUPAP medals will now carry his name: “IUPAP Kennedy Reed Medal for Outstanding Contributions to the Enhancement of Physics in Developing Countries”. The first recipient of this medal will be announced in 2024.

Honoring Early Career Scientists

Most IUPAP commissions award early career scientist prizes in their respective fields of physics. For the first time it was decided to also award an Interdisciplinary Early Career Scientist Prize. At its first edition, two winners were selected (one for 2022 and one for 2023) who do research that combines the subfields of more than one IUPAP Commission. The awardees were Evelyn Tang from Rice University and Stefano Martiniani from New York University, both based in the US, who received a monetary prize and a medal.

Expanding Membership

Until 2021, all IUPAP’s members were entities representing identified physics communities in territories around the world. They are now called Territorial Members. The new Articles and Regulations introduced the Corporate Associate Member type to reach out to physicists working outside academia and liaise with companies, large scientific facilities and/or other organizations with interest in physics. The 32nd GA approved the inclusion of several new Corporate Associate Members, including the Advanced Laser Light Source (ALLS), CERN, Joint Institute for Nuclear Research (JINR), Park Systems, and Sychrotron-Light for Experimental Science and Applications in the Middle East (SESAME).

At the same time, the 32nd GA approved the creation of the Associate Territorial Member type to allow the participation of relatively small national physics communities as a first step towards full territorial membership. Nepal was accepted as the first Associate Territorial Member, following a Memorandum of Understanding signed between IUPAP and the Nepal Physical Society. A presentation was made at the GA on the steps to attract Associate Territorial Members, particularly from Africa, showcasing IUPAP’s commitment to fostering international scientific collaboration in the Global South.

IUPAP’s restructuring: internal and external evaluation.

A task force was set up to start a discussion on the rejuvenation of the Union. Its main conclusions were presented at the 32nd GA as well as a self-evaluation report. Based on these analyses the proposal of having an external evaluation committee was approved. The type of advice that will be seek from the external is more about strategy.
And the same time, an internal committee will be tasked with defining specific minor changes that could help improve the impact and functioning of the Union. The expectation is that a report produced by these two committees will be ready to be presented at the next (in-person) GA which will take place in 2024.

**Working Groups to advance into new areas.**

Working Groups (WG) are created to focus on and develop new research fields and activities that would be difficult to resource through traditional funding programs. They are established for a limited time, but their terms can be extended depending on their scope and the needs of IUPAP. The 29th General Assembly held in 2017 approved the creation of WG16 on Physics and Industry with which IUPAP started a closer liaison with physicists working outside academia and companies with interest in physics. The 30th GA held in 2021 created WG18 on Ethics which started to collect international ethics standards across societies, journals, and funding agencies, including hiring practices. We expect that WG18 will elaborate a set of guidelines that will be applicable to the functioning, actions, and decisions of our Union and to the activities it sponsors. Finally, the 32nd IUPAP GA approved the creation of WG21 on Physics for Climate Change Action and Sustainable Development with a far-reaching set of aims that include identifying, promoting, engaging, and discussing the unique role that physics should be playing in the area and entrenching an evidence-based approach to climate change action in close collaboration with experts from other disciplines. We expect that WG21 will organize an International Conference on the subject.

**Collaborations with other organizations including APS.**

IUPAP has a long tradition of interacting with other organizations devoted both to physics and to other areas of STEM. These collaborations have resulted in joint projects such as LAAAMP, which we have mentioned before, or the Gender Gap in Science project which ended recently leading to the creation of the Standing Committee on Gender Equality in Science of which IUPAP is founding partner. Many of these collaborations have been carried out within the framework of international years. In particular, IUPAP has been the Union that led the mobilization of many scientific organizations that resulted in the United Nations declaration of the year 2022-2023 as International Year of Basic Sciences for Sustainable Development. IYBSSD celebrations started in July 2022 and will be carried out throughout the end of 2023. In particular, a ceremony is taking place at CERN as we write these words and another meeting will be held in Honduras in March 2024. The mobilization around IYBSSD has aimed at convincing economic and political leaders, as well as every citizen, of the importance of considering and mastering basic sciences to ensure a balanced, sustainable and inclusive development of the planet. Although IYBSSD is coming to an end, a new UN approved international endeavor is about to start: the International Decade of Science for Sustainable Development. IUPAP will certainly play a key role cooperating with all sciences in an interdisciplinary and transdisciplinary effort to address the complex challenges that humanity is currently facing.

The collaboration with regional and national physical societies is very important for IUPAP. It not only helps it link better with the physics communities that they represent. The sharing of experiences at various levels also inspires the definition of new actions and developments. The interaction with APS, which proved to be very fruitful in the past, has been growing lately with the advent of IUPAP’s centenary. APS organized various activities for the occasion, including a special session that was held at the 2023 APS March meeting. We expect that this collaboration will keep on growing through the organization of various other joint activities.

**Looking into the immediate future and beyond**

The 32nd General Assembly decided that the next gathering will be an in-person event, scheduled to take place in Hainan, China, in October 2024. The year 2024 marks the 25th anniversary of the creation of Working Group 5 on Women in Physics. This Working Group exerted a key role in expanding the network of communities related to IUPAP, in reshaping and enlarging the actions undertaken by the Union and in changing the composition and functioning of IUPAP’s structures. A special activity will be held during the GA to celebrate the occasion. An inter-commission symposium on “Physics Research for a Sustainable Planet” will be held as well.

Hopefully the year 2024 will see the declaration of 2025 as International Year of Quantum Science and Technology. IUPAP actively supports this initiative together with many national physical societies including APS. In particular, IUPAP created WG20 on Quantum Science and Technology to analyze the possibility of creating a new commission in the field which would certainly play a key role for the celebration of the International Year. As physics continues to play an ever more vital role in addressing the world’s challenges, IUPAP plans to be the platform for physicists from all over the world to chart a course for a brighter, more sustainable future through science and cooperation.

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**Michel Spiro** is a French physicist. He has been President of IUPAP since September 2019. It was on his initiative that the International Year of Basic Sciences for Development was launched. He was an engineer at the French Atomic Energy Commission (CEA) where he carried out work in particle physics. In particular, he participated in the discovery of the intermediate W and Z bosons at CERN. He also participated in the GALLEX experiment for the detection of solar neutrinos and the EROS experiment for the search for dark objects. He was the Director of Matter Sciences at the CEA, Director of the National Institute of Nuclear and Particle Physics (IN2P3) of the CNRS, and Chairman of the CERN Council from 2010 to January 2013.

**Silvina Ponce Dawson** holds a PhD in Physics from the Universidad de Buenos Aires (1988) and is a Full Professor, University of Buenos Aires (UBA). She is a Superior Researcher, Argentinean National Research Council (CONICET) and President Designate, International Union of Pure and Applied Physics (IUPAP). She is Faculty representative on the Executive Council of the School of Sciences of UBA; Senior Associate, International Centre for Theoretical Physics (ICTP) of Trieste, Italy; Associate Member, ICTP-SAIFR, Sao Paulo, Brazil; Member of the Advisory Board of the National Program for Gender Equality of the Ministry of Science of Argentina. Silvina was Chair (2005-2009) of the Physics Department, UBA and in charge of its outreach activities (2010-2016). She occupied positions on various advisory committees. Her main research interests are in biological and statistical physics.
How can Engineers Without Borders programs benefit society?

1. These programs also provide multiple benefits by exposing students to real development projects during their formative years. For example, EWB projects:

2. Allow students to experience all engineering aspects from problem identification to assessment, design, implementation, and monitoring.

3. Allow students to work with professional mentors during their school year, develop good contact within the industry, and learn by doing.

4. Provide students with direct hands-on engineering educational experience in a new and safe environment.

5. Allow students to work in teams on more significant projects instead of discipline-specific projects.

6. Demonstrate to students that engineering problems can be complex and not always well-defined and can be solved in more ways than one and often require working effectively with people who think differently and have different cultural backgrounds.

7. Teach students to interact with different cultures and think ‘outside the box’ with limited tools.

8. Train students to develop awareness of professional ethics and the role that engineering plays in addressing societal needs.

Above all, EWB-type engagement projects provide students with a cultural outlook on both national and international scales, similar to traditional study-abroad programs. Additionally, these projects foster a sense of belonging and engagement through teamwork, allowing students to express their passion and empathy, and provide a societal context for engineering work. They also offer a means for self-reflection, value development, and action on issues students are passionate about. Furthermore, EWB-type projects facilitate collaboration with other professionals and help students develop leadership skills, leading to a global perspective and local action. A notable outcome of these projects was the increased recruitment of women (up to 45%) attracted to engineering because of its social dimension. Finally, the engineering industry endorses and supports EWB-type fieldwork projects. Companies view these activities as a pipeline for recruiting talented engineering leaders who have been exposed to project management before graduation, including teamwork, and dealing with complex and poorly defined issues in complex settings.

The seven characteristics of EWB projects mentioned above complement traditional classroom instruction expected from engineering program accreditation boards. However, engineering engagement has faced a share of challenges, as experienced by the author over the past 20 years. For instance, one of the challenges of EWB trips is the amount of time students can spend in the field, as most implementation trips occur during academic breaks.

Sustainable projects require continuous commitment and planning from one academic year to another. For this reason, EWB projects require a five-year commitment from the volunteers. Short of that, the EWB trips would be more like volunteerism.

Another challenge is preparing students to work in diverse cultural and societal settings. As Nolan (2011) highlights, students (especially Americans) often struggle to function in foreign cultures due to their inability to “look beyond facts and figures to uncover meanings and patterns, to learn in unfamiliar surroundings, and to gain entry into the cultural world of others.” In the author’s experience, this lack of preparedness extends to the engineering students and faculty members responsible for their education.

The strict technical requirements of engineering programs often overshadow the practical aspects of engineering. The author has observed many outstanding undergraduate and graduate students who cannot perform manual work or manage field projects, despite having extensive engineering knowledge. Remedial workshops are necessary to bridge this gap between the academic world and reality. These workshops provide students with additional hands-on skills that they do not acquire in the classroom, including language proficiency, cultural awareness, first aid, fundraising, management and leadership skills, conflict analysis, and the ability to analyze risks and develop evacuation and emergency response plans.

Finally, engineering engagement projects require special consideration because of...
their distinct characteristics, which sponsors and coordinating organizations must consider preventing any unforeseen consequences that may impact the participants and communities being served (Amadei et al., 2009).

- All project participants must be informed of the sponsoring organization’s mission, vision, values, and approach to development.
- To ensure the quality of projects, participants must adhere to a professional code of ethics that encompasses behavior, accountability, quality control, quality assurance, and delivery. Furthermore, projects must incorporate quality-control standards.
- Organizational accountability must be embraced and upheld, including taking responsibility for unintended outcomes.
- Participant education must include traditional education supplemented with relevant skills training.
- The education of partner community members is fundamental to the development process and to building the capacity necessary for the community to solve its problems.
- The needs of the resource-limited end user should drive innovation. This often means that the most effective and appropriate solution could be to modify existing technology.
- Fundraising efforts should clearly explain the dual purpose of this type of work: sustainable humanitarian development projects and the education of students and engineers.
- Successful projects require collaboration with various internal and external stakeholders, and must ultimately respond to the community’s self-identified needs.
- Teamwork includes working with a culturally and intellectually diverse group and the need for the continual mentoring of future leaders who can maintain long-term collaboration through leadership turnover.
- Interventions (time and tasks) must be designed to maximize the direct response to community needs and desires, considering the available resources and project phase.
- Volunteer presence in communities may be short lived, but long-term commitment to the community is vital for sustained success.
- Sustainability requires periods of external presence in the community but not necessarily continuous presence. Groups must devise and discuss their exit strategies and timelines with project partners to ensure sufficient capacity-building efforts.
- Evaluation is the key to determining success. Organizations should embrace critical external evaluations and respond to the identified shortcomings.
The International Year of Basic Sciences for Sustainable Development (IYBSSD) was proclaimed by the 76th session of the United Nations General Assembly, and has been conducted thanks to UNESCO, IUPAP, CERN and numerous organizations across the world.

The Closing Ceremony took place at CERN Science Gateway, on December 15th, 2023. That special event offered an overview of the ending of the International Year, and some insights around the International Decade of Sciences for Sustainable Development (IDSSD) 2024–2033.

In order to illustrate this event, you will find below the Verbatim text of Prof. Eliezer Rabinovici’s Address to the Closing of the IYBSSD

Indico link to the event: [https://indico.cern.ch/event/1322261/](https://indico.cern.ch/event/1322261/)

“I’m very happy to stand here at the closing Ceremony of the International Year of Basic Science for Sustainable Development. It is a privilege to address you and to thank the initiators, in particular, Michel Spiro and the whole team that he built around him. As the director general said, I’m also very happy to have here a large group of young scientists, or let’s say, several levels of ages of scientists here. Now, these look like two pages, but actually given the very intense council meetings we had, I’m actually improvising this address, because what is written here is not sufficient to form a logical setup. I will make a few points that I would like in this context and in the context of being at CERN.

So number one is science is a tool for society! I think the human race is very fortunate that it developed over the years the tool of science. And this tool is makes available to those who govern our societies to make decisions based on a very rational basis. Now, I my first impression when I visited an experiment at CERN. Remember that I’m a theorist, so I’m actually paid not to go into experiments, usually not to spoil what they've succeeded. But what impressed me first, the strongest impression was when I went to an experiment called Atlas. It’s not far from here. It’s very, very near.

In this experiment there were different pieces of equipment, highly sophisticated pieces of equipment, each built in a different country. So, if you look at the engineers and the scientists, who built this and ask them, who is your favorite rock star, what is who do you think is the best soccer team in the world? It will immediately become an enormous argument. But nevertheless, with the power of science, they succeeded to bring all these things together. They work in a perfect way, which is not seen anywhere else. So the amazing tool that we have for society, that is science, should be treated with a lot of care by society, and it should be very appreciated.

On the other hand, we are in a period for quite a few years of also of lack, let’s say, of clear guidance from above. In a way, there is a danger that science become a substitute for religion. And I think it should be made very clear that science, as well, has values, but it’s not a substitute for values society should work together with. What do they learn to do with science? They should also pay a lot of attention to the set of values, which guide what they do. Many times when I hear Einstein made a mistake, I have the feeling that we are back again to this religious thought. Okay, we caught the upper, the idol making a mistake. Einstein, by the way, made mistakes just to make this clear. So we should respect science, appreciate science, but we should have values.

One of the values, which appears here at CERN and appears also in another country from the Middle East, even though it doesn't sound by the news you heard yesterday, today, and that you will hear tomorrow, that the case is trying to use science as a tool for understanding. And I think at CERN it played an immense role as a tool for understanding. One is trying to do and emulate that also in other parts of the world. The fact that scientists view each other with at least agreeing on the laws of physics, is there. You can. One should not underestimate how it’s an opener for a discussion, where scientists can just sit opposite of each other and evaluate them professionally, but not thinking of all the walls, which media and prejudice has built between different nations. So, science is a shortcut to be able to go to the human element and the human nature.

Now there is something more that I want to say about the power of science, and that is, again, touching authority. One of the great things in physics in particular is that your current idol in physics could go right on a blackboard for a set of equations. And as a first year graduate student, she could lift her hand and say, I’m sorry, professor, so and so, but from line two to line three, you can’t pass. You made a mistake. So he will. This person sitting there with authority will not be able to say, who the hell are you to tell me that I’m wrong? Do you know I did this, this, this and that? How do you tell me I’m wrong? Well, she will insist. I’m sorry. Going from 2 to 3, it was a mistake, and so on.
On the one hand, there is an authority in the sense of when you prove something, you accept that as an authority. But there is a ability also to remove the authority when one makes a mistake. But in other nodes of life, it’s not so simple to remove authority. Once one makes a mistake.

Then I would like to go to another thing which is very special about CERN. CERN was built for quite a few reasons. The convention to build CERN was officially signed in 1954 by 12 nations. However, it was built with the idea of healing the wounds of Europe after World War II, to the extent that it was possible. However, there were also other reasons behind that, and they were reasons, which were related to the role physicists played during World War II. The reason was also to bring here the Western knowledge in that field and have them, let’s say, working on things which interest them, but probably also be ready to be on-call.

Now, this is how it started. But as the process evolved, a very unique ecosystem of scientists developed. Hundreds of scientists from different parts, at least of the Atlantic, even though they were very much competing with each other, they also collaborated a lot and contributed one to the other. This is a very unique ecosystem, which I think is very important, again, for governments to appreciate that they don’t have many like this, or at all, on this planet. And the challenges, which face humanity could be climate, environment. These issues seem to require a global concentration of manpower, or woman power. And this at CERN is done successfully. So, this ecosystem here also, from this point of view, should be preserved. Maybe also other communities can emulate that to the extent they can. But this type of ecosystem should be preserved. Thank you very much.”

Eliezer Rabinovici is currently professor at the Racah Institute of Physics of the Hebrew University of Jerusalem and the Louis Michel visiting chair at the Institut des Hautes Études Scientifiques (IHES).

Prof. Rabinovici’s main field of research is theoretical high-energy physics and, in particular, quantum field theory and string theory. Throughout his career, he has held positions within several councils and committees. He currently serves as President of the CERN Council.

Hong-Jian He
Shanghai Jiao Tong University
Citation: For fundamental contributions to particle theory and phenomenology, and for leadership in promoting international cooperation.

Nagarajan Valanoor
UNSW Sydney
Citation: For contributions to the synthesis and processing of thin film functional materials, particularly in the interface engineering of ferroelectric and multiferroic thin films with colossal piezoelectric properties.

Alexandre Zagoskin
Loughborough University
Citation: For pioneering contributions to the development of superconducting quantum technologies and their applications.
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