



Diversity, Equity, Inclusion and Accessibility in HEP



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ICFA Seminar, November 2023



@BrookhavenLab

Outline

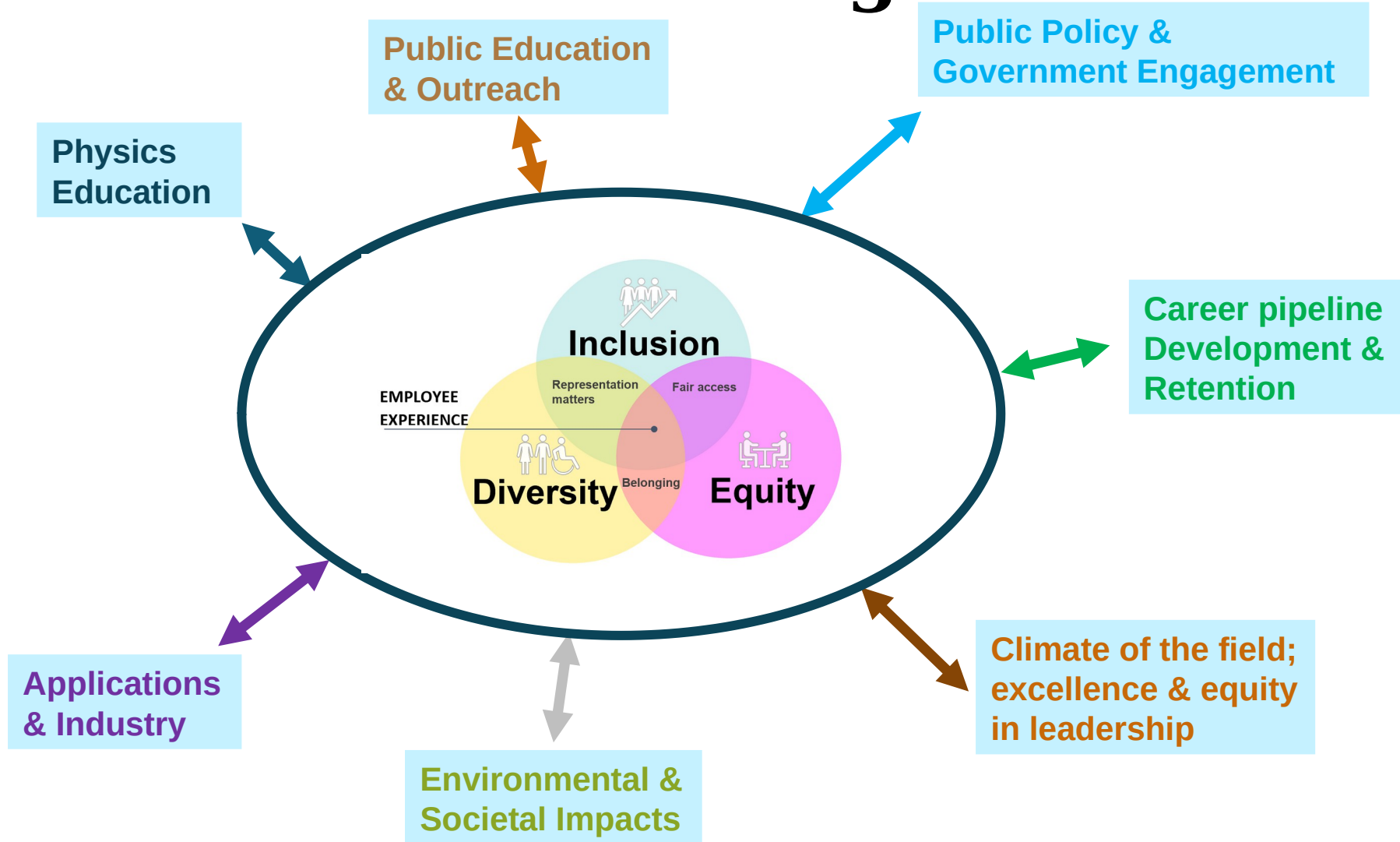
- DEIA within the larger context of community engagements in HEP
- The case of Africa
- Conclusions

HEP Community Engagement

The objective

- Develop strategic engagements to
 - draw support for and strengthen the field of high energy physics;
 - play key roles in serving these communities
- Communicate our field's value
- Maximize impact on global socioeconomic development
- Open doors to broader community participation in HEP

DEIA is cross-cutting...

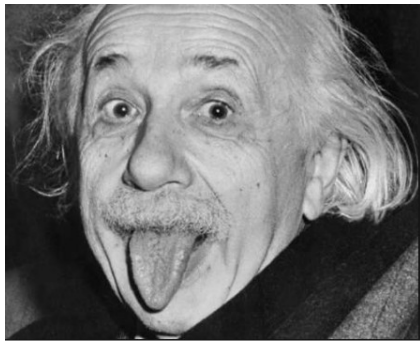


Snowmass Community Engagement

Activities in Snowmass 2021 were organized into 10 frontiers, one of which was Community Engagement (CEF)

CEF was further subdivided into 7 topical groups, namely

- Application and Industry
- Career pipeline and development
- **Diversity, Equity and Inclusion**
- Physics Education
- Public Education and Outreach
- Public Policy and Government Engagement
- Environmental and Societal Impacts



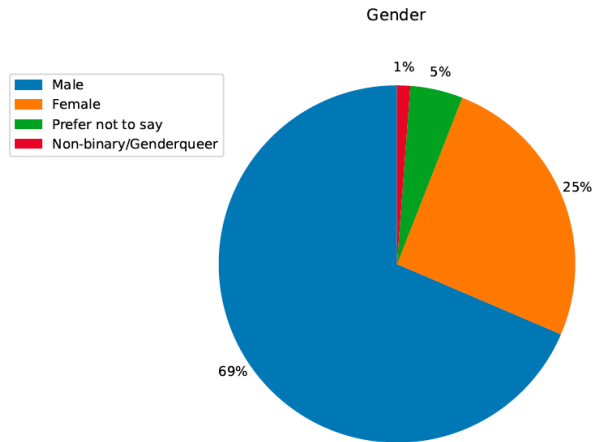
What does a physicist look like?



Draw me physicists
Perception counts

"When we are talking about diversity, it is not a box to check. It is a reality that should be deeply felt and held and valued by all of us." [Ava Marie DuVernay](#)

CSS participants

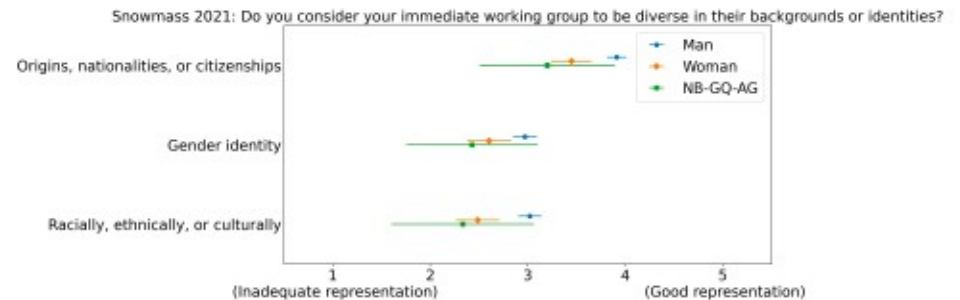


Why is that an issue?

”Achieving gender equality is about disrupting the status quo, not just negotiating it”
Phumzile Mlambo-Ngcuka

Men in HEP don't believe...

[arXiv:2203.07328](https://arxiv.org/abs/2203.07328)



There is far more under-presentation than could be expected from meritocracy

[arXiv:2203.11523v2](https://arxiv.org/abs/2203.11523v2),

[arXiv:2203.11513v2](https://arxiv.org/abs/2203.11513v2)

[arXiv:2203.11518v2](https://arxiv.org/abs/2203.11518v2),

[rXiv:2203.11508v2](https://arxiv.org/abs/2203.11508v2)

[arXiv:2203.10393v1](https://arxiv.org/abs/2203.10393v1).

Why is that an issue?

[The Diversity–Innovation Paradox in Science](#)

What is DEIA

- It is an effort to transform institutions to ensure full participation
- Large and rich institutes to stop hoarding resources
- Move away from rewarding privilege
- Move towards cultivating potential and increasing mobility for all
- Build partnerships and enable systemic approaches to increasing educational access and success for all

We don't recommend strategies that "offer a narrow, at-the-margins response to exclusion, which deflects attention from more central problems with the current system and invites zero-sum reactions to [DEI] efforts" *Susan P. Sturm*

From Diversity to Mobility and Full Participation

Building a Culture of Equitable Access and Success for Marginalized Members in Today's Physics Community

<https://arxiv.org/pdf/2206.01849.pdf>

“DEIA in physics is a broad topic. Here, we focus on the experiences of marginalized communities and outline ways different stakeholders can build a culture of equitable access for the success of marginalized individuals. Specifically, we identify urgent needs in the following areas:

- (1) We need to acquire a better understanding of the status quo, both quantitatively and qualitatively, to assess the effectiveness of existing programs and to develop best practices;
- (2) We need to develop effective and inclusive ways to engage marginalized communities;
- (3) We need to create infrastructure to better support members of marginalized communities, on an academic, financial and personal level;
- (4) We need to create an environment conducive to equitable access and success by establishing community expectations, fostering inclusion in social interactions, and holding individuals and institutions accountable; and
- (5) We need to establish a mechanism to monitor progress in the area of DEIA, including the implementation of recommendations”

Snowmass 2021 work on DEIA

**Report of the 2021 U.S. Community Study on the
Future of Particle Physics (Snowmass 2021)**

Summary Chapter

<https://arxiv.org/abs/2301.06581>

**Community Engagement Frontier
Report**

<https://arxiv.org/abs/2211.13210>

**Diversity, Equity and Inclusion
topical group report**

**[https://arxiv.org/pdf/2209.12377.p
df](https://arxiv.org/pdf/2209.12377.pdf)**

Engagement

- Community Engagement starts by improving climate within
 - Staff development
 - Code of conduct
 - Inclusion, retention, mobility
 - Hiring practices and diverse workforce
 - Accessibility, wellness and mental health, etc.
- Education and Public Outreach
 - Engagement towards under-represented communities.
 - New paradigm in public engagements to improve impact: building lasting relationships, understanding the interests of the communities, involving the communities in organizing programs
 - Organized institutional efforts, complemented by department / group / individual efforts
- Education Programs
 - Summer programs, Research Experience for Undergraduate, high school students Teachers programs, etc.
 - Engagements with local communities
- Technology transfers, international engagements
- Monitoring and Assessment of impacts

Institutional Efforts

Efforts are being made, although there is still a significant lack of diversity in our field, e.g. in 2019, 88 NP-supported students received their Ph.D.'s. Only 5% were Black or Hispanic, nearly a factor of 7 below representation in the US population

- Institutions have been increased efforts in these areas
 - **Initiatives at funding agencies**, e.g. recent initiatives from DOE
 - Reaching a New Energy Sciences Workforce (RENEW)
 - Funding for Accelerated, Inclusive Research (FAIR)
 - Promoting Inclusive and Equitable Research (PIER)
 - **Efforts at institutes (CERN, ..., etc.), departments, groups, collaborations, professional societies, etc.**

So, what is lacking?

Implementation & Progress Monitoring

- What is lacking is a coherent approach where best practices are shared and encouraged.
 - **The HEP community should create the framework where a coherent approach towards improving the climate can flourish.**
- HEP should establish a permanent Community Engagement Advocacy Committee. The charge of a such a committee would be to facilitate the community coordination of implementation, best-practice sharing, rewards, encouragements and progress monitoring and reporting.
- In its prioritization of projects, HEP Strategies could recommend, where relevant, implementation of the Community Engagement goals.

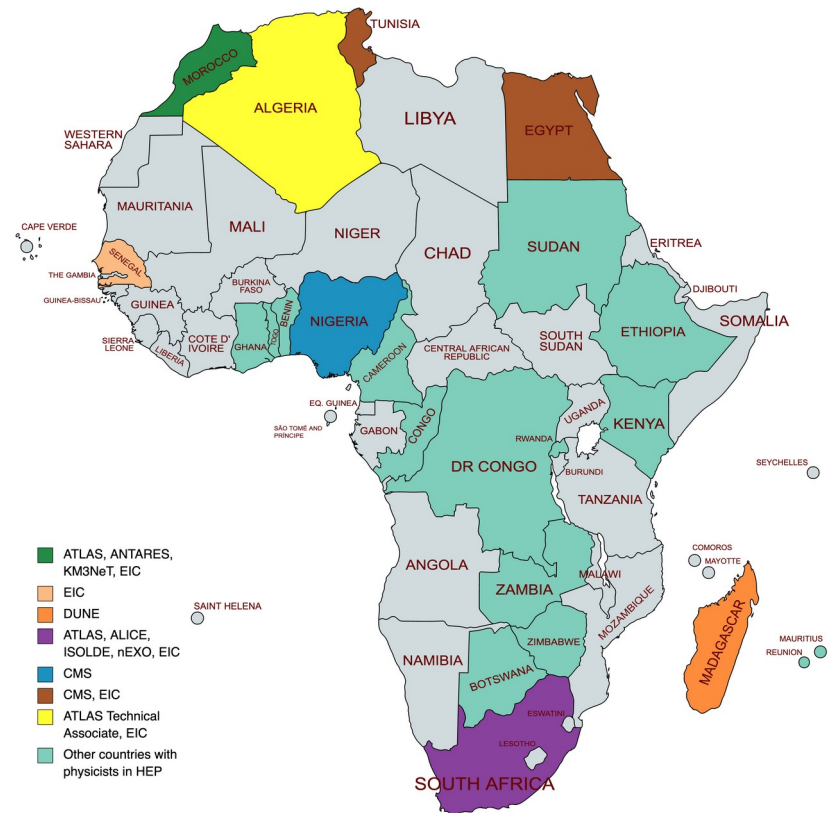
Engagements with Developing/ Emerging Countries

Engagement with emerging countries needs improvement for international diversity and pipeline development in HEP, and the global impact and visibility of HEP efforts.

- Universities, laboratories and HEP groups should improve and sustain international outreach, partnerships, schools, workshops, conferences, training, short-visits for research, and development of research consortia.
- Mechanisms should be developed to facilitate the participation of colleagues from developing countries.
- Large international research collaborations should improve efforts to facilitate the integration and participation of research groups from developing countries and support efforts to foster HEP in these countries.

Why should you care about HEP in Africa and Latin America?

- It is a legitimate question. Snowmass white paper to answer that question; [arXiv:2203.10060](https://arxiv.org/abs/2203.10060)
- U.S. / Europe offer programs to improve international engagements and cultural awareness
- The UN proclaimed 2022 as the “international year of basic sciences for sustainable development, to improve the quality of life for people all over the world”
 - Engagements with developing countries, to improve their physics education and research programs, for the benefit of all humankind



Created with mapchart.net

International Engagements

Support African School of Physics (ASP)

- Contributions to the ASP budget to support African students participation
- Coverage for staff lectures and mentor African students
- Support African institutes in large scale international projects



Chilufya Mwewa (Zambia) & Diallo Boye (Senegal), BNL post-docs. They started their HEP journeys through ASP

- Coverage for African students for 3-6 months visits for research at BNL

ASP Alumni at BNL 2019-2023

Goldhaber Fellow, BNL

Now CERN Fellow



June-December 2019. From left:

In front, Christelle Ekosso (Cameroon), Dr. Mounia Laassiri (Morocco); standing, Diallo Boye (Senegal), Dr. Somiealo Azote (Togo), Jesutofunmi Fajemisin (Nigeria), Hassnae El Jarrari (Morocco), Dr. Kétévi A. Assamagan, Raymond Yogo (Kenya), and Yves Kini (Burkina Faso).

Heba Sami Abdulrahman (Egypt), not in the figure, arrived in September 2019.



July 2022 – February 2023. From left:

Asmaa Aboulhorma (Morocco),
Zainab Soumami (Morocco),
Kétévi A. Assamagan,
Antalia Rabarisoa (Madagascar),
Xola Mapekula (South Africa),
Kayode Dada (Nigeria),
Rado Fanantenana (Madagascar)

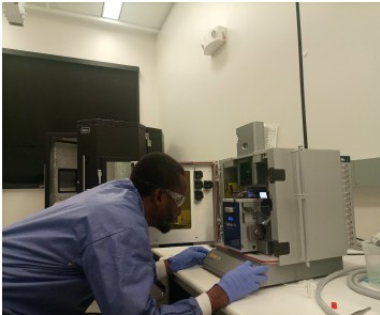
ASP Alumni short-term visits to BNL for research Cohort of August 2022-February 2023



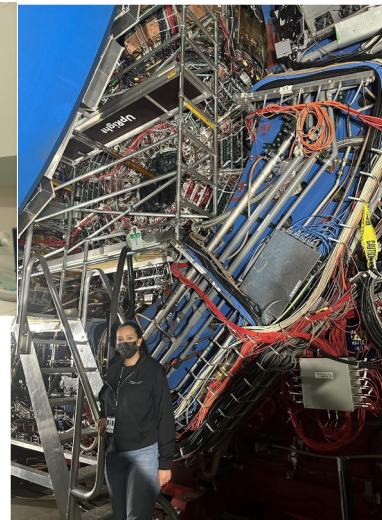
**Zainab
(ITK)**



Rado (DUNE)



Kayode (CFN)



Asmaa (ITK)



Xola (LGAD)



Antalia (DUNE)



From left:

Asmaa Aboulhorma (Morocco),
Zainab Soumaili (Morocco),
Dr. Kétévi A. Assamagan,
Antalia Rabarisoa (Madagascar),
Xola Mapekula (South Africa),
Dr. Kayode Dada (Nigeria),
Rado Fanantenana (Madagascar)

“I didn’t know a physicist could look like you!”

“I didn’t know a physicist could look like you. I always thought they were male, with crazy hair and dusty lab coats. But you... are a young woman, dress well, look normal, and don’t even need a lab coat”.

<https://blog.hip.fi/i-didnt-know-a-physicist-could-look-like-you/>

ASP2022 Geant4 Tutorial for Students



ASP2022 High School Outreach

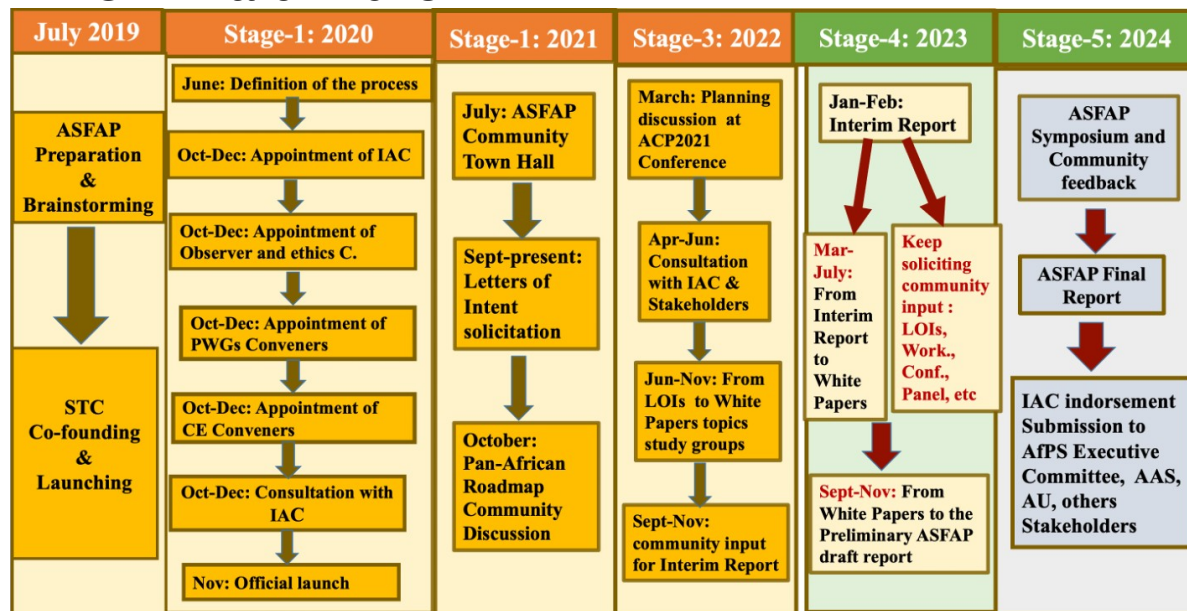


Dr. Mounia Laassiri
attended ASP2016
as a student; she
returned to ASP2022
as a lecturer



In progress — the African Strategy for Fundamental and Applied Physics (ASFAP)

- Mandated by the African Physics Society (AfPS)
- Includes other fields in addition to HEP
- **Follow the steps of our colleagues in Latin America**
- Learn the process of community-driven physics roadmap exercise
- Strengthen AfPS
- Complement top-down strategies
- Slow but steady progress; interim report submitted to the IAC in March 2023



PHYSICS GROUPS

Accelerators
 Astrophysics &
 Cosmology
 Atomic & Molecular
 Physics
 Biophysics
 Computing & 4IR
 Earth Science
 Energy
 Fluid and Plasma
 Instrumentation &
 Detectors
 Light Sources
 Condensed Matter &
 Materials Physics
 Medical Physics
 Nuclear Physics
 Particle Physics
 Optics and Photonics
 Complex Systems

ENGAGEMENT

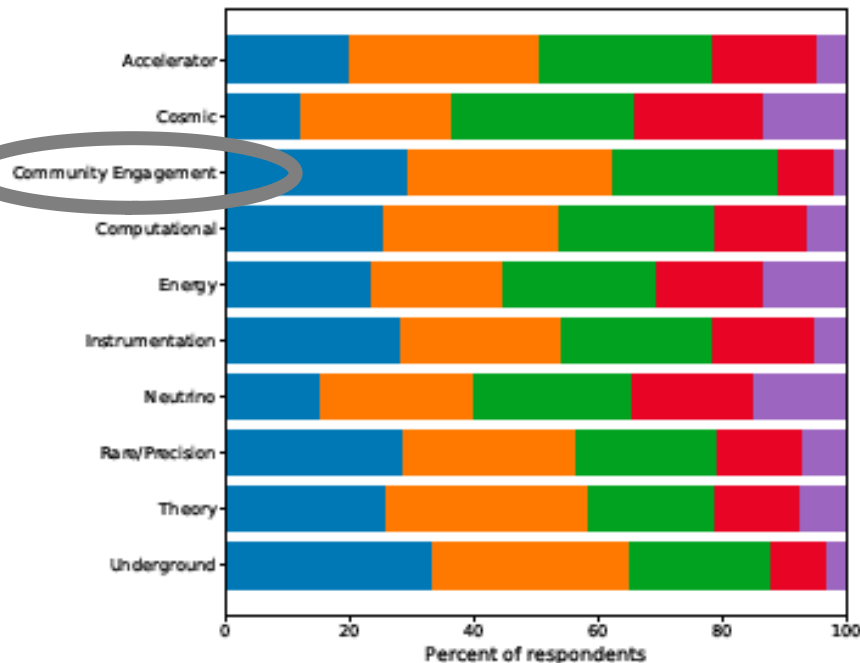
Community Engagement
 Observers Committee
 Ethics Committee
 Physics Education
 Women in Physics Forum
 Young Physicists Forum

Conclusions

- A lot of efforts to improve DEIA within the global context of community engagements
- What is lacking is a concerted and coordinated effort for best practices sharing and implementation monitoring
- In prioritization projects, HEP Strategies should recommend implementation of community engagement goals
- The need for international diversity should compel the HEP community to increase attention towards facilitating participation of developing countries

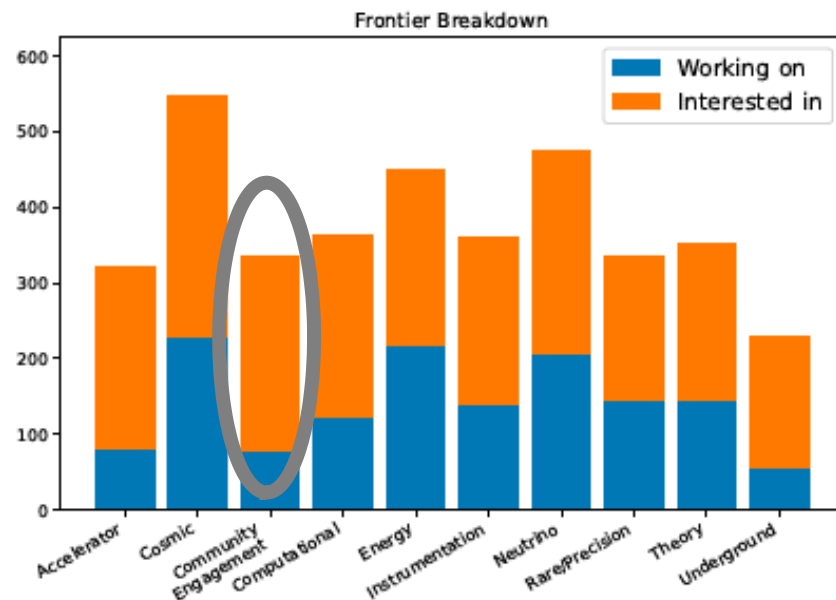
How informed folks felt about future direction in CEF

Hopefully, the body of work done in CEF should offer clarity & direction



Efforts should be made to encourage more involvement in Physics Engagement

1 (Not at all informed)
2
3
4
5 (Very informed)



Individual Participation in Community Engagement

- The aforementioned goals and suggestions for improvement will be beneficial to the individual HEP researchers in establishing a climate of inclusivity, diversity and equity that fosters scientific excellence.
- Furthermore, progress in these goals will improve the socioeconomic, societal and environmental impacts of HEP. In so doing, HEP as a whole will benefit from societal advocacy. It is therefore important for the HEP communities to encourage more participation in community engagement.
- In particular, during future Snowmass activities, the work of this frontier should not be relegated to a handful of community members.