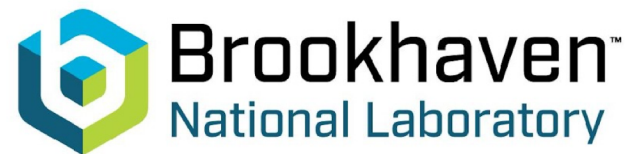


Snowmass 2021 Community Engagement



Kétévi A. Assamagan



P5 Townhall, May 2023



Outline

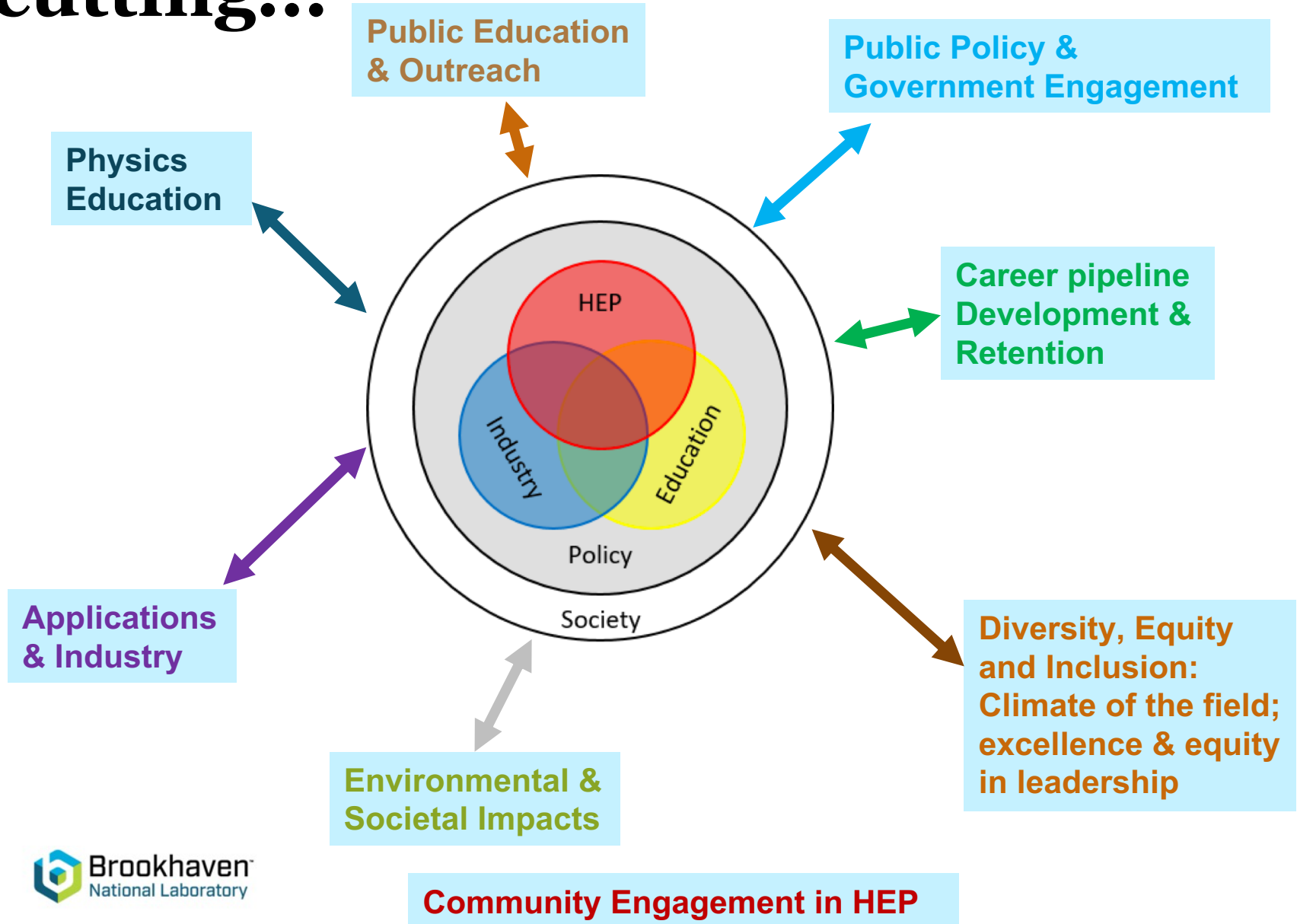
- Snowmass 2021 Community Engagement Frontier (CEF)
- Goals, suggestions, recommendations
- Conclusions

HEP Community Engagement

The objective

- Develop strategic engagements with our communities in order to draw support for and strengthen the field of high energy physics, while playing 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

Community Engagement is cross-cutting...



Personally...

- **I am not an expert on Community Engagement, not a social scientist, not a “diversity guy”; I don’t work HR, ...**
- **I am a staff physicist at BNL**
- **Working on ATLAS, with 2 post-docs + 5 graduate students; in a formal co-advising role of graduate students**
- **Currently, on BSM searches**
 - Dark sector states
 - $H \rightarrow$ invisible
 - + interpretations
 - BSM physics prospects at Future colliders
- **On hardware, software, computing**
 - Getting post-docs and students to work on ITK, LGAD, detector performance studies, software and computing, with my colleagues at BNL
- **During Snowmass, I contributed one white paper in Energy Frontier while leading efforts in the Community Engagement Frontier**
- **How can you do good physics and also contribute to community engagement?**
 - Yes, you can
 - Institutional incentive, requirements, encouragements, rewards, ..
 - Please find the balance
 - Do something

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**

The conveners of CEF were Kétévi A. Assamagan (BNL) and Breese Quinn (University of Mississippi)



Kétévi A. Assamagan (BNL)



Breese Quinn (Mississippi)

CEF Topical Group Conveners

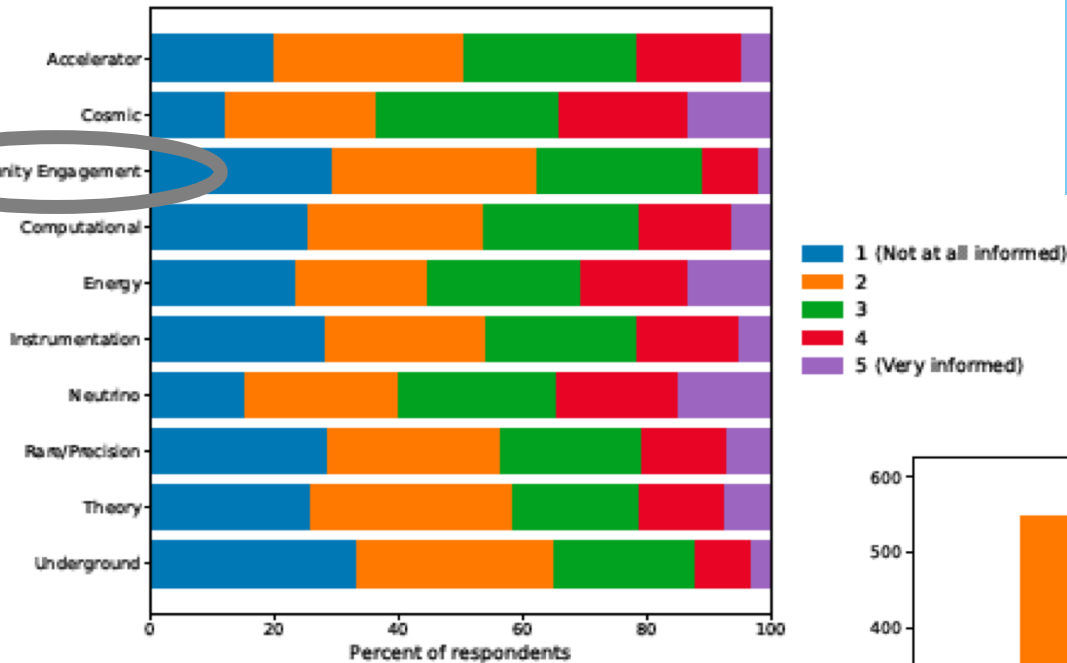
Topical Group		Topical Group Conveners			
CEF1	Applications & Industry	Farah Fahim (FNAL)	Alex Murokh (RadiaBeam Technologies)		Koji Yoshimura (Okayama)
CEF2	Career Pipeline & Development	Sudhir Malik (UPRM)	Julie Hogan (Bethel University)		Aneliya Karadzhinova-Ferrer (Ruđer Bošković Institute)
CEF3	Diversity & Inclusion	Mu-Chun Chen (UCI)	Johan S. Bonilla (UC Davis)	Yi-Hsuan Cindy Lin (SNOLAB)	Carla Bonifazi (UFRJ)
CEF4	Physics Education	Randy Ruchti (Notre Dame)	Sudhir Malik (UPRM)		Sijbrand de Jong (Radboud)
CEF5	Public Education & Outreach	Sarah Demers (Yale)	Kathryn Jepsen (SLAC)	Don Lincoln (FNAL/Notre Dame)	A. Muronga (Nelson Mandela)
CEF6	Public Policy & Government Engagement	Rob Fine (Rochester)	Louise Suter (FNAL)		
CEF7	Societal & Environmental Impacts	Veronique Boisvert (URAL)	Ken Bloom (UNL)	Mike Headley (SDSU/SURF/SDSTA)	

CEF liaisons to other frontiers

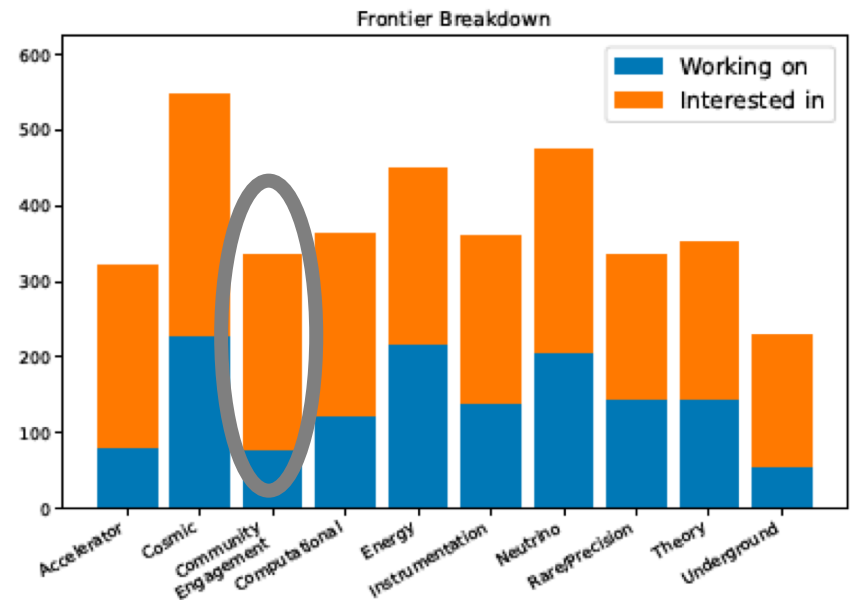
Frontier	Liaisons
Accelerator	Jeroen van Tilborg (LBL)
Computational	David Bruhwiler (RadiaSoft)
Cosmic	Sijbrand de Jong (Radboud)
Early Career	Mateus Carneiro (BNL) Scott Kravitz (LBL)
Energy	Daniel Whiteson (UCI) Sergei Gleyzer (UA)
Instrumentation	Farah Fahim (FNAL)
Neutrino Physics	Claire Lee (FNAL)
Rare Processes & Precision	Sophie Middleton (Caltech)
Theory	Devin Walker (Dartmouth)
Underground Facilities	

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



Snowmass Community Engagement

- CEF received over 100 Letters of Interest (LOI)
- In addition, we organized regular meetings, town hall discussions, expert-panel discussions, workshops and surveys to collect further inputs from the community
- All the above were condensed into 35 contributed (white) papers developed within CEF
 - Details on the CEF white papers are available here, <https://snowmass21.org/submissions/cef>
- Furthermore, each topical group prepared a report of their activities
- Finally, at the frontier level, we also prepared a frontier report
- The white papers, topical group reports, and frontier report contain suggestions to address the issues studied within the scope of CEF.

Some CEF-related papers

- **"Lifestyle and personal wellness in particle physics research activities"**, [arXiv:2203.08631](https://arxiv.org/abs/2203.08631) [[physics.soc-ph](#)] (pdf).
- **Climate of the Field: Snowmass 2021"**, [arXiv:2204.03713](https://arxiv.org/abs/2204.03713) [[physics.soc-ph](#)]
- **"Accessibility in High Energy Physics: Lessons from the Snowmass Process"**, [arXiv:2203.08748](https://arxiv.org/abs/2203.08748) [[physics.ed-ph](#)] (pdf).
- **"Why should the U.S. care about high energy physics in Africa and Latin America?"**, [arXiv:2203.10060](https://arxiv.org/abs/2203.10060) [[physics.soc-ph](#)] (pdf).
- **"Policing and Gatekeeping in STEM"**, [arXiv:2203.11508](https://arxiv.org/abs/2203.11508) [[physics.soc-ph](#)] (pdf).
- **"Power Dynamics in Physics"**, [arXiv:2203.11513](https://arxiv.org/abs/2203.11513) [[physics.soc-ph](#)] (pdf).
- **"Informal Socialization in Physics Training"**, [arXiv:2203.11518](https://arxiv.org/abs/2203.11518) [[physics.soc-ph](#)] (pdf).
- **"How to Read the Snowmass White Papers on Power Dynamics in Physics, Informal Socialization in Physics Training, and Policing and Gatekeeping in STEM"**, [arXiv:2203.11523](https://arxiv.org/abs/2203.11523) [[physics.soc-ph](#)] (pdf).
- **"Building a Culture of Equitable Access and Success for Marginalized Members in Today's Particle Physics Community"**, [arXiv:2206.01849](https://arxiv.org/abs/2206.01849) [[physics.soc-ph](#)] (pdf)
- **"The need for structural changes to create impactful public engagement in US particle physics"**, [arXiv:2203.08916](https://arxiv.org/abs/2203.08916) [[physics.soc-ph](#)] (pdf).
- **"The Necessity of International Particle Physics Opportunities for American Education"**, [arXiv:2203.09336](https://arxiv.org/abs/2203.09336) [[physics.ed-ph](#)] (pdf)
- **"Enhancing HEP research in predominantly undergraduate institutions and community colleges"**, [arXiv:2203.11662](https://arxiv.org/abs/2203.11662) [[physics.ed-ph](#)]
- **"Facilitating Non-HEP Career Transition"**, [arXiv:2203.11665](https://arxiv.org/abs/2203.11665) [[physics.ed-ph](#)]
- **"Broadening the scope of Education, Career and Open Science in HEP"**, [arXiv:2203.08809](https://arxiv.org/abs/2203.08809) [[physics.ed-ph](#)]
- **"Snowmass 2021 Community Survey Report"**, [arXiv:2203.07328](https://arxiv.org/abs/2203.07328) [[hep-ex](#)] (pdf)
- **"Particle Physics Outreach at Non-traditional Venues"**, [arXiv:2203.09585](https://arxiv.org/abs/2203.09585) [[physics.ed-ph](#)] (pdf)

CEF Topical Group Reports

- **Applications & Industry**
<https://arxiv.org/pdf/2210.01248.pdf>
- **Career Pipeline & Development**
<https://arxiv.org/pdf/2209.10114.pdf>
- **Diversity, Equity and Inclusion topical**
<https://arxiv.org/pdf/2209.12377.pdf>
- **Physics Education**
<https://arxiv.org/pdf/2209.08225.pdf>
- **Public Education & Outreach**
<https://arxiv.org/pdf/2210.00983.pdf>
- **Public Policy & Government Engagement**
<https://arxiv.org/pdf/2209.09067.pdf>
- **Environmental & Societal Impacts**
<https://arxiv.org/pdf/2209.07684.pdf>

11

Community Engagement Frontier

Frontier Conveners: Kétévi A. Assamagan¹, Breese Quinn²

Topical Group Conveners: Kenneth Bloom³, Véronique Boisvert⁴, Carla Bonifazi⁵, Johan S. Bonilla⁶, Mu-Chun Chen⁷, Sarah M. Demers⁸, Farah Fahim⁹, Rob Fine¹⁰, Mike Headley¹¹, Julie Hogan¹², Kathryn Jepsen¹³, Sijbrand de Jong¹⁴, Aneliya Karadzhinova-Ferrer¹⁵, Yi-Hsuan Lin¹⁶, Don Lincoln⁹, Sudhir Malik¹⁷, Alex Murokh¹⁸, Azwinndini Muronga¹⁹, Randal Ruchti²⁰, Louise Suter⁹, Koji Yoshimura²¹

Other Contributors: Erin V. Hansen²², Samuel Meehan²³, Erica Smith²⁴

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⁷Department of Physics and Astronomy, University of California, Irvine, CA, 92697, USA

⁸Department of Physics, Yale University, New Haven, CT, 06511, USA

⁹Fermi National Accelerator Laboratory, Batavia, IL, 60510, USA

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¹³Symmetry Magazine, SLAC National Accelerator Laboratory, Menlo Park, CA, 94025, USA

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¹⁵Helsinki Institute of Physics (HIP) P.O. Box 64, 00014 University of Helsinki, Finland, and Lappeenranta University of Technology (LUT), School of Engineering Science, Box 20, 53851 Lappeenranta, Finland

¹⁶Queen's University, Department of Physics, Engineering Physics & Astronomy, Kingston ON, Canada

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¹⁸Physics Department, University of Puerto Rico-Mayaguez, Mayaguez, PR, 00681, USA

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Report of the 2021 U.S.
Community Study on the
Future of Particle
Physics (Snowmass
2021) Summary Chapter
<https://arxiv.org/abs/2301.06581>

Snowmass work

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
- Education and Public Outreach
 - Engagement towards MSI and URM.
 - 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
 - Science Undergraduate Laboratory Internships (SULI), Research Experience for Undergraduate (REU), high school students programs, etc.
 - Engagements with local communities
- Technology transfers, international engagements
- Monitoring and Assessment of impacts

Institutional Efforts

- Institutions have been making efforts in these areas
 - e.g. NSF and DOE; 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 your institute, department, groups, collaborations, etc.
 - Efforts at your institute, directorate, department, division, etc.
 - Efforts in your collaborations, professional societies.
- So, what is lacking?

The 11 canons of Community Engagement

1. **Climate within**
2. **Work-life balance**
3. **Accessibility**
4. **Education, Career Pipeline & Retention**
5. **Policies & Government Engagement**
6. **Outreach**
7. **Environmental & Societal Engagements**
8. **International Engagements**
9. **Technology Transfers**
10. **Individual Participation**
11. **Implementation & Progress Monitoring**

(1) Climate of the field

The climate of the field needs more work:

- The HEP community should improve strategic planning procedures, science workplace norms and culture, ethics and code of conduct guidelines and procedures to encourage adherence to and address violations thereof, and ultimately create an inclusive climate that ensures diversity and equity.
- Achieving these objectives will necessitate partnership with scholars, professionals, and other experts in several disciplines, including but not limited to anti-racism, critical race theory, and social science.
- Improving the climate also consists of implementing practices and programs for participation in HEP by non-R1 institutions.

[arXiv:2203.08748 \[physics.ed-ph\]](https://arxiv.org/abs/2203.08748) (pdf)

[arXiv:2206.01849 \[physics.soc-ph\]](https://arxiv.org/abs/2206.01849) (pdf)

(2) Work-life balance

Research institutes and universities should do more to maintain the highest standard in work-life balance and mental health of staff. Proper training of staff should be developed to integrate productive work habits that encourage a balance between professional expectations and private affairs, and good mental health.

[arXiv:2203.08631 \[physics.soc-ph\] \(pdf\)](https://arxiv.org/abs/2203.08631).

(3) Accessibility

- Funding agencies, laboratories, universities, professional societies and event organizers should do more to make events accessible to all community members, including those with disabilities. Planning for events should include, from the very beginning, effective coverage for accessibility.

[arXiv:2203.08748 \[physics.ed-ph\]](https://arxiv.org/abs/2203.08748) (pdf)

- Sensibility to neurodiversity & invisible disabilities—**for details, see the contributed remarks of Yu-Dai Tsai.**

(4) Physics Education & Career Pipeline Development

- The lack of diversity in HEP has been linked to, not only the issue of climate, but also to the lack proper education and pipeline development. A diverse pool of candidates cannot be expected at the tertiary or higher levels of HEP engagement, in spite of best efforts and practices, if efforts were not made as far back as the K-12 and university undergraduate levels, to nurture the pipeline.
- It is therefore necessary for the HEP community to create effective programs to support pupils, teachers and students in their local communities, to develop and maintain interests in physics. Educational institutes should develop or expand programs to prepare students with the skills needed for HEP and related applications.
- Our field cannot absorb all the early career members that it produces; funding agencies, laboratories and universities should work together and create training, skills and career opportunities for transitions to, and success in, non-academic environments.

(5) Technology Transfers

Technology transfers between HEP and industry are necessary for the socioeconomic impacts of HEP research and the integration of cutting-edge industrial developments to advance HEP goals.

- Funding agencies and laboratories should improve policies and programs to foster technology transfers and collaborative programs with industry on targeted technology development beneficial for HEP.
- Laboratories and universities should improve targeted partnerships on HEP projects.
- The HEP community should make efforts to maintain connections with networks of alumni to facilitate HEP–industry relations and HEP advocacy.

[See the talk of Matt Garrett](#)

(6) Public Policy & Government Engagement

- The HEP community should be proactive in providing resources to sustain and grow the annual HEP Congressional advocacy efforts.
- HEP groups should coordinate efforts by laboratories and universities in order to extend advocacy to the federal executive branch, state and local governments.
- Considering that HEP research draws international collaborations, HEP groups should improve concerted efforts toward international advocacy to facilitate the reach of HEP and, in particular, to support HEP communities of developing countries.
- HEP advocacy for non-HEP funding issues is highly encouraged and can be beneficial for HEP goals.

[For details, see the talk by Louise Suter](#)

(7) Physics Outreach

- Funding agencies, universities and research institutes should encourage staff to spend appropriate time on outreach, DEI and climate improvement efforts. Such time spent should be included favorably in staff evaluation, career progressions and grant evaluations.
- In designing outreach programs, it is important to understand the needs of the audience, include its members in the design of programming and pay attention to its interest – the HEP community should take a foundational approach to successful outreach by building lasting relationships with target communities. Successful outreach programs cannot be transactional with the target communities.

(8) Environmental & Societal Impacts

- Laboratories, universities and research collaborations should work to improve environmental impacts of HEP activities, including the design, development and operation of HEP research facilities and detectors. Good community relations are important to integrate community needs and feedback in site selections, and subsequently, operation of HEP facilities.
- HEP communities should build synergistic collaborations with other communities to draw on a broader spectrum of funding sources for work on technologies that could benefit HEP.

[For details, see the talk of Ken Bloom](#)

(9) Engagements with 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.

(10) 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.

(11) Implementation & Progress Monitoring

- Many institutions have been making efforts in community engagement; 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.**
- DPF 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, P5 could recommend, where relevant, implementation of the Community Engagement goals listed in the 11 canons of engagements

Conclusions

- P5 Ask—Project planning, development, maintenance and operation should include community engagement goals
 - **See the 11 canons of community engagements**

Please, don't recommend strategies that “offer a narrow, at-the-margins response to [community engagements], which deflects attention from more central problems with the current system and invites zero-sum reactions to [engagement] efforts”

Susan P. Sturm

Additional materials

Community Engagement Frontier

Frontier Conveners: Kétévi A. Assamagan¹, Breese Quinn²

Topical Group Conveners: Kenneth Bloom³, Véronique Boisvert⁴, Carla Bonifazi⁵, Johan S. Bonilla⁶, Mu-Chun Chen⁷, Sarah M. Demers⁸, Farah Fahim⁹, Rob Fine¹⁰, Mike Headley¹¹, Julie Hogan¹², Kathryn Jepsen¹³, Sijbrand de Jong¹⁴, Aneliya Karadzchinova-Ferrer¹⁵, Yi-Hsuan Lin¹⁶, Don Lincoln⁹, Sudhir Malik¹⁷, Alex Murokh¹⁸, Azwinndini Muronga¹⁹, Randal Ruchti²⁰, Louise Suter⁹, Koji Yoshimura²¹

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²²Department of Physics, University of California, Berkeley, Berkeley, CA, 94720, USA

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CEF01 — Applications & Industry



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Alex Murokh
Radiabeam
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Koji Yoshimura
Okayama

- ★ **Develop and strengthen HEP/Industry relationships in both directions: form more partnerships to draw on industry expertise to further HEP goals, and build on programs to facilitate transfer of HEP technologies/techniques for use in the broader society.**

8 Contributed Papers

CEF01 Contributed Papers

Topical Group Report

CEF02 — Career Pipeline & Development



Julie Hogan
(Bethel University)



Sudhir Malik
*University of
Puerto Rico
Mayagüez (UPRM)*



Aneliya Karadzhinova-Ferrer
(Ruđer Bošković Institute)

- ★ **Not simply making young scientists aware of different opportunities, but also changing culture of HEP career paths**

2 Contributed Papers

CEF02 Contributed Papers

Topical Group Report

CEF03 — Diversity, Equity & Inclusion



Mu-Chun Chen
(UC Irvine)



Carla Bonifazi
([Universidade Federal do Rio de Janeiro](#),
UFRJ)



Yi-Hsuan C. Lin
(SNOLAB)



Johan S. Bonilla
(UC Davis)

- ★ Improve diversity, equity and inclusion in our field to drive scientific advancement and achieve intellectual excellence.

11 Contributed Papers

CEF03 Contributed Papers

Topical Group Report

CEF04 — Physics Education



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Rico Mayagüez (UPRM)*



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4 Contributed Papers

CEF04 Contributed Papers

Topical Group Report

- ★ **Broader than simply how we teach physics courses. It is about what education and training our field needs to produce the physicists required for the HEP program to be successful (e.g. computational, beams, instrumentation; workshops, univ./lab/collaboration-level courses, etc.)**

CEF05 — Public Education & Outreach



Sarah Demers
Yale University
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Kathryn Jepsen
Symmetry Magazine
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Don Lincoln
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Azwinndini Muronga
Nelson Mandela University
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- ★ **Work to see public education and engagement acknowledged as important work within our field, rewarded in the career paths of researchers, and integrated into our research practices such that it is a recognized component of what it means to be a physicist.**

2 Contributed Papers

CEF05 Contributed Papers

Topical Group Report

CEF06 — Public Policy & Government Engagement



Rob Fine
Los Alamos
National Lab,
LANL



Louise Suter
Fermilab

- ★ **Discuss all aspects of how the HEP community is impacted by public policy, and all aspects of how the community engages in advocacy.**

3 Contributed Papers

CEF06 Contributed Papers

Topical Group Report

CEF07 — Environmental & Societal Impacts



Veronique Boisvert
(Royal Holloway, University
of London, RHUL)



Ken Bloom
(University of Nebraska)



Mike Headley
(South Dakota Science and Technology
Authority, SDSTA / Sanford Underground
Research Facility, SURF)

- ★ **We cannot ignore the impacts of our research efforts on the broader world, as the broader world will decide if we are allowed to do this research.**
- ★ **Particle physics can have an outsized impact on the earth's climate and on the communities that host our research infrastructure.**

5 Contributed Papers

CEF07 Contributed Papers

Topical Group Report