

Community Engagement Frontier

Topical Group Working Topics

Applications & Industry

1. What could industry do to help HEP programs and missions?

- Develop new technological capabilities ripe for adaptation by HEP projects, facilities and instrumentation
- Continuously incubate and maintain a competent, efficient and cost-competitive vendors base in support of new HEP construction projects and upgrades
- Maximize the impact of SBIR program funded R&D in support of HEP programs and initiatives
- *Linked Topical Groups/Frontiers:*
- *LOI document: TBD*

2. What can HEP community do to help industry?

- Medical, industrial, communication, and security applications that benefit from HEP-funded R&D programs
- Industrial entities that sell products to HEP laboratories (scientific equipment, software, services, etc.)
- Provide guidance and programmatic support to businesses involved in HEP-funded SBIR program
- *Linked Topical Groups/Frontiers:*
- *LOI document: TBD*

Career Pipeline & Development

1. Career paths after HEP postdoc

Less than a third of the postdocs get hired into faculty positions. It is also known that due to this factor and other reasons, the young postdocs and PhDs seek employment outside academia. Some also go into academia but 4-year institutions with a risk of losing a continuation of their original research path due to a higher teaching load and being at a great disadvantage in getting guidance and competing for research funding compared to their peers at R1 type institutes. HEP experiments also provide hurdles (in terms of joining fees or authorship fees) to the hires at 4-year institutes. There is no door open for HEP alumni in industry to participate in HEP experiments in any capacity by design. HEP as a field should explore organised career guidance to the alternative jobs and sometimes supervisors may not have interest or knowledge of providing such guidance. In this way we can continue to attract new talent into our field.

- Skill Building for non-HEP career path: For a typical faculty/academic position, the job preparation process is more or less well established. However, when it comes to non-HEP jobs both the candidate as well as recommendation letter writer find themselves in an uncharted territory. It is clear that highlighting skills that industry is looking for in a job candidate must be highlighted in the CV but what are they and how to pen it in CV. Industry jobs may care to know additional skills like time management and strict time bound deliverables that our postdocs may not be equipped to evidence. The letter

recommendation letter writers, at the same time, need experience on how to cater their letter towards non-HEP jobs. HEP must develop and provide guidance in this direction.

- *Linked Topical Groups/Frontiers: PE*
- *LOI document: TBD*

2. Non-HEP career paths

Non-HEP career areas could be software providers, health sector, hedge funds, Wall Street or science journalists, writers, communicators or non-profit organisations where HEP skills of coding, data analysis, math, statistics, grasp of scientific process and complex problem solving ability come very much handy. However, besides personal or word-of-mouth contacts, an organised way of direct knowledge, requirements, networking or preparation for these jobs is non-existent. One advantage that HEP has over other physics research areas is a highly collaborative nature that can play to the advantage of seeing this as a common issue and its solution helping the entire field. The goal of this study is to identify ways to make the process of transition to industry jobs more smooth and obvious..

- *Linked Topical Groups/Frontiers: A&I*
- *LOI document: TBD*

3. Tools for better communication and bonding with HEP alumni

Tools and communication portals are prerequisites to streamline access to job opportunities and networking related especially to non-HEP job pools. Portals like linkedin do exist for employers and job seekers. However, one limitation that our alumni find is a direct and a central way to communicate with prospective job seekers from HEP, effectively and quickly. In addition, many job seekers working in HEP do not know contact information of alumni. Following the model of *inspire* database for HEP publications and *arXiv* for communicating physics results one could design alumni database for efficient networking. The goal of this study is to explore tools to achieve networking to facilitate non-HEP job process.

- *Linked Topical Groups/Frontiers:*
- *LOI document: TBD*

4. Brain drain and reverse

Even though two-third of postdocs go and work outside academia due to availability of less faculty positions but is there a trend beyond that to lose our highly skilled force to the industry for other reasons like salary / benefit issues, research funding challenges that may risk tenure after a 5-7 year period of being in a faculty position. Is there any way to retain these people? Can we absorb or attract folks in industry back into academia? For example the ones with technical skills in detectors and computing? Besides differences in salary, what do we need? An understanding of this could lead us to steps leading to an increase in the workforce needed to solve challenges in HEP projects.

- *Linked Topical Groups/Frontiers:*
- *LOI document: TBD*

5. HEP & Industry Partnership

With more job availability and possibility in the industry for our postdocs, could we be proactive in partnering with them in order to develop skills and profiles of our postdocs that industries are looking for and likely to employ? Given that our field has many spin offs, we could focus on those skills as a step board to getting industry jobs. Acquiring some of these skills might be more easy based at a national lab rather than at a university. Such a partnership could prepare

postdocs better for jobs. Also many technicians and engineers in industry who work for HEP projects (say bump bonding, Readout Chips, magnet parts) should also have a way of getting trained at the HEP lab to be able to do a better job for us and may work for us in future.

- *Linked Topical Groups/Frontiers: A&I*
- *LOI document: TBD*

6. Faculty at an Undergraduate Institution

Getting a faculty position at an undergraduate institution is highly attractive for postdocs who are passionate about teaching in addition to research continuation and could become a new norm. However, there are several challenges and some of them could be beyond the faculty to address. Due to the very nature of the job, commitment to teaching is a requirement. This means up to 12-credits per week of teaching load, leaving very little time to do research. Faculties find themselves in a tug of war where the intuition may not care for their research while they themselves work over time to fulfill research commitments, especially staying afloat in the first couple of years of actively seeking funding for research. Since there is no research group to guide the faculty they are left to fend for themselves. We must study in detail how to solve related issues collectively by working with experiments and funding agencies

- *Linked Topical Groups/Frontiers: PE*
- *LOI document: TBD*

7. Disadvantage and bias seeking a job

While there are different job possibilities for the postdocs with its related challenges, some set of postdocs could be at a greater disadvantage than others for any job possibility. This could be due to their ethnic backgrounds or language skills which in turn could impact their networking skills. For example, some postdocs who do not have a degree from a US institution may not have a local support group that one acquires during formative years of the academic path, say a PhD supervisor. In addition, they could have a language accent or other hindrance that may not allow them to “fit in” or “gel in”. In addition, factors like gender or color bias do not respect any national boundary. How can we work towards diluting if not eliminate these factors?

- *Linked Topical Groups/Frontiers: D&I*
- *LOI document: TBD*

8. Training Techs and Engineers from industry who work for HEP projects

Scientific staff, technicians and engineers in industry who work for HEP projects (say bump bonding, Readout Chips, magnet parts, microwave or laser systems development) should also have a way of getting trained at the HEP lab to be able to do a better job for us and may get employed for us in future for love of science or other reasons.

Unlike graduate students and postdocs, who gets exposed to the state-of-the-art training in their fields by attending conferences, or participating in academic exchanges and internship programs, the industrial engineers and technicians involved in HEP-relevant projects, as a rule have much more limited exposure to networking with their peers outside of their place of work. This is particularly the case in the equipment manufacturing industry, where it takes a long time to train new technicians, and such trained technicians usually don’t move around too much. Thus the applied skill-sets pool becomes very static and granular across the entire community.

It could be beneficial to initiate an “internship-like” HEP program that cultivates networking, apprenticeship, and continuous education of engineers, technicians, machinists and other skilled non-scientist professionals, whose continuous contributions are critical to the long-term sustainability of the cutting-edge scientific infrastructure and experimental programs in the

US. Such training and exchange programs would add dynamism to these job positions, and attract more talent into the field. A possible program could be centered at National Laboratories, and be partially supported by the industrial companies involved.

- *Linked Topical Groups/Frontiers: A&I*
- *LOI document: TBD*

Diversity & Inclusion

1. Accessibility

- Amount of demands
 - i. deaf/hard of hearing
 - ii. language barriers
 - iii. Physical accessibility of venues
 - iv. Financial barriers
 - v. <https://docs.google.com/forms/d/1hdCJlp80A7D5783BZ0Zf2CJ8NtkPs9dXXzQ9Sk96fo/edit>
 - vi. Collaborative Tools
 1. This is spurred by the zoom stuff, but can also cover the use of google, etc.
- Existing solutions (AI, human transcribers, etc)
- Cost bearing responsibility
- *Linked Topical Groups/Frontiers:*
- *LOI document:*
 - i. *Deaf/HoH :*
https://docs.google.com/document/d/1a_Xqcl7r76Vo_Mjirxdzd_1fPoyHWqyV2m8wCdU38YA/edit

2. Building the pipeline

- Career training for success (imposter syndrome, dealing with discrimination/harassment etc)
 - i. From the survey :
 1. A major part of success in academia comes down to confidence. A sense of belonging, competence, etc, that is as much about attitude as it is about actual physics skills (for want of a better word), if not more. This is why the feeling of competence usually doesn't gradually, but rather as a watershed moment (indicating a perspective shift). This is true in my own experience and from what I've asked around.
 2. Imposter Syndrome, which can affect the academic experience to various degrees, is a problem among students, and especially among underrepresented minorities.
 3. Are there ways to encourage institutions to include DEI activities as a part of tenure/performance reviews so that time spent on them has equal value to other contributions?
- *Linked Topical Groups/Frontiers: PE, CP&D*
- *LOI document:*

3. Recruitment, Evaluation, and Recognition with the Goal of XYZ

- Transparency and protocol
- Best practices in student admission, faculty hiring with the *goal* of creating diversity
- Faculty hiring: two body opportunities
- Best practice in proposal evaluation
- Awards, speaker selections
 - i. <https://snowmass2021.slack.com/archives/C012TR0AF8D/p1593021971317600>
- From the survey
 - i. I hope the community can start a discussion about the correlation between the strong power dynamics between senior and junior scientists and its impact on diversity/inclusion. I'm a female postdoc and am being bullied severely by my postdoc mentor. Yet, because of how important his recommendation letter/his verbal support is for my application, I have no way to stand up to him, even though plenty of other people in my field tell me that I do great work. I talked to quite a few other female postdocs or young female faculty and a lot had similar things happening to them. Working with the mentor makes me want to quit physics, and I don't easily see a way to stay in physics, be successful, and not want to cry every day because of the bully.
 - ii. Issue: How do we establish an accountability system that properly reward people that have done good deeds for advancing the diversity in the field, and also hold people accountable for their harmful/abusive behaviors (e.g., making sexist/racist remarks, or harassments, or being abusive to under-represented minorities or early career scientists)? It seems that rewards for diversity and inclusion advocacies hasn't been prominent enough that inspires the whole field to model after such practices. Meanwhile, although academics sometimes are able to hold people accountable for severely bad behaviors (e.g., sexual assaults), reporting/investigation systems are often in-sufficient to deal with less severe forms of bad behaviors (e.g., gas-lighting, microaggressions at conferences, implicit biases in selection panels), especially in collaboration projects that collaborators are not from the same institutions.
- *Linked Topical Groups/Frontiers: PE, CP&D*
- *LOI document:*

4. Resource Issues and Recommendations for Funding Agencies

- Resources
 - i. fellowships and grant opportunities for underrepresented groups
- Policy
 - i. diversity requirement
 - ii. code of conduct enforcement/accountability
- Best practices in proposal evaluation (overlap w/ Topic 3)
- Structure to make recommendations to government agencies beyond just advocating funding
- Comparative analysis of collaborations and labs
 - i. Compare the diversity statements
 - ii. Compare the types of committees/panels (i.e. it's not clear that CERN has a diversity committee like the experiments do)
 - iii. How are statistics on diversity collected in various organizations
- Financial Barriers to Entry
 - i. How can HEP be done with no money?

- From the survey :
 - i. I feel like if we put some thought into it, we should be able to come up with strategies/practices/recommendations that individual experiments, university departments, self-organized student groups can do to boost students' confidence and self-assuredness. A publicly available resource on these recommendations can go long way in improving equity.
 - ii. This came up in a Snowmass Early Career forum (so is not my idea), but I am expanding on it here. There was the suggestion that we provide guidance to the funding agencies on specific guidelines for diversity, equity, and inclusion for grants. There is a general feeling that there are requests to be diverse, but no specific guidelines or requirements. These could include things like guidance on codes of conduct, including minority serving institutions in collaborations, implementing mentorship programs within collaborations, etc.
- From slack :
<https://snowmass2021.slack.com/archives/C012TR0AF8D/p1591373369171100>
- *Linked Topical Groups/Frontiers: PPGE*
- *LOI document:*
 - i. From astro : <https://arxiv.org/abs/1907.13202>
 - ii. From astro : <https://arxiv.org/abs/1907.13172>

5. Climate

- Education to bring awareness
 - i. from the survey : I noticed that awareness and best practices for diversity and inclusion are often self-acquired in later stages of career development -- undergrad students and grad students at early stages usually have not gathered much awareness of the issues or better practices. This can be especially hard for faculties and postdocs in the under-represented categories working with them (students may make sexist/racists comments, or do not give sufficient respect to their URM mentors/supervisors). I've also seen students that role model after people that are not good at inclusive practices, because they don't know what good practices look like.
 - ii. I think it could be nice if raising awareness and practicing best practices for diversity and inclusion at the beginning of students' research experience, e.g., making such classes/lectures a mandate for grad students in the first year.
- How to build inclusive communities
- Effective committees, recognition for DEI efforts
- Rectifying effects of power dynamics
- Official climate in terms of code of conduct
 - i. Enforcement, accountability
 - ii. Rectifying effects of power dynamics
 - iii. From slack :
<https://snowmass2021.slack.com/archives/CRABV81CG/p1586285489004600>
 - iv. <https://frameshiftconsulting.com/code-of-conduct-book/>
- Training for leadership
 - i. <https://snowmass2021.slack.com/archives/CRABV81CG/p1575544582006600>
 - ii. This has been done at CERN but not focused on diversity
- Non-Americans in US Physics
 - i. Things like the executive order

- ii. Discussing sensitive topics with chinese collaborators
 - iii. From the survey
 - 1. Nationality as a limiting factor to high energy careers and seeking positions in specific geographical locations. Alternative to marital status for couples in long-term relationships without marrying
- “Microaggressions” - I didn’t know I am biased
 - i. Overlaps with CoC
 - ii. Could serve as example for HEP-specific examples
 - 1. <https://snowmass2021.slack.com/archives/CN7UPSM7U/p1582836781011300>
- *Linked Topical Groups/Frontiers: PE&O, PP&GE, SEC*
- *LOI document:*

6. Under-represented communities

- Black
- Latino
- Women
- LGBT+
- How do these communities participate uniquely in particle physics?
- *Linked Topical Groups/Frontiers:*
- *LOI document:*

7. Lifestyle and Personal Wellness

- What is a “work week” anyhow?
- Work life balance/respecting boundaries (i.e. weekends/vacation)
- Families - maternity/paternity leave, working with children
 - i. <https://snowmass2021.slack.com/archives/C012TR0AF8D/p1590406800011700n>
- Working in different timezones
- COVID-19
- Mental Health
 - i. how does the effects of other things impact you and feed into mental health
- *Linked Topical Groups/Frontiers: PE&O, PP&GE, SEC*
- *LOI document:*

8. How to “deal” with “Crackpots”

- slack : <https://snowmass2021.slack.com/archives/CQ43C26JE/p1590076174060400>
- *Linked Topical Groups/Frontiers: PE&O*
- *LOI document:*

9. Educational resources for DEI

- How should I educate myself? [resource list]
 - i. This could be the “laundry list” of resources that is basically a union of the references in all other documents
 - ii. Could curate it by priority and then it provides a “GoTo” for advisors to give to their graduate students
 - iii. This supports the “climate” topic, but gets directly at the point of what resources exist that are not produced by us

- iv. Example here - <https://www.shutdownstem.com/action>
- I'm Organizing a Conference/Workshop, What should I do?
 - i. <https://snowmass2021.slack.com/archives/C012TR0AF8D/p1590527733110700>
 - ii. requested here - <https://snowmass2021.slack.com/archives/C012TR0AF8D/p1592857724274800>
 - iii. Many resources - <https://snowmass2021.slack.com/archives/CQ43C26JE/p1587571787009800>
 - iv. <https://snowmass2021.slack.com/archives/CQ43C26JE/p1589732435056400>
- Playbook on Increasing DEI in my Group
- *Linked Topical Groups/Frontiers: PE&O*
- *LOI document:*

10. Societal Impacts of Science Projects

- Environmental impact of in person conferences
 - i. <http://hiltner.english.ucsb.edu/index.php/ncnc-guide/>
- Harsh gasses in experiments (ATLAS TRT gas leaks)
- Indigenous lands
- From slack
 - i. <https://snowmass2021.slack.com/archives/CQ43C26JE/p1576529188003300>
 - ii. <https://snowmass2021.slack.com/archives/C012TR0AF8D/p1592314333213000>
- Ethical implications of algorithm development and its intersections with scientific computing and physics
 - i. Proposed by Brian on slack - <https://snowmass2021.slack.com/archives/CN7UPSM7U/p1573657008019600>
- From astro : <https://arxiv.org/abs/1908.02822>
- *Linked Topical Groups/Frontiers: PE&O, PP&GE*
- *LOI document:*

Physics Education

1. Particle Physics Instruction at Undergraduate and Graduate Levels

Successful training of research scientists requires significant preparation in particle physics at the graduate level. To engage students early, strong undergraduate course development emphasizing particle physics would be advantageous. This study will survey and assess the current state of particle physics preparation at the undergraduate and graduate levels with the aim of strengthening the overall teaching of the subject across R1 institutions and USIs.

- Study and assessment of particle physics at the undergraduate level
- Survey and assessment of particle physics at the graduate level
- *Linked Topical Groups/Frontiers: CP&D, D&I....all the F's including TF, CF, AF, IF*
- *LOI document:* [Projects-doc-6845](#)

2. Study of Mathematical Preparation for Physics Students and Particularly for Those Interested in Particle Physics

To be successful research scientists requires significant preparation in mathematics at the high school, undergraduate and graduate levels. This study will survey and assess the current state of mathematics preparation, particularly in areas of applied mathematics and

statistics which are central to the understanding of the physical significance of scientific results, as well as assessment of preparation for new techniques for data analysis, simulation and event reconstruction.

- Study and assessment of mathematics preparation at the middle school and high school levels as a means of attracting students to physics and strengthening their preparation for high school physics as well as engineering and technology careers.
- Survey and assessment of mathematics preparation for undergraduate degrees in physics and technology. This includes both R1 institutions and USIs.
- Assemble and make available a repository of course and lecture materials that could be shared among institutions.
- Survey and assessment of mathematics preparation for graduate students.
- Advanced mathematical opportunities for postdoctoral fellows and faculty and research staff.
- *Linked Topical Groups/Frontiers: PE&O, A&I, D&I, CP&D...all the F's including TF, CF*
- *LOI document: Projects-doc-6842*

3. Coherent Vision for Enabling Software Training in HEP

Software skills are an integral part of the toolkit of any successful HEP experimentalist. And maximizing the science from the hardware investments in current and future projects relies critically on it. It is also a skillset that is transferable in case of non-HEP career evolution of people trained in HEP.

Though software training is now key in many research fields, most users learn software skills only after joining a research program. Individual universities do not uniformly provide such training to students, prior to their beginning their Ph.D. research. Many domain-specific aspects add challenges to the learning process. Embarking on a HEP-specific path presents its own experiment-specific software environment challenges. No one size fits all while imparting related trainings.

A possible solution in HEP is to exploit our large-scale community structure and organize training within our research domains. Efforts like IRIS-HEP, FIRST-HEP and HEP Software Foundation have taken strong and effective steps in this direction and impart training to those within the field and ancillary fields. Snowmass can play a role in bringing together a focus on these efforts to foray into sustainability and scalability and initiate learning early on in the process of preparing a software-equipped future particle physicist.

- *Linked Topical Groups/Frontiers: all the F's...and clearly CF...*
- *LOI Document: Projects-doc-6854*
 - *From astro : <https://arxiv.org/abs/1910.08376>*

4. Study of New Mechanisms for Faculty Collaboration across Academia

The field of Particle Physics has successfully brought many young researchers through the post-doctoral ranks, at which time these individuals are then searching for more permanent positions in academia, National Laboratories and in the private sector. In the domain of academia, many may consider positional opportunities at R1 universities as well as other institutions including undergraduate-serving colleges and universities as well as community colleges. For those seeking these latter positions, the potential exists to attract a broader geographic and demographic base of students to the particle physics field, and this affords the possibility of strengthening the participation of underrepresented groups in the particle physics research program. Engaging those teaching at undergraduate institutions in front-line particle physics research will strengthen our academic workforce.

- A needs analysis to assess the needs of faculty at such undergraduate institutions in order for them to be successful in conducting vibrant research programs, whilst maintaining a significant teaching load characteristic of such institutions.
- Survey of institutional collaborations of Undergraduate Serving Institutions (USI) with R1 and laboratory groups that have proven successful so far, to assess lessons learned.
- Study of new models of collaboration or cooperation that would allow USI faculty and their students to collaborate in demonstrably effective ways in experiments - to be effective leaders, rather than simply being regarded as followers.
- Survey of R1 institution and research laboratory physicists who might share an interest in collaboration with USIs.
- *Linked Topical Groups/Frontiers: CP&D, D&I, PE&O, A&I....all the F's*
- *LOI Document: Projects-doc-6839*

5. Study of the Potential for a new Masters Degree in Applied Physics

The field of Particle Physics has successfully brought many young researchers through the post-doctoral ranks, but the process is not necessarily providing meaningful opportunity for participation from broader demographic and geographic groups. To ameliorate and perhaps help correct this situation, a Master's Degree in Applied Physics is proposed with the aim of providing an advanced degree beyond bachelors level that would provide for a meaningful career path for students into a technological career in laboratories or the private sector, as well as the prospects for a springboard for those who find a PhD degree is possible, once they are engaged in such a program.

- A needs analysis to assess the value and chances of success of such a program.
- Compare such a program with current models of Masters Degrees in engineering and MBA degrees.
- Would the private sector buy in and support such a degree opportunity for current students and for their employees seeking career improvement.
- Would such a degree provide training opportunities for those seeking technical careers at laboratories in our field or elsewhere or perhaps medical fields.
- What is the curriculum for such degree(s) and could they be made available nationwide through shared curriculum?
- Would universities and USIs buy-in to such programs?
- *Linked Topical Groups/Frontiers: A&I, CP&D, D&I, PE&O...all the F's*
- *LOI Document: Projects-doc-6848*
 - *From Astro : <https://arxiv.org/abs/1909.02103>*

Public Education & Outreach

1. Why do we do outreach?

- *Linked Topical Groups/Frontiers:*
- *LOI document:*

2. Training and Resources

- Inspiration from astro : <https://arxiv.org/abs/1910.14088>
- *Linked Topical Groups/Frontiers:*
- *LOI document:*

Public Policy & Government Engagement

1. **Federal government engagement re: HEP funding:** Expand scope around annual DC Trip
 - Expand community member database (WHIPS). How representative have the delegations been historically? Are there barriers preventing good communicators from participating?
 - Engage in advocacy outside of the one-week trip each Spring? Engage a wider swath of the community at a lower level of effort (e.g. sending a few letters) concurrent with in-person trip by “champions”?
 - *Linked Topical Groups/Frontiers:*
 - *LOI document:*
2. **Federal government engagement re: Other issues:** (How) should the HEP community advocate for non-funding public policy. e.g. legislation re: immigration policy; diversity in STEM
 - Mechanics for that. Do we utilize the toolkit developed for funding advocacy? Do we advocate as the HEP community, or do we instead direct HEP community members to existing APS tools, for example?
 - Who decides that a legislative issue is important to the HEP community at large? And, important enough that members of the community should be encouraged to contact Congress *as a member of the HEP community*
 - *Linked Topical Groups/Frontiers: D&I?*
 - *LOI document:*
3. **Other group engagement**
 - State government engagement
 - i. Should we be in the business of engaging government at levels below the federal?
 - International government engagement
 - i. Should we be in the business of engaging government at levels above the federal?
 - Additional coordinated engagement with federal funding agencies, DOE, NSF
 - i. Changes and feedback on grant criteria
 1. Does the current breakdown of research/outreach/inreach/community engagement reflect what the community wants. Do we want a uniform approach from NSF and DOE?
 2. The agencies follow the recommendations of P5, but traditionally those recommendations have not extended beyond research. Does the community want to build in recommendations in areas such as outreach.
 3. How much flexibility do the agencies have, how much is legislated? Do we also need congressional outreach in this area.
 - ii. Changes and feedback on comparative review
 - Is there an avenue to modify grant criteria? Grant applicants are (implicitly or explicitly) discouraged from Including outreach/inreach/community engagement as part of their proposals, particularly DOE. (NSF enables this to some extent currently, if the PI happens to be doing the “right” kind of outreach.) Outreach/education is not a priority of the DOE, whereas at NSF it nominally helps your grant application scoring. How did

this come to be at NSF? NSF includes workforce training -- that's how we ended up with the broader impact component of the grant application process.

- i. Do the funding agencies have the flexibility to adjust their granting process?
Does this need to be achieved through legislation?
 - ii. What role does P5 play in this process? Clearly P5 provides guidance to the funding agencies for planning research, but if P5 said "we should encourage PIs to participate in outreach", does that help e.g. the DOE enable that?
- Additional communication with the executive branch, eg OMB, OSTP
 - *Linked Topical Groups/Frontiers:*
 - *LOI document:*

4. Advocacy 'outward' training for HEP community members

- Advocacy training is focused on core group of "champions" that visit DC each Spring. Other community members aren't given resources by the HEP community to engage in advocacy on behalf of the HEP community or otherwise
- *Linked Topical Groups/Frontiers: PEO*
- *LOI document:*

5. Advocacy 'inward' awareness within HEP community

- Education about existing advocacy efforts by/for the HEP community; why it's important
- *Linked Topical Groups/Frontiers: PE*
- *LOI document:*

6. Engagement of industry to support HEP funding

- *Linked Topical Groups/Frontiers: PE*
- *LOI document:*