Letter of Intent for Snowmass2021: CommF4 Physics Education Working Group

CEF4 LOI-6: Preparing and Educating the Research Community and the Public for Particle Physics over the next two decades (2021-2040)

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Abstract:
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. Trained in this manner however, the demographics of the research community is highly selective and generally exclusionary of participation by underrepresented minority and female students, to the potential detriment of society in general and the particle physics field specifically. The next two decades of the Snowmass 2021 vision afford an opportunity to review the challenges and develop strategies to correct the disparities and transform the particle physics field into a stronger and more diverse ecosystem of talent, expertise and public-minded support. Working together across the various groups of the Community Engagement Frontier and the Scientific and Technical and Computation Frontiers of the Snowmass2021 Community Self-study, the community can understand and project the person-power needs of the field in terms of students, physicists, and technical, analytical, and managerial expertise on an annual basis – AND – the societal benefits that could be acquired through this process.

Content:
Among the facets of this proposed study:

1. Needs Assessment of the Community: Work with the various research and technical frontiers to develop projections of their person-power and educational needs on an annual basis over the next two decades.
2. Needs Assessment of the Education Process: Review of teaching at all levels – particularly transition points between education levels – where “transmission coefficients” of students are low and develop ideas to improve these circumstances. Understanding these are particularly important to increasing the participation of underrepresented groups in the field.
3. Model Development to Guide Community Planning: Engage with AIP and APS who follow the education process of younger students upward through schools to develop statistical models of what currently is the situation and how it might be improved, not only to the benefit of particle physics, but also the broader