

Letter of Intent for Snowmass2021: CEF4 Physics Education Topical Group

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

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Abstract:

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.

Content:

Among the facets of this proposed study:

1. 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.
2. Survey and assessment of mathematics preparation for undergraduate degrees in physics and technology. This includes both R1 institutions and USIs.
3. Assemble and make available a repository of course and lecture materials that could be shared among institutions.
4. Survey and assessment of mathematics preparation for graduate students.
5. Advanced mathematical opportunities for postdoctoral fellows and faculty and research staff.