

## Perspective on a Unified U.S. Particle Physics Program

HEP finds itself at a most interesting time exploring energy and matter at its deepest level. There is more today that we do not understand about the universe than before and the community is bubbling with new ideas that have the potential to drive a new revolution. Currently, however, the field is dominated by mega-projects that leave little room for a broad spectrum of experimental research. The scientific merit of these large projects is unquestioned. HEP, however, stands to gain tremendously by exploiting non-traditional high-energy facilities to complement and expand its research portfolio. For example, ORNL has been developing the utilization of its neutron facilities for fundamental neutrino science. PROSPECT at HFIR and COHERENT at the SNS have demonstrated that these facilities can deliver world-class neutrino science. Searches for free neutron oscillations at these facilities provide unique opportunities to study other symmetry breaking mechanisms that are complementary and necessary to complete the picture of the fundamental interactions.

An inclusive approach both to the science program and to the development of facilities will allow for significant benefits. Two non-HEP accelerator projects, the proton power upgrade at ORNL, delivering a 2.8MW proton driver in 2025, and the EIC, are projects that can inform the future HEP research program. At ORNL a muon storage facility is being considered as a probe for materials studies and could provide a new source of muons for fundamental physics studies. The Material Plasma Exposure experiment will study materials in extreme radiation environments that could inform targetry for multi-megawatt neutrino sources.

A balanced program consisting of a mix of small and large projects is required for a healthy, broadband high energy physics program. Various opportunities will be identified to complement and strengthen a future high energy physics program for the community to embrace in its upcoming planning exercise.

### Primary frontier topic

General

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