

The Neutrino Laboratory at the Spallation Neutron Source

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The first observations of coherent elastic neutrino nuclear scattering (CEvNS) on multiple nuclei were recently made by the COHERENT experiment at the Spallation Neutron Source at the Oak Ridge National Laboratory. This basic interaction now lays the foundation for a new era in developing compact neutrino detectors as well as a new probe of physics topics including electromagnetic properties, searches for physics beyond the standard model, and nuclear form factors. The Spallation Neutron Source is ideally suited for not only CEvNS studies but also a broader set of high-precision neutrino physics measurements and dark matter searches due to the accelerator's intensity, pulsed structure, and proton-beam energy. We present an overview of the compelling scientific opportunities in particle physics enabled by proton power upgrades now underway and a future upgrade of a new target facility at the SNS.

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