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Neutrinos are Everywhere: Towards a New Understanding of the Quantum Universe

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Neutrinos are the most numerous matter particles in the universe, but the least understood. The peculiar properties of neutrinos suggest connections to many of the big mysteries of particle physics, including the possibility that the matter we are made of originated from neutrinos. Today a host of new experiments are trying to unlock the secrets of these elusive particles. Fermilab is gearing up to produce a megawatt proton beam neutrino source capable of sending high energy neutrinos to giant liquid argon detectors located 1300 kilometers away and a mile underground in South Dakota. The detectors will be built and operated by a newly formed scientific collaboration called DUNE (for Deep Underground Neutrino Experiment), a global effort of 145 universities and labs from 26 countries. DUNE will be the first truly international mega-science project hosted in the U.S., and a game-changing experiment for neutrino science.