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Detecting Long Baseline Neutrinos in the NOvA Experiment

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The NOvA Collaboration is building a massive tracking liquid-scintillator calorimeter at a location in North-eastern Minnesota, which is 14 mrad off-axis of a high power muon neutrino beam (NuMI) originating 810 km away at the Fermi National Accelerator Laboratory (near Chicago), for the purpose of recording the appearance of electron neutrino events. The principle goals are in comparing neutrino events in a near and far detectors to establish electron neutrino appearance and a non-zero neutrino mixing angle θ_{13} , thus observing CP violation in neutrinos and resolving the neutrino mass hierarchy. Other important oscillation parameters will be recorded to improve knowledge of this phenomena. This calorimeter will be sensitive to supernova neutrinos. Building such a detector is not without challenges. In this talk we discuss the physics goals, describe the detecting components, and provide a status report on its installation and operation.

Reference: <http://www.umn.edu/~demuth/nova/>

for the collaboration

NOvA Collaboration: <http://www-nova.fnal.gov>

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