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Studying neutrinos with DUNE

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The Deep Underground Neutrino Experiment (DUNE) is a near-future neutrino oscillation experiment in the U.S.A. consisting of a high-intensity neutrino beam produced and characterized at Fermilab, Illinois before it travels 1300 km to reach the DUNE Far Detector site in SURF, South Dakota. The DUNE experiment features a wide range of neutrino beam energies, long baseline length, and excellent energy resolution with the novel Liquid Argon Time Projection Chamber (LArTPC) technology for the Far Detector.

In this talk, I will first give an overview of the primary physics program of DUNE. The program includes precision measurement of neutrino oscillation to measure the PMNS matrix, resolve the neutrino mass ordering problem, and study CP violation in the leptonic sector. Furthermore, DUNE will also search for proton decay and detect neutrinos from supernova core collapse in our galaxy. I will also briefly summarize the current status and timeline of the experiment.

Lastly, I will give an overview of my work on ProtoDUNE, the far detector prototype program at CERN, aimed at developing and testing the necessary technology required for building the four 17 kt LArTPC modules planned for the DUNE Far Detector.

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