



Physics Colloquium



Tuesday, November 12, 2019, 3:30PM in SC 10

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Tracing the Neutrino with Liquid Argon Detector Technology

Neutrinos are the most elusive fundamental constituents of matter. And yet these particles may hold the key to exotic new phenomena, which transcend our Standard Model of particle physics. In the last several decades neutrino oscillation experiments have given us a consistent picture of neutrino mass and mixing among three neutrino flavors. However, fundamental questions about the nature of the neutrino and matter itself remain unanswered. In addition, a series of longstanding and more recent anomalies hint at the existence of additional “sterile” neutrino flavors and complicate this simple picture. In order to improve on the previous generation of neutrino oscillation experiments, new detector technologies are required. Liquid Argon time projection chambers (LArTPCs) promise to have the sensitivity and scale needed to chart this new territory. MicroBooNE is the first of three LArTPC detectors planned for the newly re-established Short Baseline Neutrino program at Fermilab built to address the sterile neutrino hypothesis and to develop the technologies and expertise necessary to deploy multi-kiloton-scale LArTPCs for future long baseline neutrino oscillation experiments, such as the Deep Underground Neutrino Experiment (DUNE). In this talk, I will present recent results from the MicroBooNE experiment along with future prospects for DUNE, the first truly international megascience project hosted on U.S. soil.

Refreshments at 3:00PM in SC 103