

Noble Dreams: Neutrinos, Liquid Argon, and the Ultimate Experiment

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Abstract

A remarkable amount of progress has been made in the development of Liquid Argon Time Projection Chamber (LArTPC) technology for the study of neutrinos in the past ~ 15 years. In particular, the domestic program to use these detectors has moved from small-scale strictly R&D efforts to fully-realized scientific collaborations whose results are pushing the boundaries of what we know about neutrinos. In this seminar I will highlight some of the critical developments, in terms of both technology and neutrino physics measurements, that have occurred with LArTPCs. In particular, I will emphasize recent work in reconstructing low-energy (< 50 MeV) activity in a LArTPC and discuss the analysis opportunities this presents. I will then focus on the upcoming Deep Underground Neutrino Experiment (DUNE), which will be the culmination of all of this LArTPC technology development and will deploy multiple building-size detectors in an abandoned gold mine in South Dakota, offering the possibility for transformative discoveries with neutrinos and beyond.