Argonne NATIONAL LABORATORY

PHY Seminar

Physics Division Seminar

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The Deep Underground Neutrino Experiment

Host: Paul Reimer

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Neutrinos provide a promising window to probe a wide range of fundamental physics. Neutrino related discoveries in the last two decades indicate that the answer to the most sought after question of why we live in a matter-dominated universe maybe within reach. The Deep Underground Neutrino Experiment (DUNE) is a long baseline neutrino oscillation experiment at Fermilab with primary goals of resolving the neutrino mass hierarchy and measuring the charge-parity violating phase, the indicator of a possible explanation for our matter dominated universe. DUNE will use the promising liquid argon time projection chamber technology as it provides exceptional tracking and calorimetric capabilities along with high-resolution imaging of the particles produced by neutrino interactions. However, the path to DUNE is technologically very challenging as it will be the biggest, most intense neutrino experiment ever to be built. This talk will describe the DUNE experiment, its current status and physics program. A near term program of DUNE prototypes is also described along with highlighting some of the challenges involved in constructing and operating a multi-kiloton scale experiment like DUNE deep underground.