

Physics Colloquium

Monday, March 25, 2019 / Pupin Hall Theory Center, 8th Floor / 12:30 PM

Lunch will be available for attendees

"Unlocking the Mysteries of Neutrinos with the Deep Underground Neutrino Experiment"

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. Although more than a trillion of neutrinos pass unnoticed through our bodies every second, they still remain largely mysterious. These ghostly little particles are notoriously difficult to detect given how rarely they interact with matter and require building immense and exquisitely sensitive detectors. The Deep Underground Neutrino Experiment (DUNE) is a long baseline neutrino oscillation experiment at Fermilab and South Dakota with primary goals of resolving the neutrino mass ordering and measuring the charge-parity violating phase, the indicator of a possible explanation for our matter dominated universe. However, the path to DUNE is technologically very challenging as it will be the biggest, most intense neutrino experiment ever to be built. After briefly reviewing the current state of neutrino physics, open questions and recent results from accelerator-based neutrino oscillation experiments, this talk will describe the DUNE experiment along with the rich physics that it offers and highlight some of the challenges involved in realizing such an experiment.

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