

AG-66

Lecture Theatre

JUNE 06,

4 pm



**ASET -TIFR
Colloquium**

**Unlocking the Mysteries of the Universe
with the
Deep Underground Neutrino Experiment**

Abstract

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 may be 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. DUNE will use the promising liquid argon time projection chamber (LArTPC) technology as it presents neutrino interactions with unprecedented detail. However, the path to DUNE is 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 and open questions, this talk will describe the DUNE experiment along with the rich physics that it offers and highlight some areas where new collaborations are being sought.



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