

## **The Deep Underground Neutrino Experiment - DUNE: the precision era of neutrino physics**

*Sunday, 7 May 2017 11:00 (30 minutes)*

The last decade was remarkable for neutrino physics. In particular, the phenomenon of neutrino flavor oscillations has been firmly established by a series of independent measurements. All parameters of the neutrino mixing are now known and we have elements to plan a judicious exploration of new scenarios that are opened by these recent advances. With precise measurements we can test the 3-neutrino paradigm, neutrino mass hierarchy and CP asymmetry in the lepton sector. The future long-baseline experiments are considered to be a fundamental tool to deepen our knowledge of electroweak interactions. The Deep Underground Neutrino Experiment –DUNE will detect a broad-band neutrino beam from Fermilab in an underground massive Liquid Argon Time-Projection Chamber at an L/E of about  $10^3$  km / GeV to reach good sensitivity for CP-phase measurements and the determination of the mass hierarchy. The dimensions and the depth of the Far Detector also create an excellent opportunity to look for rare signals like proton decay to study violation of baryonic number, as well as supernova neutrino bursts, broadening the scope of the experiment to astrophysics and associated impacts in cosmology. In this presentation, we will discuss the physics motivations and the main experimental features of the DUNE project required to reach its scientific goals.

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