



Contribution ID: 118

Type: **not specified**

The DUNE Science Program

The international collaboration designing and constructing the Deep Underground Neutrino Experiment (DUNE) at the Long-Baseline Neutrino Facility (LBNF) has developed a two-phase strategy for the implementation of this leading-edge, large-scale science project. The 2023 report of the US Particle Physics Project Prioritization Panel (P5) reaffirmed this vision and strongly endorsed DUNE Phase I and Phase II, as did the previous European Strategy for Particle Physics. The construction of DUNE Phase I is well underway. DUNE Phase II consists of a third and fourth far detector module, an upgraded near detector complex, and an enhanced > 2 MW beam. The fourth FD module is conceived as a 'Module of Opportunity', aimed at supporting the core DUNE science program while also expanding the physics opportunities with more advanced technologies. The DUNE collaboration is submitting four main contributions to the 2026 Update of the European Strategy for Particle Physics process. This submission to the 'Neutrinos and cosmic messengers', 'BSM physics' and 'Dark matter and dark sector' streams focuses on the physics program of DUNE. Additional inputs related to DUNE detector technologies and R&D, DUNE software and computing, and European contributions to Fermilab accelerator upgrades and facilities for the DUNE experiment, are also being submitted to other streams.

Authors: SOREL, Michel (IFIC); BERTOLUCCI, Sergio (Universita e INFN, Bologna (IT)); GOLLAPINNI, Sowjanya (Los Alamos National Laboratory (US))