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The DUNE Experiment: Status and Physics Prospects

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The Deep Underground Neutrino Experiment (DUNE) is a next-generation long-baseline neutrino experiment that will address key open questions in neutrino physics. A powerful >2 MW wide-band beam from Fermilab will be directed to a 40-kiloton liquid argon time projection chamber (LArTPC) far detector 1,300 km away in South Dakota, enabling an unambiguous determination of the neutrino mass ordering and a precise search for CP violation. DUNE will be deployed in two phases: in the first phase, two LArTPC modules will be installed —one using horizontal-drift and one vertical-drift technology—both validated through full-scale prototypes at CERN. The near detector complex will precisely characterize the unoscillated neutrino flux and constrain systematic uncertainties. This contribution will present the experiment's current status and its physics prospects. DUNE also offers unique sensitivity to supernova and solar neutrinos. Installation begins soon, with physics data taking expected in 2030.

Collaboration you are representing

DUNE

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