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DUNE: science and status

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The Deep Underground Neutrino Experiment (DUNE) is a next-generation long-baseline neutrino oscillation experiment. Its primary goal is the determination of the neutrino mass hierarchy and the CP-violating phase. The DUNE physics program also includes the detection of astrophysical neutrinos and the search for beyond the Standard Model phenomena, such as nucleon decays. DUNE will consist of a near detector complex placed at Fermilab, several hundred meters downstream of the neutrino production point, and 17-kton Liquid Argon Time Projection Chamber (LArTPC) far detector modules to be built in the Sanford Underground Research Facility (SURF), approximately 1.5 km underground and 1300 km away. The detectors will be exposed to a wide-band neutrino beam generated by a 1.2 MW proton beam, with a planned upgrade to 2.4 MW. Two prototypes of the FD technology, the ProtoDUNE 700 ton LArTPCs, have been operated at CERN for over 2 years, and have been recently optimised to take new data in 2024-2025. Additionally, the 2x2 Demonstrator, a prototype of the LAr component of the near detector, has recently started operations in the NuMI beam at Fermilab. This talk will present the science programme, as well as recent progress of DUNE and its different prototyping efforts.

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