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Prototyping the world's largest liquid argon TPC: ProtoDUNE Single Phase

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Neutrino physics are a rich field of research with many unanswered questions. To continue exploring this field, liquid argon TPCs (LArTPC) are becoming increasingly popular because of their many advantages over other detector technologies. One of the largest future long-baseline neutrino oscillation experiments, DUNE, aims to build 4 x 10kt LArTPCs as its far detector. ProtoDUNE-SP is the single-phase DUNE Far Detector prototype that was built between Dec. 2015 and Jun. 2018 and is currently operating at the CERN Neutrino Platform. This experiment is a crucial part of the effort towards the construction of the first DUNE far detector module and is a significant experiment in its own right. With a total liquid argon mass of 0.77 kt, it is the largest monolithic single-phase LArTPC detector built to date. It has currently finished cumulating data from a new dedicated charged-particle test beamline at CERN and will continue running with cosmic data. Through the journey of the construction and activation of ProtoDUNE SP, we will explore how DUNE's goals can be reached.

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