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Title: Unlocking the Mysteries of the Universe with Neutrinos

Abstract: Neutrinos provide a promising window to probe a wide range of fundamental physics. Although more than a trillion of neutrinos pass unnoticed through our bodies every second, they still remain largely mysterious. These ghostly little particles are notoriously difficult to detect given how rarely they interact with matter and require building immense and exquisitely sensitive detectors. The planned Deep Underground Neutrino Experiment (DUNE) is a long baseline neutrino oscillation experiment at Fermilab and South Dakota aimed at answering the most sought-after question of why there is much more matter than antimatter in the universe. DUNE will use the innovative liquid argon time projection chamber (LArTPC) technology as it provides unprecedented detail to study neutrino interactions with matter. However, the path to DUNE is technologically very challenging as it will be the biggest, most intense neutrino experiment ever to be built. The MicroBooNE experiment, aimed at addressing the anomalous excess of electromagnetic events observed by MiniBooNE, is the first large scale LArTPC detector that successfully operated on U.S. soil, serving as a technology demonstrator in a phased program towards the construction of massive, multi-kiloton-scale LArTPC detectors like DUNE. This talk will describe the MicroBooNE and DUNE programs, their status and latest results along with highlighting some of the challenges involved in realizing DUNE.