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The FLArE Experiment for High Energy Neutrino and Dark Matter Searches at LHC

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The Forward Physics Facility (FPF) is a proposed program to build an underground cavern with the space and infrastructure to support a suite of far-forward experiments at the Large Hadron Collider in the High Luminosity era (HL-LHC). The Forward Liquid Argon Experiment (FLArE) is a Liquid Argon Time Projection Chamber (LArTPC)-based experiment designed to detect very high energy neutrinos and search for dark matter in FPF, 620 m from the ATLAS interaction point in the far-forward direction, and will collect data during HL-LHC. With a fiducial mass of ˜10 tons, FLArE will detect millions of high-energy tau neutrinos at the highest energies ever detected from a human source, and will also search for dark matter particles with world-leading sensitivity in the MeV to GeV mass range. In this talk, I will give an overview of the physical reach, preliminary design and status of FPF and FLArE. The reconstruction and identification of high-energy tau neutrinos at FLArE will also be discussed.

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