

## The LXe detector R&D for the PIONEER experiment

*Wednesday, 20 May 2026 09:30 (30 minutes)*

The PIONEER experiment aims to perform precision tests of lepton flavor universality through measurements of rare pion decays using a stopped-pion technique. Achieving the targeted sensitivity requires excellent control of systematic effects, high energy and timing resolution, and robust pile-up rejection under high-rate conditions.

Liquid xenon calorimetry offers attractive performance characteristics for meeting these requirements, including high light yield, fast response, and homogeneous energy measurement.

The LXe approach still requires experimental demonstration under PIONEER-specific conditions, including studies of MPPC PDE degradation, the development of thin windows with thin Chip-on-Film MPPC designs, and detailed measurements and simulations of the achievable resolution and pile-up rejection capabilities.

This talk will present the current general status of the PIONEER experiment and of the LXe detector R&D and discuss its role within the broader PIONEER detector strategy.

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