

Searches for dark matter using LAr TPC detectors

Monday, 22 April 2024 13:00 (1 hour)

Dark Matter searches are captivating as they hold the potential to unravel one of the universe's most enduring mysteries. The Global Argon Dark Matter Collaboration (GADMC) comprises the ArDM, DarkSide, DEAP, and MiniCLEAN dark matter direct detection experiments, with the collective aim of fully exploring the experimentally accessible dark matter parameter space down to the neutrino fog. While the experimental collaborations that formed GADMC all utilized argon-based detectors, they employed a variety of detector designs. This presentation will provide an overview of the DarkSide-20k detector, currently under construction by GADMC at the LNGS laboratory in Italy. DarkSide-20k is a two-phase Time Projection Chamber with low-radioactivity acrylic walls and optical readout using Silicon PhotoMultipliers (SiPMs). Notably, DarkSide-20k will be filled with Underground Argon, minimizing the cosmogenically-produced background of Ar-39. We will discuss the design, implemented background reduction techniques, expected sensitivity, and the current status of DarkSide-20k.

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