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DARWIN –a next-generation liquid xenon observatory for dark matter and neutrino physics

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Benefiting from more than a decade of experience in WIMP searches with dual-phase xenon time projection chambers, the DARWIN (DARk matter WImp search with liquid xenoN) collaboration intends to build a next-generation detector involving 50 tonnes (40 tonnes active) of xenon. The primary goal of the observatory is to explore the entire experimentally accessible parameter space for WIMP masses above 5 GeV/c^2 down to the irreducible neutrino floor. With its low energy threshold and ultra-low background level, DARWIN will be an excellent platform to search for various other rare interactions. These include the neutrinoless double beta decay of ^{136}Xe, a high-precision measurement of the low-energy solar neutrino flux, as well as searches for solar axions and axion-like-particles. In this talk, we will present the detector concept, the sensitivity to the various science channels, and ongoing R&D efforts.

Keywords

low background; dark matter; WIMP; neutrinoless double beta decay; solar neurinos; axions; ALP; TPC; Xenon;

Collaboration

other (fill field below)

other Collaboration

DARWIN

Subcategory

Future projects

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