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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 search with liquid xenon time projection chambers, the DARWIN (DARK matter WImp search with liquid xenoN) collaboration intends to build an observatory involving 50 tonnes of xenon. The primary goal of the experiment is to explore the entire experimentally accessible parameter space for WIMP masses above $5 \text{ GeV}/c^2$ down to the irreducible neutrino floor. With its low energy threshold and ultra-low background level, DARWIN will provide an excellent platform to search for various other rare interactions, including the neutrinoless double beta decay of ^{136}Xe , solar axions and axion-like particles. Furthermore, it will measure the low-energy solar neutrino flux with high precision, observe coherent neutrino-nucleus interactions and detect galactic supernovae. In this talk, we will present the detector concept, the sensitivity to the various science channels, and ongoing R&D efforts.

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