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

The DARWIN experiment is a proposed next-generation multi-purpose dark matter observatory. This dual-phase Time Projection Chamber will comprise a 50 tonne liquid xenon target, allowing to probe the experimentally accessible parameter space for Weakly Interacting Massive Particles (WIMPs) in a wide mass range until neutrino interactions with the target become an irreducible background. With a low-energy threshold and an ultra-low background level, the observatory will also be sensitive to other physics channels, such as searches for axion-like particles and neutrinoless double-beta decay of ^{136}Xe . It will also allow for high-precision measurements of low-energy solar neutrinos, galactic supernova detection and neutrino-nucleus coherent scattering observation. We discuss here the concept of DARWIN, the ongoing R&D and the sensitivity for the different physics channels.

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