

Latest results from the LUX Dark Matter Experiment

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LUX (Large Underground Xenon) was a 250 kg dual-phase (liquid/gas) xenon TPC with an active mass of 250 kg that operated at the Sanford Underground Research Facility (SURF) in the US, from 2013 until 2016. Its main objective was to look for evidence of galactic dark matter in the form of Weakly Interacting Massive Particles (WIMPs). During the full 427 live-days run, it excluded WIMP-nucleon spin-independent cross sections above $1.1 \times 10^{-46} \text{ cm}^2$ (90% confidence level) at a WIMP mass of $50 \text{ GeV}/c^2$. Due to its low radioactive and large sensitivity, LUX is able to look for other dark matter particle candidates and rare event signals. In this presentation, we will report the most recent results from several new data analyses such as: an effective field theory approach to explore a more general set of possible nuclear responses from WIMP-nucleon scattering, mirror dark matter searches with the electron recoil data, and searches for annual and diurnal rate modulations in the data. We will also present the most recent calibrations studies, such as i) pulse shape discrimination, ii) ^{14}C beta calibrations, iii) nuclear recoil calibration using a pulsed D–D neutron generator. These calibrations are essential to the development of the next generation of dark matter detectors.

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