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The LUX Dark Matter Detector

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The Large Underground Xenon (LUX) is a dark matter direct detection experiment being deployed at the Homestake Mine in South Dakota, USA.

The LUX detector is a dual-phase Xe TPC, with a total liquid Xe mass of 350 kg. It measures both scintillation and ionization produced by radiation interacting in the liquid Xe to differentiate between the nuclear recoils expected from WIMPs and

the electron-recoil background signals. The LUX experiment aims at a sensitivity of $7\text{E-}46\text{ cm}^2$ for the WIMP-nucleon cross-section for a 100 GeV/cm^2 WIMP, an order of magnitude better than the existing results. While leveraging the well

establish dual-phase Xe technology (proven by ZEPLIN and XENON experiments), LUX adds technological improvements in key areas, such as shielding and cryogenics, required for the next generation of 1-10 ton dark matter detectors.

The detector has recently finished a period of calibration and testing of all subsystems at a surface facility at Homestake and is currently being prepared for underground commissioning by mid-2012. In this talk, we present the experiment and its status,

with a focus on the design elements that make the detector a major competitor in the field of dark matter detection.

for the collaboration

on behalf of LUX Collaboration

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