



ΑΡΙΣΤΟΤΕΛΕΙΟ  
ΠΑΝΕΠΙΣΤΗΜΙΟ  
ΘΕΣΣΑΛΟΝΙΚΗΣ

# ΣΕΜΙΝΑΡΙΟ

ΤΜΗΜΑ ΦΥΣΙΚΗΣ

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## Searching for Dark Matter with LUX and LUX-ZEPLIN

Αναζητώντας την Σκοτεινή Ύλη με τα  
πειράματα LUX και LUX-ZEPLIN

**Isabel LOPEZ**

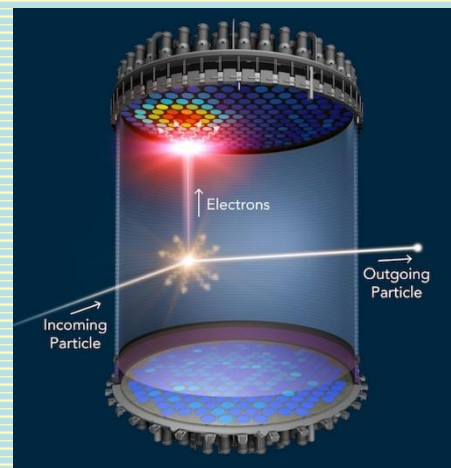
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The identification of dark matter is presently one of the greatest challenges in science, fundamental to our understanding of the Universe. Weakly Interacting Massive Particles (WIMPs) that arise naturally in several models of physics beyond the Standard Model are compelling candidates for dark matter.

The Large Underground Xenon (LUX) detector was a dual-phase xenon Time Projection Chamber with an active mass of 250 kg searching for Weakly Interacting Massive Particle (WIMP) dark matter via direct detection. It operated at the Stanford Underground Research Facility (SURF) in Lead, South Dakota from 2012 to 2016.

LUX has published three world leading limits on the spin independent cross section for the WIMP-nucleon scattering. Since the Fall of 2016, when the detector was dismantled, efforts have been focused on additional analyses with the science and calibration data sets. LUX-ZEPLIN (LZ) is the successor of LUX, featuring a 7-tonne active liquid xenon target (from a total of 10 tons of xenon) that will run in the same installations as LUX.

In this talk, after giving a brief overview of the dark matter problem, we will present the last results of LUX, emphasizing the advances in the detector calibration and data analysis, followed by an overview of the LZ detector design, planned program, current project status and timeline.



Full Professor at the Physics Department of Coimbra University. Director of the Laboratory of Instrumentation and Experimental Particle Physics, a Research Laboratory in Portugal.

She is co-author of 138 papers in international peer-reviewed journals listed in Web of Science (WOS), having published 30 papers since 2013. Considering the WOS metrics, 5564 citations with a h-index of 32.

Participation in international collaborations/experiments:

- Alpha Magnetic Spectrometer (AMS) • n TOF/CERN PS 213 • Dark matter experiments ZEPLIN II & ZEPLIN III
- Dark matter experiment (LUX) • Dark matter experiment LUX-ZEPLIN (LZ)

Other Current Positions: • Executive Council Member, LUX-ZEPLIN Collaboration (from 2012)

- LUX Collaboration (from 2010), • International Radiation Physics Society (from 2006)

Main areas of expertise: dark matter search, astroparticle physics, particle detectors, radiation physics and medical imaging.

Το προφίλ της  
ομιλήτριας  
**Isabel LOPEZ**

