

UCLA Department of Physics & Astronomy

COLLOQUIUM

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Designing and probing quasi-particles in flatlands

Alvine Kamaha

University of California, Los Angeles



Numerous astronomical and cosmological observations indicate that about 85% of the matter in our universe is in an unknown and yet to be discovered form, so-called dark matter. Identifying the nature of this dark matter has arguably become one of the most important questions in physics research today. Many worldwide experiments (telescopes, colliders, underground based detectors) are in the race to answer this question, utilizing various detection techniques. Among them, is the dual-phase liquid xenon time projection chambers (LXe-TPCs) currently used by some underground based experiments. An example of these experiments is the LUX-ZEPLIN (LZ) experiment, the flagship dark matter experiment in the US which has been designed to reach unprecedented sensitivity in dark matter search. In this talk, I will first discuss the various detector technologies searching for dark matter with an emphasis on the LZ detector and the UCLA group contribution to LZ. I will then review the status and outlook of the current experiments. I will end by talking about the search for dark matter beyond the scope of current detectors and some R&D efforts for the next generation of dark matter detectors.

Undergraduates Welcome!