

**UCLA Department of Physics & Astronomy**

# **COLLOQUIUM**

Thursday, January 18th, 2023 at 4 p.m.

PAB 1-434

## **The quest to see the unseen with LUX-ZEPLIN, the US flagship Dark Matter Experiment**

Alvine Kamaha  
UCLA



LUX-ZEPLIN (LZ) is a direct detection dark matter experiment currently being operated at the Sanford Underground Research Facility (SURF) in Lead, South Dakota. The experiment utilizes a dual phase time projection chamber (TPC) to primarily look for dark matter in the form of Weakly Interacting Massive Particles (WIMPs). The active TPC region consists of 7 tonnes of liquid xenon instrumented with photomultiplier tubes to record light signals from particle interactions. A liquid xenon "skin" detector and an outer detector volumes surround the TPC to veto background events in the detector.

This talk will give an overview of the LZ experiment and discuss its first WIMP search results, which are consistent with a background-only hypothesis and set the most stringent limits so far on WIMP-nucleon cross-sections for WIMP masses above  $9 \text{ GeV}/c^2$ . I will also discuss the current status of the experiment as well as its outlook.