

UCLA High Energy & Astro-Particle (HEAP) Seminar

“Low-Background Shielding and Cryogenic Design for Future Liquid-Xenon Detectors”

Presented by Antoine Amy
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Liquid-xenon time projection chambers are leading detectors for rare-event searches, but their sensitivity depends strongly on radiogenic-background control and stable cryogenic operation. In the next-generation neutrinoless double-beta decay detector nEXO, the xenon volume is surrounded by hydrofluoroether (HFE) fluid, a dense and radiopure liquid that remains liquid at both room and liquid-xenon temperatures, providing shielding and thermal stability for the detector.

In this seminar, I will first present background studies motivated by the possible use of ultraclean nickel cryostat vessels. Since nickel is expected to be much cleaner than the previous carbon-fiber composite design, it motivates a re-optimization of the HFE inventory and cryostat geometry. I will discuss simulations evaluating how reduced shielding affects backgrounds from the cryostat, water shield, and other external structures. I will then describe the UMass HFE recirculation setup built to study whether this fluid can be reliably cooled and circulated near liquid-xenon temperatures.

Location: Knudsen 4-134

Date: Wednesday, May 27, 2026

Time: 12:00pm

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