

UCLA High Energy & Astro-Particle (HEAP) Seminar

“Optical and Cryogenic Studies in Support of DarkSide-20k and Future Xenon-doped Liquid Argon Detectors”

Presented by Alec W. Peck (*UC Riverside*)

Noble liquid detectors have pushed the sensitivity thresholds for dark matter searches and neutrino studies in recent years. This field will continue to see greater focus as projects like DarkSide-20k, which is currently under construction at LNGS, expand the next generation of rare event searches. To achieve the required low noise and high sensitivity, the muon veto of DarkSide-20k supports the TPC and also has potential for early supernova detection and solar neutrino measurements due to its large volume of atmospheric argon. The sensitivity of the muon veto depends critically on the optical efficiency of the veto volume and our ability to model the detector response.

As part of the design process, I constructed a cryogenic, optical test chamber for the testing of sheet reflectors for use in the DarkSide-20k muon veto. The geometry of the muon veto presents several unique challenges to optical simulations of cosmogenic events and event reconstruction. I present the analysis methods I designed which will further enable future studies for DarkSide-20k. Finally, I review our progress of our in-house cryogenic system at UC Riverside which will be used for the development of future designs of xenon-doped argon TPCs

Location: Zoom

Date: Wednesday, Oct. 21, 2026

Time: 12:00pm