

Erin V. Hansen – HEP Seminar – April 18, 2023
University of California – Berkeley

TITLE: CUPID, CUPID-1T, and the future of neutrinoless double beta decay

ABSTRACT: Despite years of intense focus, there is much still to learn about neutrinos; for example, the absolute neutrino mass scale and potential Majorana masses are still unknown, requiring exploration of physics beyond the Standard Model. Searches for neutrinoless double beta decay have moved to the ton-scale, spanning the isotopes available to undergo this rare process and providing information about Majorana masses of neutrinos. This talk will highlight a selection of current and future efforts toward discovery of neutrinoless double beta decay, including recent results from CUORE --- a search for $0\nu\beta\beta$ in ^{130}Te using a bolometric array of TeO_2 crystals and is currently taking data at Gran Sasso National Laboratory (LNGS). I will also discuss hardware and software advances toward CUPID, the successor to CUORE, which will search for $0\nu\beta\beta$ in ^{100}Mo with additional sensitivity from scintillation signals in Li_2MoO_4 . Finally, we will look ahead toward the future of $0\nu\beta\beta$, as next-to-next generation detectors like CUPID-1T begin R&D --- I will focus specifically on readout improvements and background reduction techniques which are the target of the DEMETER demonstrator experiment at UC Berkeley.