UCLA High Energy & Astro-Particle (HEAP) Seminar

"Better Neutrinoless Double Beta Decay through Biochemistry"

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The goal of future neutrinoless double beta decay experiments is to establish whether neutrino is its own antiparticle, by searching for an ultra-rare decay process with a half life that may be more than 10^27 years. Such a discovery would have major implications for cosmology and particle physics, but requires ton-scale detectors with backgrounds below 1 count per ton per year. This is a formidable technological challenge that has prompted consideration of unconventional solutions. I will discuss an approach being developed within the NEXT collaboration: high pressure xenon gas time projection chambers augmented with single molecule fluorescent imaging-based barium tagging. This combines techniques from the fields of biochemistry, super-resolution microscopy, organic synthesis and nuclear physics, possibly enabling the first effectively background-free, ton-scale neutrinoless double beta decay technology.

Location: Broadcast via Zoom
Date: Wednesday, April 22, 2020
Time: 11:50am

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