

CSU PHYSICS COLLOQUIUM

“Big Detectors and Small Particles, The Search for New Physics ”

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Fermilab

Monday, November 27th at 4:00 PM

120 Engineering (Hammond Auditorium)

Abstract

Particle physics studies the building blocks of our universe and the forces that hold them together. After decades of study, we have a very well-defined theory known as the “Standard Model,” which has been tested by many cutting-edge experiments. While this theory has “survived” many stringent tests, we know that it doesn’t explain many aspects of our universe, including dark matter, the expansion of the universe, and why we live in a universe dominated by matter. One of the most exciting methods to search for new physics is to search for rare nuclear decays that occur without emitting light, ghostly particles known as neutrinos. In this talk, I will discuss these rare nuclear decays, the insight they can offer to our universe, and a new concept for how we can search for these decays using a new, massive liquid argon time projection chamber being built for the Deep Underground Neutrino Experiment.

Biography

Joseph Zennamo’s primary research interests are searches for sterile neutrino oscillations, rare searches, and instrumentation R&D with large liquid argon TPCs at Fermilab. He received his PhD from SUNY Buffalo in 2013, working on the D0 experiment on the Fermilab Tevatron. After graduating, he moved to the University of Chicago for his postdoc, where he worked extensively on MicroBooNE and the Short-Baseline Neutrino Program proposal. Since 2018, he has been a Wilson Fellow (associate scientist) and is now a scientist at Fermilab, working on MicroBooNE, the SBN Program, and LArTPC R&D.