

Spring 2025 Physics Colloquium

Friday, February 7th

3:00 PM

PAS 201 or Zoom

(<https://arizona.zoom.us/j/86395646910>)

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TRIUMF

What can neutrinoless double-beta decay teach us about neutrinos?

Abstract: Our knowledge about particles and their interactions is based on the standard model of particle physics. Despite being a very successful theory, the standard model cannot explain some observed phenomena in our Universe: why does matter dominate antimatter? What gives neutrinos their masses? Could neutrinos be their own antiparticles? Observing neutrinoless double-beta decay -- in which two neutrons in an atomic nucleus simultaneously transform into two protons and two electrons without emitting (anti-)neutrinos -- could help answer these open questions.

The potential to discover new physics from this hypothetical decay drives ton-scale experimental searches around the world. Extracting the interesting physics from the experiments however relies on nuclear-theory predictions, which remain a major obstacle. I will discuss recent efforts to improve the theory predictions, and how other nuclear observables can help us better predict the yet unobserved rare decay.

** Refreshments served in PAS 218 at 2:30 PM – 3:00 PM **

