

# PHYSICS COLLOQUIUM

## PROFESSOR THOMAS O'DONNELL

VIRGINIA TECH

---

THE HUNT FOR MAJORANA NEUTRINOS: A COLD-HEARTED APPROACH

SEPTEMBER 24 | 2:30 PM

130 HAHN HALL NORTH

ZOOM LINK: [HTTPS://VIRINIATECH.ZOOM.US/J/96084996911](https://viriniatech.zoom.us/j/96084996911)

---

The discovery of neutrino mass in the first decade of the 21st century has spurred intense experimental effort to determine if Majorana masses and lepton-number-violating processes should be part of the new, extended Standard Model of particle physics. Neutrinoless double-beta decay is a process with a relatively robust signature, which is hypothesized to occur if indeed neutrinos have Majorana masses. To observe it, large detectors with excellent energy resolution and very low backgrounds are required. CUORE, a cryogenic bolometer array operating near 10 mK, is one such detector. In this talk I will describe the global effort to search for neutrinoless double-beta decay, discuss the CUORE experiment, its unique cryogenic system, and some challenges of holding more than 1 tonne of material near absolute zero temperature.