Department of Physics and Astronomy Colloquium Series

Tuesday, March 26th, 2024, 2:30pm in PSE 317

Speaker: Dr. Ania Kwiatkowski

Institution: TRIUMF

Title: What can one radioactive ion tell us about the universe? Studies at TITAN

Abstract:

The atomic mass provides a snapshot of the total interaction among every constituent particle. This manifestation of the subatomic forces reveals the evolution of nuclear shells (analogous to electron shells) and exotic structures in radioactive atoms. Moreover, the mass dictates the pathways accessible in stellar burning, influencing how the elements were formed. The highest-precision mass measurements are critical inputs into rigorous tests of the Standard Model. The necessary precision is achieved through ion-trapping techniques.

In an ion trap, a single ion (or a whole cloud) can be manipulated, measured, and stored with increasingly sophisticated and exquisite control. As such they are my tool of choice at TRIUMF's Ion Trap for Atomic and Nuclear science (TITAN), where ground-state properties are measured in the fraction of a second these radioactive ions live.