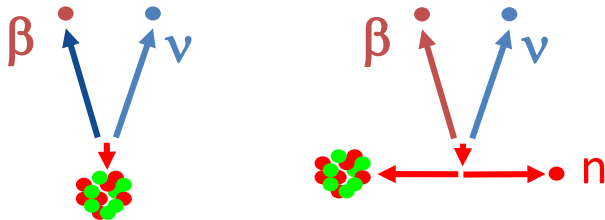# Precision Studies of Nuclear Beta Decay

Research Overview

Beta decay is the most common nuclear decay, and detailed studies impact:

- nuclear astrophysics
- tests of the Standard Model
- neutrino oscillations
- nuclear energy
- stockpile stewardship

We are pioneering new approaches using:
- Ion traps which suspend radioactivity in vacuum for access to nuclear recoils
- Advanced radiation detector arrays
- Radioactive ion beams

Potential Collaborations

We are looking for 2 graduate students to:

- Develop ion trap for β-delayed neutron spectroscopy to study r-process nucleosynthesis and provide data for reactors

- Measure β-spectra to better understand reactor neutrino spectra

- Collect precision data for γ-ray emission following β decay of fission products for fission-yield measurements.

Selected Previous Dissertations

"Beta-delayed neutron studies of $^{137-138}$I and $^{144-145}$Cs performed with trapped ions" (Aga Czeszumska, UCB, 2016)

"Experiments to improve nuclear data for high energy density environments" (Brian Champine, UCB, 2016)

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