NUCLEAR SEMINAR SERIES

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Monday, December 2

4:00 pm - Rm 184 NSH

Characterizing r-Process Sites through Actinide Production

The rapid neutron-capture ("r-") process is responsible for synthesizing many of the heavy elements observed in both the solar system and Galactic metal-poor halo stars. Simulations of r-process nucleosynthesis can reproduce abundances derived from observations with varying success, but so far fail to account for the observed over-enhancement of actinides, present in about 30% of r-process-enhanced stars. In this work, we investigate actinide production in the dynamical ejecta of a neutron star merger and explore whether key properties of nuclei accessed in merger sites (i.e., fission, β-decay, and nuclear mass model) can account for the actinide boost. I will present and discuss recent results on characterizing r-process sites through actinide production and show how incorporating actinide signatures of metal-poor, r-process enhanced stars into theoretical studies of r-process production can offer crucial constraints on the origin of heavy elements.

PHYSICS

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