

UNIVERSITY OF NOTRE DAME
DEPARTMENT OF PHYSICS

NUCLEAR SEMINAR

Monday, December 4

Spin Distributions and Gamma-Decay Branching Ratios from Surrogate Reactions using Hyperion

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Accurate neutron capture cross sections are vital input to calculations for nuclear astrophysics, reactors, and stockpile stewardship. Away from the line of stability, however, experimental data needed becomes difficult to obtain due to instability or low natural abundance. The surrogate method has been developed over the years in order to measure such cross sections. This method commonly relies on the Weisskopf-Ewing limit of Hauser-Feshbach theory, in which the gamma-decay branching ratios are assumed to be equal for each spin of the entry level. Recent work by of a number of experimental groups including those at LLNL and LANL have emphasized that this is not a good approximation.

Combined work which began at Yale University and the University of Richmond, and which now continues at Notre Dame, aimed at pinpointing the spin distribution and gamma-decay branching ratios of surrogate reactions will be presented. Data analyzed from experiments using the HPGe- Silicon Telescope array Hyperion have been analyzed, and spin distributions below the neutron separation energy have been deduced from the particle-gamma coincidences and gamma-decay simulations. These distributions will be compared with calculations using a new reaction code developed at Richmond to probe the viability deducing gamma-decay branching ratios above the neutron separation/energy.

4 pm – 5 pm
**Nuclear Science
Laboratory**
**124 Nieuwland
Science Hall**

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All interested  
persons are  
cordially invited  
to attend

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Refreshments will be
served prior to the
seminar in room 124