UNIVERSITY OF NOTRE DAME
DEPARTMENT OF PHYSICS

NUCLEAR SEMINAR

Monday, March 20

Determining Astrophysical Cross Sections at FENRIS: the Facility for Experiments on Nuclear Reactions in Stars

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NC State University

To understand nucleosynthesis in astrophysical environments, reaction cross sections must be known to a high degree of accuracy. Often, these cross sections are too small to be measured directly in the laboratory or require radioactive targets, so novel methods must be employed. One such method involves performing particle transfer reactions. In these reactions, a particle is deposited onto or stripped off of the target to produce the same compound nuclear states as in the direct reaction of interest. Important quantities of those states can then be inferred, such as their spin, single-particle nature, or decay branching ratios. At the Facility for Experiments on Nuclear Reactions in Stars (FENRIS), we perform these experiments by analyzing the reaction products in a high-resolution charged particle spectrometer: the Enge Split-pole Spectrograph located at the Triangle Universities Nuclear Laboratory. In this talk, I will outline the FENRIS program, highlighting recent upgrades to the spectrograph and focal-plane detector package. I will show the results of our characterization studies and preliminary results from our first two physics experiments. Finally, I'll discuss future upgrade paths that are either in progress or planned for the future.

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