



NUCLEAR ASTROPHYSICS AT FENRIS: THE FACILITY FOR EXPERIMENTS ON NUCLEAR REACTIONS IN STARS

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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. During these reactions, a particle is deposited onto or stripped off of the target to produce the same compound nuclear states as in the 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. The focal-plane detector was also recently characterized, and shown to have a position resolution comparable to energy straggling of particles in the target. The performance of the detector will be discussed in detail. I'll also highlight some of our recent results and how they impact astrophysical reaction rates. Finally, I'll discuss future upgrade paths that are either in progress or planned for the near future.

Tuesday, October 30, 2018

4:00 pm

Roger W. Finlay Conference Room

Coffee and Cookies at 3:50 pm