

UNIVERSITY OF NOTRE DAME
DEPARTMENT OF PHYSICS

NUCLEAR SEMINAR

Monday, February 15

Low-Energy $^{20}\text{Ne}(p,g)^{21}\text{Na}$ Cross-section Study with the 5U-4 St. Ana Accelerator

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In stars whose temperature is greater than 0.05 GK, hydrogen burning can proceed via the NeNa cycle, which is important for the nucleosynthesis of Ne, Na, and Mg isotopes. The first reaction in this cycle is $^{20}\text{Ne}(p,g)^{21}\text{Na}$, which also has the slowest proton capture reaction rate [1], thereby influencing the rest of the cycle and, potentially, abundances of the other nuclei that are synthesized in the cycle. The stellar reaction rate for $^{20}\text{Ne}(p,g)^{21}\text{Na}$ is dominated by direct capture and the high energy tail of a subthreshold resonance. The aim of this work is to understand the direct-capture component of this reaction. Using Notre Dame's recently commissioned 5U-4 accelerator, the $^{20}\text{Ne}(p,g)^{21}\text{Na}$ cross-section has been measured relative to the 1169 keV resonance at low energies. The resonance strength of the 1169 keV resonance was also independently determined. Improvements to previous cross-section measurements will be discussed [2].

[1] Iliadis et. al. The Astrophysical Journal Supplement Series 134, 151 (2001)

[2] Rolfs et. al. Nuclear Physics A 241, 480 (1975)

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