

Studying (α, γ) reactions at Notre Dame

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At the end of its life, during their violent death through a supernovae explosion, massive stars collapse into neutron stars. The neutrino flux released during this collapse is so significant that the probability of a neutrino interacting with a nucleus is enhanced enough to have an influence on element nucleosynthesis. This phenomenon is known as the ν -process.

The ν -process is believed to be responsible for a significant part of the observed abundance of certain element in nature, in particular ^{11}B .

Neutrino triggered reactions lead to the creation of ^{11}B through a reaction chain terminating with $^7\text{Li}(\alpha, \gamma)^{11}\text{B}$. Understanding the rate of this reaction will help to constrain the ν -process. This reaction was recently studied at Notre Dame through direct measurement and the preliminary results will be presented.

Another method to study (α, γ) reactions is through inverse kinematics using a recoil mass separator. At Notre Dame, the recoil mass separator, St. George, is being commissioned to measure (α, γ) with heavy beams and low background. I will discuss the current progress of St. George commissioning.