

Recent Nuclear Physics Results from NIF

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The National Ignition Facility (NIF) is the world's premier inertial confinement fusion facility designed to achieve sustained thermonuclear burn (ignition) through the compression of Hydrogen isotopic fuels to densities in excess of 10^3 g/cm³ and temperature in excess of 100 MK. These conditions are very similar to that found in the cores of Asymptotic Giant Branch (AGB) stars, where the slow neutron capture nucleosynthesis (s-process) takes place. NIF offers the possibility of studying s-process neutron capture in a stellar plasma for the first time. Starting in Fall 2010 NIF has been operating regularly with 2-4 shots being performed weekly. These experiments have allowed the first *in situ* calibration of the detectors and diagnostics needed to measure neutron capture, including neutron time-of-flight and prompt gamma-ray detection. In this talk I will present an overview of recent results from these detectors and present a plan for measuring s-process neutron capture cross sections using NIF. I will also describe the nuclear data needed for the interpretation of NIF neutron capture measurements and make suggestions for their measurement using low-energy accelerator facilities.

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