Notre Dame Science
Department of Physics

ANGULAR DISTRIBUTION ANISOTROPY OF THE $E_{C.M.}$=2.68-MeV RESONANCE IN THE $^{12}C(\alpha, \gamma)^{16}O$ REACTION

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2:30 P.M. NSH 124

The $^{12}C(\alpha, \gamma)^{16}O$ reaction, in combination with the triple-a process, determines the $^{12}C/^{16}O$ fraction at the end of stellar helium-burning. This fraction has been shown to strongly influence any subsequent stellar evolution and, due to imprecise knowledge of $^{12}C(\alpha, \gamma)^{16}O$ reaction rate, severely complicate precision tests of stellar models. A large uncertainty in the reaction belongs to the cross section for electric-quadrupole (*E2*) capture into the ground state of ^{16}O. A prominent feature in the measured *E2* cross section is the narrow resonance at *E*=2.68 MeV. The resonance affects the *E2* cross section over a region of experimental significance. How the resonance affects the cross section depends on the relative sign of its amplitude to other *E2* amplitudes. The sign is not well determined by existing capture data and has a non-negligible effect on extrapolating the *E2* cross section to helium-burning energies (E_0). Details about the recent measurement of the sign at the Ohio University Accelerator Laboratory and its importance for a new *E2* cross section at E_0 will be discussed.

Nuclear Seminar

All interested persons are cordially invited to attend.