

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

On **January 31, 2007** at **14:30**, **Daniel Bemmerer** from **INFN Padova** and **FZ Dresden-Rossendorf** will give a seminar entitled:

**The $^3\text{He}(\alpha,\gamma)^7\text{Be}$ reaction
measured by activation at LUNA**

Abstract:

The nuclear physics input from the $^3\text{He}(\alpha,\gamma)^7\text{Be}$ cross section is a major uncertainty in the fluxes of ^7Be and ^8B neutrinos from the Sun predicted by solar models and in the ^7Li abundance obtained in big-bang nucleosynthesis calculations. In the seminar I will report on a new precision experiment on this reaction performed by the LUNA collaboration [1]. Using a windowless gas target, the high beam intensity of the LUNA2 accelerator, and the Gran Sasso low background gamma-counting facilities, the $^3\text{He}(\alpha,\gamma)^7\text{Be}$ cross section has been determined by the activation method at 90 -- 170 keV center-of-mass energy with a total uncertainty as low as 4%. The present low energies are directly relevant to big-bang nucleosynthesis and had previously been reached experimentally only by the prompt-gamma technique and with inferior precision. The new LUNA data can be used in big-bang nucleosynthesis calculations and to constrain the extrapolation of the $^3\text{He}(\alpha,\gamma)^7\text{Be}$ astrophysical S-factor to solar energies.

[1] D. Bemmerer et al. (LUNA Collaboration), Phys. Rev. Lett. 97, 122502 (2006)

(“B. Pontecorvo” room)