Nuclear Seminar

Underground nuclear astrophysics for the Sun, and for the Big Bang

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Monday

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4 P.M.

Rm 124 NSH

After the resolution of the solar neutrino problem in 2002, the study of the Sun has now entered a precision era, and an entirely new dilemma has come up: New elemental abundance data from Fraunhofer line analyses are in contradiction with helioseismological observables. Observations of 13N and 15O neutrinos from the Sun may address this so-called solar abundance problem, but their interpretation will require precise nuclear reaction data. Due to the low cross sections involved, such data can only be provided by experiments in an underground low-background setting. Work at the world's only underground accelerator, the 0.4 MV LUNA machine in Gran Sasso (Italy), on solar fusion reactions and on the Big Bang production of lithium-6 and -7 will be reviewed. In addition, some surface-based data on radiative capture reactions on 12C, 14N, and 40Ca will be shown. The status and working program of the planned higher-energy underground accelerator at the Dresden Felsenkeller in Germany will be discussed.

Refreshments served prior to the seminar in Rm 124.

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