

The LUNA experiment at Gran Sasso Laboratory: Studying stars by going underground

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Cross sections of nuclear reactions powering stars are essential ingredients for element nucleosynthesis, energy generation and neutrino fluxes in stellar environments. The low value of such cross sections at astrophysically relevant energies prevents their measurement in a laboratory at the Earth's surface due to the unfavourable signal-to-noise ratio. The LUNA collaboration installed two accelerators in the Underground Gran Sasso National Laboratory in Italy where the cosmic background is very much reduced and measured a few key reactions of the Hydrogen burning and Big Bang nucleosynthesis. The most relevant results achieved by LUNA will be reviewed. The next step in this research field consists in the installation of a MV machine underground: the "LUNA MV" project will be described.