

Latest results from LUNA experiment

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Cross sections of nuclear reactions relevant for astrophysics are crucial ingredients to understand the energy generation inside stars and the element nucleosynthesis. At astrophysical energies, nuclear cross sections are often too small to be measured in laboratories on the Earth's surface where the signal would be overwhelmed by the cosmic-ray induced background.

LUNA (Laboratory for Underground Nuclear Astrophysics) is an experimental approach for the study of nuclear fusion reactions based on an underground accelerator laboratory.

Since 20 years the LUNA Collaboration has been directly measuring cross sections of nuclear processes relevant in several astrophysical scenarios in the underground laboratories of Laboratori Nazionali del Gran Sasso (LNGS) with unprecedented sensitivity.

In the talk the latest LUNA results will be presented, focusing mainly on the $^{22}\text{Ne}(p,\gamma)^{23}\text{Na}$ cross section measurement. This reaction takes part in the neon-sodium cycle of hydrogen burning and influences the synthesis of the elements between ^{20}Ne and ^{27}Al in red giant stars and novae explosions.

Future researches will be carried out in the frame of the LUNA-MV project which aims at measuring several astrophysical key reactions. The scientific program of LUNA-MV as well as status and schedule will be presented.

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