

## Nuclear Reaction of Astrophysical Interest with LUNA projects

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About 25 year ago LUNA (laboratory for Underground Nuclear Astrophysics) opened the era of underground nuclear astrophysics installing a home-made 50 kV ion accelerator under the Gran Sasso mountain. A second machine, with a terminal voltage of 400 kV, was then installed and it is still in operation. Most of the processes so far investigated were connected to the physics of solar neutrinos and hence to the hydrogen burning phase in stars. The interest to next and warmer stages of star evolution (i.e. helium and carbon burning) pushed a new project based on a ion accelerator in the MV range called LUNA-MV. Thanks to a special grant of the Italian Ministry of Research (MIUR), INFN is now building, inside one of the major hall at Gran Sasso, a new facility which will host a 3.5 MV single-ended accelerator able to deliver proton, helium and carbon beams with intensity in the mA range. The scientific program for the first phase of the LUNA-MV life will be described with the first experiment scheduled for June 2019.

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