

Low energy nuclear reaction studies at Atomki for the astrophysical γ -process

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The study of nuclear physics in stellar explosions is a strong driving force for the development of modern radioactive ion beam (RIB) facilities. Indeed, in explosive astrophysical processes isotopes far from the valley of stability are created and they can only be studied with RIB facilities. Low energy reactions on heavy stable isotopes, on the other hand, are still important as the relevant experimental database is very limited even at stability. Nucleosynthesis model calculations have therefore to rely on theoretical reaction rates, which often prove to be unreliable.

In the last twenty years the experimental study of the astrophysical γ -process has been one of the most important research topics of the Atomki nuclear astrophysics group. Cross sections of proton and α -induced reactions are systematically measured in order to provide data for the assessment of theoretical calculations [1]. As one of the key nuclear physics ingredient, the low energy α -nucleus optical potential was investigated with special emphasis [2]. In this talk, some recent experiments and results related to the γ -process will be presented. In order to give a comprehensive overview, the group's other activities will also be shortly summarized.

[1] T. Rauscher *et al.*, Rep. Prog. Phys. **76**, 066201 (2013).

[2] P. Mohr *et al.*, At. Data Nucl. Data Tab. **99**, 651 (2013).