



Nuclear Matter

« Nuclear astrophysics: a textbook case study »

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Nuclear astrophysics recently celebrated its 100th anniversary and remains an active field of science. The goal of this presentation is to review several experimental techniques used to determine nuclear-reaction rates. Additionally, I will present some theoretical aspects directly related to these experimental techniques, providing an introduction to the fundamental principles underlying them.

The ${}^{18}F(p,\alpha){}^{15}O$ reaction is probably the most studied reaction in nuclear astrophysics recently, with more than 50 studies published in the last two decades. The ${}^{18}F(p,\alpha){}^{15}O$ reaction is associated with gamma-ray emission from classical novae during the first hours after expansion. This reaction will be used as a central theme of the presentation. Several examples of recent experiments will be highlighted, particularly those conducted in nuclear facilities utilizing radioactive beams.





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