

Reaction rates for stellar nucleosynthesis

A Mengoni
CERN, Geneva^(*)

The accurate determination of reaction rates under stellar conditions requires, in most cases, combined information derived from experiments as well as from nuclear structure and reaction modeling. Typical examples of this situation are the neutron capture reactions and beta-decays where the stellar rates can be substantially altered by the population of nuclear excited states.

Considerable improvements have been recently achieved on the accuracy and on the availability of nuclear data derived from measurements, due to innovative concepts on detection systems as well as on the availability of radioactive ion beams and advanced neutron sources. At the mean time, significant progress has been made on the modeling of reaction processes and on the theoretical description of exotic structure properties.

I will report here on some results of recent neutron capture cross section measurements performed at various neutron sources and on their implications in the nuclear astrophysics context, in particular, on the analysis of s-process branchings and on nuclear cosmochronometry (Re/Os clock).

^(*) Now at IAEA-Nuclear Data Section, Vienna