

NUCLEAR REACTION RATES FOR ASTROPHYSICAL NUCLEOSYNTHESIS

Annalia Palumbo, D. Galaviz¹

¹ *Centro de Física Nuclear da Universidade de Lisboa, Lisboa, Portugal,
a_palumbo7@yahoo.com*

Heavy element nucleosynthesis proceeds via mainly neutron captures in the r- and s-processes. Additional processes include the rp-process (a series of proton captures), the vp-process (a neutrino flux process) and the p-process (mainly a series of photodissociations). All processes involve a series of reaction networks where nuclear reaction rates are used as inputs to determine the final abundance distribution based on the astrophysical site of synthesis.

A new reaction rate formalism (currently in its preliminary stages) planned for the EMPIRE code will be used to illustrate the sensitivity of the rates to various nuclear physics inputs. Although not presented here, once this formalism is fully implemented, this will allow nuclear structure effects (such as ground state deformation and nuclear masses) to be explicitly taken into account. In addition, a reasonable estimate of the errors one can anticipate from the reaction rates will be included.