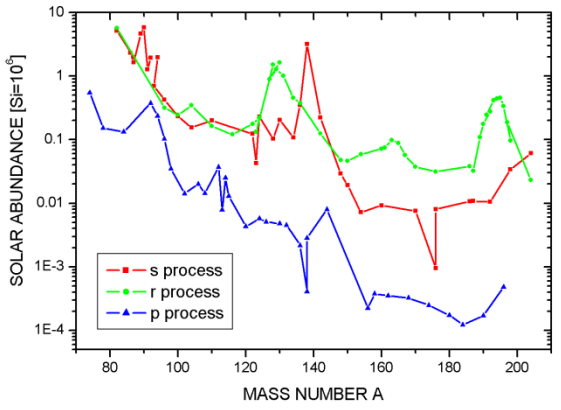
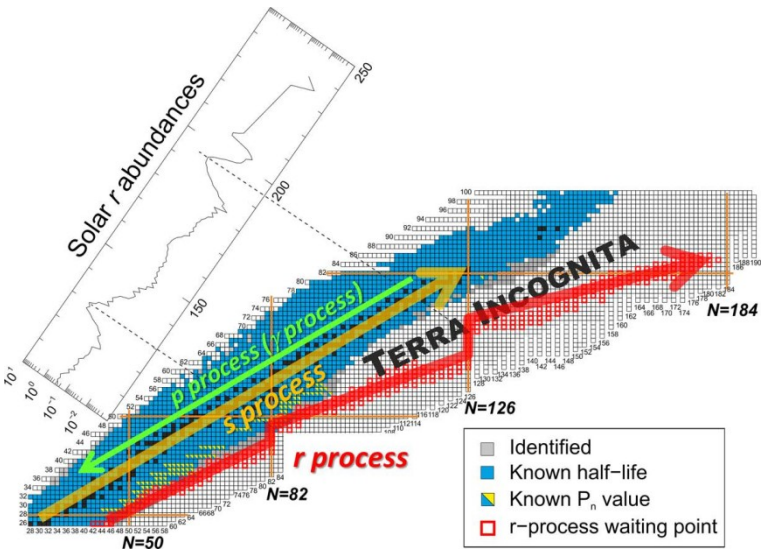
DESY
Physics Seminar

Nuclear Astrophysics with Neutrons.

Iris Dillmann (Giessen Univ., GSI Darmstadt)

Tuesday, 13 March 2012, 16:00 h
DESY Auditorium





Neutrons play a crucial role in astrophysics during the heavy element nucleosynthesis. The largest fraction of isotopes heavier than iron is produced by neutron capture processes on short (r process) and long timescales (s process).
The “rapid neutron capture process” is responsible for ~50% of the solar abundances of the heavy elements. Here neutrons with densities of 10^{20}-10^{30} cm^{-3} are captured on a very fast timescale (ms) during a Core Collapse Supernova in a region close to the forming neutron star. The r-process isotopes are thus very short-lived, neutron-rich isotopes up to the actinides region. These isotopes can only be produced and investigated at large-scale facilities like the GSI in Darmstadt. Here the most important nuclear physics parameters are for example masses, half-lives, and at later stages also beta-delayed neutrons.
This talk will summarize the role of neutrons in nuclear astrophysics and give a short overview about the related astrophysics program at the GSI Helmholtzzentrum für Schwerionenforschung in Darmstadt the future FAIR facility.
This work is supported by the German Helmholtz association via the Helmholtz Young Investigator projects VH-NG-627.

- Coffee, tea and cookies will be served at 15:45h

- After the seminar there is a chance for private discussions with the speaker over soft drinks and pretzels