

Nuclei in the Cosmos (NIC XVII)



Contribution ID: 206

Type: **Invited**

Neutron-capture reactions and heavy element nucleosynthesis

Monday, 18 September 2023 16:15 (30 minutes)

In recent years, new astronomical observations have revealed abundance patterns that cannot be explained by the classic nucleosynthesis picture. A description of the synthesis of heavy elements using only the s, r and p processes is not adequate anymore and for this reason new scenarios had to be proposed. In this talk I will focus on neutron-capture processes that involve exotic nuclei, specifically the r process and the intermediate (i) process. I will discuss possible contributions from each and, in particular, I will address uncertainties related to the nuclear physics input. Neutron-capture reactions play a major role in both processes, and I will present recent developments in providing experimentally constrained reaction rates using indirect techniques. I will share recent results from experiments at Argonne National Laboratory in the US and future experiments at the Facility for Rare Isotope Beams (FRIB).

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Session Classification: Nuclear reaction rates and stellar abundances

Track Classification: Nuclear reaction rates and stellar abundances