

Nuclei in the Cosmos (NIC XVII)



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The p-process nucleosynthesis in core-collapse supernovae

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Neutron-capture processes made most of the abundances of heavy elements in the Solar System, however they cannot produce a number of rare proton-rich stable isotopes lying on the left side of the valley of stability. The p-process, or γ -process, is recognised and generally accepted as a feasible process for the synthesis of proton-rich nuclei in core collapse supernovae. However this scenario still leaves some puzzling discrepancies between theory and observations.

My aim is to explore in more detail the p-process production from massive stars in different sets of models and using the latest nuclear reaction rates. Here I will show some of the result of my analysis, by identifying the p-process sites and focusing on supernova progenitors that experience a C-O shell merger just before the collapse of the Fe core. I will also briefly discuss how the p-process depends on the supernova explosion energy.

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