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The slow neutron capture process in AGB stars

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Asymptotic giant branch (AGB) stars are responsible for the production of the main component, i.e. nuclei from Sr to Pb, of the solar s-process distribution. Despite tremendous advances in the theoretical modeling of these objects over the last few decades, many uncertainties remain. An example is represented by the still-unknown mechanism leading to the ^{13}C neutron source. The nucleosynthetic signature of AGB stars can be observed in a variety of different stellar sources, from spectroscopic observations of intrinsic and extrinsic stars to the heavy-element isotopic compositions of presolar grains found in meteorites. In this view, the wealth of available observational data allows putting constraints on the processes occurring in AGB interiors and the nuclear physics data relevant for the s-process nucleosynthesis. In this contribution, I will present recent results from new AGB models including the effects of mixing triggered by magnetic fields, and show comparisons of the related s-process nucleosynthesis with available observations.

Field of work

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