

# Rotation and slow neutron capture nucleosynthesis

*Tuesday, 26 June 2018 19:00 (1h 30m)*

The slow neutron capture process (s-process) is responsible for about half of all elements heavier than iron in the universe, and is therefore important for galactic chemical evolution. Its main production site is the Asymptotic Giant Branch (AGB) phase, a stellar evolution phase in stars with an initial mass between about 0.8 and 8  $M_{\odot}$ . As stars rotate, it is important to calculate stellar evolution models of these stars including rotation. Currently, only one complete set of rotating AGB models exists (see [1], and <http://fruity.oa-teramo.inaf.it/>). There is only one, because the implementation of rotation and rotation-induced mixing in stars is uncertain and does not reproduce all observables. Specifically, recent observables obtained by asteroseismology show a process of angular momentum transport is missing in stellar evolution theory. We will show that the uncertainties in the implementation of rotation lead to unphysical features in our AGB models, that strongly influence the s-process nucleosynthesis. We will present new AGB models including rotation that also include an additional, artificial viscosity, which reduces these unphysical features. Adding this artificial viscosity is motivated by current efforts to constrain the missing process of transport of angular momentum (see [2] and more recently [3]). We will show the impact of this artificial viscosity on the AGB phase and its nucleosynthesis.

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