

# NuGrid stellar data set: updated *s*-process nucleosynthesis

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The abundances of the heavy elements beyond iron that we observe today in the solar system are mainly the result of the two nucleosynthesis processes: the slow neutron capture (*s*-) process and the rapid neutron capture (*r*-) process. Low-mass Asymptotic Giant Branch (AGB) ( $2 < M/M_{\odot} < 3$ ) and massive ( $M/M_{\odot} > 10$ ) stars have been identified as the sites of the *s*-process. We provide a new set of low-mass AGB models with initial masses  $M/M_{\odot} = 2, 3$  and  $Z = 0.01, 0.02$  and  $0.03$ . Internal gravity wave mixing is the physics mechanism responsible for the formation of a  $^{13}\text{C}$ -pocket on average three times larger than our previous data set. Consequently the *s*-process production is significantly enhanced. Abundances are compared to other stellar datasets available in the literature and to a wide range of observations, including carbon-stars, barium stars, post-AGB stars, and pre-solar grains. The full nucleosynthesis was calculated in post-processing using the NuGrid mppnp code.