Impact of rotation on heavy element production within stars on the low-mass/high-mass star divide

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Super-AGB stars reside in the mass range $\approx$ 6-10 $M_\odot$ and bridge the divide between low/intermediate-mass and massive stars. They undergo off-centre carbon ignition prior to a thermally pulsing phase which can consist of many 10-1000s of thermal pulses. With their high luminosities and very large, cool, red stellar envelopes, these stars may appear seemingly identical to their slightly more massive red supergiant (RSG) counterparts and may act as massive star imposters. Important for both of these classes of star is rotation, and in particular its impact to the surface composition relative to the process of second dredge up. The chemical surface enrichment may result in a clear nucleosynthetic signature to differentiate between super-AGB stars and (massive star) RSGs. Rotation also acts to reduce the lowest initial mass for core collapse supernovae, with the refinement of this mass boundary having important implications for the energetics and chemical enrichment of galaxies. Here we present detailed heavy element nucleosynthesis predictions for a grid of rotating and non-rotating super-AGB star and low-mass massive star models.