## The 13th Torino Workshop on AGB stars & the 3rd Perugia Workshop on Nuclear Astrophysics



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## A Grid of Binary AGB Stars

Tuesday, 21 June 2022 12:00 (25 minutes)

AGB stars are notoriously difficult to model with full stellar evolution codes, such as MESA, due to the various instabilities and convergence issues that arise during the thermal pulses. This makes the production of grids of AGB stars, with varying masses and metallicities, time consuming due to the large amount of human debugging required. This talk will summarise the various instabilities and convergence issues found using MESA and discuss ways to evolve past them, such that a grid of AGB models can be reliably run without intervention. The grid will, for the first time, contain stellar models with varying envelope to core mass ratios in order to cover the parameter space probed by binary systems that exchange mass. This will allow investigation of the third dredge-up parameter as a function of core mass in addition to total stellar mass and metallicity. From the full models, data will be extracted and transformed into a tabulated grid for use in the population synthesis code binary\_c. Populations of stars can then be run through the AGB phase by interpolating parameters from the tabulated grid. These populations will have various uses including calculations of chemical yields and the ability to constrain stellar physics, such as convection, by comparison to observations.

## Session

Stellar evolution

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