

# Stellar evolution and nucleosynthesis in 3D hydrodynamic models of stars

*Monday 10 June 2024 10:00 (20 minutes)*

Our understanding of stellar evolution and nucleosynthesis is limited by the uncertainties coming from the complex multi-dimensional processes in stellar interiors, such as convection and nuclear burning. 3D stellar models can improve this knowledge by studying realistic multi-D processes for a short timerange (minutes or hours). Recent advances in computing resources have enabled 3D stellar models to reproduce longer timescales and include nuclear reactions, making the simulations more realistic and allowing to study explicit nucleosynthesis.

In this talk, I will present results from 3D stellar simulations that include an explicit nuclear network for different burning phases in advanced massive stars. I will introduce the methods and limitations of multi-D stellar modelling, and describe the effects on the evolution of the stellar structure, discussing also the implications for stellar evolution, nucleosynthesis, and convection theory.

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