

Adam Griffiths:

The role of magnetic instabilities during the late stages of massive star evolution.

Recent developments in stellar evolution have shown that magnetic fields play a key role in stellar evolution. For massive stars the strength and structure of the magnetic field in its final moments are key to understanding the subsequent supernova explosion and the type of compact remnant left behind. We study the effects of magnetic instabilities in these late phases through a 1D stellar evolution code and also through a multi-dimensional MHD code to further our understanding of the exact magnetic field topology and impact on the star. In our work we have incorporated magnetic instabilities such as the magneto-rotational-instability and the Tayler-Spruit dynamo into the 1D stellar evolution code GENEC to understand the impact magnetic instabilities have on stellar evolution. We then aim to run these very same models during the last 5 minutes before core-collapse in our 3D MHD code Aenus-ALCAR. I will discuss our results on the impact magnetic instabilities have on stellar evolution, notably during the final phases, and discuss the challenges of running 3D magnetic supernova progenitor models in the final stage of massive star evolution.