

# Supercomputer models of dying stars

Supervisor: Adj. Assoc. Prof. **Shazrene S. Mohamed**  
University of Cape Town and SAAO  
Email: [shazrene@sao.ac.za](mailto:shazrene@sao.ac.za)

In their final stages of evolution, stars lose copious amounts of mass and momentum via powerful, dense stellar winds. Enriched in dust and heavy elements forged in the cores of stars, these outflows not only provide the raw material for planetary systems, but also play a central role in chemical evolution of galaxies. In binary systems, where the winds impinge upon a close companion, a wide range of phenomena result, from bipolar outflows in planetary nebulae to violent nova and supernova explosions.

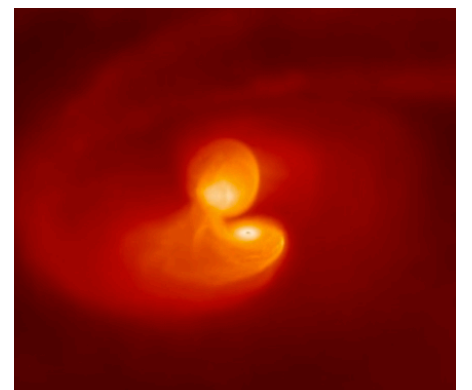
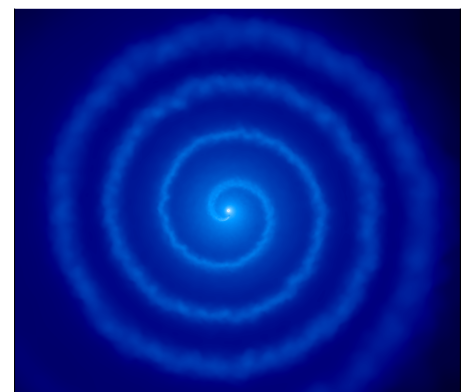
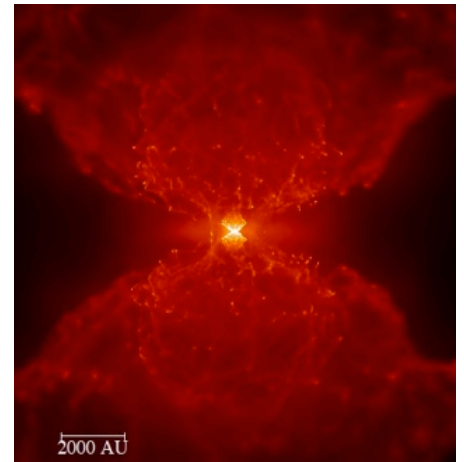
This project aims to fundamentally improve our understanding of the complex outflows and explosions of dying stars, and their impact on their environments.

Possible project topics include supercomputer simulations of:

- Radio emission from explosions of stars
- Star-planet interactions
- Mass transfer in binary star systems
- Bow shocks from runaway stars

For this project students must be comfortable with unix/linux commands and programming (python and/or C/Fortran). Previous experience with computational hydrodynamics and/or radiative transfer will also be very useful. Please email for further details and to make arrangements to discuss the project.

*Simulations of dying stars*



*Observations of dying stars*

