

Insight on AGB mass-loss and dust production from PNe

Friday 14 June 2024 11:50 (20 minutes)

Low-mass stars lose a significant fraction of their mass during the final stages of the asymptotic giant branch (AGB) phase, resulting in the production of a substantial mass fraction of dust. The mass loss process influences the timescales of the transition from the AGB to the planetary nebulae (PNe) phase, while the residual dust contributes to the spectral energy distribution of the PNe. Our latest research endeavors aim to establish a link between what is currently observed in the PNe and the evolution of their progenitor stars in previous phases, thereby improving our understanding of the mechanisms behind dust production and mass loss during the final AGB phase.

In this talk, I will present an investigation of PNe likely originating from single stars, observed from both the Magellanic Clouds and the Milky Way. By comparing the observed spectral energy distribution with that obtained from photoionization modeling, we can discern crucial details such as the luminosity and effective temperature of the central star, the mass of the gaseous nebula, and the amount and composition of dust present. The physical and chemical properties of the central stars are then compared with predictions from ATON evolutionary tracks to constrain the mass of the PN progenitor. The determination of these parameters enables allows us to infer crucial insights into the processes of mass loss and dust formation experienced occurred during the final thermal pulses of the AGB phase.

Primary author: TOSI, Silvia (Roma Tre University)

Presenter: TOSI, Silvia (Roma Tre University)

Session Classification: AGB and beyond: learning from the advanced phases