

PIECES OF THE PLANETARY NEBULA PUZZLE WITH GAIA

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Central stars of planetary nebulae (CSPNe) are some of the rarest objects in the Gaia Hertzsprung Russell (HR) diagram, tracing the brief but remarkable journey from the asymptotic giant branch (AGB) to the white dwarf phase of stellar evolution. Recent data from the Gaia mission offer a new opportunity to better understand these objects and the nebulae that surround them, with astrometric and photometric data providing crucial distance indicators and hinting at physical parameters such as ages, masses, temperature, and even binarity. In this talk we introduce our approach to automatically identifying CSPNe in the Gaia catalogue. We show how the resulting sample compares to recent post-AGB evolutionary tracks, and demonstrate a relationship between the positions of CSPNe in the HR diagram and their kinematics and nebular abundances.

We present followup work on identifying close binary central star candidates from photometric variability in Gaia, and on using the Gaia parallaxes together with ground-based narrowband imagery to investigate the local Milky Way [O III] planetary nebula luminosity function.