

# Are we missing something beyond the mass from post-common-envelope PNe?

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## Abstract

Planetary nebulae (PNe) arising from common envelope (CE) interaction represent a kind of embarrassing binary. Asymptotic Giant Branch (AGB) stars in close-binary systems undergoing CE are believed to abruptly eject their remaining envelope, giving rise to the PNe we observe around some of them. Whereas we are confident that angular momentum transfer during the CE is the main driver of the ejection, our understanding of this brief but important stage does not go much further: on the one hand, statistical analyses suggest that at least 25% of all PNe come from CE interaction, although we only know around a hundred of them; on the other hand, models struggle to unbind the whole AGB envelope from angular momentum exchange, needing to tap on alternate reservoirs such as that from recombination energy, and achieving very limited success even so. Our previous ionised + molecular mass estimates of a fifth of all known post-CE PNe added another piece to this puzzle, suggesting that PNe arising from the first CE of the system (Single Degenerates, SD) are substantially less massive, on average, than PNe arising from the second one (Double Degenerates, DD), and up to two orders of magnitude less massive than the AGB envelopes from which they are believed to arise. Where is all that missing mass?

We present the results of an expanded, more statistically significant analysis comprising an additional 21 post-CE PNe observed in the molecular regime, and the combined ionised + molecular estimates of 10 more, and discuss their implications.

My poster in zenodo.org can be found here