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# Single, Rotating stars, and the influence of companions on PNe shaping

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## Abstract

Planetary Nebulae (PNe) formation is a consequence of stellar evolution and in the process of PNe shaping several processes play their role: stellar mass, rotation, magnetic fields, and the presence of companions. By computing stellar models with rotation we have rule out single main sequence stars to achieve the needed physical conditions to cause asymmetrical mass-loss. We have quantified under which circumstances the presence of companions can induce sufficient tidal spin-up to form bipolar PNe. Finally, by computing models of star-planet interactions we have explored the role that substellar companions have in the overall stellar evolution and thus how they might influence PNe properties.

**Keywords:** Stellar rotation, substellar companions, PN shaping

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