IAUS-REG-NUMBER: IAUS-105
NAME: Palmira Jimenez
AFFILIATION: Dublin Institute of Advanced Studies
CONTRIBUTION: Poster
TITLE: Dust properties as fingerprint of stellar evolution in WR nebulae: M 1-67 and RCW 58
AUTHORS: Jimenez-Hernandez, P.(1,2), Arthur, S. J.(2), Toala, J.(2)
AFFILIATIONS: (1) DIAS, (2) IRyA-UNAM

ABSTRACT:
The properties of the nebular material can be used to infer the mass-loss history of stars in the late stages of their evolution. For this work, we focused on WNh Wolf-Rayet (WR) stars. The presence of Hydrogen in their spectrum have allowed WNh WR stars to be considered as an intermediate stage between an O-type star and the RSG/LBV stage. Some late-type WNh Wolf-Rayet stars are surrounded by clumpy or irregular ejecta nebulae, suggesting a violent mass-loss episode as their origin. We used archive photometric observations from WISE, Spitzer, and Herschel to construct the spectral energy distribution (SED) of M 1-67 and RCW 58, which surround WN8h stars. Modelling Cloudy shows that in both nebulae the infrared SED and photoionized gas properties can be reproduced by a dusty layer consisting of two populations of grains with a high dust-to-gas mass ratio. The large grain size in both nebulae, as large as 0.9 microns, and the nebular material distribution suggest a common eruptive dust-formation history for the two objects. The Common Envelope (CE) can result in the ejection of the CE and a tighter binary. Our results indicate that the central star of M 1-67 and RCW 58 (WR 124 and WR 40, respectively) have gone through an RSG stage and later evolved within a CE. Then, we suggest that both nebulae are products of the evolution of a binary system.