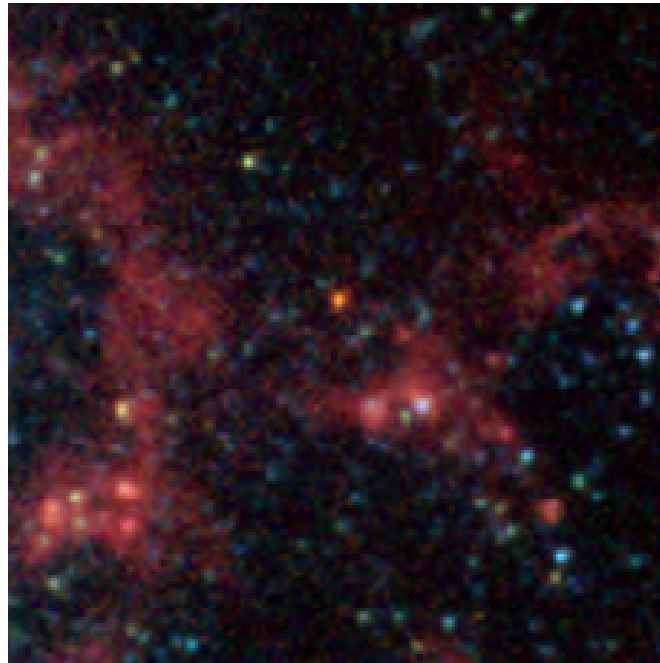


A Spitzer Spectrum of the 2008 Luminous Transient in NGC 300: Connection to Proto-Planetary Nebulae



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with K. Stanek, **T. Thompson**, C. Kochanek, K. Sellgren, J. Beacom (OSU),
H. Bond, **A. Bonanos**, R. Bedin (STScI), R. Humphreys (UMin)

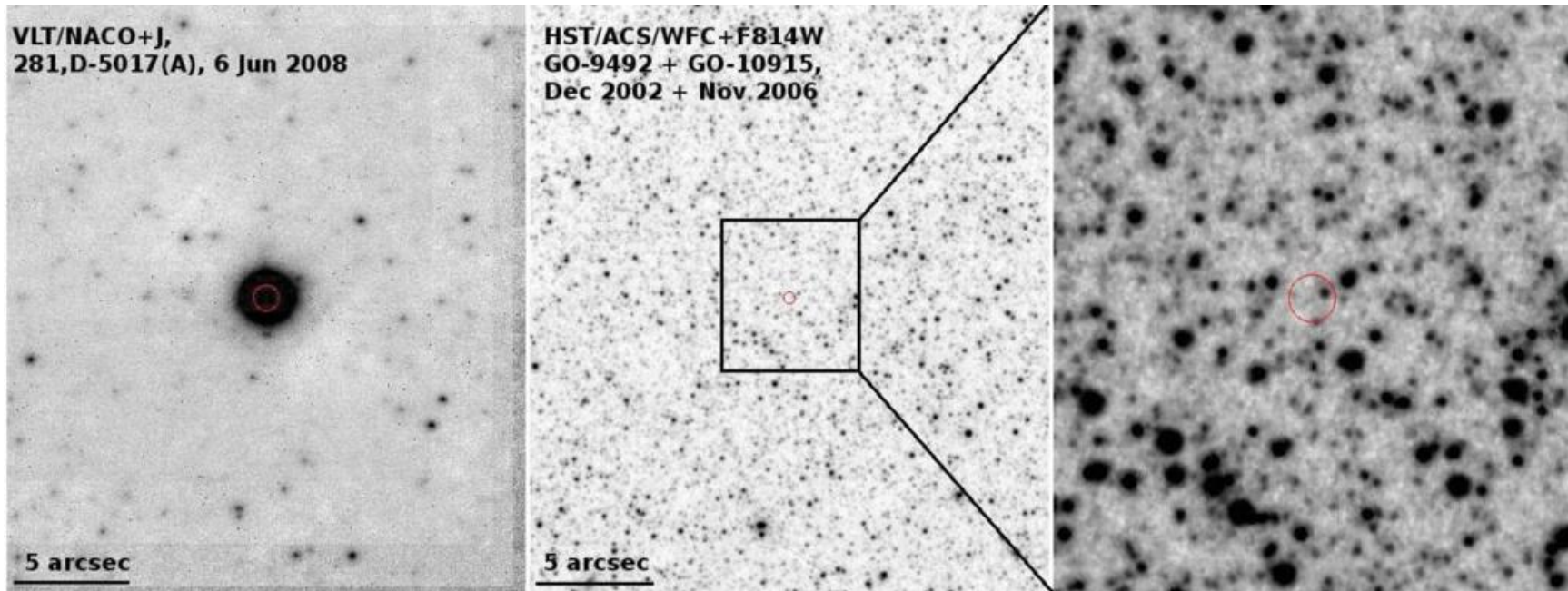
Luminous Transient in NGC 300



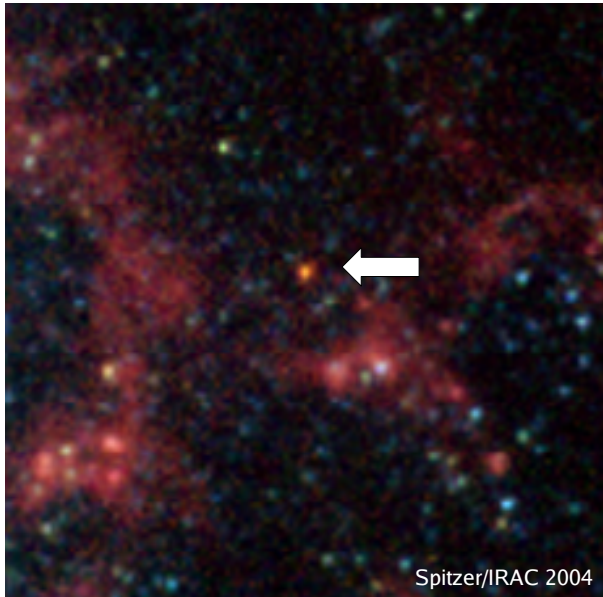
Discovered May 14, 2008 by Berto Monard in NGC 300 (2 Mpc)

$M_V = -13$ mag, spectrum similar to V838 Mon and “SN impostors”

Progenitor of NGC 300-OT

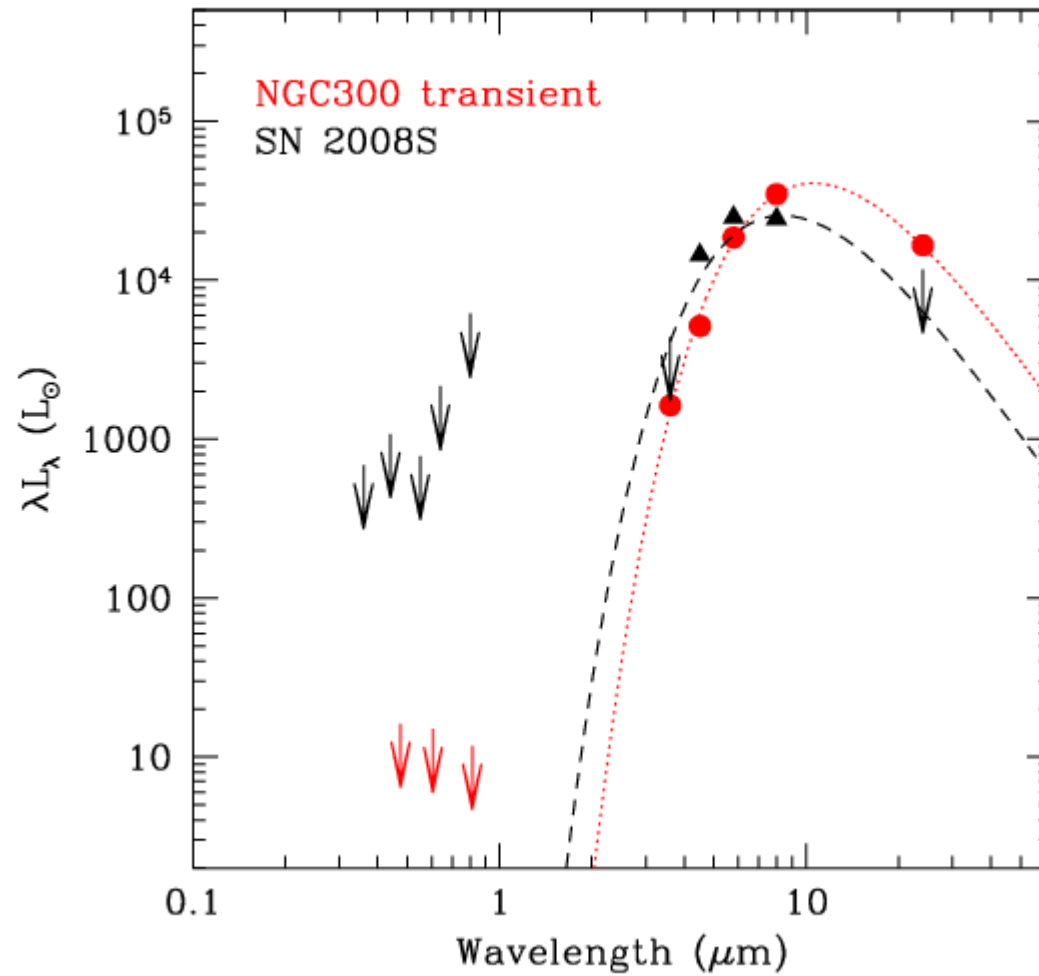


(Bond et al. 2009)



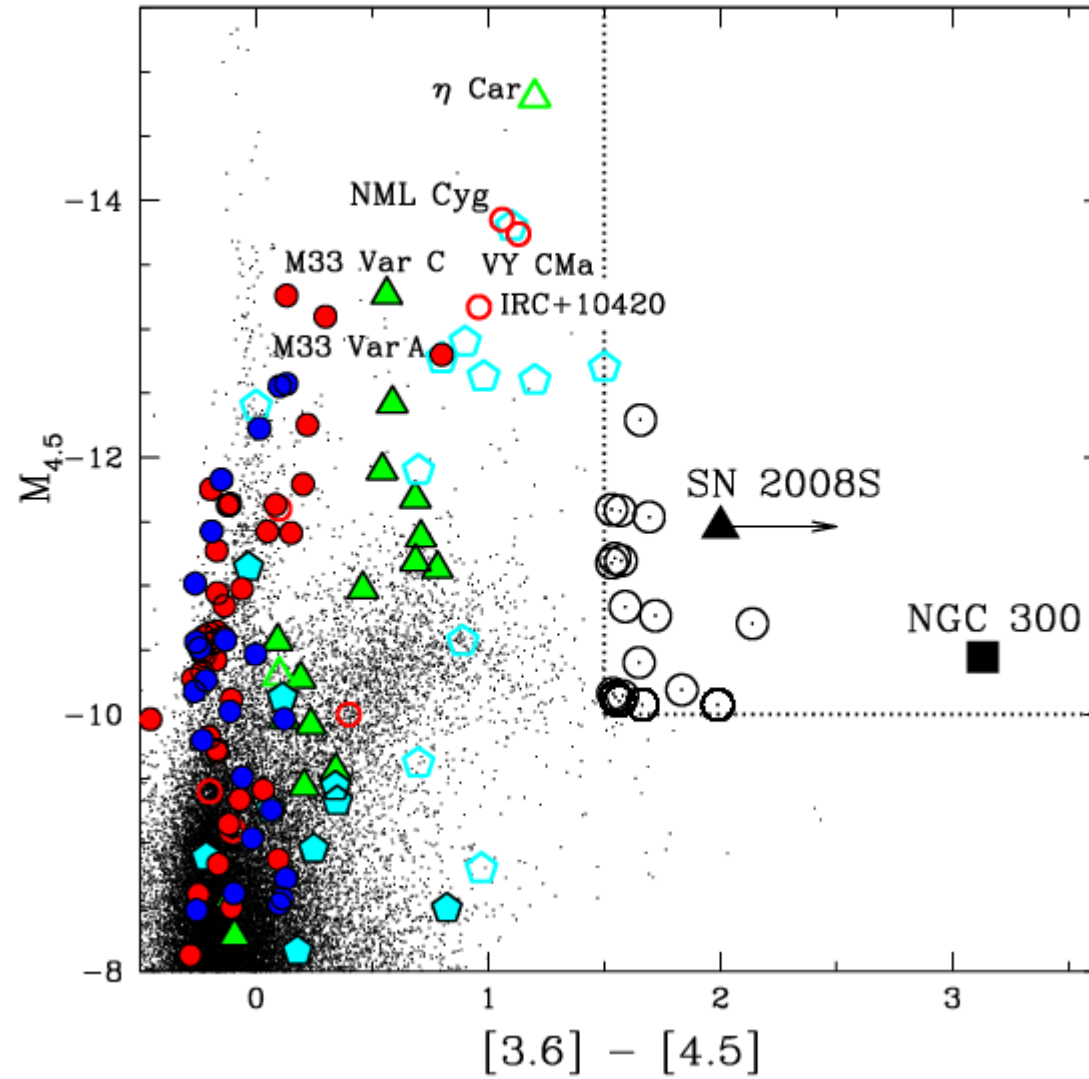
- Progenitor undetected in very deep optical images from HST (Berger & Soderberg 2008; Bond et al. 2009)
- Luminous source in pre-explosion Spitzer images (Prieto 2008; Thompson et al. 2008)

Progenitor: Dust Enshrouded Star



- Luminosities $4\text{-}6 \times 10^4 L_\text{sun}$
- $T = 300\text{-}450 \text{ K}$
- $R = 150\text{-}300 \text{ AU}$

Progenitors as a Class



(Thompson et al. 2008)

Progenitors and Transients

NGC 300-OT and SN 2008S

- Low peak magnitude $M_V = -13$ to -15 mag and int. energy
- Spectra of “optically thick wind” with H, He, Ca II in emission (100 to >1000 km/s)
- Massive dust-enshrouded progenitors ($M_{\text{prog}} = 6-15 M_{\text{sun}}$)
- Transients are dusty with asymmetric distribution

Prieto et al. (2008, 2009); Thompson et al. (2008); Smith et al. (2009); Bond et al. (2009); Berger et al. (2009); Botticella et al. (2009); Gogarten et al. (2009); Wesson et al. (2009); Patat et al. (2009)

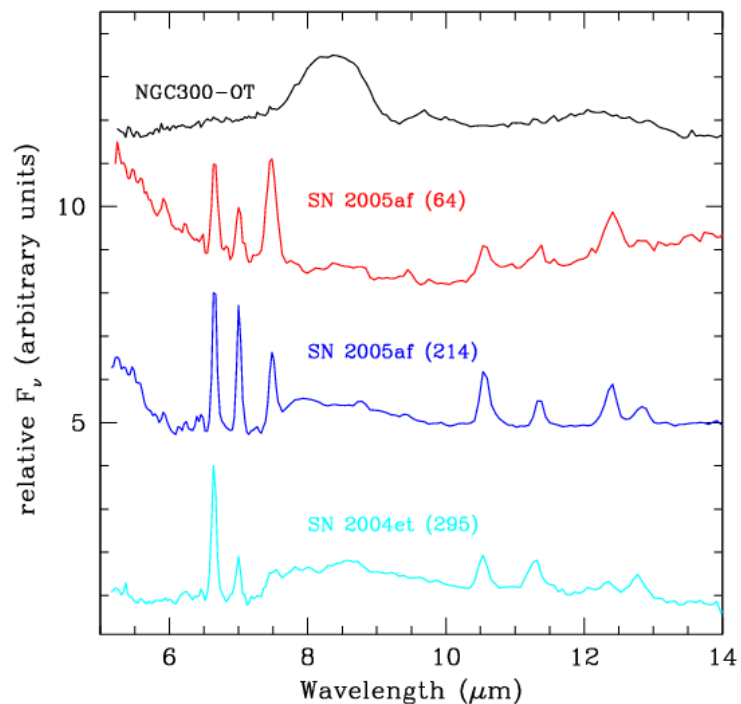
What are NGC 300-OT and SN 2008S ?

- Electron-capture SNe ($M_{\text{prog}} = 8-10 \text{ Msun}$)
- Low-luminosity CC SNe ($M_{\text{prog}} = 10-12 \text{ Msun}$)
- Massive Star Eruption ($M_{\text{prog}} = 10-15 \text{ Msun}$)
- Massive White Dwarf Birth ($M_{\text{prog}} = 6-8 \text{ Msun}$)

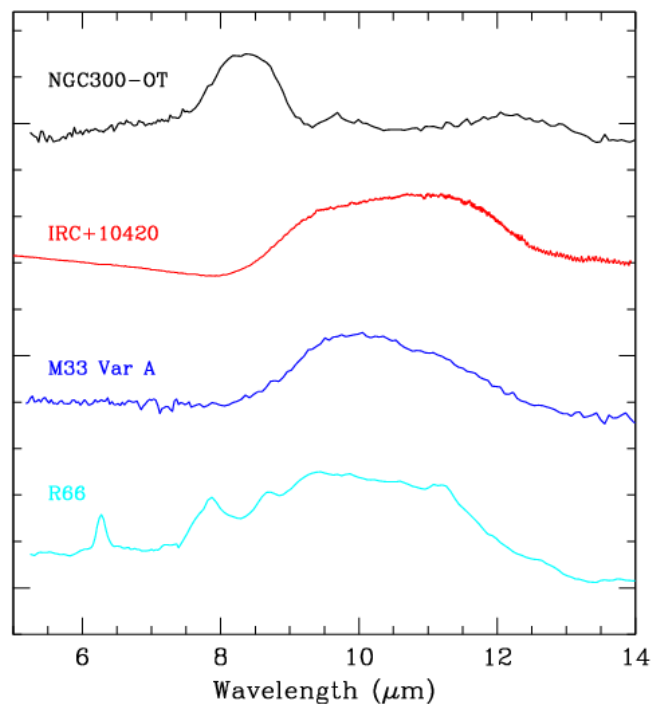
Thompson et al. (2008)

Spitzer Spectrum of NGC 300-OT

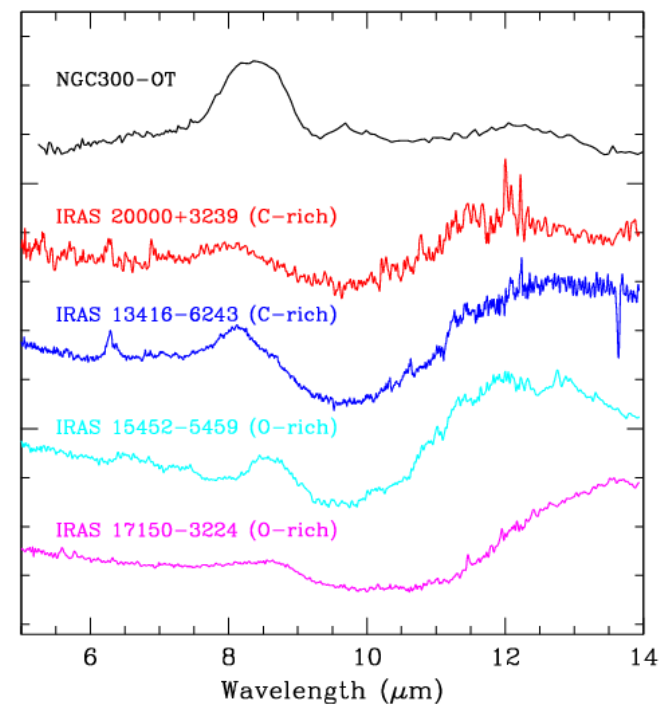
vs SN II-P



vs massive stars



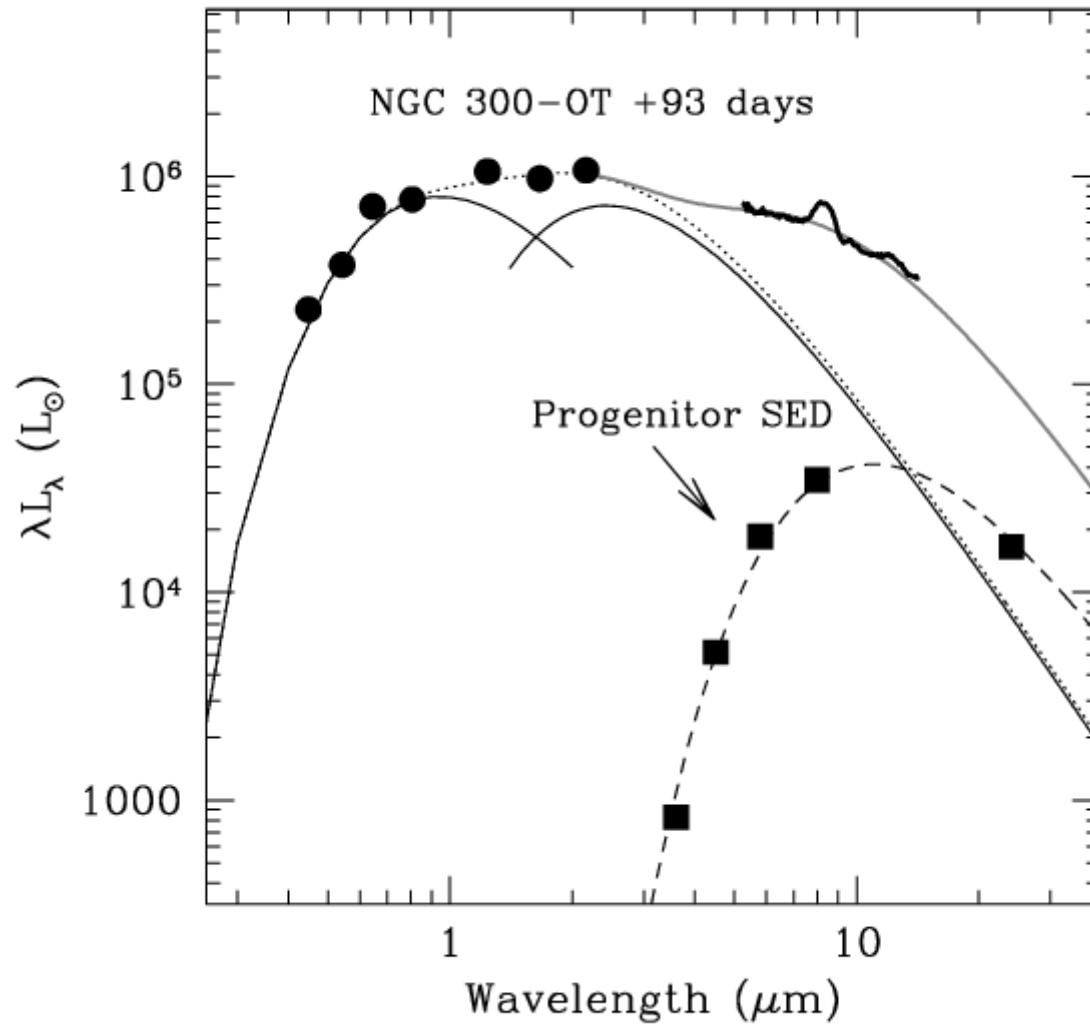
vs proto-PNe



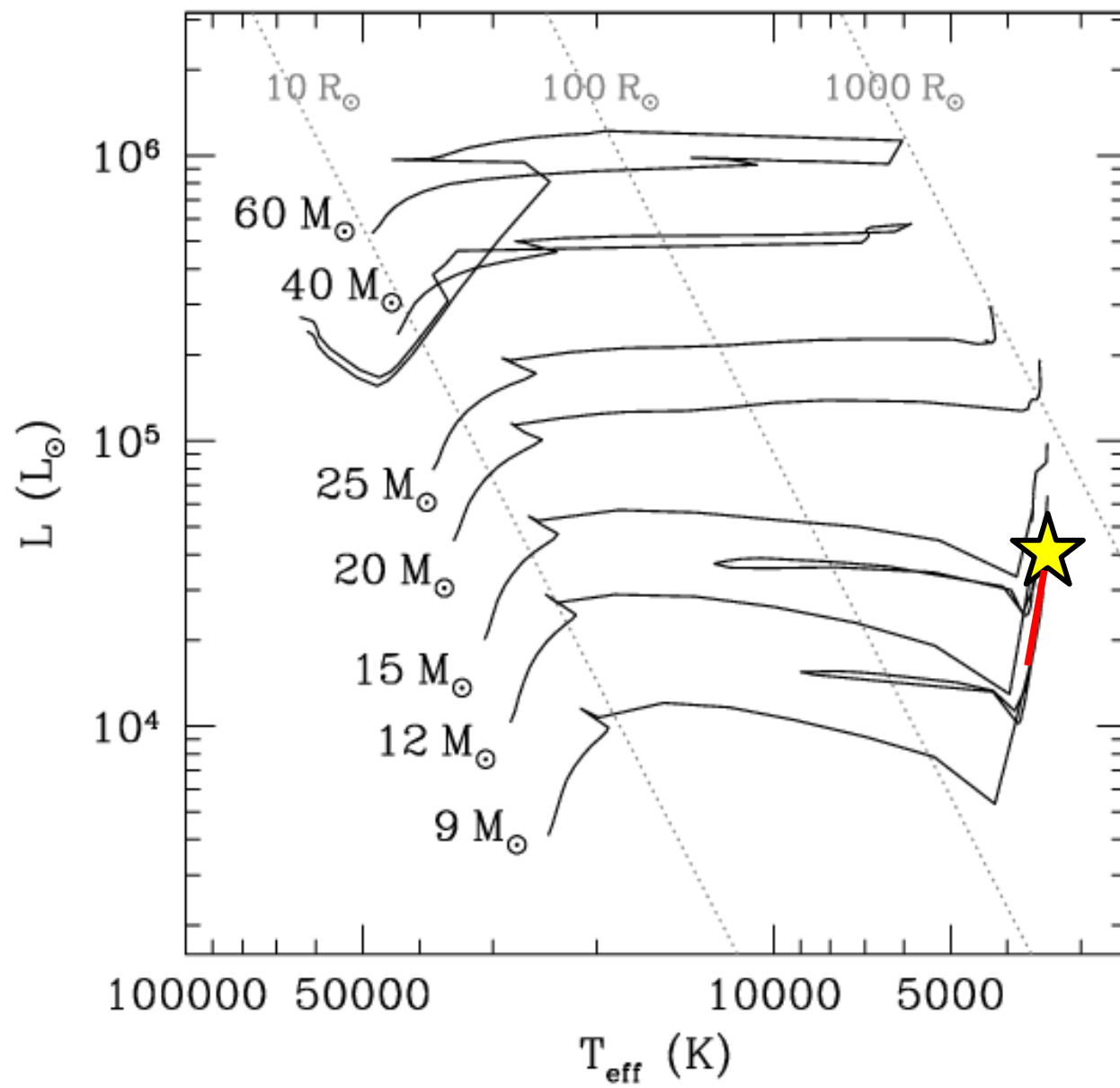
→ Mid-IR features similar to C-rich proto-PNe

(see poster and arXiv:0907.0230)

Spectral Energy Distribution



→ Progenitor dust survived explosion



Thanks !