AFGL 4106: Proto-Planetary Nebula or Post-Red Supergiant?

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Superficially, proto–planetary nebulae (PPNe) and post-red-supergiant (post–RSG) stars look alike: typically, they both have detached dust shells, A–G type supergiant classifications, and on-going mass loss. Usually a star with such properties is classified as post–AGB. However, there are two stars known in the literature, IRC +10420 (e.g. Jones et al. 1993, *ApJ*, 411, 323) and AFGL 2343 (Hawkins et al. 1995, *ApJ*, 452, 314), which were previously identified as post–AGB stars, but appeared to be post–RSG stars. AFGL 4106 might be the next candidate to join this illustrious couple.

AFGL 4106 is located in the direction of the Carina arm. It is heavily reddened and at IRAS wavelengths shows strong dust emission from a cool detached envelope. It has been classified in the literature as a G–type post–AGB star. However, new observations give rise to a skeptical approach to this classification. We show new and surprising observations: a 10 μm image, showing an asymmetric dust distribution; a spectacular Hα image, indicating the presence of a bow shock; and spectra for different orientations of the slit.

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