

INFRARED IMAGES AND LINE PROFILES OF PLANETARY NEBULAE

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ABSTRACT. We present high spatial resolution infrared images of the planetary nebulae NGC 7027, M2-9, BD +30 3639, NGC 7099 and NGC 7662. These were taken through a selection of broad and narrow-band line and continuum filters (including a Fabry-Pérot interferometer) using the 2D infrared array "IRCAM" on the United Kingdom Infrared Telescope, UKIRT, in July 1987. Comparison is made with recently published high-resolution VLA radio maps (Basart and Daub 1987, *Ap. J.*, 317, 412) and mid-IR Wyoming Infrared Telescope raster-scanning maps (Bentley et al. 1984, *Ap. J.*, 278, 665).

Significant differences are found in the fine structure of BD +30 3639 seen in the 3.3 micron emission feature when compared with the image in Brackett- γ .

The image of M2-9 changes substantially between 1.2 and 2.2 microns. At the shorter infrared wavelengths the knots, visible in earlier optical CCD observations, are seen predominantly on the east side of the nebula. Photometry at K shows the nebula to a limiting magnitude of about 18th per square arcsecond, where it is considerably more uniform in appearance than at shorter wavelengths, J and H photometry, calibrated using earlier aperture measurements, has allowed us to form (J - K) and (H - K) colour images. These show a predominant disk-like structure 10 arcseconds in size stretching across the core region of M2-9. The reddening in the disk peaks at over 6 magnitudes in (J - K) in two locations symmetrically placed east and west of the intensity peak.

Line profiles of Brackett- γ and $v = 1 \rightarrow 0$ S(1) molecular hydrogen emission are presented. These were obtained at UKIRT using our combination of cooled grating spectrometer and Fabry-Pérot. The molecular hydrogen line, taken through a 5 arcsecond diaphragm centred on the middle of the 6-cm VLA map of the nebula, midway between the two central molecular-hydrogen peaks, shows a splitting of about 30 km s^{-1} .