MID-IR (8-13μm) IMAGES OF PLANETARY NEBULAE

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We present mid-IR (8-13μm) images of dust in six young planetary nebulae: IC 418, IRAS 21282+5050, NGC 6790, M4-18, M2-9 and IC 5117. The images were taken at UKIRT and the IRTF with the Berkeley mid-IR camera which was developed at the Space Sci. Lab. in UC Berkeley and is supported by IGPP and LEA, LLNL. In IC418, M2-9 and IRAS 21282, the spatial distributions of dust and of ionized gas are measurably different. In M4-18, IC5117 and NGC 6790 the spatial distributions are similar, so apparently the dust and the gas are well mixed. Spatial resolution is the key to discerning the differences in the gas and dust morphologies, and in 2 of the 3 cases where the spatial distributions appear similar, higher resolution may reveal differences. For example, we can discern that the [NeII] peaks further out than the SiC in IC 418 because it is so close and thus large in angular size compared to our $\sim 0.''8$ resolution. In IRAS 21282+5050, we have compared the spatial distribution of the different features attributed to Polycyclic Aromatic Hydrocarbons to the dust continuum (Fig.1). Our data shows that while the 8.5 and 11.3 μm emission peaks outside the 10μm dust continuum, the 12.5μm emission is spatially coincident with it. Hence, not all PAH emission peaks outside of the dust continuum. The plateau emission, sampled by our 12.5μm band, arises from smaller PAHs than the size that causes the 11.3μm PAH feature. Thus, one interpretation of our observations is that the grain size distribution changes with radius: smaller PAHs in the center, increasing size with radius.

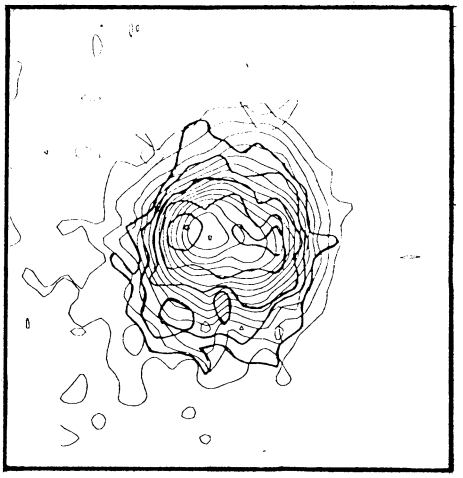

Fig. 1. IRAS 21282+5050: 8.5μm (heavy line) overlaid on 10μm

https://doi.org/10.1017/S0074180900170731 Published online by Cambridge University Press