THE FILAMENTARY STRUCTURE OF THE RING NEBULA

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Image-tube photographs taken through narrow-band interference filters have been used to obtain monochromatic surface brightnesses of the Ring Nebula (NGC 6720) in the strongest emission lines of H I, He I, He II, [N II], [O I], [O II], [O III], and [S II]. These data have been used to analyze the spatial distribution of the various ionized species within the nebula. The bulk of the observed emission is shown to arise from a network of neutral filaments whose inner surfaces are ionized by the incident stellar radiation. The filamentary network is embedded in a low-density, high-temperature medium which is the source of most of the observed high-excitation lines. The ionization structure of several prominent filaments is examined in detail and comparisons are made to recent ionization structure calculations.

DISCUSSION

Balick: Is there any chance that improperly subtracted plate fog or halation might account for the HeII brightness coming up to the edge of the nebula?

Goad: The background levels and photographic calibration were very carefully examined for possible sources of systematic errors. We feel that the weak high excitation emissions observed at the edge of the Ring Nebula are real.

Osterbrock: What are the transmission characteristics of the filters in the wings at the positions of other possible contaminating lines?

Goad: The filter passband used was ∿10Å FWHM. Blocking was generally very good, and contamination by other lines appears unlikely for this λ4686 filter.

Terzian: Is it true that in all your observations the maximum brightness is in the direction of the minor axis?

Goad: Yes.

Yervant Terzian (ed.), Planetary Nebulae, Observations and Theory, 289-292.