

OPTICAL AND UV NEBULAR SPECTRA OF NGC 40

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The planetary nebula NGC 40 has a WC8 central star. From analysis of IUE spectra of the star, Benvenuti, Perinotto and Willis (1981, IAU Symposium 99) obtain the remarkable abundance ratio C/He \sim 0.2 and probably no hydrogen. The question arises as to whether the nebular shell has abnormal abundances.

We have made observations of a bright region of nebulosity at about 14 arc sec NW of the star, optical observations at the Kitt Peak Observatory and UV observations with IUE. In the UV the fluxes in spectral lines are measured relative to those in the nebular continuum and hence put on the same scale as those measured at optical wavelengths relative to H β .

The abundances deduced - $\log N(\text{C}) = 9.1$, $\log N(\text{N}) = 8.4$, $\log N(\text{O}) = 9.0$ - are typical of planetary nebulae and do not share the anomalies of the central star.

The C IV λ 1549 line is unexpectedly strong in the nebular spectrum. It may be produced by resonant scattering of λ 1549 from the star.

Newly-identified C II recombination lines have been detected in NGC 40 and IC 418. Their relative strengths are discussed.