The Central Star of NGC 7027

N.A. Walton and S.R. Pottasch
Kapteyn Laboratorium
Groningen
The Netherlands

N.K. Reay
Queensgate Instruments Ltd.
Sunbury
Great Britain

T. Spoelstra
Radiosterrenwacht Dwingeloo
The Netherlands

Abstract

We have detected the central star of NGC 7027 by imaging the nebula through a narrow band 'continuum' filter onto the IPCS detector at the 2.5m Isaac Newton Telscope. We obtain an apparent visual magnitude for the central star of $m_v = 17.7 \pm 0.5$ mags.

Assuming that the central star radiates approximately as a blackbody, which is reasonable for the case of a hot star, then Zanstra temperatures for the central star can be calculated. We find $T_Z(H) = 3.9 \times 10^5$K and $T_Z(HeII) = 2.6 \times 10^5$K. Using the correction due to Stasinska & Tylenda (1986) we estimate the central star of NGC 7027 to have a temperature, $T_{eff} = 3.1 \times 10^5$K.

The luminosity and radii are found assuming a distance of d=1.2 kpc., giving L = 12,600 $L_\odot$ and R = 0.039 $R_\odot$. Placing the central star on the Log L – Log T diagram and comparing with evolutionary tracks for central stars with various masses from Wood & Faulkner (1986), indicates that the central star of NGC 7027 must have a mass, $M \geq 0.8\ M_\odot$.

Radio observations of NGC 7027 have been taken using the Westerbork Radio Synthesis Telesocpe at 21cm. Self calibration techniques have been employed to give a radio continuum map of high dynamic range. These observations are being compared with a deep optical Hβ map to study the nature of the faint halo seen around NGC 7027 (Atherton et al. 1979)

References

Atherton, P.D., Hicks, T.R., Reay, N.K., Robinson, G.J., Worswick, S.P., Phillips, J.P.: 1979, *Astron. Astrophys.* **232**, 786
Stasinska, G., Tylenda, R.: 1986, *Astron. Astrophys.* **155**, 137
Wood, P.R., Faulkner, D.J.: 1986, *Astrophys. J.* **307**, 659

Note Added In Proof

Prime focus CCD observations of NGC 7027 have been obtained in Oct. 1987. These observations clearly show the central star. The results are presented in a forthcoming paper, Walton et al. 1988, *Astron. Astrophys. Letts.*, accepted.

S. Torres-Peimbert (ed.), Planetary Nebulae, 301.