

NGC 2070 and NGC 3603

You-Hua Chu
University of Illinois at Urbana-Champaign
Patrick Seitzer
Kitt Peak National Observatory
Nolan Walborn
Space Telescope Science Institute

Giant H II regions are usually so distant that only the integrated properties of their stellar contents can be studied. However, the nearby giant H II regions 30 Doradus in the Large Magellanic Cloud and NGC 3603 in the Galaxy offer a rare opportunity for a spatially resolved study of their central stellar associations - NGC 2070 and NGC 3603. We have obtained 4m prime focus plates with interference filters centered on the He II 4686 line ($\Delta\lambda=65 \text{ \AA}$) and the adjacent blue continuum at 4765 \AA ($\Delta\lambda=70 \text{ \AA}$) to identify the Wolf-Rayet (WR) stars in their cores. We have also obtained CCD images in UBVRI for NGC 2070, and BVRI for NGC 3603 to determine their color-magnitude diagrams and luminosity functions. Since the WR stars in the core of 30 Dor have been reported by Chu, Cassinelli, and Wolfire (1984) and Moffat, Seggewiss, and Shara (1985), and the CCD photometry of NGC 2070 and 3603 is still preliminary, we will discuss in these proceedings only the WR stars resolved in the core of NGC 3603.

The core of NGC 3603, HD 97950, was resolved into ABCDEFG components (Walborn 1973; see Fig. 1 for their positions). The A component was recently further resolved into 3 components by speckle interferometry (Weigelt, Baier, and Ladebeck 1985). Moffat, Seggewiss, and Shara (1985) have determined that there is more than one WR star in HD 97950. The resolution of their CCD images is unfortunately limited by the pixel size of 0.6 arcsec, so that the individual WR stars are not resolved.

Based upon our on-line, off-line pair of two-minute exposure prime focus plates, the C component is clearly a WR star, and the B component of the AB group is probably the main contributor of the He II line emission. (The He II line emission components are best illustrated in the false color contour plots as shown in the poster. A black and white photocopy is presented in Fig. 2.) The excellent seeing also allows the D component to be resolved into two stars (see Fig. 1).

The unresolved cores of giant H II regions have been suggested to

contain peculiar objects, e.g. supermassive stars. The WR stars resolved in our data and the stars resolved by speckle interferometry (Weigelt, Baier, and Ladebeck 1985) for NGC 2070 and 3603 demonstrate that peculiar objects may not be necessary.

References:

- Chu, Y.-H., Cassinelli, J. P., Wolfire, M. G. 1985, *Ap. J.*, 283, 560.
 Moffat, A. F. J., Seggewiss, W., and Shara, M. M. 1985, *Ap.J.*, in press.
 Walborn, N. R. 1973, *Ap. J. Letters*, 182, L21.
 Weigelt, G., Baier, G., and Ladebeck, R. 1985, *ESO Messenger*, No. 40.

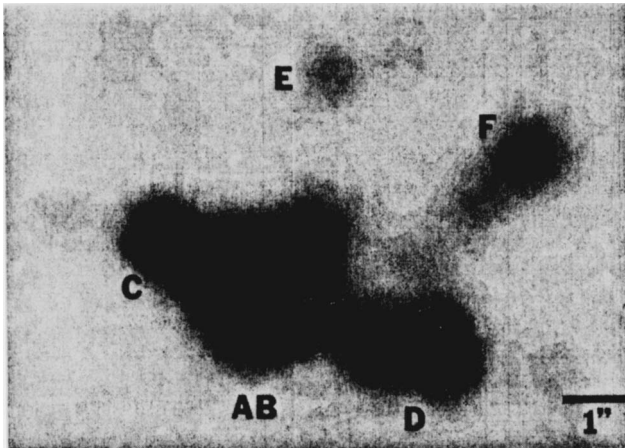


Fig.1. HD 97950, the core of NGC 3603. North is at top, and east is at left.

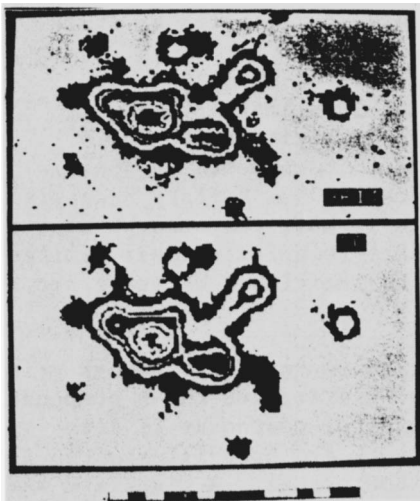


Fig.2. Black and white reproduction of the false color contour plots of HD 97950. The upper panel is for the He II image, and the lower panel for the blue continuum image. The scale below represents plate densities of 0 to 5 from left to right. The C component is brighter in the He II than the blue continuum by about 0.3 in density. The He II image of AB is denser than the blue continuum counterpart, especially at the southeast where the B component is located.