

spectrum has been observed in S307 and S311. This emission could be due to free-free in the HII region observed in the radio continuum. A detailed discussion of the sources including VLA radio data and IRAS observations will be presented.

#### NEW INFRARED OBSERVATIONS OF NGC 3603

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NGC 3603, one of the most massive HII regions in our galaxy, shows recent star forming activity (Frogel *et al.* 1977; Tapia 1981; Persi *et al.*, 1985). In this paper we report new near-infrared maps and photometric observations in the complex region surrounding Irs 9, Irs 2 and Irs 8. Most data were gathered at the 1.5-m telescope of CTIO, using an InSb photometer. Tables 1 and 2 synthesize the observations and the results of the photometry. While the low resolution K map (Figure 1) shows basically the previously reported features, the high resolution K and L maps (shown superimposed in Figure 2), show that Irs 9 is the brightest source in the field, clearly resolved from Irs 2 and Irs 8. The presence of a previously unreported source some 22"N and 5"W of Irs 2, should be further investigated. The spectral distributions derived from our measurements and from previous ones by Persi *et al.* (1985) strongly suggest that the 10 and 20  $\mu\text{m}$  fluxes reported by Frogel *et al.* (1977) at the position of Irs 2, probably correspond to Irs 9. Under this assumption, Irs 9 is probably a highly reddened massive star (1  $\mu\text{m}$  to 20  $\mu\text{m}$  luminosity,  $L_* = 2.2 \times 10^4 L_\odot$ ) while the luminosity of Irs 2 is less than  $10^2 L_\odot$ . We therefore conclude that Irs 9 is a young massive star surrounded by a warm ( $T_{\text{dust}} \sim 250$  K) dust envelope; Irs 2 seems to be the less obscured part of an associated HII region, as further corroborated by the Br $\gamma$  emission and the free-free like spectrum and spectral distribution, as reported by Persi *et al.* (1985) and in this paper.

New observations of Irs 16, whose striking variability of at least six magnitudes in the K band was reported by Persi *et al.* (1985), show that at least one period has elapsed since its discovery by Tapia, in 1978 (Tapia, 1981). Figure 3 shows the peculiar behaviour of this late-type star.

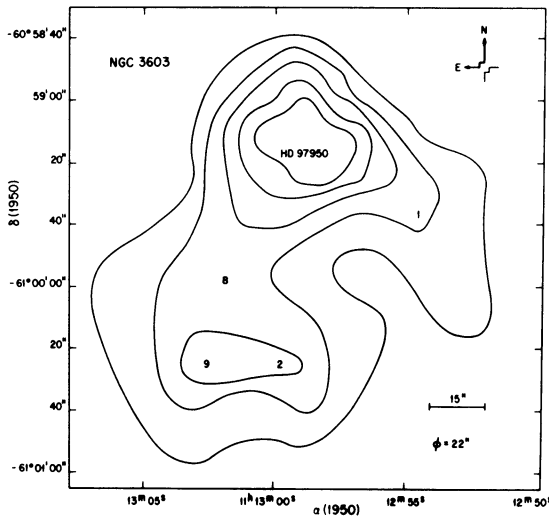


Fig. 1. Low resolution  $2.2 \mu\text{m}$  map of the NGC 3603 region.

TABLE 1: MAPS

Date 1985	Size of the Region arcmin	Central Coordinates $\alpha$ (1950)	Central Coordinates $\delta$ (1950)	Beam arcsec	Steps arcsec	Throw arcsec	Filter
April 12	1.08 x 1.08	$11^h 14^m 33^s$	$-61^{\circ} 11' 57''$	7	5	120	K
April 13	1.08 x 1.08	$11^h 14^m 30^s$	$-61^{\circ} 11' 52''$	7	5	140	L
April 13	2.5 x 2.5	$11^h 14^m 30^s$	$-61^{\circ} 11' 52''$	22.0	15	140	K
April 13	2.5 x 2.5	$11^h 14^m 30^s$	$-61^{\circ} 11' 52''$	22.0	15	190	K

TABLE 2: PHOTOMETRY

Date 1985	Source NGC 3603	Coordinates $\alpha$ (1950)	Coordinates $\delta$ (1950)	Diaph. (")	J	H	K	L	M
March 14 <sup>†</sup>	Irs 16	$11^h 13^m 07^s.6$	$-60^{\circ} 58' 37''$	15	10.77	8.27	6.66	4.75*	4.19
April 12	Irs 9	$11^h 13^m 02^s.8$	$-61^{\circ} 00' 22''$	5	11.78	10.12	8.31	6.16	4.95
April 12	Irs 9	$11^h 13^m 02^s.8$	$-61^{\circ} 00' 22''$	7	11.34	9.92	8.18	6.03	-
April 12	Irs 9	$11^h 13^m 02^s.8$	$-61^{\circ} 00' 22''$	11	10.73	9.50	7.92	5.85	-
April 13	Irs 8	$11^h 13^m 26^s$	$-60^{\circ} 59' 59''$	7	9.48	8.95	8.71	-	-
April 12	Irs 16	$11^h 13^m 07^s.6$	$-60^{\circ} 58' 37''$	9	10.72	8.24	6.64	5.07	4.32

<sup>†</sup> Measurements made at ESO.  
 \* Photometry with L' filter.

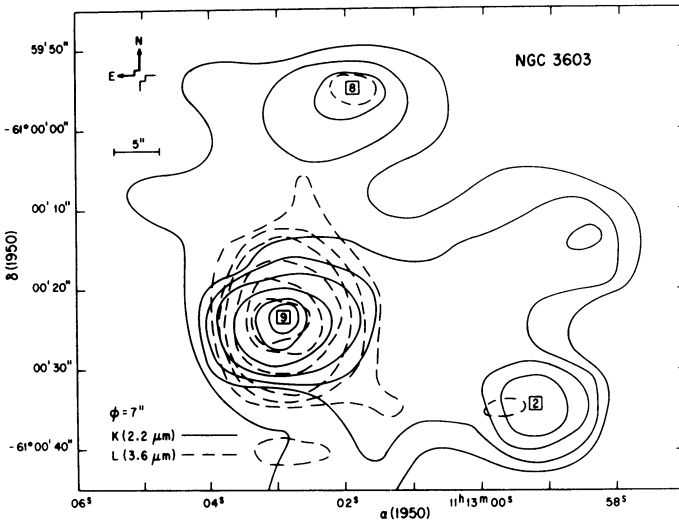


Fig. 2. High resolution 2.2 and 3.6  $\mu\text{m}$  maps of the Irs 9, Irs 2, and Irs 8 region.

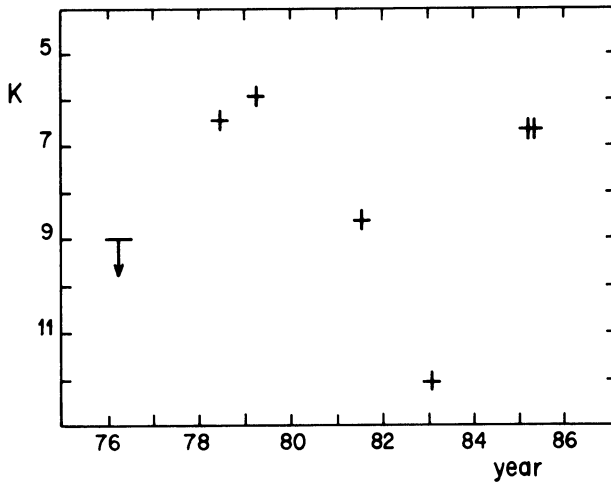


Fig. 3. 2.2  $\mu\text{m}$  light curve of Irs 16.

REFERENCES

Frogel, J., Persson, C., and Aaronson, M.: 1977, *Astrophys. J.* 213, 723.  
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 Tapia, M.: 1981, *Monthly Notices. Roy. Astron. Soc.* 197, 949.