

Revista Mexicana de Astronomía y Astrofísica

Revista Mexicana de Astronomía y Astrofísica
Universidad Nacional Autónoma de México
rmaa@astroscu.unam.mx
ISSN (Versión impresa): 0185-1101
MÉXICO

2003

D. E. A. Nürnberger / Th. Stanke

THE DUSTY SIDE OF NGC 3603: TIMMI 2 DATA REVEAL A STRIKING DIVERSITY
OF MID-IR SOURCES

Revista Mexicana de Astronomía y Astrofísica, número 015

Universidad Nacional Autónoma de México

Distrito Federal, México

p. 203

Red de Revistas Científicas de América Latina y el Caribe, España y Portugal

Universidad Autónoma del Estado de México

reDalyC
LA BIBLIOTECA CIENTÍFICA EN LÍNEA
<http://redalyc.uaemex.mx>

THE DUSTY SIDE OF NGC 3603: TIMMI 2 DATA REVEAL A STRIKING DIVERSITY OF MID-IR SOURCES

D. E. A. Nürnberg¹ and Th. Stanke²

We give an overview of results obtained in the framework of our sub-arcsec resolution $11.9\ \mu\text{m}$ and $18\ \mu\text{m}$ imaging survey of the southern hemisphere giant H II region NGC 3603 (Nürnberg & Stanke 2003). The fields observed with TIMMI 2 at the ESO 3.6 m telescope comprise the vicinity of the OB cluster, covering dense molecular cloud cores, embedded near-IR sources and maser sources. Surprisingly, we detect mid-IR emission from a large variety of sources.

In the area surveyed—a small part is shown in Figure 1—the protostar IRS 9A is found to be the most luminous point source at both $11.9\ \mu\text{m}$ and $18\ \mu\text{m}$. Located in its immediate vicinity two more sources (IRS 9B and IRS 9C) also exhibit significant $11.9\ \mu\text{m}$ and $18\ \mu\text{m}$ emission, thus providing further indications for IRS 9 being an association of protostars in its own right. Several other $11.9\ \mu\text{m}$ point sources are related to near-IR sources with strong K -band excess emission and/or to maser sources, which classifies them as young sources, too. In contrast, the second strongest $11.9\ \mu\text{m}$ source, IRS 4, appears to be in a more evolved stage.

Towards the center of the OB cluster we also observe mid-IR emission arising from the three Wolf-Rayet stars WR 43abc, providing evidence for dust production and/or the presence of plasma in their circumstellar envelopes. Spread all over the cluster, we detect a number of sources with mid-IR fluxes close to the sensitivity limit ($\sim 0.01\ \text{Jy}$) of our $11.9\ \mu\text{m}$ data, which apparently have very red $K-N$ colors. We suggest that these sources are circumstellar disks which are externally heated by the nearby massive stars.

Towards the south and west of the OB cluster, large amounts of diffuse emission are found closely correlated with ionized material. We identify at least 7 shocks and ionization fronts, reflecting the enormous impact of the fast stellar winds and ionizing photons, originating from the massive cluster stars, on the adjacent gas and dust. This is impressively

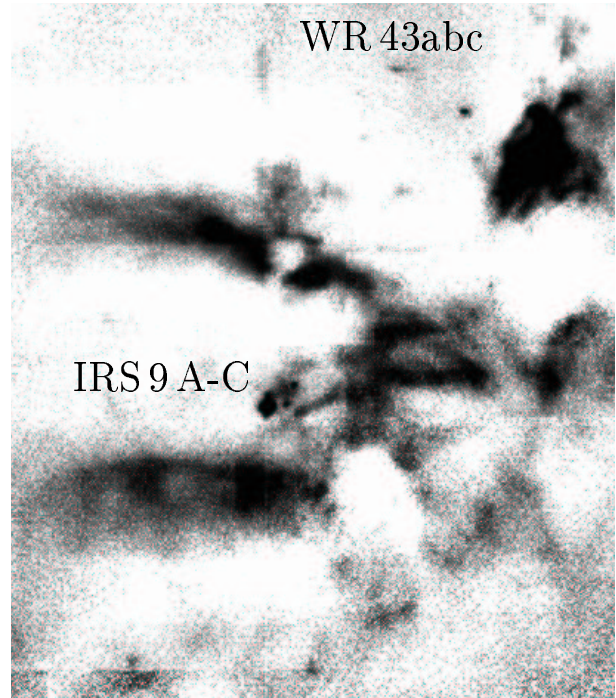


Fig. 1. Central part (FOV = $2'.0 \times 2'.3$) of our $11.9\ \mu\text{m}$ NGC 3603 data.

emphasized by the shocked and ionized material associated with the heads of the two prominent pillars. Both pillars are easily seen in our $11.9\ \mu\text{m}$ and $18\ \mu\text{m}$ data: the western one in emission, the eastern one in absorption against a strong diffuse mid-IR background.

Among those sources, for which our data do not reveal any point-like mid-IR counterpart, are IRS 1 as well as the three “proplyds”. However, at least for “proplyd” 3 we detect extended, rim-like $11.9\ \mu\text{m}$ emission. Therefore, we consider it likely that NGC 3603’s “proplyds” simply represent scaled-down versions of the neighbouring pillars, i.e., remnant density enhancements of the pristine molecular cloud which to date were able to resist the ionizing and photoevaporating radiation from the nearby OB stars.

REFERENCES

Nürnberg, D. E. A., & Stanke, Th. 2003, A&A, in press

¹European Southern Observatory, Casilla 19001, Santiago 19, Chile (dnuernbe@eso.org).

²Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, 53121 Bonn, Germany (tstanke@mpifr-bonn.mpg.de).