

## **7. The Central Parsecs of the Milky Way**

## NIR AND MM MOSAICS OF THE CENTRAL 100 PC

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The conditions within the nuclear bulge (NB,  $R \sim 300$  pc) of our Galaxy are extreme: less than 0.1% of the volume of the galactic disc contains more than 10% of the total ISM and stars. There are indications that star formation in the NB is not a continuous process, but rather undergoes cyclic variations. Details of the current and past star formation processes and the stellar content of the central parsecs - especially the ratio of old to young population - are not very well known (Mezger *et al.*, 1996).

To investigate the star formation processes within the NB, we have begun various observing programs. The physical state of the ISM is investigated using molecular spectroscopy and mm/submm dust continuum emission. The stellar population is investigated through its near infrared (NIR) emission which dominates for  $\lambda \leq 5 \mu\text{m}$ .

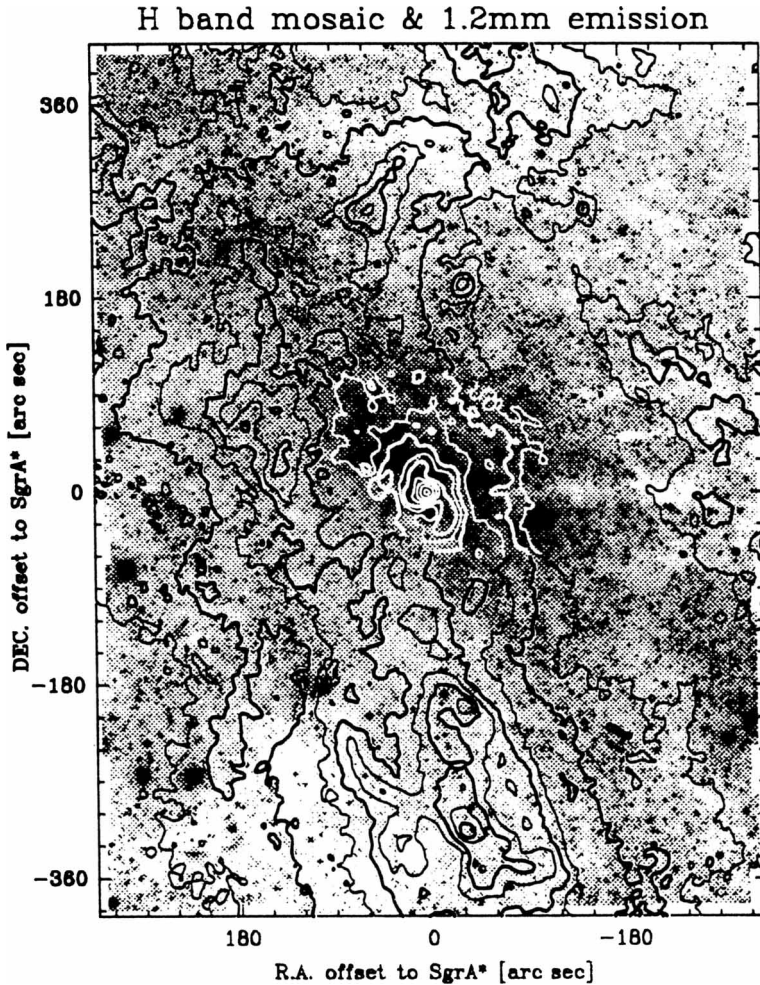
So far, we have mapped the entire Sgr A complex, the Arc and the Bridge, i.e. the central  $15' \times 25'$ , in both the NIR ( $2.2 \mu\text{m}$  and  $1.65 \mu\text{m}$ ) and mm (1.2 mm). The NIR observations were made with the IRAC2B camera at the ESO/MPIA 2.2-m telescope. The millimeter maps were obtained with the MPIfR 7- and 19-channel bolometer arrays installed at the IRAM 30-m telescope between 1993 and 1997. The observing techniques and data reduction are summarized in Philipp & Zylka (1997).

The data show that the whole central cluster is heavily extinguished. There is, in most cases, a very tight correlation between dust clouds and areas with reduced stellar surface brightness due to dust extinction (Fig. 1). From the depth of this extinction, together with the column density of extinguishing

clouds, the location of these clouds along the line of sight and the unaffected distribution of stars can be derived. The average surface star density in the central  $600'' \times 750''$  is  $0.1-0.3''^{-2}$ .

## References

Mezger P.G., Duschl W.J., Zylka R., 1996, A&AR, 7, 4.  
 Philipp & Zylka, 1997, in these proceedings.



*Figure 1.* H band mosaic with overlaid contours representing the 1.2 mm continuum emission. The H band data were obtained with the IRAC2B camera at the ESO/MPG 2.2m ( $\sim 2000$  images); the 1.2 mm data were observed with the 19-channel bolometer array at the IRAM 30 m. The central part of the H mosaic presented here, is constructed from  $\sim 600$  images. The 1.2 mm contour levels are: 70, 170, 320, 470, 650, 850, 1200, 1650, 2500 and 3500 mJy/11'' beam. The rms is  $\sim 15$  mJy/11''.