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EIGHTH ESLAB SYMPOSIUM ON HII REGIONS AND THE GALACTIC CENTRE

A symposium on HII regions and the galactic centre was organised by the Space Science Department of the European Space Research Organisation. It was held at ESRO Establishment in Frascati, Italy, from June 4 to June 7.

About forty papers were presented at the symposium. The papers presented included observations at infrared, millimetre and radio wavelengths. A large number of papers on the observations in the infrared region reflected the growing interest in this field. There was an emphasis on the correlation of observations made at different wavelengths, and on the role of dust and molecules associated with HII regions.

The infrared emission from HII regions and the role of dust in this emission was discussed in detail. The observations in 1-25μ region indicate that most of the emission is from dust grains which are well mixed with the ionised gas. Resonantly trapped Lyman α photons can account for the heating of dust. The absorption feature around 10μ, usually associated with silicates, shows similar structure for many different sources, and its optical depth is correlated with the depth of H_2CO absorption obtained from radio observations. The observations at longer wavelengths ($\geqslant 40\mu$) show source sizes comparable to radio contiuum sizes, and the two luminosities are also correlated. The cool dust and molecular clouds,(which give the absorption feature around 10μ,) could be responsible for longer wavelength emission.

The association between the infrared emission and molecular sources was also a topic covered in detail. The observations at 1-20 μ infrared wavelengths have shown sources associated with molecular masers within HII regions. These sources do not have a radio continuum and are possible candidates for protostars. Association of CO emission was reported with far infrared ($\sim$ 100μ) sources, and with sources having excess emission at short infrared wavelengths.

A paper reported the observation of preferential association of OH masers with compact sources and lack of association with broad sources in HII regions. This indicates that the star in the process of arriving at the main sequence gives rise to a maser, but as the star heats up the maser disappears.

Several models of infrared emission and absorption from dust towards the galactic centre were discussed. A picture consisting of a hot core, of a few parsec, and a cooler halo emerges if the dust is assumed to have a resonance behavior at 10μ. This resonance picture is consistent with the observed absorption feature around 10μ. The calculations based on the 10μ absorption feature indicate an average hydrogen density of about 5 atoms. cm^{-3} in the galactic centre direction, assuming normal silicon abundance and the source of absorption feature as silicates. A lower value of hydrogen density would require a high silicon abundance. The observations on association Cyg OB2 were also suggestive of a very high dust to gas ratio.

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