

N91-14978
P-1

INFRARED CIRRUS POINT SOURCES

William T. Reach, Carl Heiles, and Bon-Chul Koo
Astronomy Department, University of California, Berkeley

The Infrared Astronomical Satellite (IRAS) discovered a large number of unresolved sources which were much more intense at $100\mu\text{m}$ than at shorter infrared wavelengths. We have isolated a sample of these point sources (Heiles *et al.* 1987) which are located in regions of very low Galactic H I column density, as determined from the Hat Creek 21-cm line survey. Whereas we initially believed these sources to be prime candidates for a class of previously unknown astronomical object, our observations have now proven that most of the sources are associated with the interstellar medium (ISM) of our Galaxy.

Using the NAIC Arecibo telescope to search for Galactic and redshifted 21-cm emission, we have found that:

- (1) The excess H I column density at the position of the the IRAS source is less than 10^{19} cm^{-2} over the $3'$ beam of the telescope.
- (2) Some (roughly $1/3$) of the point sources are associated with features in nearby, catalogued spiral galaxies with large angular size.
- (3) Many of the point sources are associated with clouds at anomalous LSR velocities. One extraordinary source is associated with a small high velocity cloud, at $v_{LSR} = +133 \text{ km/s}$.

Using the NRAO Kitt Peak 12-m telescope to search for Galactic ^{12}CO J=1-0 line emission, we have found that:

- (1) A large fraction (65% detection rate at the 0.2 K antenna temperature level) of the IRAS source positions reveal CO in position-switched observations.
- (2) The CO lines are frequently at anomalous velocities, identical to the H I line velocities.
- (3) There is a correlation between the IRAS $100\mu\text{m}$ flux and the CO antenna temperature. This correlation suggests that the CO emission may be optically *thin*. We are performing ^{13}CO observations (1988 June 11-15) in order to determine the CO optical depth at the location of the IRAS sources; the results will be presented in our poster.

Heiles, C., McCarthy, P. J., Reach, W. T., and Strauss, M. A. 1987, in *Star Formation in Galaxies*, NASA CP-2466, ed. C. J. Lonsdale, p. 553.