

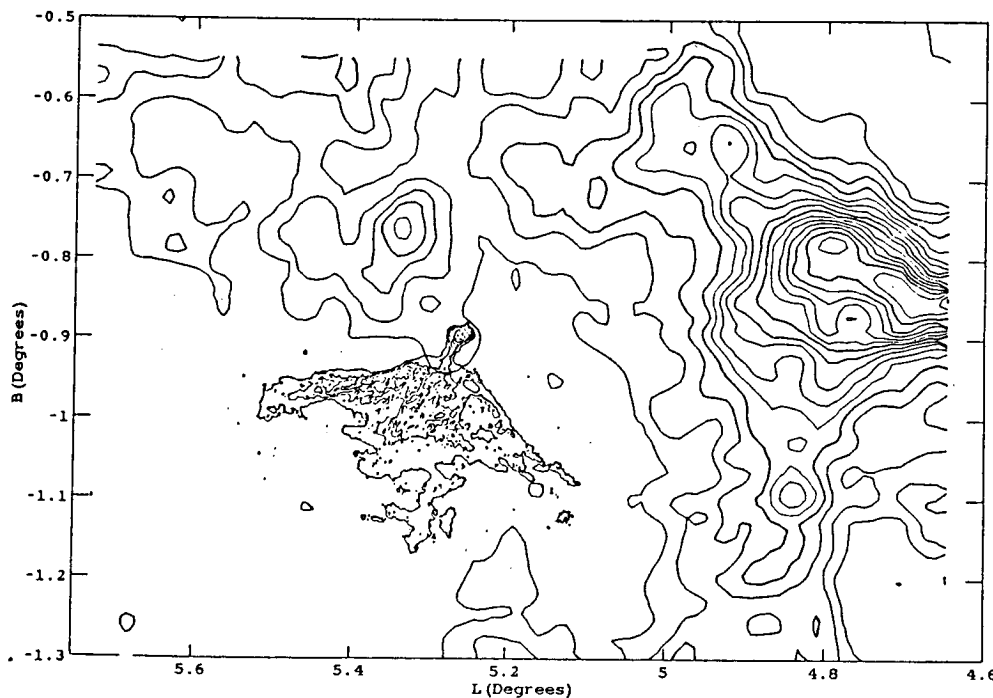
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The Bird: A Pressure-Confined Explosion in the Interstellar Medium

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The non-thermal radio continuum source G5.3-1.0, mapped at 20 cm with the VLA by Becker and Helfand (1985, *Nature* **313**, 115), has an unusual bird-like shape (see figure below). In order to determine possible interaction of this source with adjacent cold gas, we have mapped this region in the J=1-0 line of CO using the AT&T Bell Laboratories 7m antenna and the FCRAO 14m antenna. The map shown below contains 1859 spectra sampled on a 1.5 arcminute grid; each spectrum has an rms noise of 0.2 K in 1 MHz channels. There are several molecular clouds at different velocities along the line of sight. The outer regions of a previously unknown Giant Molecular Cloud at $l=4.7^\circ$, $b=-0.85^\circ$, $v=200 \text{ km s}^{-1}$ appears to be interacting with G5.3-1.0: the molecular cloud has a bird-shaped hole at the position of the continuum source, except that the brightest continuum point (the bird's head) appears to be embedded in the cloud. The velocity of this GMC indicates it is within 2 kpc of the galactic center.

The morphology suggests that a supernova or other explosive event occurred near the outside of the GMC, in a region where $\langle n \rangle \sim 300 \text{ cm}^{-3}$, and expanded into a region of lower density and pressure. The pressures, densities, and velocity gradients of molecular clouds near the galactic center are on average higher than those of clouds near the Sun. We therefore expect that Type II supernovae near the galactic center would be distorted by their interactions with their parent molecular clouds.



Contours of CO emissivity integrated over the velocity range 180-230 km s^{-1} superposed on the 20 cm VLA map of G5.3-1.0 from Becker and Helfand (1985). CO contours are at intervals of 20 K-km s^{-1} .