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# THE CANADIAN GALACTIC PLANE SURVEY

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**The Canadian Galactic Plane Survey (CGPS) is a large collaboration pursuing high-resolution multiwavelength studies of the interstellar medium (ISM) over wide fields of view in the Galactic plane.**

The observational component of the CGPS is being carried out primarily by the Synthesis Telescope (ST) at the Dominion Radio Astrophysical Observatory (DRAO; Landecker et al. 2000). Complementary data sets from other instruments have been integrated with the DRAO data to produce a database which traces all the major components of the ISM. The centerpiece of the CGPS is the first high-resolution (1 arcminute) interferometric survey of the H I 21 cm line over a significant area of the northern Galactic plane. All of the H I data in the first phase of the CGPS has now been observed and processed, and it and other data products are being made publicly available for research through the Canadian Astronomy Data Centre (http://cadcwww.hia.nrc.ca/cgps/).

The CGPS was initiated in 1995 as an effort to obtain panoramic images of the major components of the Galactic ISM along a 666 square degree section of the plane extending from Cygnus to the Cassiopeia-Perseus region ($74.^\circ195 < l < 147.^\circ310, -3.^\circ560 < b < +5.^\circ555$). The survey brings together more than 70 researchers from Canadian universities, the National Research Council of Canada, and international scientists. The CGPS also receives support from the Natural Sciences and Engineering Research Council of Canada.

The ST data products consist of 21 cm continuum in Stokes $I$, $Q$, and $U$, 74 cm continuum, and spectroscopy of the H I 21 cm line. Other data sets include the Five College Radio Astronomy Observatory (FCRAO) CO survey of the outer Galaxy reprocessed at DRAO for inclusion in the CGPS, and *IRAS* data HIRES-reprocessed by IPAC and CITA (Kerton & Martin 2000). The CGPS Database thus contains complementary data sets, which include tracers for all of the major components of the ISM (Table 1).

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TABLE 1

THE CGPS DATABASE

| Product | Format | Tracer |
|---|---|---|
| 21 cm Spectro. | 3-D Cubes | H I |
| 21 cm Cont. ($I$) | 2-D Images | H II, Rel[a] |
| 21 cm Cont. ($Q$, $U$) | 2-D Images | MiM[b]; Rel[a] |
| 74 cm Cont. | 2-D Images | Rel |
| 151 MHz Cont.[c] | 2-D Images | Rel |
| 115 GHz Spectro. | 3-D Cubes | CO |
| 12, 25, 60, 100 $\mu$m | 2-D Images | Dust |

[a] Rel = Relativistic Electrons.

[b] MiM = Magneto-ionic Medium.

[c] From Cambridge Low-Frequency Synthesis Telescope.

The CGPS is continuing into a second phase of observations. CGPS 2 will extend imaging towards the inner Galaxy to $l = 64^\circ$, and towards the anticentre to $l = 175^\circ$. *IRAS* HIRES images will be created, and surveys from *Onsala Space Observatory* and the FCRAO-Boston University Galactic Ring Survey collaboration will provide, respectively, CO and $^{13}$CO data. Included in CGPS 2 will be ST observations of a section of the plane $117^\circ < l < 100^\circ$ extending to $b = +17.^\circ5$. This will permit study of the ISM in the Perseus Arm high above the Galactic plane as well as the extended complex of nearby low-mass star-forming clouds known as the Cepheus Flare.

The CGPS has inspired the International Galactic Plane Survey, a coordinated effort to image at high resolution nearly the entire Galactic plane. The IGPS will bring together the first and second phases of the CGPS with the Southern Galactic Plane Survey (McClure-Griffiths et al. 2001) and the VLA Galactic Plane Survey. The IGPS will provide arcminute-scale H I observations covering more than 90% of the stellar disk of the Galaxy. The IGPS will ultimately lead to the first high-resolution spectroscopic imaging of neutral atomic hydrogen throughout the entire Galaxy.

## REFERENCES

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Landecker, T. L., et al. 2000, A&AS, 145, 509
McClure-Griffiths, N. M., et al. 2001, ApJ, 551, 394