

# Poster: A Complete Census of the 7000 Milky Way HII Regions

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HII regions are the archetypical tracers of high-mass star formation. Because of their high luminosities, they can be seen across the entire Galactic disk from mid-infrared to radio wavelengths. A uniformly-sensitive survey of Galactic HII regions across the disk would allow us to constrain the properties of Galactic structure and star formation. We have cataloged over 8000 HII regions and candidates in the WISE Catalog of Galactic HII Regions ([astro.phys.wvu.edu/wise](http://astro.phys.wvu.edu/wise)), but only 2000 of these are confirmed HII regions. To bring us closer to a complete census of high-mass star formation regions in the Milky Way, we have several ongoing observational campaigns. These efforts include (1) Green Bank Telescope radio recombination line (RRL) observations as part of the HII Region Discovery Survey (HRDS); (2) Australia Telescope Compact Array observations of HII region candidates in the Southern HII Region Discovery Survey (SHRDS); (3) Green Bank and Gemini North Telescope observations of star formation regions thought to reside at the edge of the star forming disk in the Outer Scutum-Centaurus Arm (OSC); and (4) Very Large Array continuum observations of the faintest HII region candidates in the second and third Galactic quadrants. Together, these observations will detect the RRL emission from all Galactic HII regions with peak cm-wavelength flux densities  $> 60\text{mJy}$ , establish the outer edge of Galactic high-mass star formation, and determine the number of HII regions in the Galaxy. The HRDS and SHRDS surveys have more than doubled the known population of Galactic HII regions. We use the OSC observations to determine the properties of high-mass star formation in the extreme outer Galaxy and our VLA observations to determine how many of our faint candidates are indeed HII regions. We combine the completeness limits we obtain through these HII region surveys with an HII region population synthesis model to estimate the total number of Galactic HII regions. From this, we predict nearly 7000 HII regions in the Milky Way created by a central star of type B2 or earlier.

*Galactic Scale*