

The WISE Catalog of Galactic HII Regions

Loren Anderson
West Virginia University

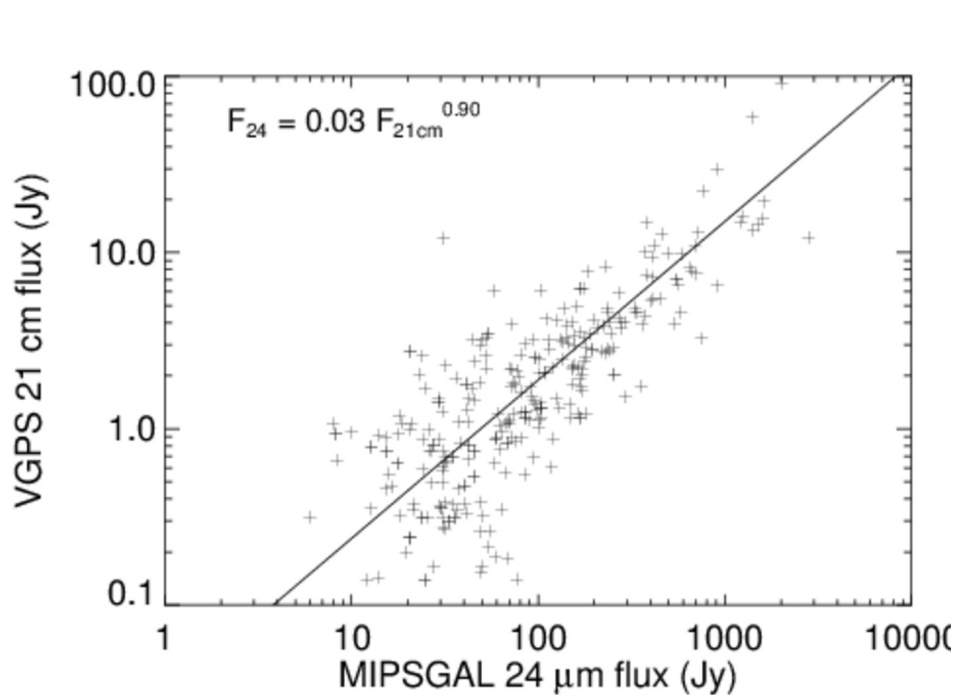
February 12, 2015

Thomas Bania (BU), Dana Balser (NRAO), Trey Wenger
(BU), Virginia Cunningham (WVU), Will Armentrout (WVU)

Motivation

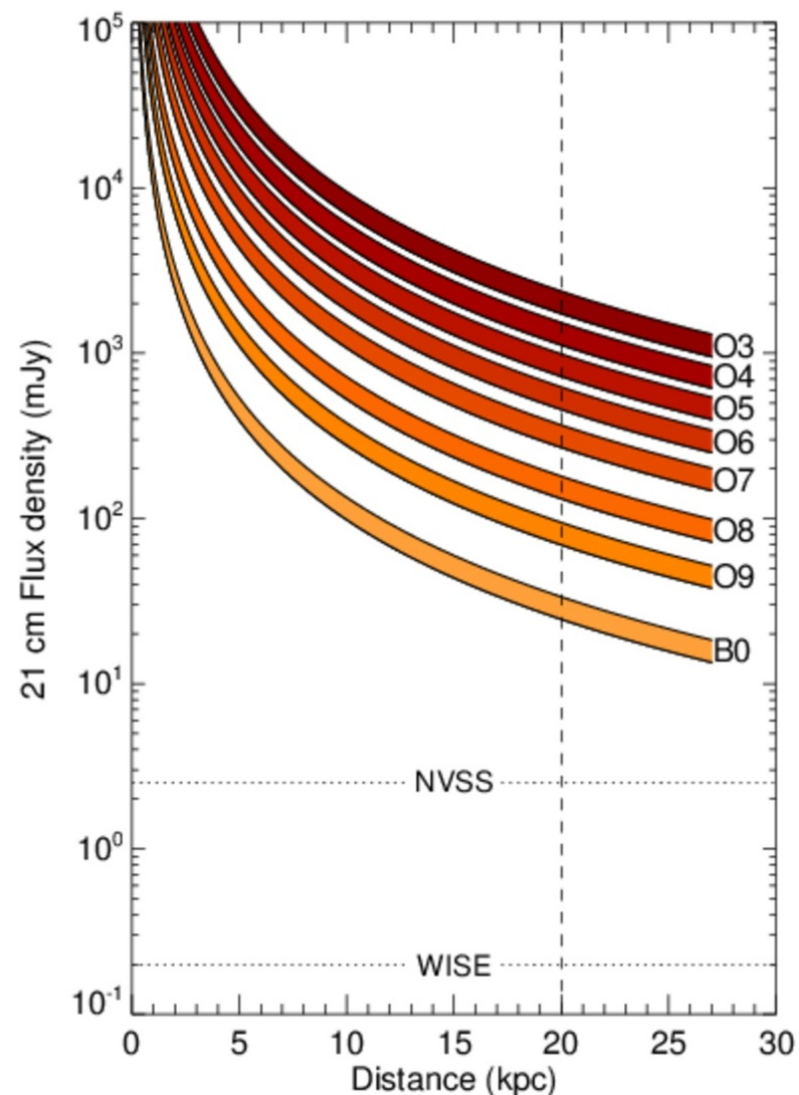
- Most recent work in massive star formation, especially the larger surveys, has focused on the earliest phases
 - (RMS, ATLASGAL, BGPS, CHaMP, MALT90...)
- There are $\sim 200,000$ OB-stars in the Galaxy (Reed, 2006) that can create HII regions
 - Where are they?
 - We need a complete catalog to trace Galactic structure and global massive star formation

WISE Can detect all Galactic HII regions



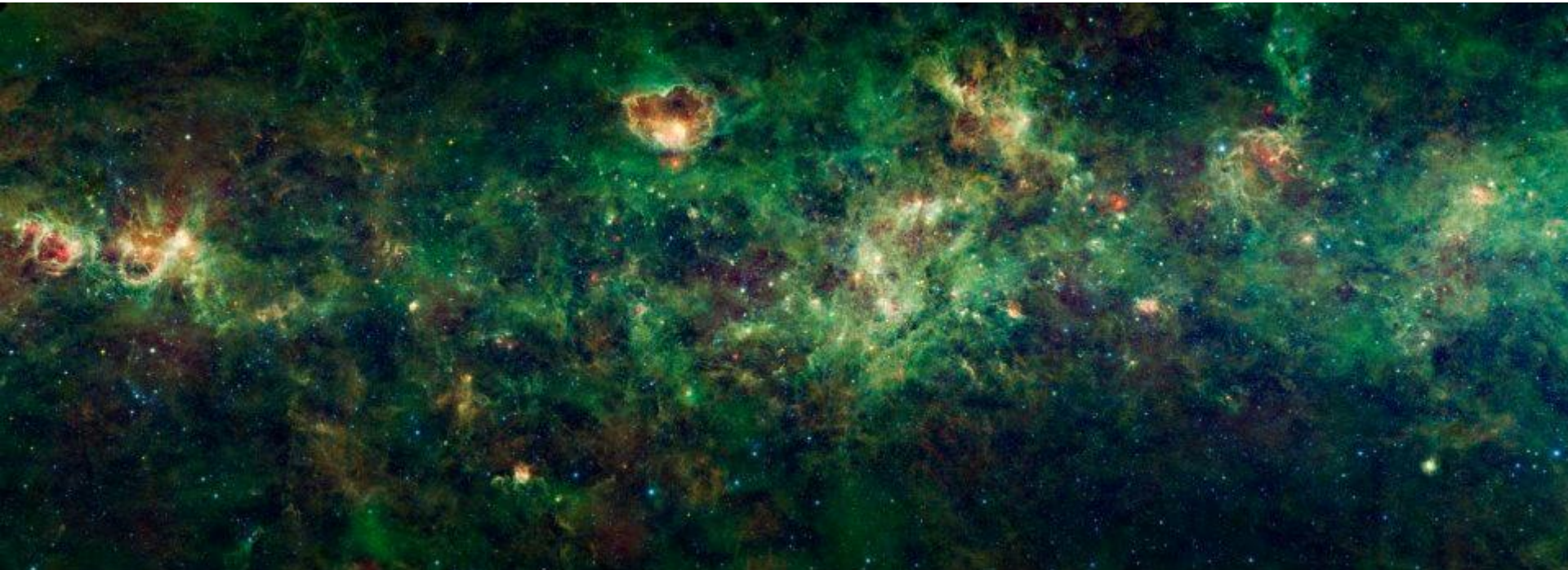
$$F_{24\mu\text{m}} \approx 30 F_{21\text{cm}}$$

With WISE we can make a complete catalog of Galactic HII Regions!



HII Region Detection

- 8.0/12 μm : Mainly PAH emission; traces photodissociation regions around HII regions
- 24/22 μm : Hot (~ 100 K) small grain emission; traces massive stars



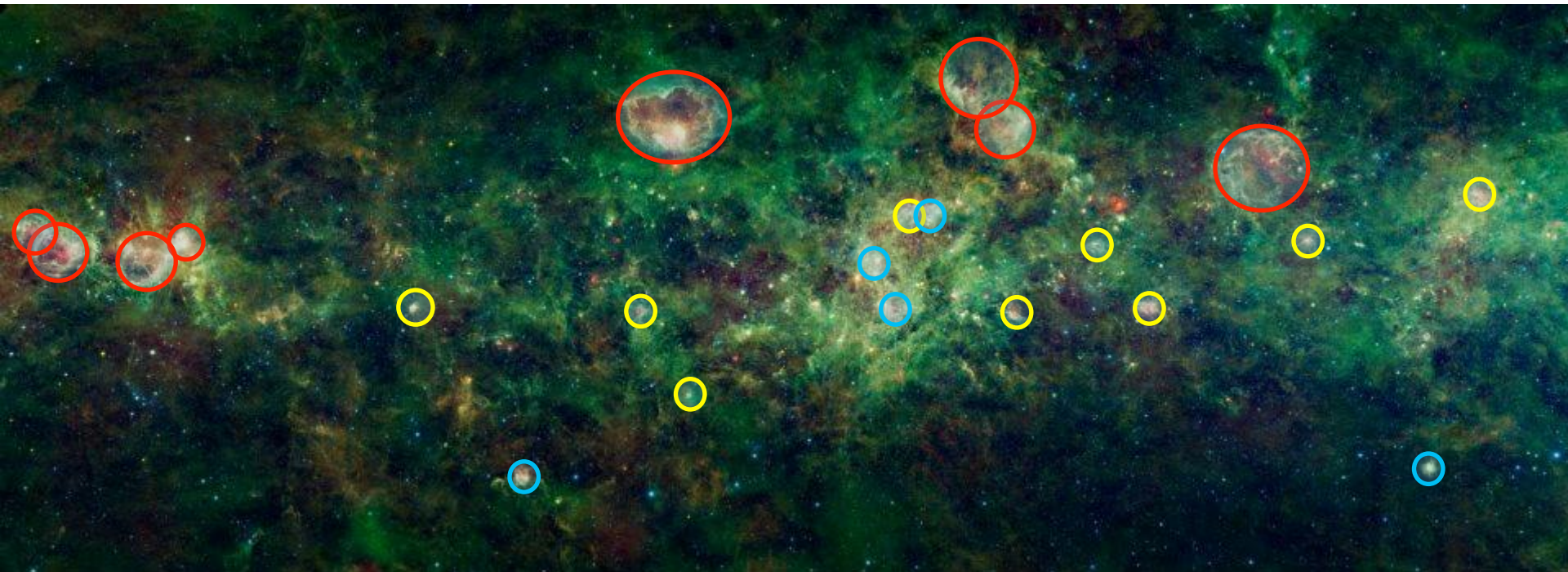
WISE HII Region Detection

Red: previously known as HII regions

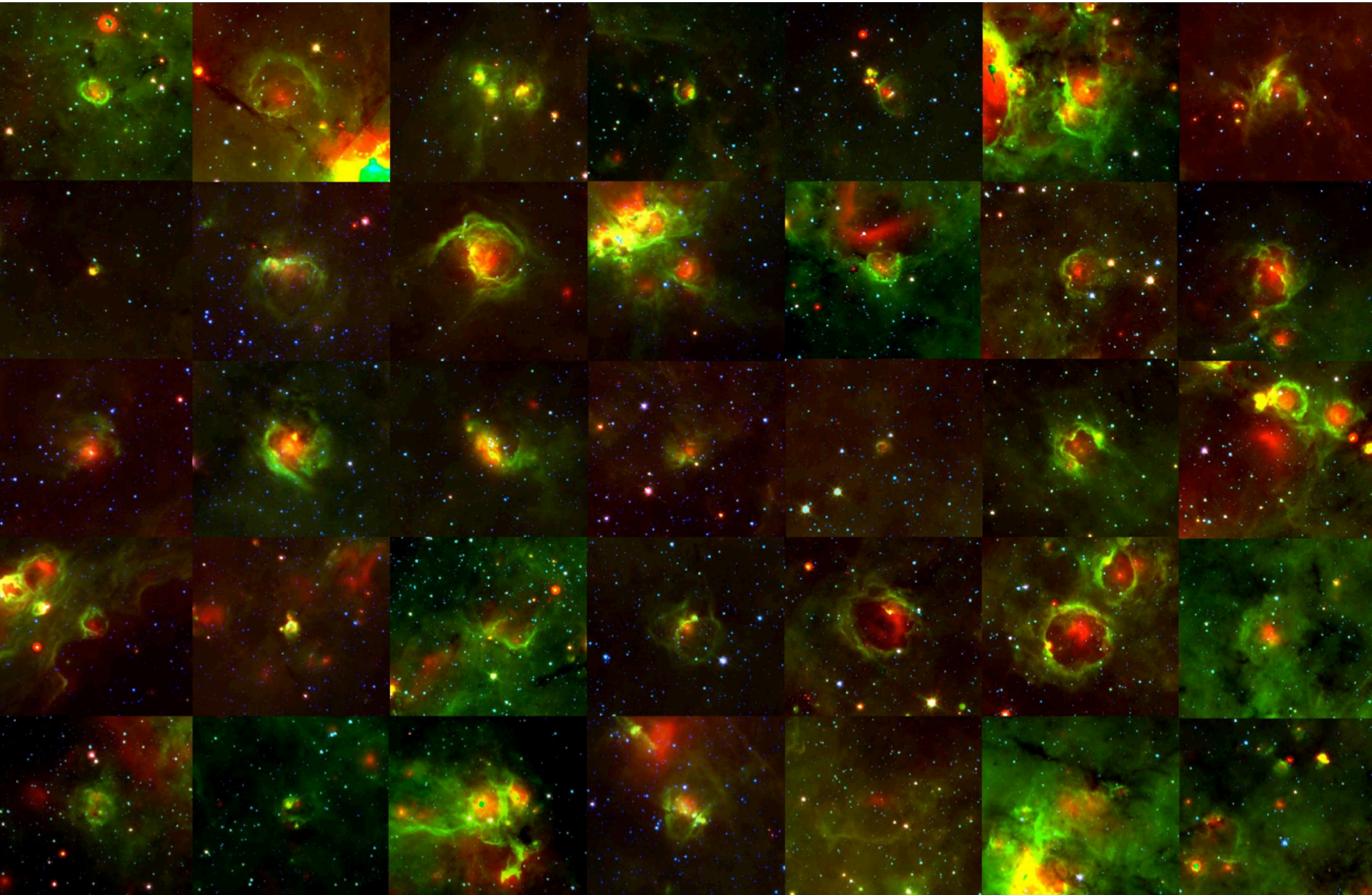
Cyan: HII region candidates with radio continuum

Yellow: HII region candidates without radio continuum

For entire Galaxy $|b| < 9^\circ$, found ~ 8400 objects



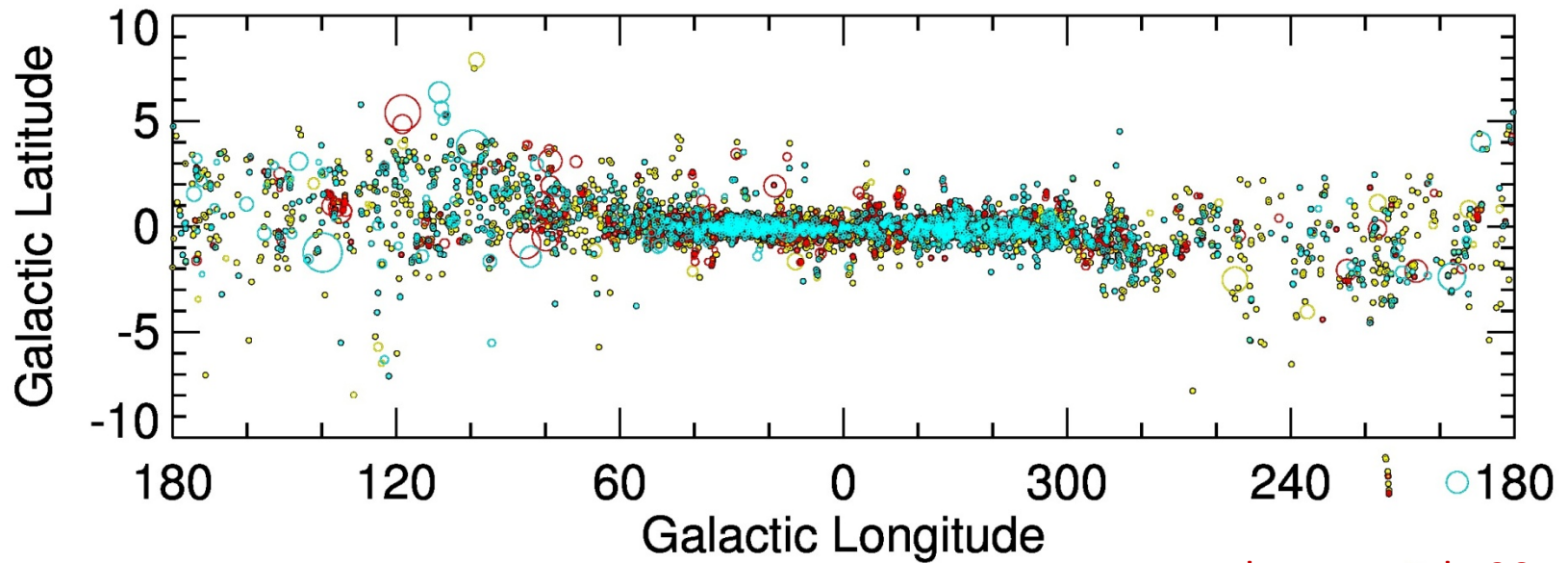
Example Sources (from *Spitzer* – sorry!)



Correlations

- 12 radio recombination line surveys to provide velocities & distances
- 4 IR/mm/submm surveys, 10 molecular line surveys and 40 distance works (mostly maser parallax), also to provide velocities & distances
- Most sources (the radio-quiet) do not have a positional correlation with above works

The WISE Catalog of Galactic HII Regions



Anderson et al., 2014

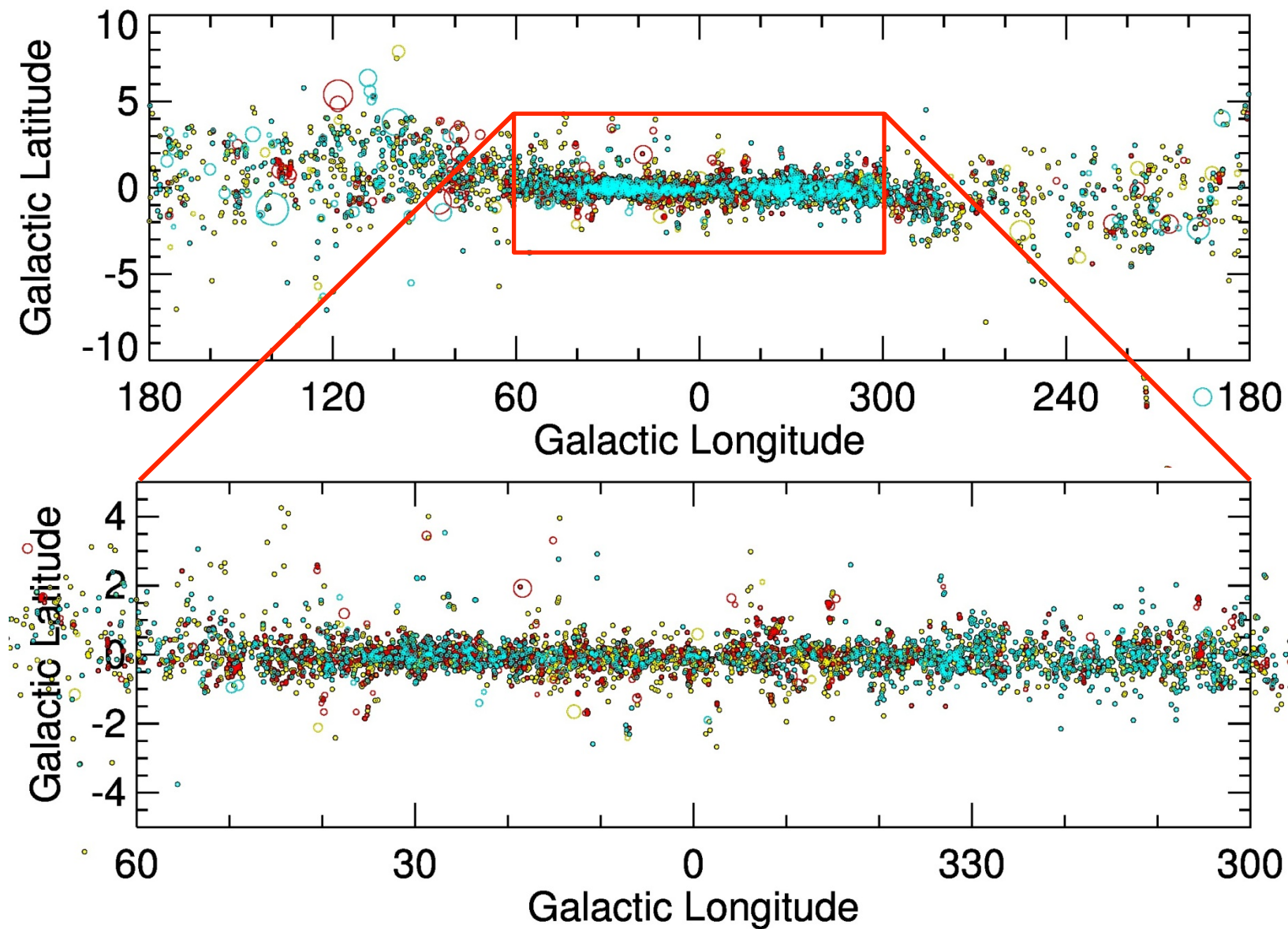
~8400 objects

~~~1400~~ 1700 previously known from ionized gas spectroscopic observations; ~600 associated with these known regions

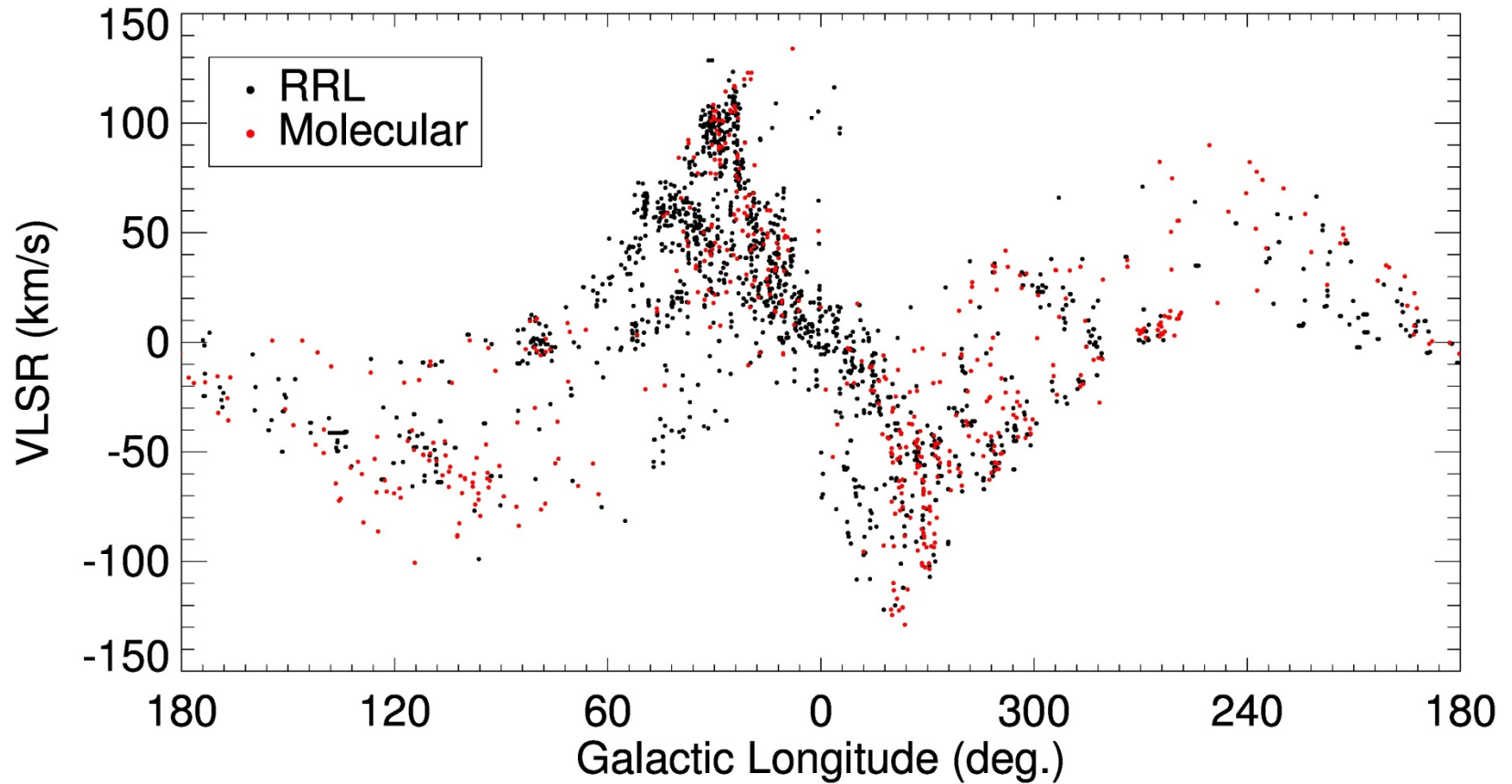
~~~2000~~ 1700 candidates with detected radio continuum

~4000 objects that look like HII regions, but do not have radio continuum emission

The WISE Catalog of Galactic HII Regions



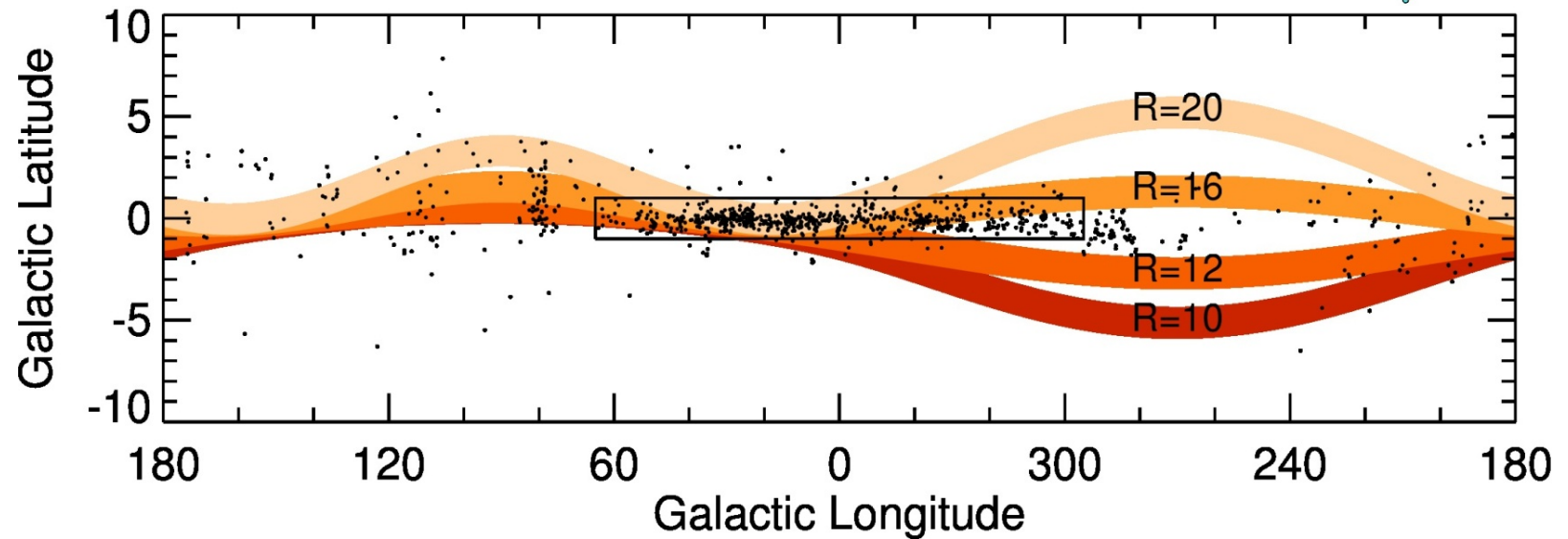
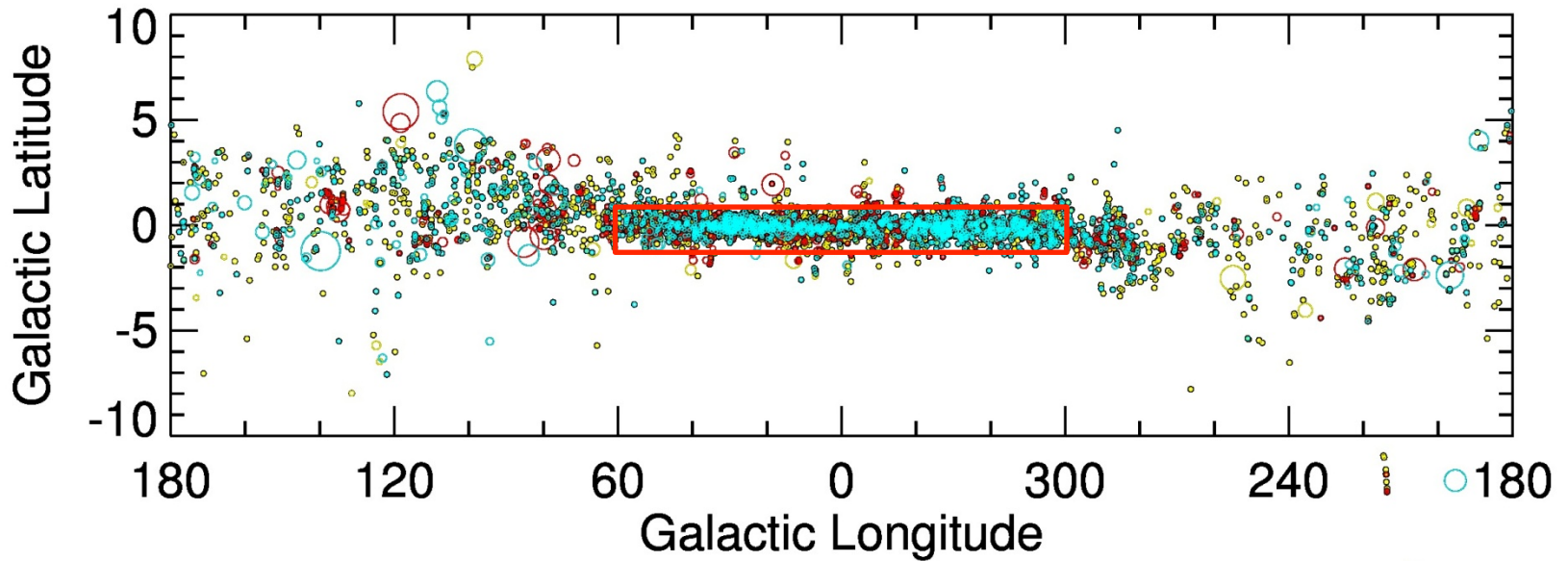
Longitude-Velocity Diagram



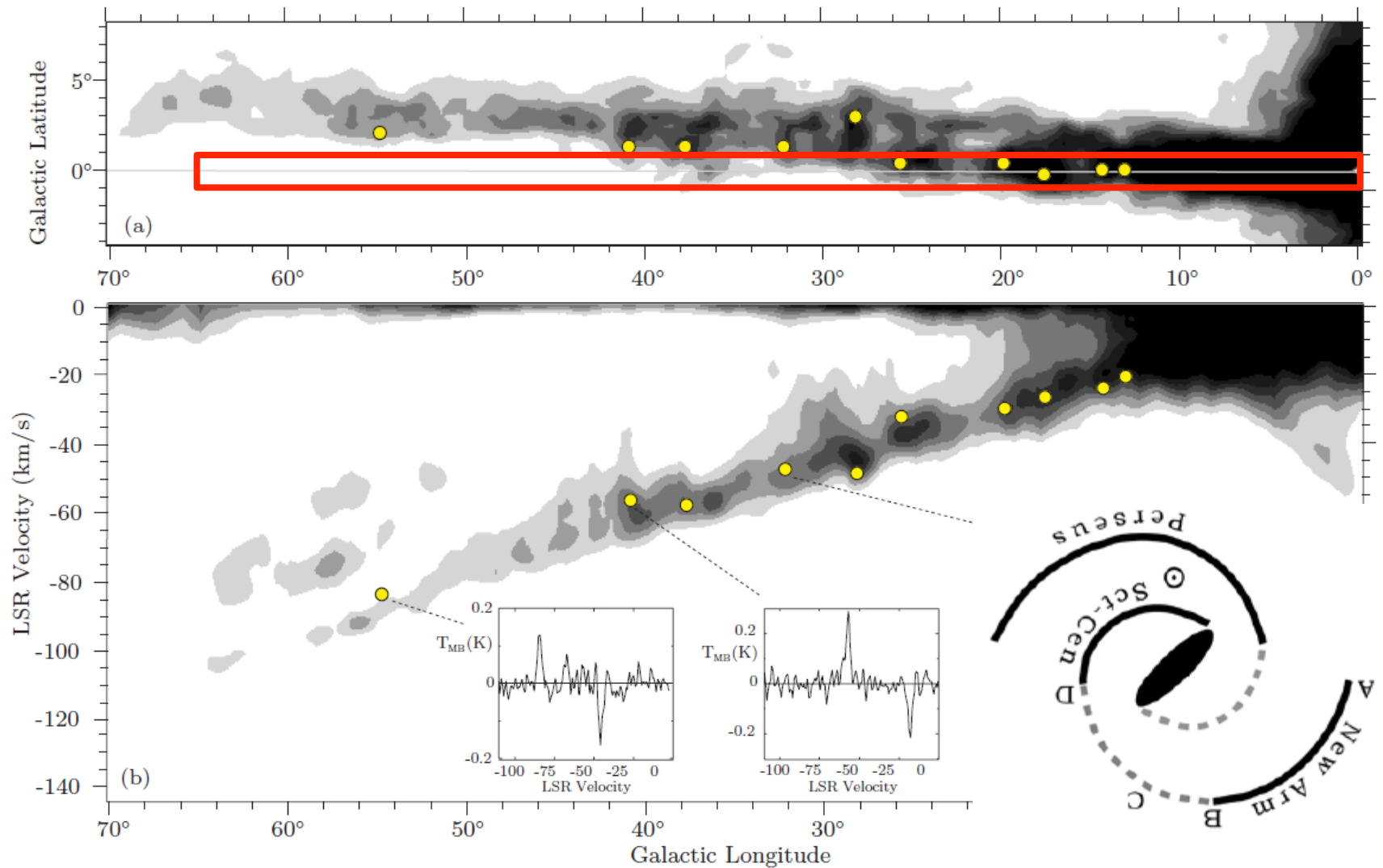
Science with the WISE Catalog

- 1) Surveys for new (distant) Galactic HII Regions
- 2) The z-distribution and Sun's height
- 3) The clustering of Galactic HII regions
- 4) The HII region luminosity function
- 5) The Galactic star formation rate from extragalactic star formation relations

Latitude Range Essential for Distant Sources



The Outer Scutum-Centaurus Arm



The WISE Extension of the HRDS

The HII Region Discovery Survey observed 448 Galactic HII regions in radio recombination lines (RRLs) with the GBT (Bania+ 2010; Anderson+ 2012)

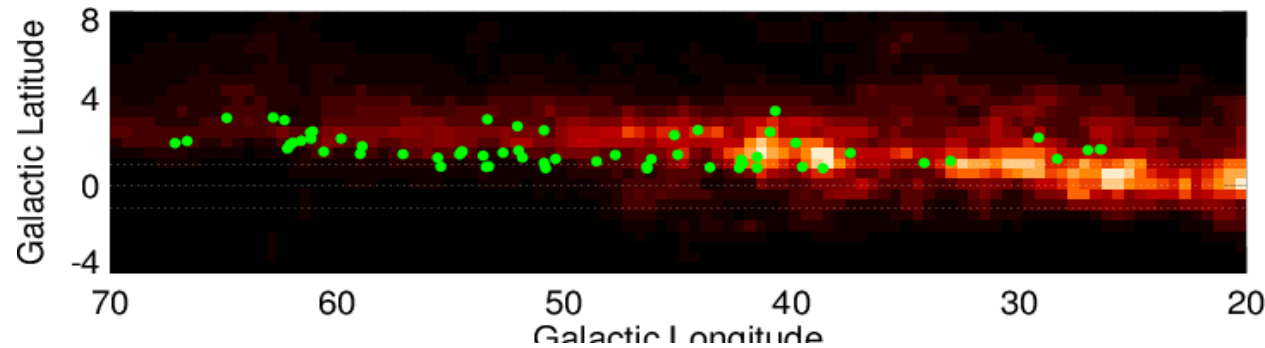
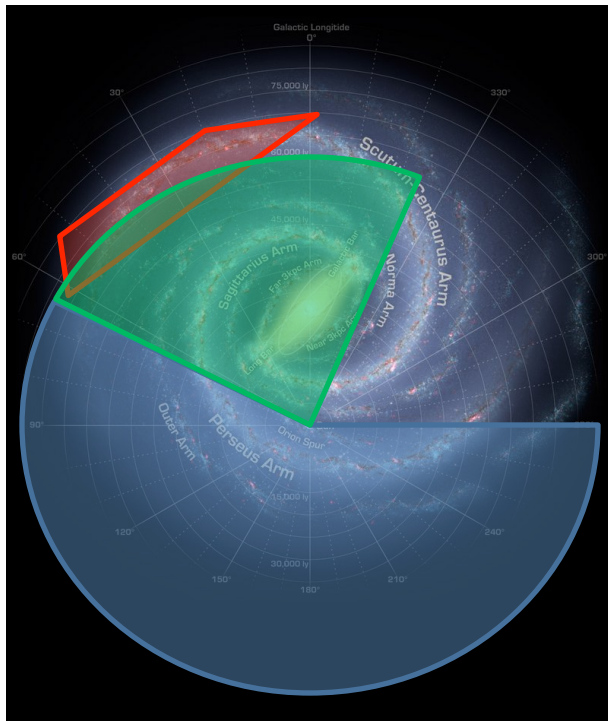
Targets from *Spitzer*; $l=343^\circ$ to 65° , $|b| < 1^\circ$

The WISE catalog allows us to extend this in both longitude and latitude

The WISE Extension of the HRDS

We repeated the HRDS to discover 302 new Galactic HII regions from $l=340^\circ$ to 270° , $|b| < 8^\circ$ (Anderson+ in prep.)

Red: OSC; Green: HRDS; Blue: Outer Galaxy



Color scale: HI integrated to trace the OSC
Points: OSC HII region candidates

The WISE Extension into the OSC

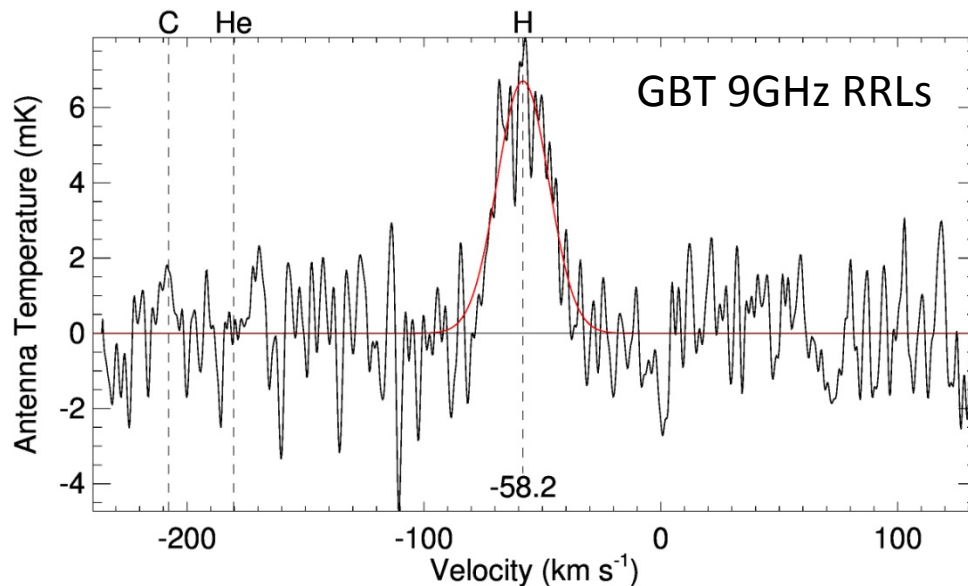
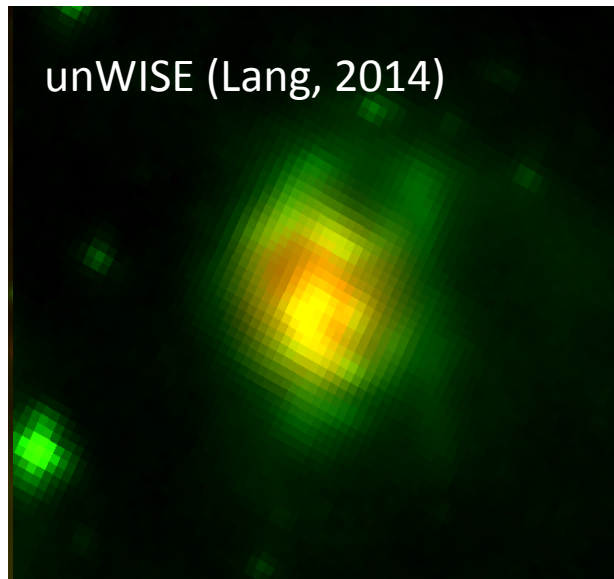
64 candidates in the l , b range of the OSC. Three-pronged approach:

- 5 detections of OSC HII regions in RRLs
- 38 VLA radio continuum detections (GHz)
- 3 (+2 possible low SNR) GBT detections in NH_3 and H_2O masers

These regions are 17kpc from the Galactic center, 24 kpc from the Sun

Based on the HII Region luminosities of the OSC HII regions, this may be everything!

The Most Distant Galactic HII Region (?)

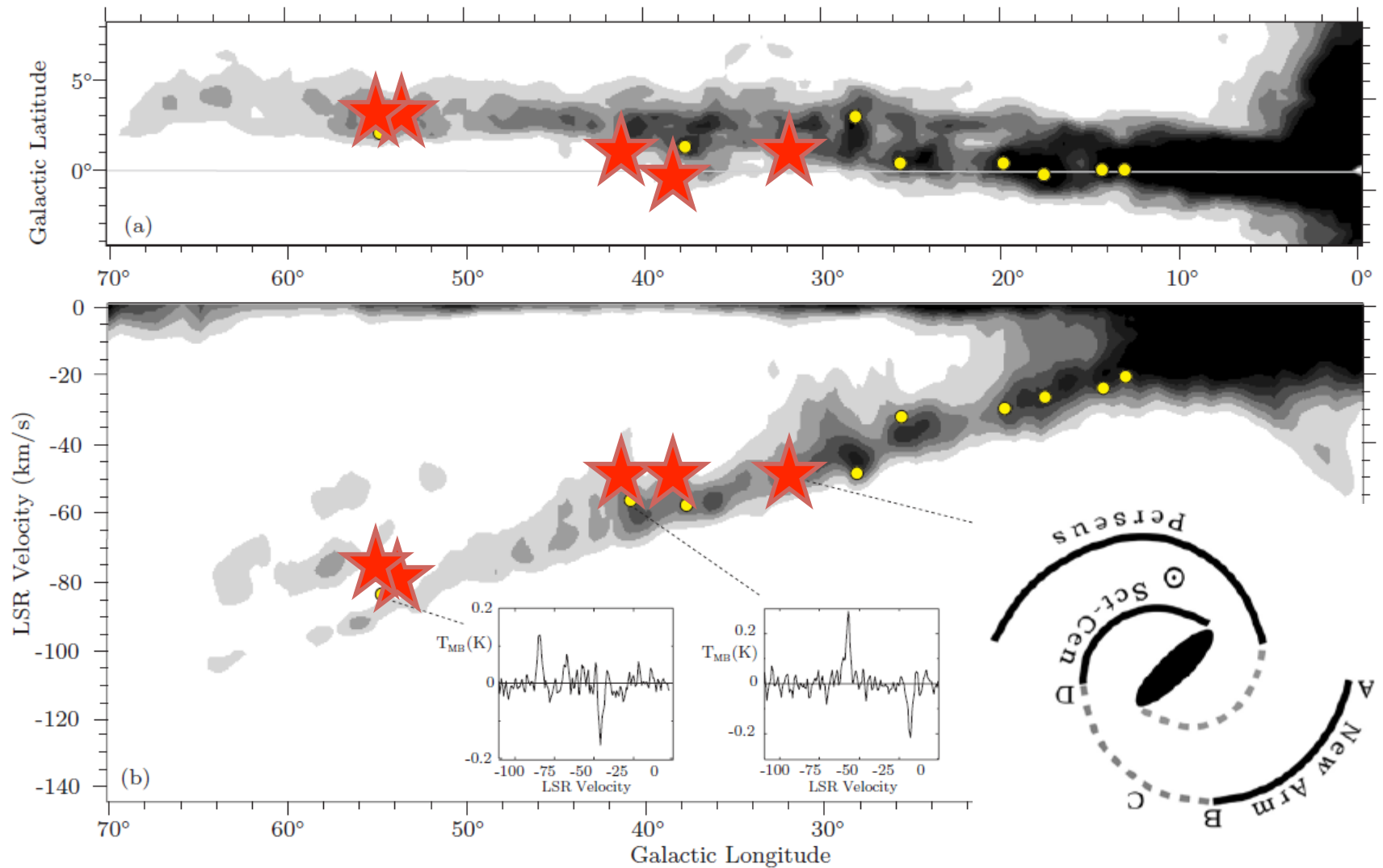


Distance = 24 kpc

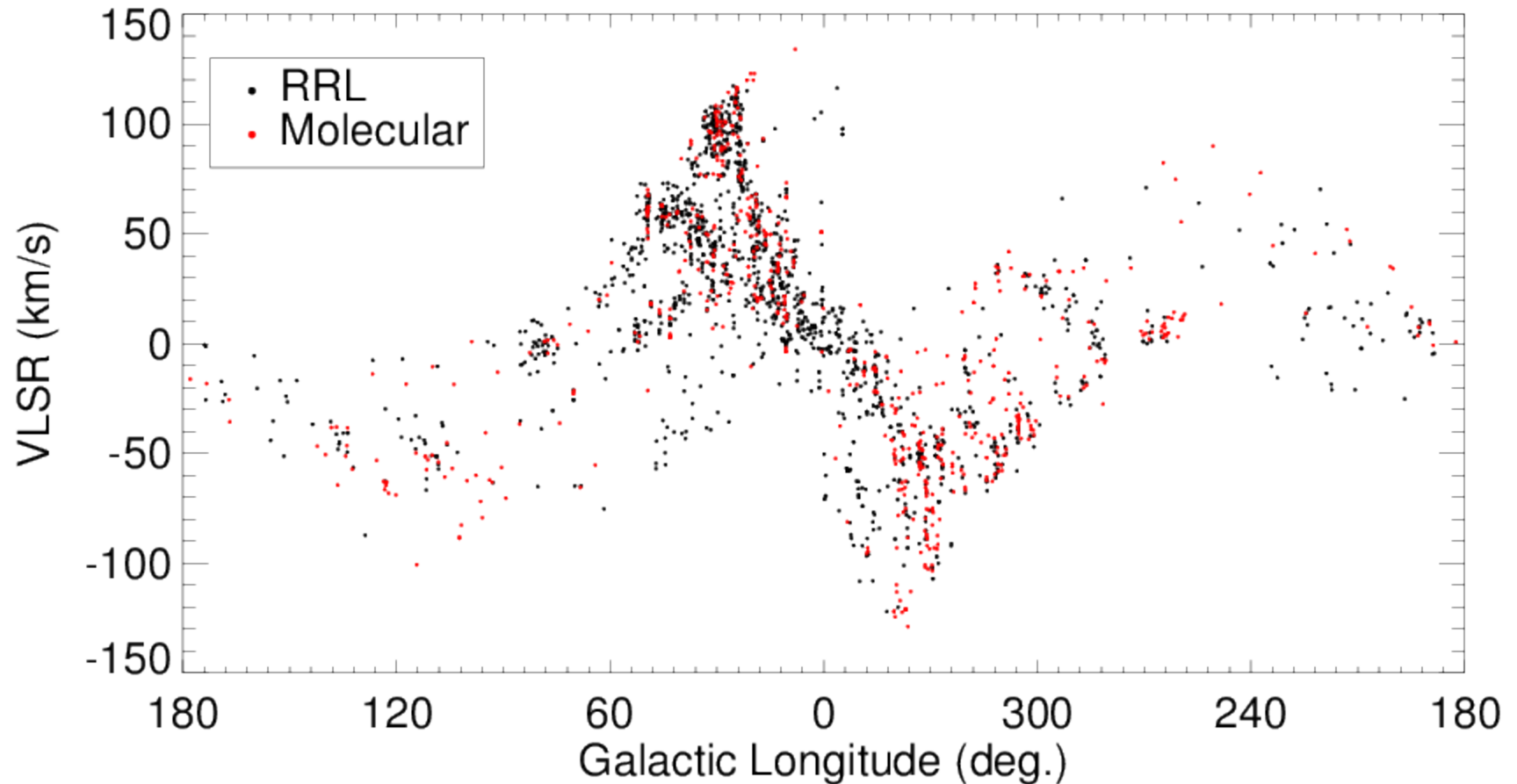
$R_{\text{Gal}} = 17$ kpc

Anderson+, in prep.
Armentrout+, in prep.

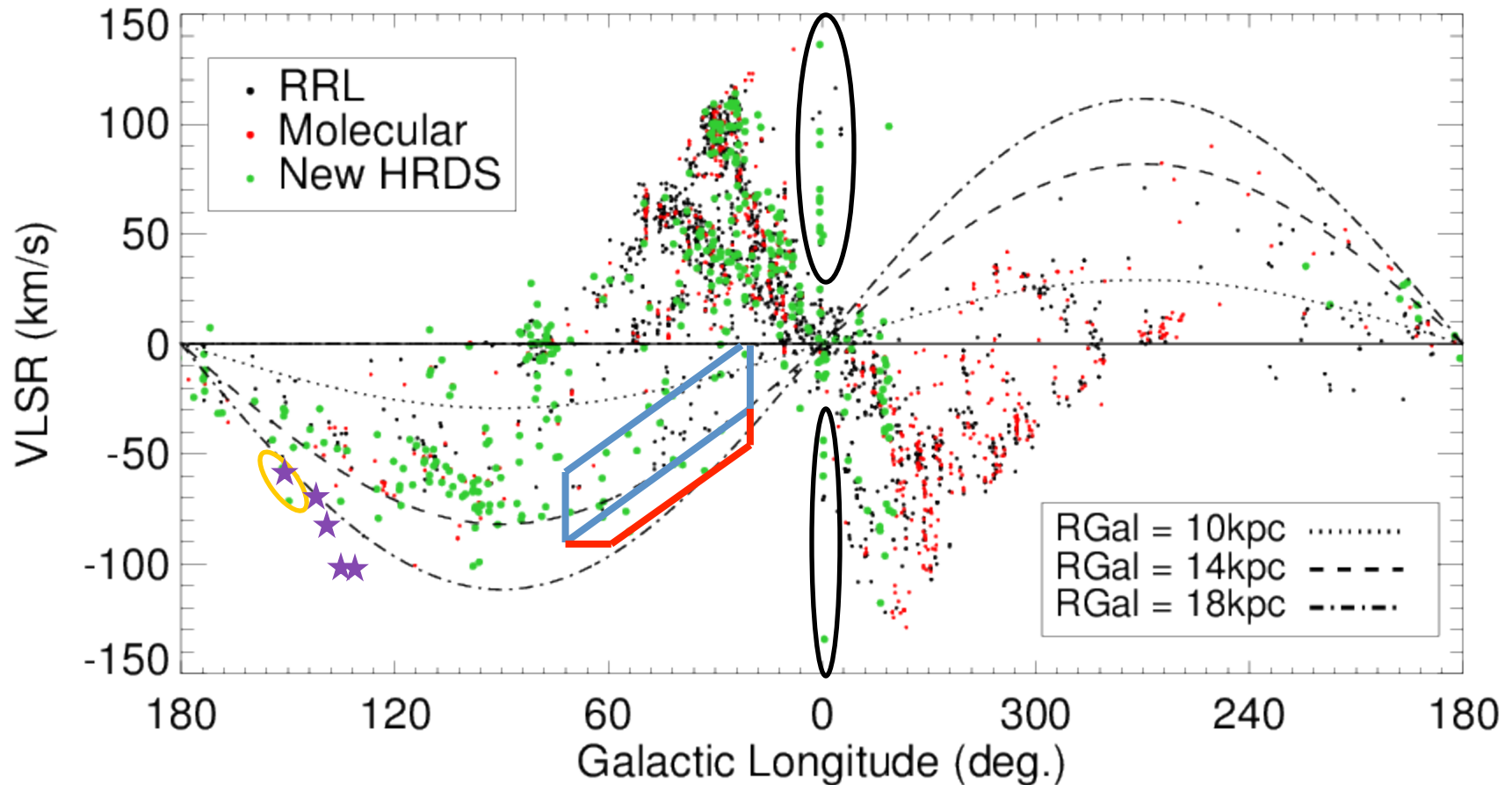
The Outer Scutum-Centaurus Arm



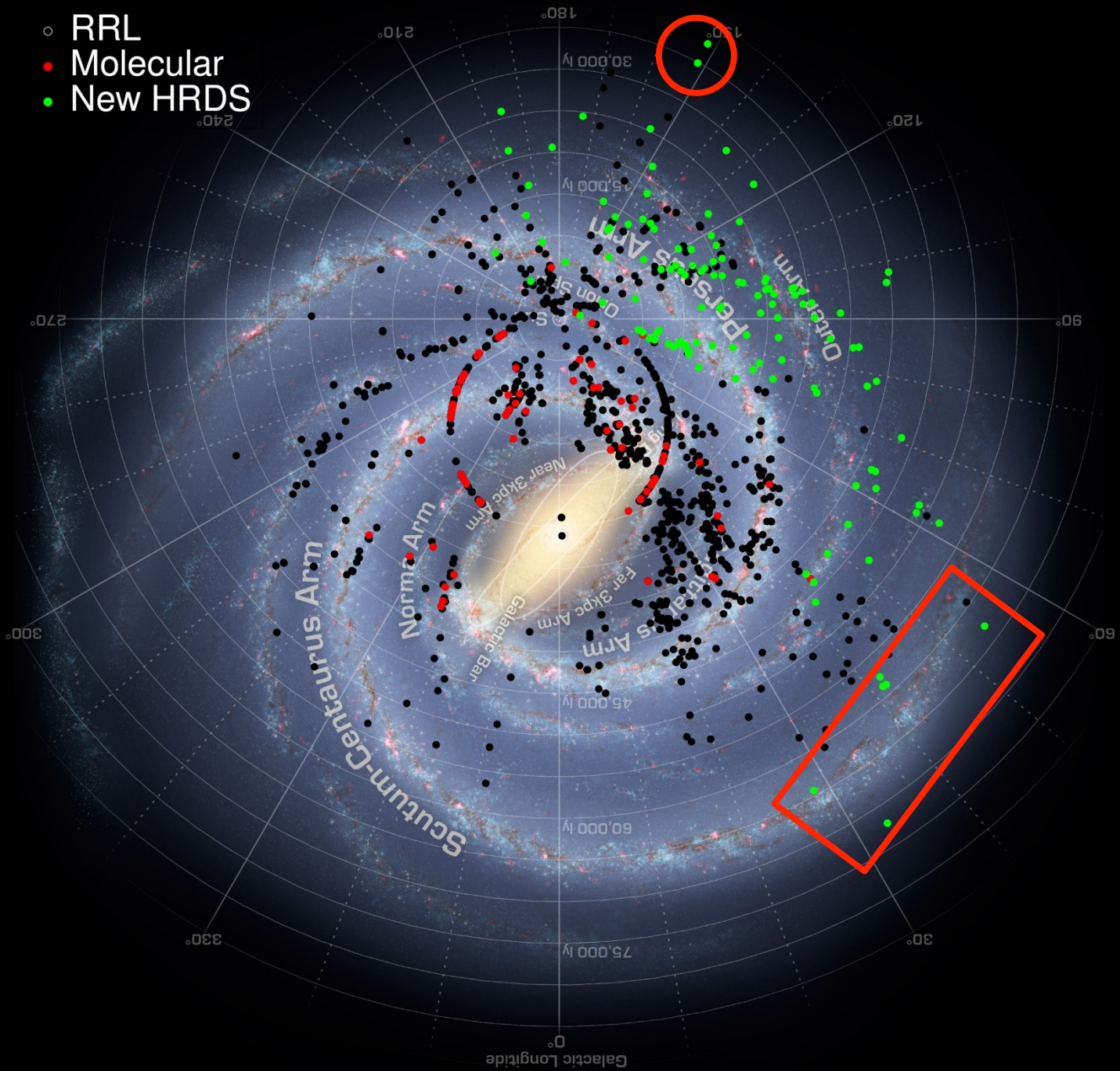
Longitude-Velocity Diagram



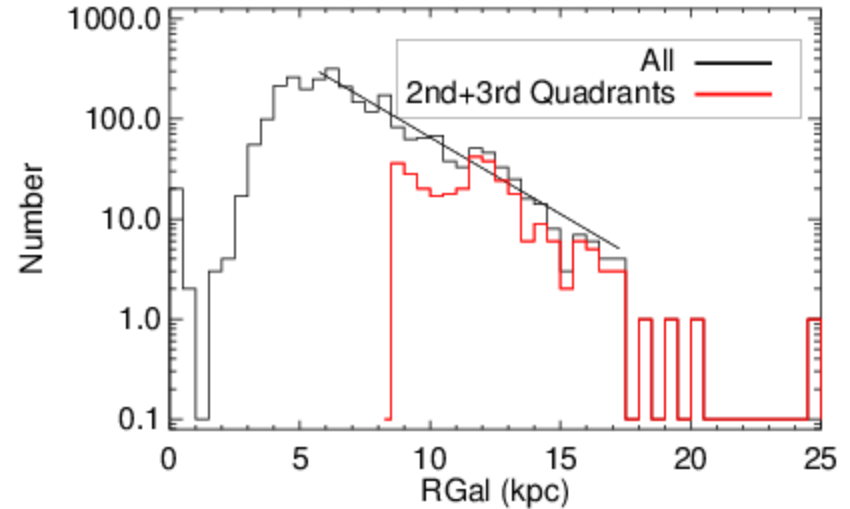
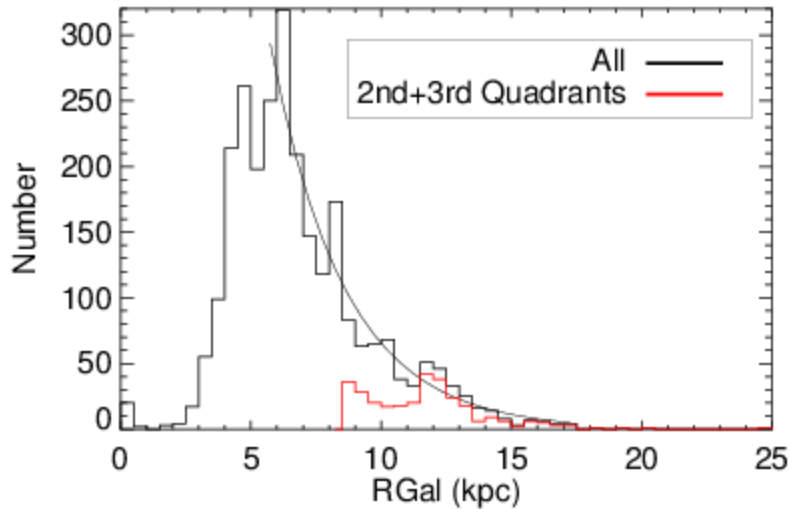
Longitude-Velocity Diagram



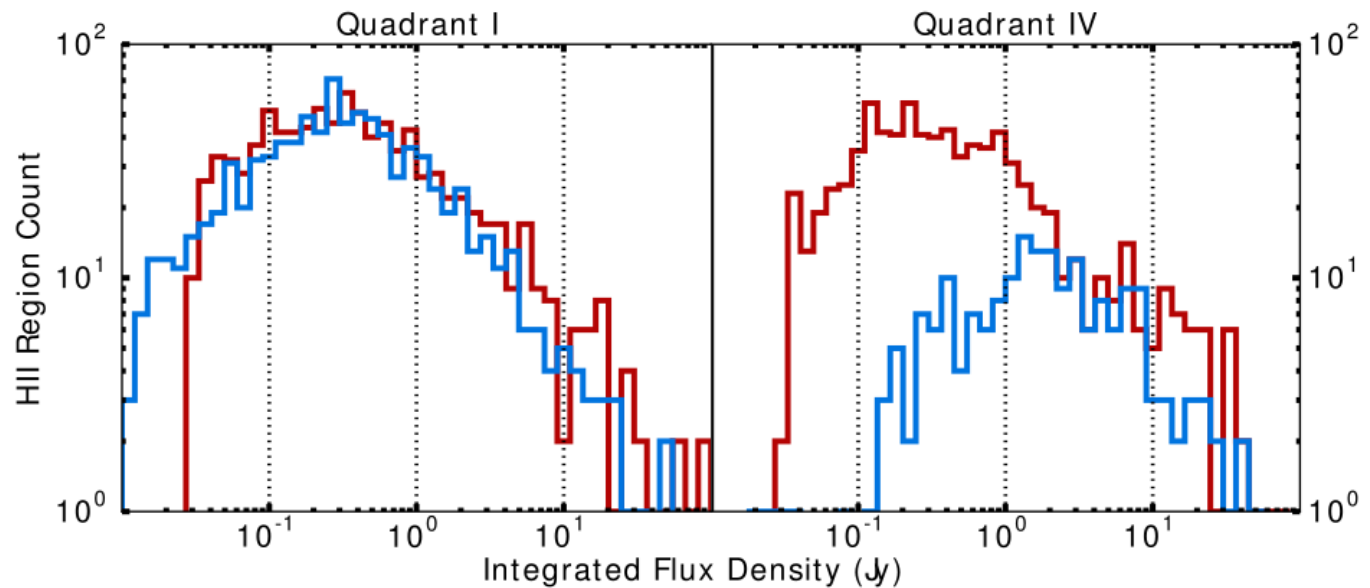
- RRL
- Molecular
- New HRDS



Complete Sample for O-stars... kind of



Simulation (red)
Data (blue)

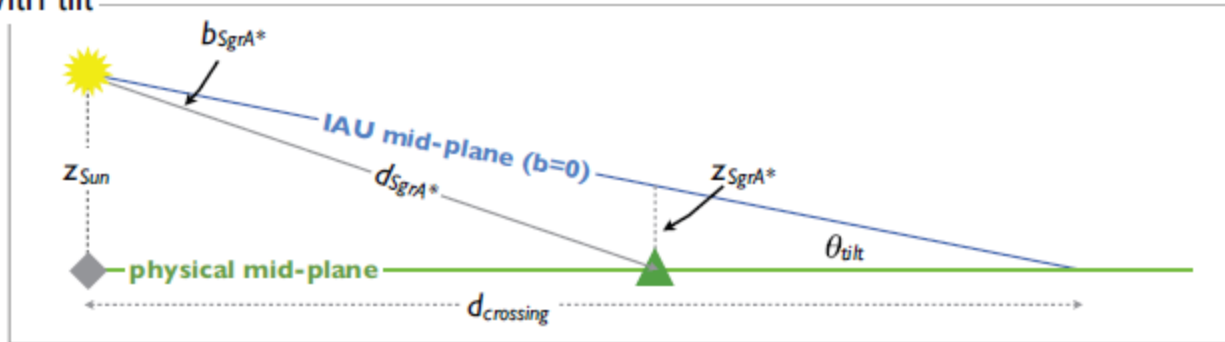


Sgr A* is not at b=0!

no tilt of plane

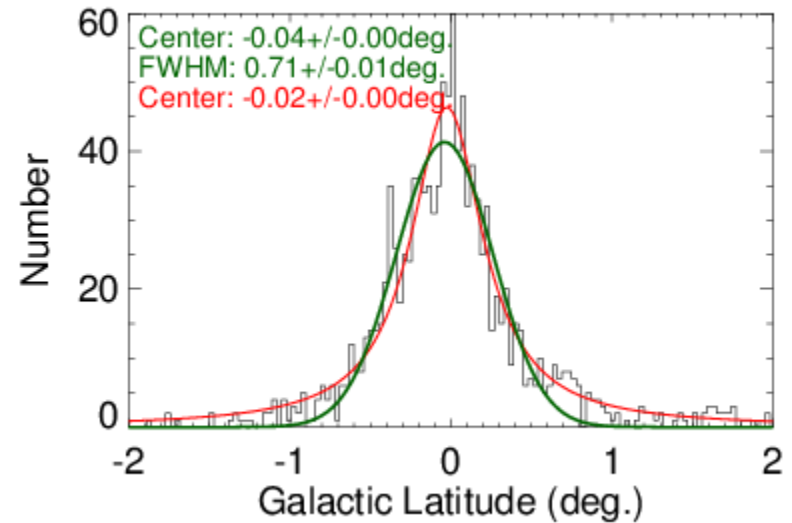
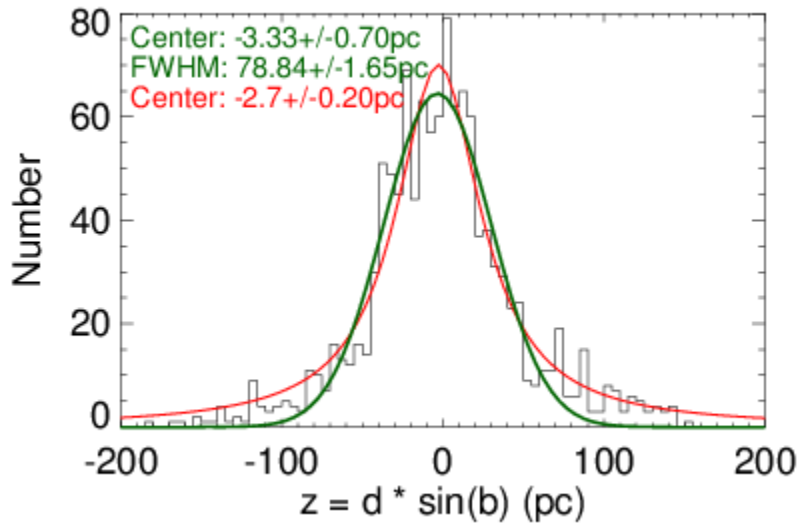


with tilt

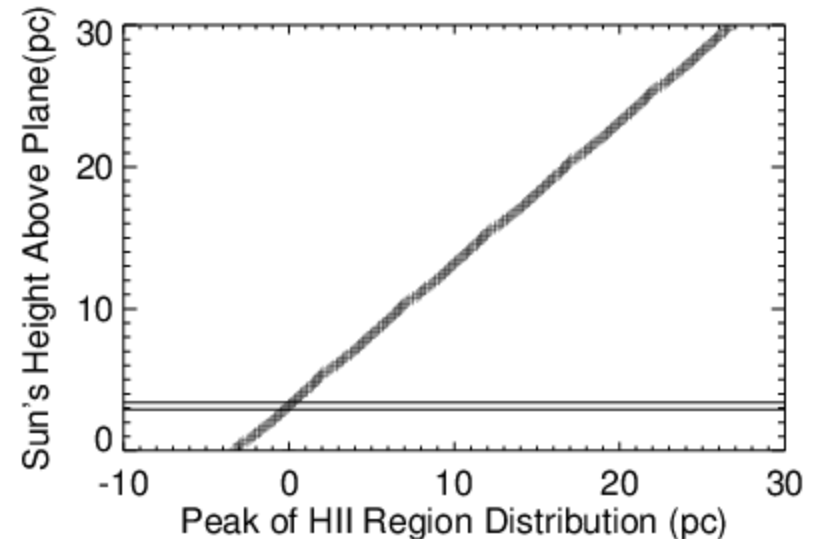


Goodman et al., 2014

The Sun's Height

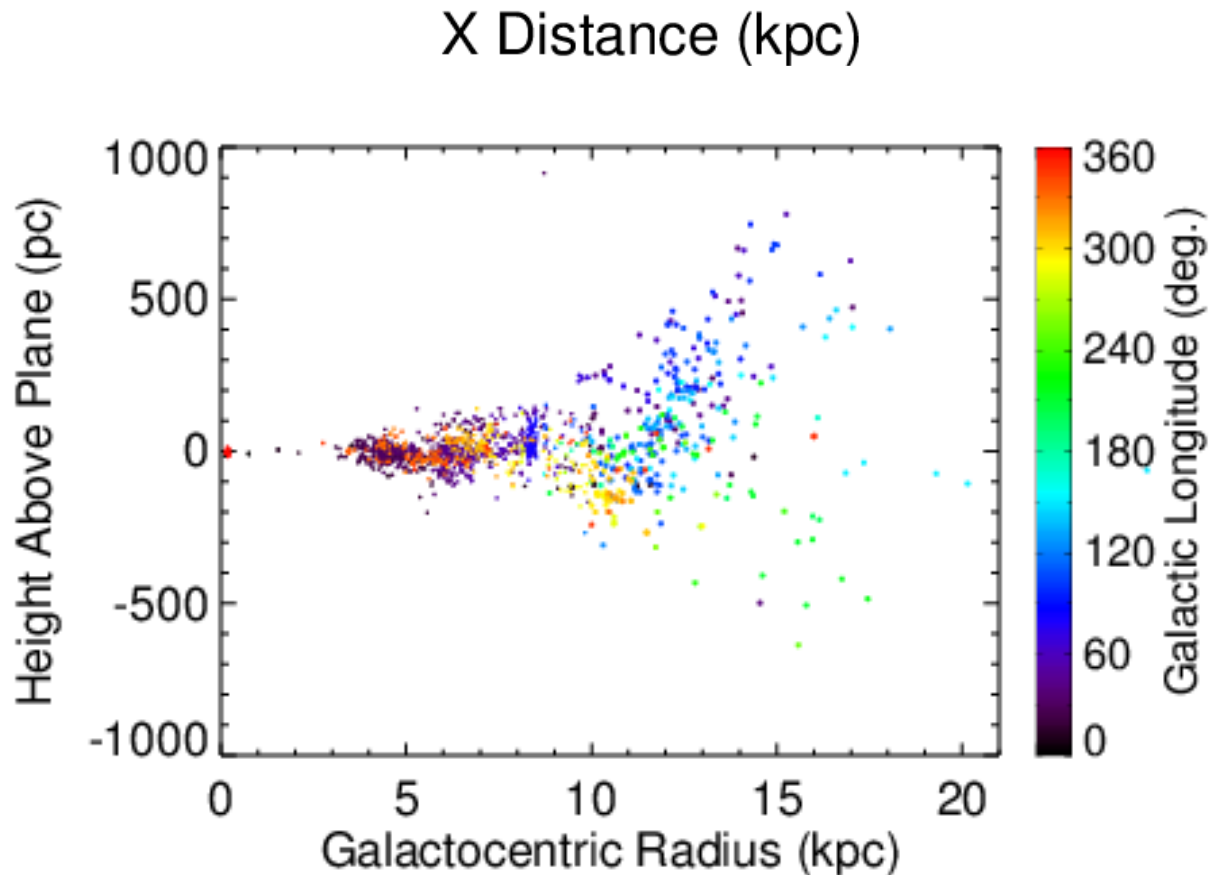


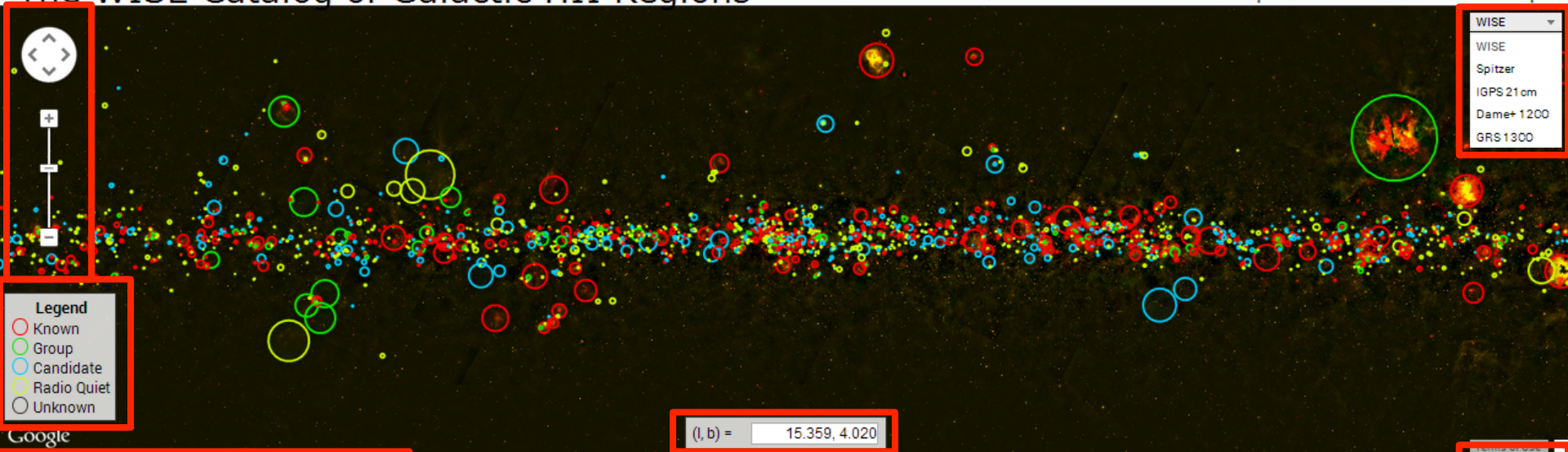
Assume: Galactic mid-plane within Solar circle can be defined by HII regions
Change the Sun's height in repeated trials until above figure peaks at $b=0^\circ$.



The Galactic Warp

ESO 510-G13





Search Column: WISE Name for text: Go to selection!

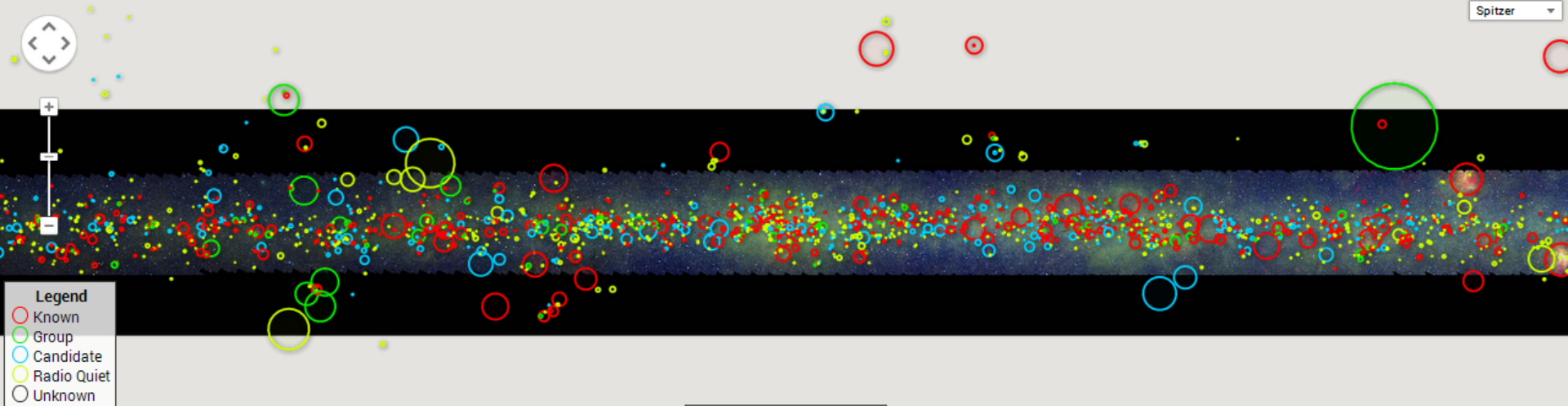
Export CSV Hide Map Hide Table Filter Options

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method | RGal | z |
|----|-----------------|---------|-------|--------|--------|------------|------------|------|-------------|----------|------|-------|-----------|--------------|------|---|
| 1 | G000.003+00.127 | K | 0.004 | 0.128 | 206 | S17 | | | | | | | | | | |
| 2 | G000.008+00.036 | Q | 0.009 | 0.036 | 24 | | | | | | | | | | | |
| 3 | G000.025-00.232 | Q | 0.026 | -0.231 | 46 | | | | | | | | | | | |
| 4 | G000.029-00.090 | Q | 0.03 | -0.089 | 31 | | | | | | | | | | | |
| 5 | G000.041+00.021 | Q | 0.041 | 0.021 | 20 | | | | | | | | | | | |
| 6 | G000.043+00.013 | Q | 0.044 | 0.014 | 15 | | | | | | | | | | | |
| 7 | G000.052-00.205 | Q | 0.053 | -0.205 | 18 | | | | | | | | | | | |
| 8 | G000.079-00.211 | Q | 0.08 | -0.21 | 66 | | | | | | | | | | | |
| 9 | G000.079-00.626 | Q | 0.08 | -0.625 | 92 | | | | | | | | | | | |
| 10 | G000.082-00.097 | Q | 0.083 | -0.096 | 29 | | | | | | | | | | | |
| 11 | G000.099-00.168 | C | 0.099 | -0.168 | 15 | | | 16.0 | | CS | | | | | | |
| 12 | G000.114-00.092 | Q | 0.115 | -0.091 | 22 | | | | | | | | | | | |
| 13 | G000.120-00.556 | K | 0.12 | -0.556 | 360 | S19 | | 11.6 | | | | | | | | |
| 14 | G000.120-00.633 | Q | 0.121 | -0.632 | 93 | | | | | | | | | | | |
| 15 | G000.121-00.304 | Q | 0.122 | -0.304 | 37 | | | | | | | | | | | |
| 16 | G000.125-00.086 | Q | 0.126 | -0.086 | 29 | | | | | | | | | | | |

Previous Next 1 2 10 80 84

The WISE Catalog of Galactic HII Regions

Spitzer

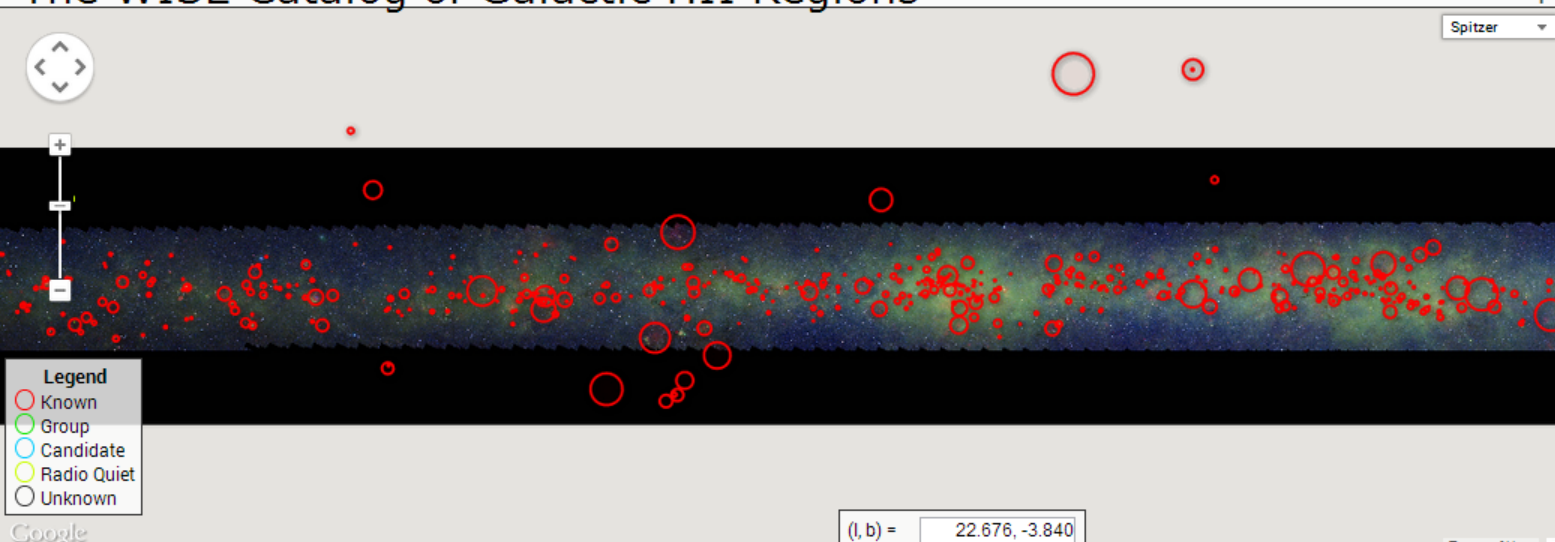


(l, b) = 19.622, -3.687

Search Column: WISE Name for text: [Terms of Use](#)

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method | RGal | z |
|----|-----------------|---------|-------|--------|--------|------------|------------|------|-------------|----------|------|-------|-----------|--------------|------|---|
| 1 | G000.003+00.127 | K | 0.004 | 0.128 | 206 | S17 | | | | | | | | | | |
| 2 | G000.008+00.036 | Q | 0.009 | 0.036 | 24 | | | | | | | | | | | |
| 3 | G000.025-00.232 | Q | 0.026 | -0.231 | 46 | | | | | | | | | | | |
| 4 | G000.029-00.090 | Q | 0.03 | -0.089 | 31 | | | | | | | | | | | |
| 5 | G000.041+00.021 | Q | 0.041 | 0.021 | 20 | | | | | | | | | | | |
| 6 | G000.043+00.013 | Q | 0.044 | 0.014 | 15 | | | | | | | | | | | |
| 7 | G000.052-00.205 | Q | 0.053 | -0.205 | 18 | | | | | | | | | | | |
| 8 | G000.079-00.211 | Q | 0.08 | -0.21 | 66 | | | | | | | | | | | |
| 9 | G000.079-00.626 | Q | 0.08 | -0.625 | 92 | | | | | | | | | | | |
| 10 | G000.082-00.097 | Q | 0.083 | -0.096 | 29 | | | | | | | | | | | |
| 11 | G000.099-00.168 | C | 0.099 | -0.168 | 15 | | | 16.0 | | CS | | | | | | |
| 12 | G000.114-00.092 | Q | 0.115 | -0.091 | 22 | | | | | | | | | | | |
| 13 | G000.120-00.556 | K | 0.12 | -0.556 | 360 | S19 | | 11.6 | | | | | | | | |
| 14 | G000.120-00.633 | Q | 0.121 | -0.632 | 93 | | | | | | | | | | | |
| 15 | G000.121-00.304 | Q | 0.122 | -0.304 | 37 | | | | | | | | | | | |
| 16 | G000.125-00.086 | Q | 0.126 | -0.086 | 29 | | | | | | | | | | | |

The WISE Catalog of Galactic HII Regions



Spitzer

Basic Area Conditions

Catalog

- Known
- Groups
- Candidate
- Radio Quiet
- No Radio Data

Search Column: WISE Name for text: [Terms of Use](#)

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method |
|----|-----------------|---------|-------|--------|--------|-----------------|-----------------|-----------|-------------|----------|------|-------|-----------|--------------|
| 1 | G000.003+00.127 | K | 0.004 | 0.128 | 206 | S17 | | | | | | | | |
| 2 | G000.120-00.556 | K | 0.12 | -0.556 | 360 | S19 | | 11.6 | | | | | | |
| 3 | G000.279-00.482 | K | 0.279 | -0.482 | 60 | G000.284-00.478 | | 20.0 | 18.5 | CS | | | | |
| 4 | G000.314-00.194 | K | 0.314 | -0.194 | 26 | S20 | | 9.6 | 18.7 | CS | | | | |
| 5 | G000.314-00.205 | K | 0.315 | -0.204 | 42 | S20 | | 9.6 | 18.7 | CS | | | | |
| 6 | G000.328-00.804 | K | 0.329 | -0.803 | 234 | G000.361-00.780 | G000.361-00.780 | 20.0 | | | | | | |
| 7 | G000.382+00.017 | K | 0.382 | 0.017 | 67 | G000.382+00.017 | | 25.7;41.4 | 84.4 | CS | | | | |
| 8 | G000.455-00.476 | K | 0.456 | -0.475 | 677 | G000.394-00.540 | G000.394-00.540 | 24.0 | | | | | | |
| 9 | G000.475-00.675 | K | 0.476 | -0.674 | 54 | G000.489-00.668 | | 17.5 | | | | | | |
| 10 | G000.498-00.678 | K | 0.498 | -0.678 | 54 | G000.489-00.668 | | 17.5 | | | | | | |
| 11 | G000.519-00.051 | K | 0.52 | -0.051 | 208 | G000.510-00.051 | G000.510-00.051 | 45.0 | | | | | | |
| 12 | G000.528+00.180 | K | 0.528 | 0.181 | 25 | G000.521+00.178 | G000.521+00.178 | -2.3 | -3.8 | CS | | | | |
| 13 | G000.583-00.871 | K | 0.584 | -0.871 | 79 | G000.561-00.850 | G000.561-00.850 | 15.0 | | | | | | |
| 14 | G000.595-00.618 | K | 0.596 | -0.617 | 215 | G000.572-00.628 | | 20.0 | | | | | | |
| 15 | G000.602+00.333 | K | 0.603 | 0.334 | 83 | G000.605+00.325 | | -0.6 | | | | | | |

Previous Next 1 2 10 16

The WISE Catalog of Galactic HII Regions



Spitzer

Basic Area Conditions

Cone Area Neither

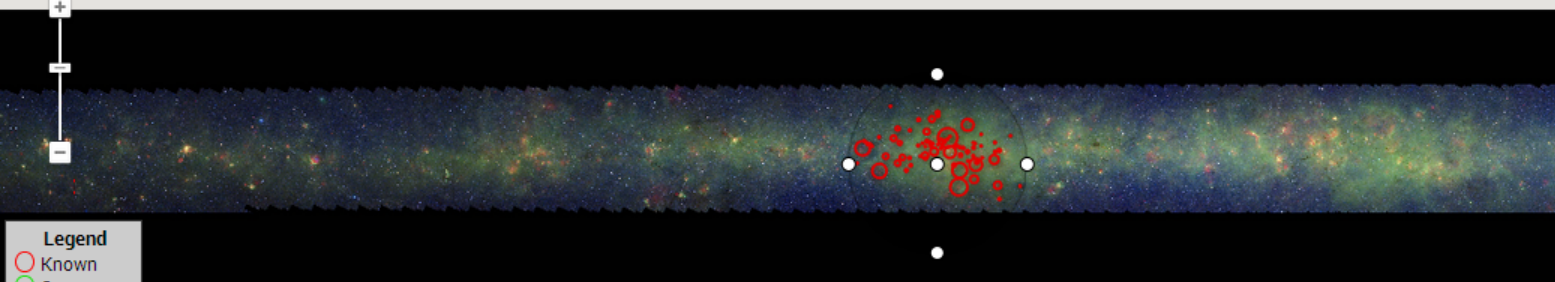
Cone Search

Longitude:

Latitude:

Radius (arcmin):

Remove Draw New



Legend

- Known
- Group
- Candidate
- Radio Quiet
- Unknown

(l, b) =

Terms of Use

Search Column: for text:

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Me |
|----|-----------------|---------|--------|--------|--------|-----------------|-----------------|-----------------|-------------|----------|------|-------|-----------|-------------|
| 1 | G031.268+00.478 | K | 31.268 | 0.479 | 83 | G031.274+00.485 | | -6.3 | | | F | 15.3 | 00.9 | OG/KJ |
| 2 | G031.279+00.061 | K | 31.279 | 0.062 | 51 | G031.275+00.056 | G031.275+00.056 | 104.7 | 107.6 | HCO+ | T | 07.3 | 00.1 | TP/Kii |
| 3 | G031.269+00.064 | K | 31.27 | 0.064 | 24 | G031.275+00.056 | G031.275+00.056 | 104.7 | 107.6 | HCO+ | N | 07.3 | 00.1 | HIEA+ |
| 4 | G031.394-00.258 | K | 31.394 | -0.258 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | HIEA+ |
| 5 | G031.412+00.309 | K | 31.413 | 0.309 | 60 | G031.410+00.310 | | 100.9 | 96.0 | NH3 | N | 06.6 | 00.1 | HIEA+ |
| 6 | G031.403-00.268 | K | 31.403 | -0.267 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | IRDC (Mol.) |
| 7 | G031.102+00.128 | K | 31.103 | 0.128 | 42 | G031.104+00.125 | | 85.0;105.3;40.0 | | | | | | |
| 8 | G031.135+00.129 | K | 31.136 | 0.129 | 78 | G031.140+00.121 | | 45.5;102.9;81.6 | | | | | | |
| 9 | G031.138+00.285 | K | 31.138 | 0.286 | 167 | G031.130+00.284 | | 104.7 | 102.5 | 13CO | F | 07.3 | 02.5 | HIEA+ |
| 10 | G031.156-00.148 | K | 31.157 | -0.147 | 73 | G031.157-00.148 | | 43.6;101.6 | 41.7 | HCO+ | | | | |
| 11 | G031.159+00.045 | K | 31.159 | 0.046 | 42 | G031.159+00.048 | | 35.6;100.7 | 38.9 | HCO+ | F | 11.9 | 00.4 | HISA |
| 12 | G031.165-00.105 | K | 31.165 | -0.104 | 190 | G031.165-00.127 | | 41.4 | 41.5 | 13CO | F | 11.7 | 00.4 | HIEA+ |
| 13 | G031.207+00.098 | K | 31.207 | 0.098 | 42 | G031.207+00.098 | G031.207+00.098 | 102.6;45.5 | | | | | | |
| 14 | G031.241-00.109 | K | 31.242 | -0.109 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HIEA+ |
| 15 | G031.244-00.113 | K | 31.244 | -0.113 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HISA |



Spitzer

Basic Area Conditions

KDAR

Catalog

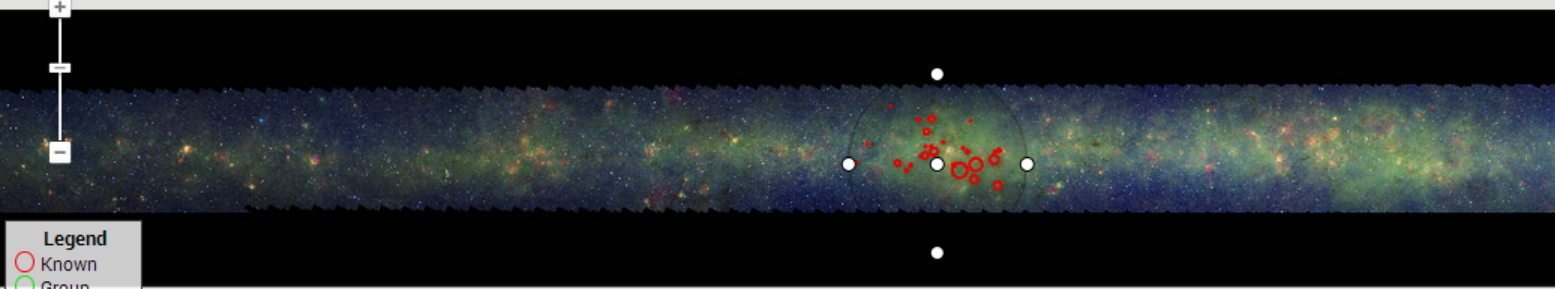
Catalog

Catalog

Catalog

Catalog

SQL query: WHERE 'Catalog' IN ('K') AND ST_IN



Legend

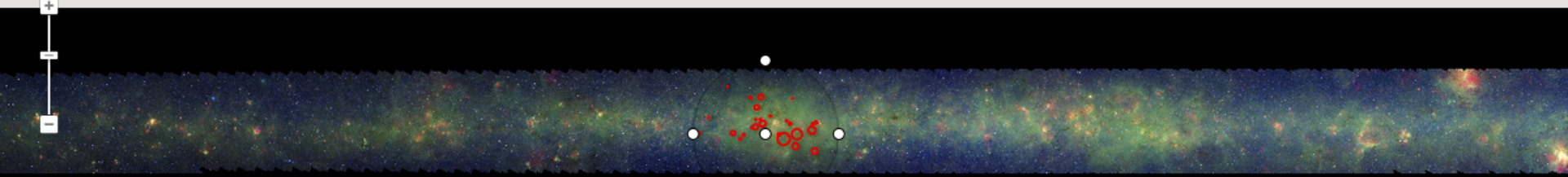
- Known
- Group
- Candidate
- Radio Quiet
- Unknown

(l, b) = 21.248, 1.562

Search Column: WISE Name for text:

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method |
|----|-----------------|---------|--------|--------|--------|-----------------|-----------------|------------|-------------|----------|------|-------|-----------|--------------------|
| 1 | G030.022-00.042 | K | 30.022 | -0.042 | 60 | G030.022-00.044 | | 94.9 | 91.7 | HCO+ | F | 08.9 | 00.6 | HIEA/Kin |
| 2 | G031.268+00.478 | K | 31.268 | 0.479 | 83 | G031.274+00.485 | | -6.3 | | | F | 15.3 | 00.9 | OG/Kin |
| 3 | G030.036-00.167 | K | 30.037 | -0.166 | 265 | G030.069-00.160 | | 98.2 | | | F | 08.7 | 00.8 | HIEA+HISA |
| 4 | G029.979-00.587 | K | 29.98 | -0.587 | 219 | G030.001-00.602 | | 42.6;93.2 | 92.1 | 13CO | F | 09.1 | 00.6 | HIEA+HISA |
| 5 | G031.394-00.258 | K | 31.394 | -0.258 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | HIEA+HISA |
| 6 | G031.403-00.268 | K | 31.403 | -0.267 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | IRDC+HIS (Mol)/Kin |
| 7 | G031.016-00.039 | K | 31.017 | -0.039 | 225 | G030.999-00.038 | | 101.2 | 100.5 | 13CO | F | 08.0 | 02.8 | HIEA+HISA |
| 8 | G031.138+00.285 | K | 31.138 | 0.286 | 167 | G031.130+00.284 | | 104.7 | 102.5 | 13CO | F | 07.3 | 02.5 | HIEA+HISA |
| 9 | G031.159+00.045 | K | 31.159 | 0.046 | 42 | G031.159+00.048 | | 35.6;100.7 | 38.9 | HCO+ | F | 11.9 | 00.4 | HISA (Mol) |
| 10 | G031.165-00.105 | K | 31.165 | -0.104 | 190 | G031.165-00.127 | | 41.4 | 41.5 | 13CO | F | 11.7 | 00.4 | HIEA+HISA |
| 11 | G031.054+00.491 | K | 31.054 | 0.491 | 168 | G031.050+00.480 | G031.050+00.480 | 27.9 | 30.2 | 13CO | F | 12.6 | 00.5 | HIEA+HISA |
| 12 | G031.241-00.109 | K | 31.242 | -0.109 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HIEA+HISA |
| 13 | G031.065+00.045 | K | 31.065 | 0.046 | 60 | G031.070+00.050 | | 33.6;98.4 | 39.2 | HCO+ | F | 11.9 | 00.4 | HIEA+HISA |
| 14 | G031.244-00.113 | K | 31.244 | -0.113 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HISA (Mol) |
| 15 | G031.612-00.226 | K | 31.612 | -0.226 | 157 | G031.602-00.227 | | 41.6;98.7 | 43.9 | 13CO | F | 11.5 | 00.4 | HIEA+HISA |

Created and maintained by Loren Anderson (Loren.Anderson@mail.wvu.edu). Last updated December 2013.



Legend

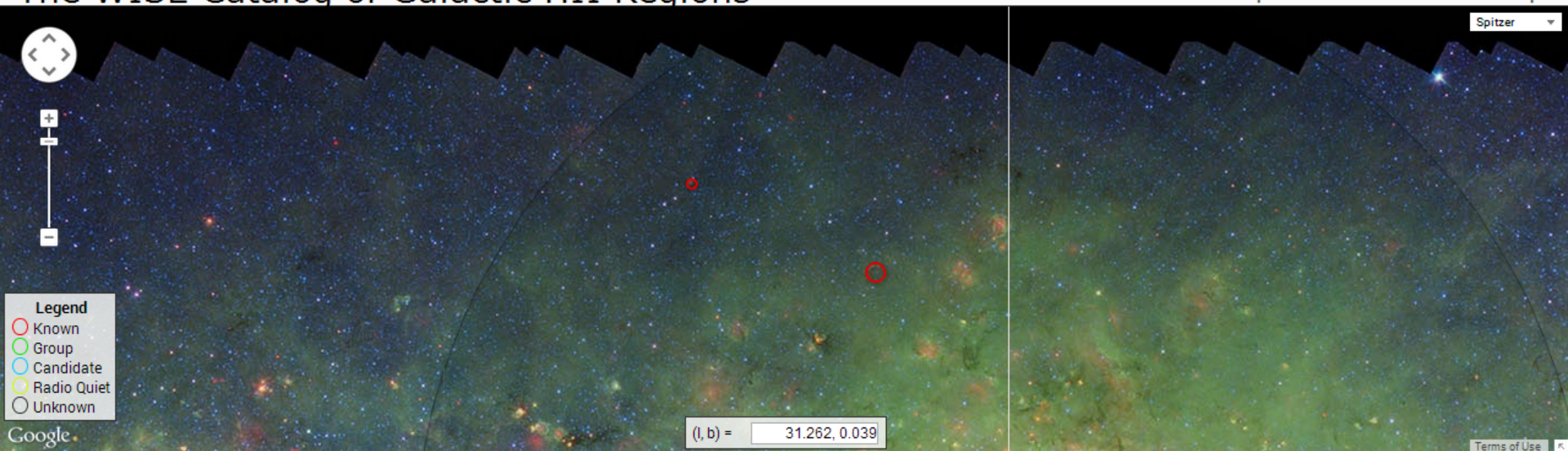
- Known
- Group
- Candidate
- Radio Quiet
- Unknown

(l, b) =

Search Column: WISE Name for text: Go to selection! Export CSV Hide Map Hide Table Filter Options Terms of Use

| WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method | RGal | z | |
|-----------|-----------------|-------|--------|--------|------------|-----------------|-----------------|-------------|----------|------|-------|-----------|--------------|---------------------|------|------|
| 1 | G031.727+00.698 | K | 31.727 | 0.698 | 42 | G031.727+00.698 | | -39.2 | | | F | 19.7 | 01.6 | OG/Kin | 13.3 | 0240 |
| 2 | G031.268+00.478 | K | 31.268 | 0.479 | 83 | G031.274+00.485 | | -6.3 | | | F | 15.3 | 00.9 | OG/Kin | 09.2 | 0127 |
| 3 | G031.244-00.113 | K | 31.244 | -0.113 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HISA (Mol)/Kin | 07.3 | -025 |
| 4 | G031.241-00.109 | K | 31.242 | -0.109 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HIEA+HISA/Kin | 07.3 | -024 |
| 5 | G030.425+00.463 | K | 30.425 | 0.463 | 20 | G030.420+00.460 | G030.420+00.460 | 22.5 | 15.6 | HCO+ | F | 13.0 | 00.5 | H2CO/Kin | 07.1 | 0105 |
| 6 | G032.272-00.226 | K | 32.272 | -0.226 | 42 | G032.272-00.226 | | 21.5 | 22.6 | HCO+ | F | 12.8 | 00.6 | HIEA/Kin | 07.2 | -050 |
| 7 | G031.054+00.491 | K | 31.054 | 0.491 | 168 | G031.050+00.480 | G031.050+00.480 | 27.9 | 30.2 | 13CO | F | 12.6 | 00.5 | HIEA+HISA/Kin | 06.9 | 0107 |
| 8 | G031.065+00.045 | K | 31.065 | 0.046 | 60 | G031.070+00.050 | | 33.6;98.4 | 39.2 | HCO+ | F | 11.9 | 00.4 | HIEA+HISA/Kin | 06.3 | 0009 |
| 9 | G031.159+00.045 | K | 31.159 | 0.046 | 42 | G031.159+00.048 | | 35.6;100.7 | 38.9 | HCO+ | F | 11.9 | 00.4 | HISA (Mol)/Kin | 06.4 | 0009 |
| 10 | G030.867+00.113 | K | 30.867 | 0.113 | 60 | G030.870+00.110 | | 36.3;102.9 | 39.9 | HCO+ | F | 11.8 | 00.4 | HIEA+HISA/Kin | 06.3 | 0023 |
| 11 | G031.165-00.105 | K | 31.165 | -0.104 | 190 | G031.165-00.127 | | 41.4 | 41.5 | 13CO | F | 11.7 | 00.4 | HIEA+HISA/Kin | 06.2 | -021 |
| 12 | G031.612-00.226 | K | 31.612 | -0.226 | 157 | G031.602-00.227 | | 41.6;98.7 | 43.9 | 13CO | F | 11.5 | 00.4 | HIEA+HISA/Kin | 06.2 | -045 |
| 13 | G030.547+00.014 | K | 30.547 | 0.014 | 24 | G030.539+00.024 | | 46.1;95.2 | 48.0 | NH3 | F | 11.4 | 00.4 | HISA (Mol)/Kin | 06.0 | 0002 |
| 14 | G030.533+00.021 | K | 30.533 | 0.021 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HIEA+HISA/Kin | 05.9 | 0004 |
| 15 | G030.545+00.027 | K | 30.545 | 0.027 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HISA (Mol)/Kin | 05.9 | 0005 |
| 16 | G029.979-00.587 | K | 29.98 | -0.587 | 219 | G030.001-00.602 | | 42.6;93.2 | 92.1 | 13CO | F | 09.1 | 00.6 | HIEA+HISA/Kin | 04.6 | -093 |
| 17 | G031.403-00.268 | K | 31.403 | -0.267 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | IRDC+HISA (Mol)/Kin | 04.8 | -042 |
| 18 | G031.394-00.258 | K | 31.394 | -0.258 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | HIEA+HISA/Kin | 04.8 | -041 |

Created and maintained by Loren Anderson (Loren.Anderson@mail.wvu.edu). Last updated December 2013.

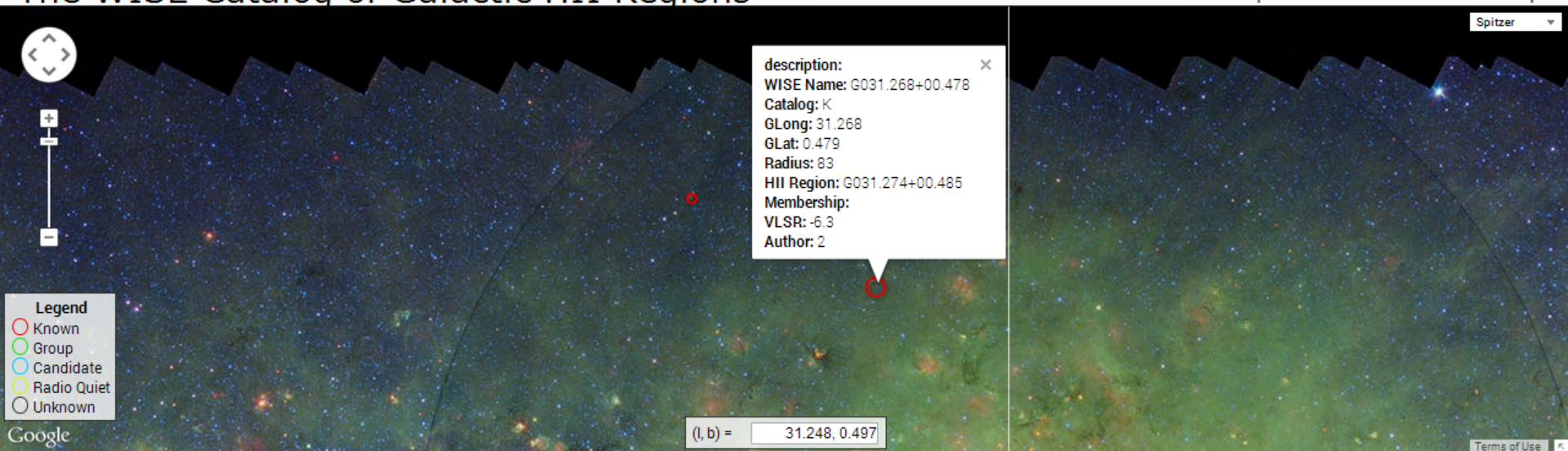


Search Column: WISE Name for text:

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method | RGal | z |
|----|-----------------|---------|--------|--------|--------|-----------------|-----------------|------------|-------------|----------|------|-------|-----------|---------------------|------|------|
| 1 | G031.727+00.698 | K | 31.727 | 0.698 | 42 | G031.727+00.698 | | -39.2 | | | F | 19.7 | 01.6 | OG/Kin | 13.3 | 0240 |
| 2 | G031.268+00.478 | K | 31.268 | 0.479 | 83 | G031.274+00.485 | | -6.3 | | | F | 15.3 | 00.9 | OG/Kin | 09.2 | 0127 |
| 3 | G031.244-00.113 | K | 31.244 | -0.113 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HISA (Mol)/Kin | 07.3 | -025 |
| 4 | G031.241-00.109 | K | 31.242 | -0.109 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HIEA+HISA/Kin | 07.3 | -024 |
| 5 | G030.425+00.463 | K | 30.425 | 0.463 | 20 | G030.420+00.460 | G030.420+00.460 | 22.5 | 15.6 | HCO+ | F | 13.0 | 00.5 | H2CO/Kin | 07.1 | 0105 |
| 6 | G032.272-00.226 | K | 32.272 | -0.226 | 42 | G032.272-00.226 | | 21.5 | 22.6 | HCO+ | F | 12.8 | 00.6 | HIEA/Kin | 07.2 | -050 |
| 7 | G031.054+00.491 | K | 31.054 | 0.491 | 168 | G031.050+00.480 | G031.050+00.480 | 27.9 | 30.2 | 13CO | F | 12.6 | 00.5 | HIEA+HISA/Kin | 06.9 | 0107 |
| 8 | G031.065+00.045 | K | 31.065 | 0.046 | 60 | G031.070+00.050 | | 33.6;98.4 | 39.2 | HCO+ | F | 11.9 | 00.4 | HIEA+HISA/Kin | 06.3 | 0009 |
| 9 | G031.159+00.045 | K | 31.159 | 0.046 | 42 | G031.159+00.048 | | 35.6;100.7 | 38.9 | HCO+ | F | 11.9 | 00.4 | HISA (Mol)/Kin | 06.4 | 0009 |
| 10 | G030.867+00.113 | K | 30.867 | 0.113 | 60 | G030.870+00.110 | | 36.3;102.9 | 39.9 | HCO+ | F | 11.8 | 00.4 | HIEA+HISA/Kin | 06.3 | 0023 |
| 11 | G031.165-00.105 | K | 31.165 | -0.104 | 190 | G031.165-00.127 | | 41.4 | 41.5 | 13CO | F | 11.7 | 00.4 | HIEA+HISA/Kin | 06.2 | -021 |
| 12 | G031.612-00.226 | K | 31.612 | -0.226 | 157 | G031.602-00.227 | | 41.6;98.7 | 43.9 | 13CO | F | 11.5 | 00.4 | HIEA+HISA/Kin | 06.2 | -045 |
| 13 | G030.547+00.014 | K | 30.547 | 0.014 | 24 | G030.539+00.024 | | 46.1;95.2 | 48.0 | NH3 | F | 11.4 | 00.4 | HISA (Mol)/Kin | 06.0 | 0002 |
| 14 | G030.533+00.021 | K | 30.533 | 0.021 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HIEA+HISA/Kin | 05.9 | 0004 |
| 15 | G030.545+00.027 | K | 30.545 | 0.027 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HISA (Mol)/Kin | 05.9 | 0005 |
| 16 | G029.979-00.587 | K | 29.98 | -0.587 | 219 | G030.001-00.602 | | 42.6;93.2 | 92.1 | 13CO | F | 09.1 | 00.6 | HIEA+HISA/Kin | 04.6 | -093 |
| 17 | G031.403-00.268 | K | 31.403 | -0.267 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | IRDC+HISA (Mol)/Kin | 04.8 | -042 |
| 18 | G031.394-00.258 | K | 31.394 | -0.258 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | HIEA+HISA/Kin | 04.8 | -041 |

Created and maintained by Loren Anderson (Loren.Anderson@mail.wvu.edu). Last updated December 2013.

The WISE Catalog of Galactic HII Regions



Search Column: **WISE Name** for text:

| | WISE Name | Catalog | GLong | GLat | Radius | HII Region | Membership | VLSR | VLSR (Mol.) | Molecule | KDAR | Dist. | Err Dist. | Dist. Method | RGal | z |
|----|-----------------|---------|--------|--------|--------|-----------------|-----------------|------------|-------------|----------|------|-------|-----------|---------------------|------|------|
| 1 | G031.727+00.698 | K | 31.727 | 0.698 | 42 | G031.727+00.698 | | -39.2 | | | F | 19.7 | 01.6 | OG/Kin | 13.3 | 0240 |
| 2 | G031.268+00.478 | K | 31.268 | 0.479 | 83 | G031.274+00.485 | | -6.3 | | | F | 15.3 | 00.9 | OG/Kin | 09.2 | 0127 |
| 3 | G031.244-00.113 | K | 31.244 | -0.113 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HISA (Mol)/Kin | 07.3 | -025 |
| 4 | G031.241-00.109 | K | 31.242 | -0.109 | 24 | G031.239-00.108 | | 29.9;98.0 | 20.3 | HCO+ | F | 13.1 | 00.6 | HIEA+HISA/Kin | 07.3 | -024 |
| 5 | G030.425+00.463 | K | 30.425 | 0.463 | 20 | G030.420+00.460 | G030.420+00.460 | 22.5 | 15.6 | HCO+ | F | 13.0 | 00.5 | H2CO/Kin | 07.1 | 0105 |
| 6 | G032.272-00.226 | K | 32.272 | -0.226 | 42 | G032.272-00.226 | | 21.5 | 22.6 | HCO+ | F | 12.8 | 00.6 | HIEA/Kin | 07.2 | -050 |
| 7 | G031.054+00.491 | K | 31.054 | 0.491 | 168 | G031.050+00.480 | G031.050+00.480 | 27.9 | 30.2 | 13CO | F | 12.6 | 00.5 | HIEA+HISA/Kin | 06.9 | 0107 |
| 8 | G031.065+00.045 | K | 31.065 | 0.046 | 60 | G031.070+00.050 | | 33.6;98.4 | 39.2 | HCO+ | F | 11.9 | 00.4 | HIEA+HISA/Kin | 06.3 | 0009 |
| 9 | G031.159+00.045 | K | 31.159 | 0.046 | 42 | G031.159+00.048 | | 35.6;100.7 | 38.9 | HCO+ | F | 11.9 | 00.4 | HISA (Mol)/Kin | 06.4 | 0009 |
| 10 | G030.867+00.113 | K | 30.867 | 0.113 | 60 | G030.870+00.110 | | 36.3;102.9 | 39.9 | HCO+ | F | 11.8 | 00.4 | HIEA+HISA/Kin | 06.3 | 0023 |
| 11 | G031.165-00.105 | K | 31.165 | -0.104 | 190 | G031.165-00.127 | | 41.4 | 41.5 | 13CO | F | 11.7 | 00.4 | HIEA+HISA/Kin | 06.2 | -021 |
| 12 | G031.612-00.226 | K | 31.612 | -0.226 | 157 | G031.602-00.227 | | 41.6;98.7 | 43.9 | 13CO | F | 11.5 | 00.4 | HIEA+HISA/Kin | 06.2 | -045 |
| 13 | G030.547+00.014 | K | 30.547 | 0.014 | 24 | G030.539+00.024 | | 46.1;95.2 | 48.0 | NH3 | F | 11.4 | 00.4 | HISA (Mol)/Kin | 06.0 | 0002 |
| 14 | G030.533+00.021 | K | 30.533 | 0.021 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HIEA+HISA/Kin | 05.9 | 0004 |
| 15 | G030.545+00.027 | K | 30.545 | 0.027 | 30 | G030.539+00.024 | | 46.1;95.2 | 48.4 | HCO+ | F | 11.4 | 00.4 | HISA (Mol)/Kin | 05.9 | 0005 |
| 16 | G029.979-00.587 | K | 29.98 | -0.587 | 219 | G030.001-00.602 | | 42.6;93.2 | 92.1 | 13CO | F | 09.1 | 00.6 | HIEA+HISA/Kin | 04.6 | -093 |
| 17 | G031.403-00.268 | K | 31.403 | -0.267 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | IRDC+HISA (Mol)/Kin | 04.8 | -042 |
| 18 | G031.394-00.258 | K | 31.394 | -0.258 | 50 | G031.401-00.259 | G031.401-00.259 | 86.2 | 86.0 | NH3 | F | 09.1 | 00.5 | HIEA+HISA/Kin | 04.8 | -041 |

Created and maintained by Loren Anderson (Loren.Anderson@mail.wvu.edu). Last updated December 2013.

Future

- 1) Southern spectroscopic survey with the ATCA to complete distribution Galaxy-wide

Summary

- 1) WISE can detect all Galactic HII regions
- 2) Locating sources with WISE, we have detected the most distant Galactic HII regions
- 3) Our sample is complete for all O-stars (in the first quadrant)
- 4) The Sun may only be a few pc above the true plane (defined by Sgr A*)
- 5) We can trace the warp with HII regions
- 6) Check out the web site! astro.phys.wvu.edu/wise