

The background of the slide is a color map of a star-forming region, likely the Orion Molecular Cloud. It shows various structures in shades of blue, cyan, green, and yellow, with some darker spots. The text is overlaid on this image.

# SCOPE: A JCMT survey of PGCCs

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Cold Cores - Besançon  
5th June 2018

# Outline

- Description of the SCOPE survey, observing strategy, and science goals
- Source extraction with the SCOPE survey
- Star formation in and out of the Galactic Plane
- Future studies

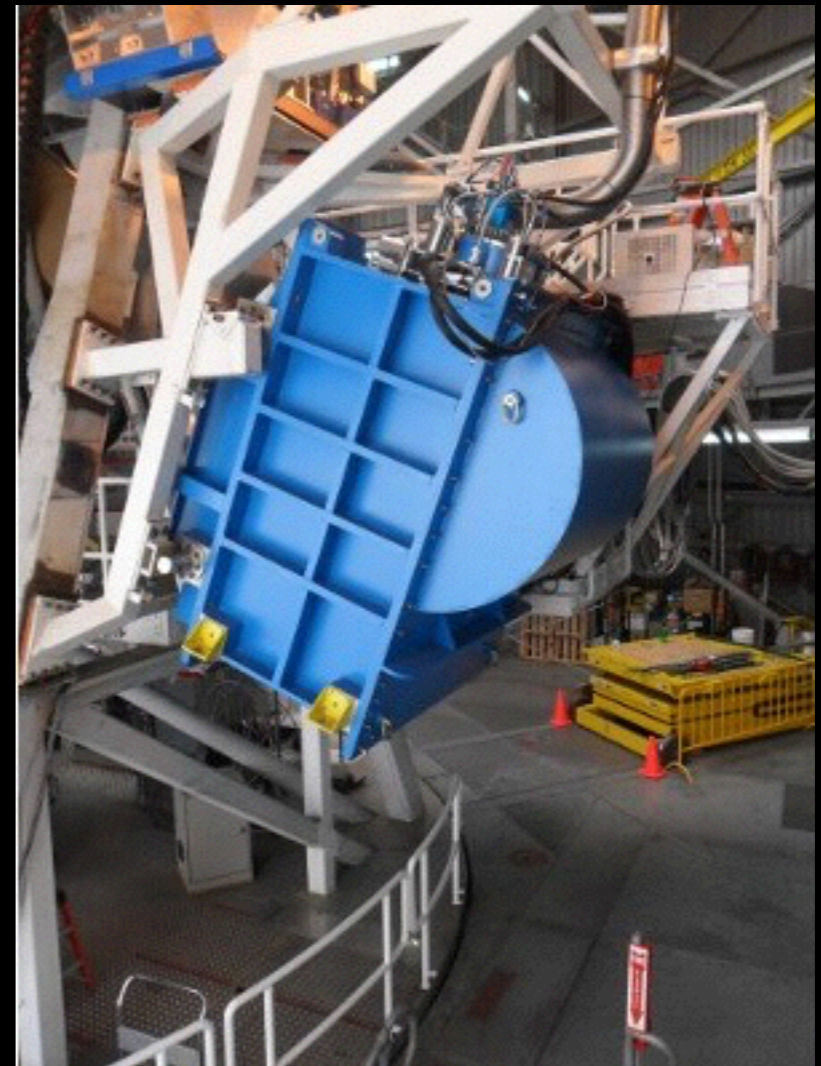
# SCOPE

SCUBA-2 Continuum Observations of Pre-protostellar Evolution



300 hours at 850 $\mu$ m

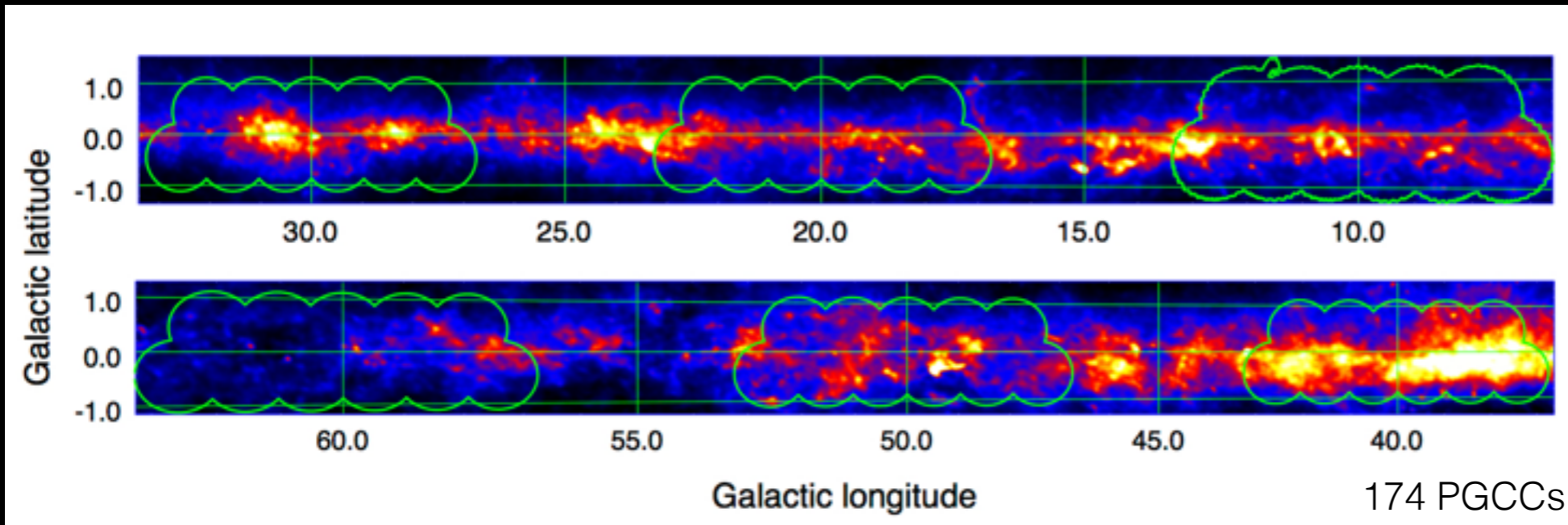
Band 3-4:  $0.08 \leq \tau_{225 \text{ GHz}} \leq 0.20$



Matches the 353 GHz band of *Planck*

# Observing Strategy

Existing JCMT surveys:

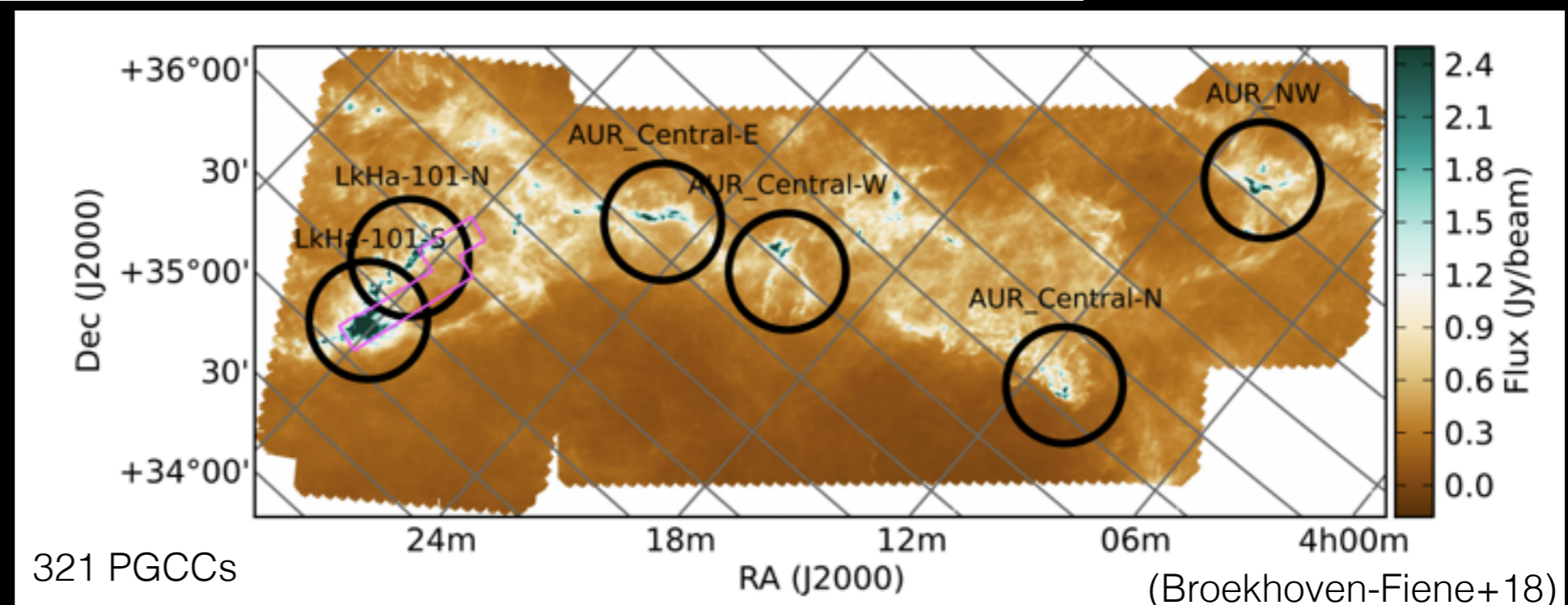


JCMT  
Plane  
Survey

(Moore+15, Eden+17)

JCMT  
Gould's Belt  
Survey

(Ward-Thompson+07)



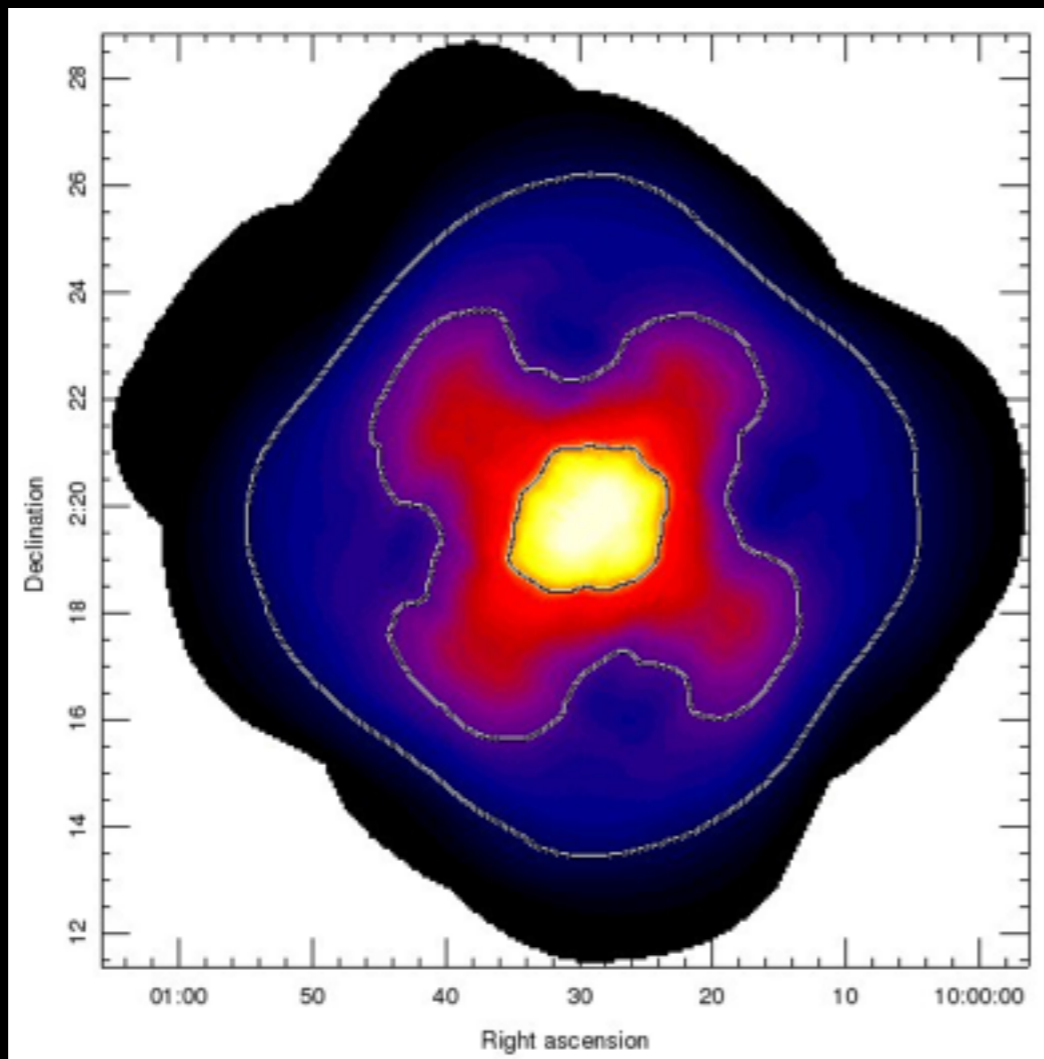
(Broekhoven-Fiene+18)

# Observing Strategy

Selected randomly from the following bins, with a preference for colder objects:

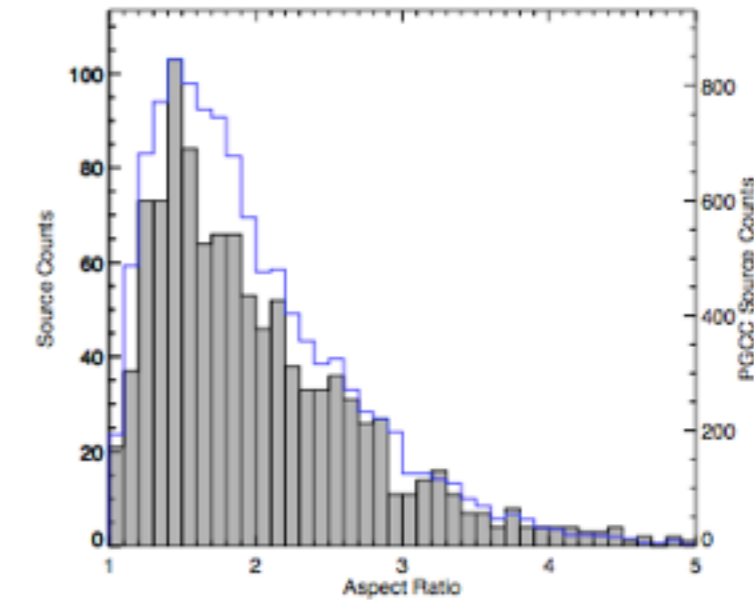
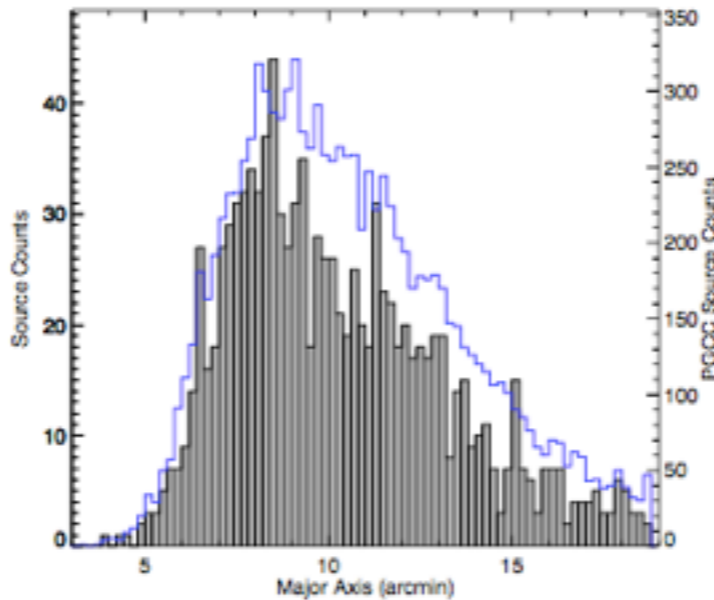
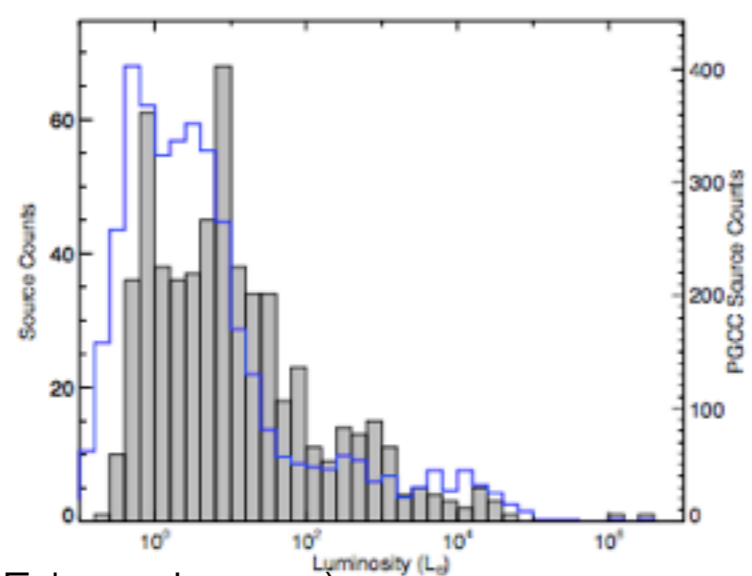
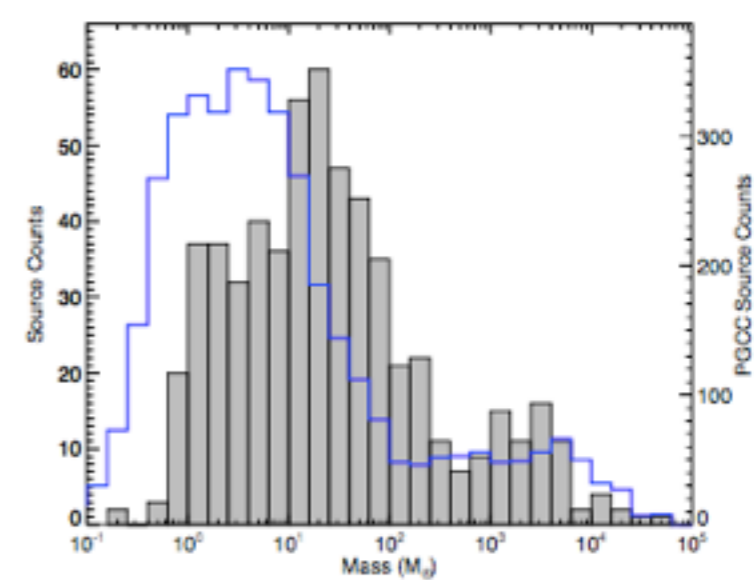
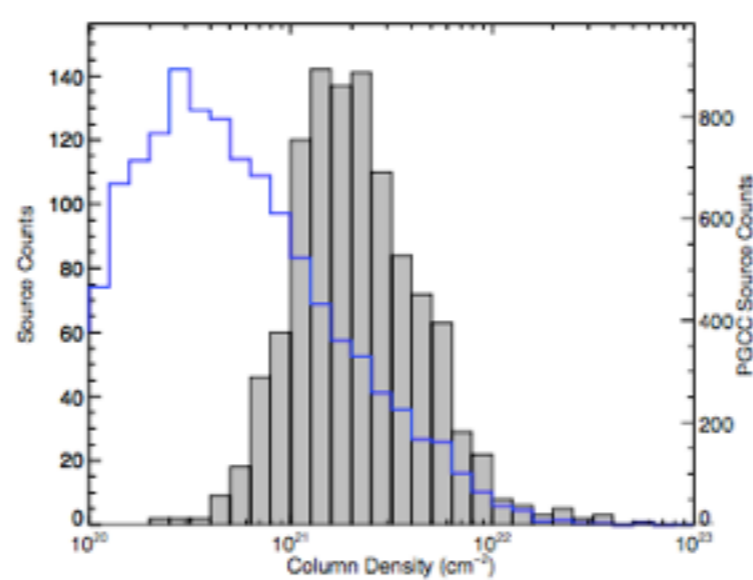
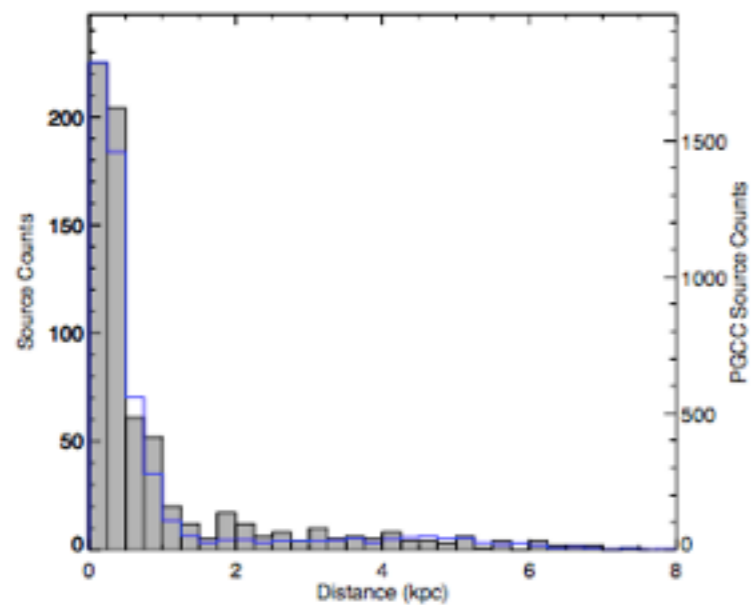
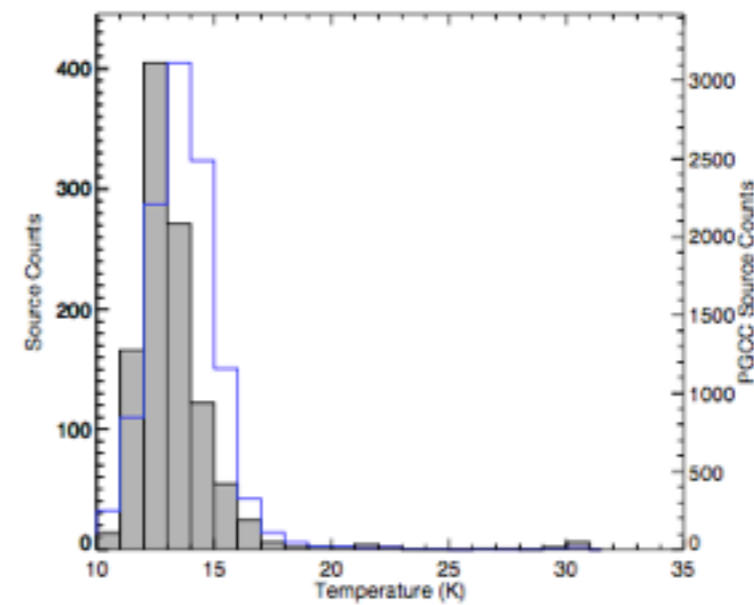
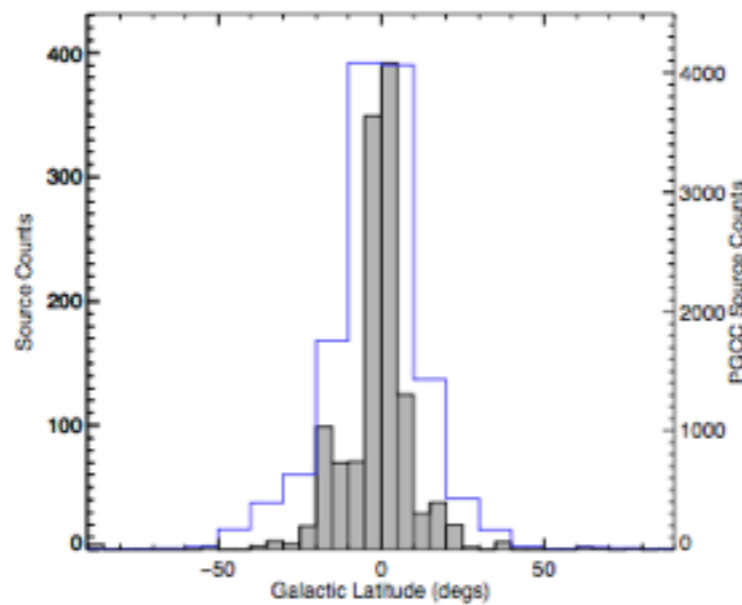
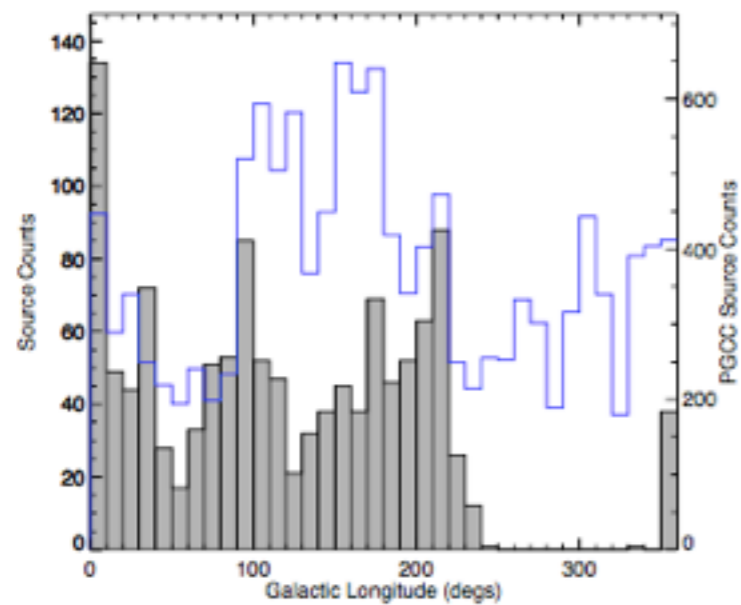
Galactic Longitude	every 30
Galactic Latitude	$ b  = 0, 4, 10, 90$
Distance	$d = 0, 0.2, 0.5, 1, 2, 8$ kpc

8'

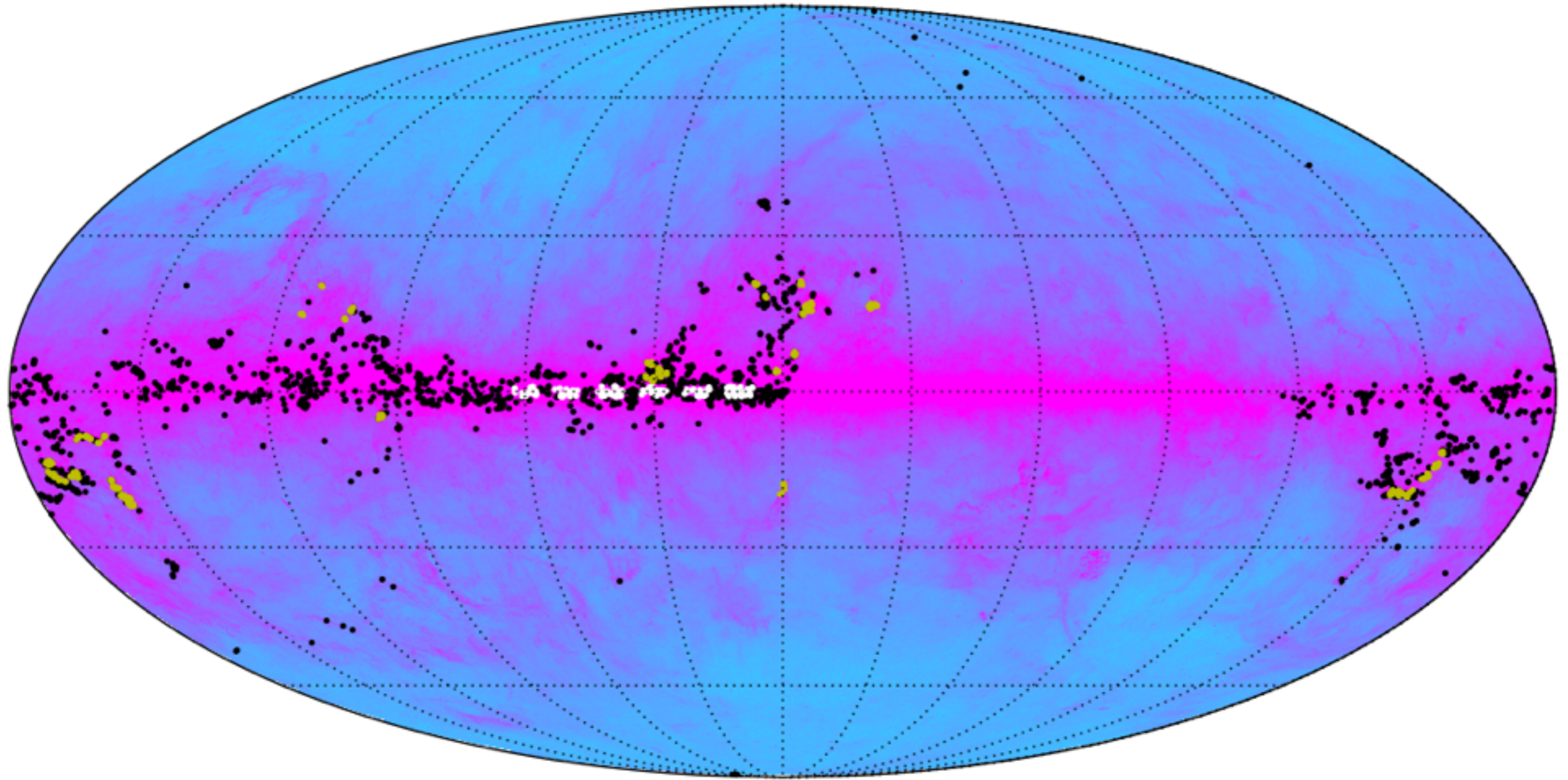


6 mJy/beam in central 3'  
10-30 mJy/beam out to 12'

(Bintley+14)



(Eden+, in prep)

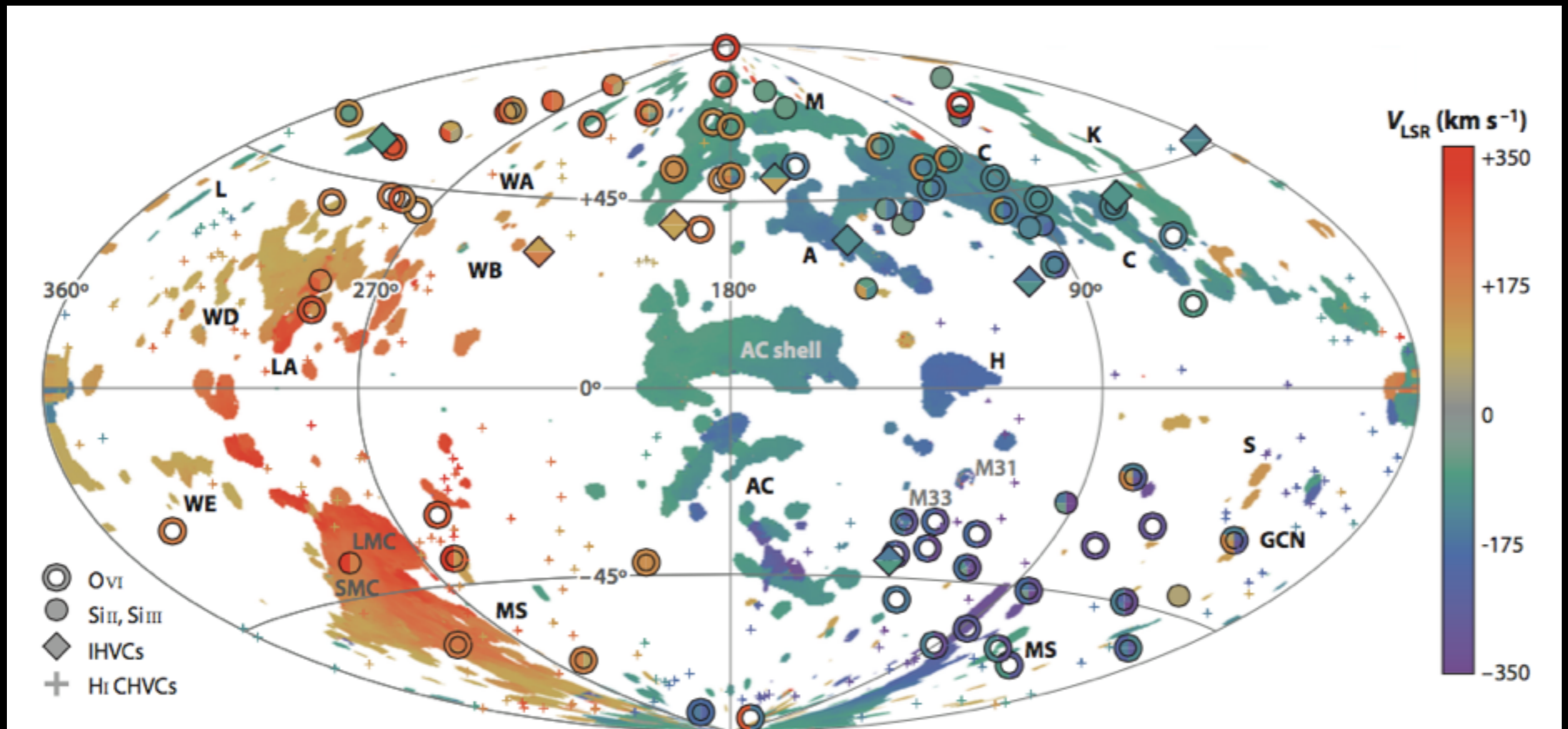


(Eden+, in prep)

# SCOPE Science Goals

Amongst those goals are:

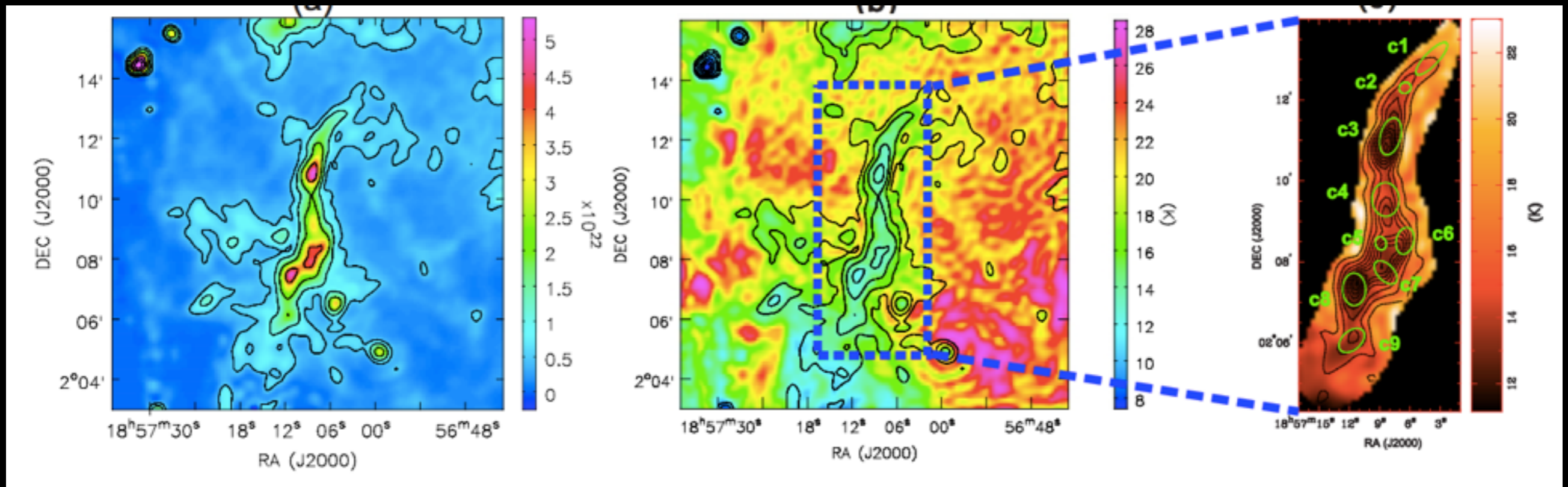
High-latitude star formation





# SCOPE Science Goals

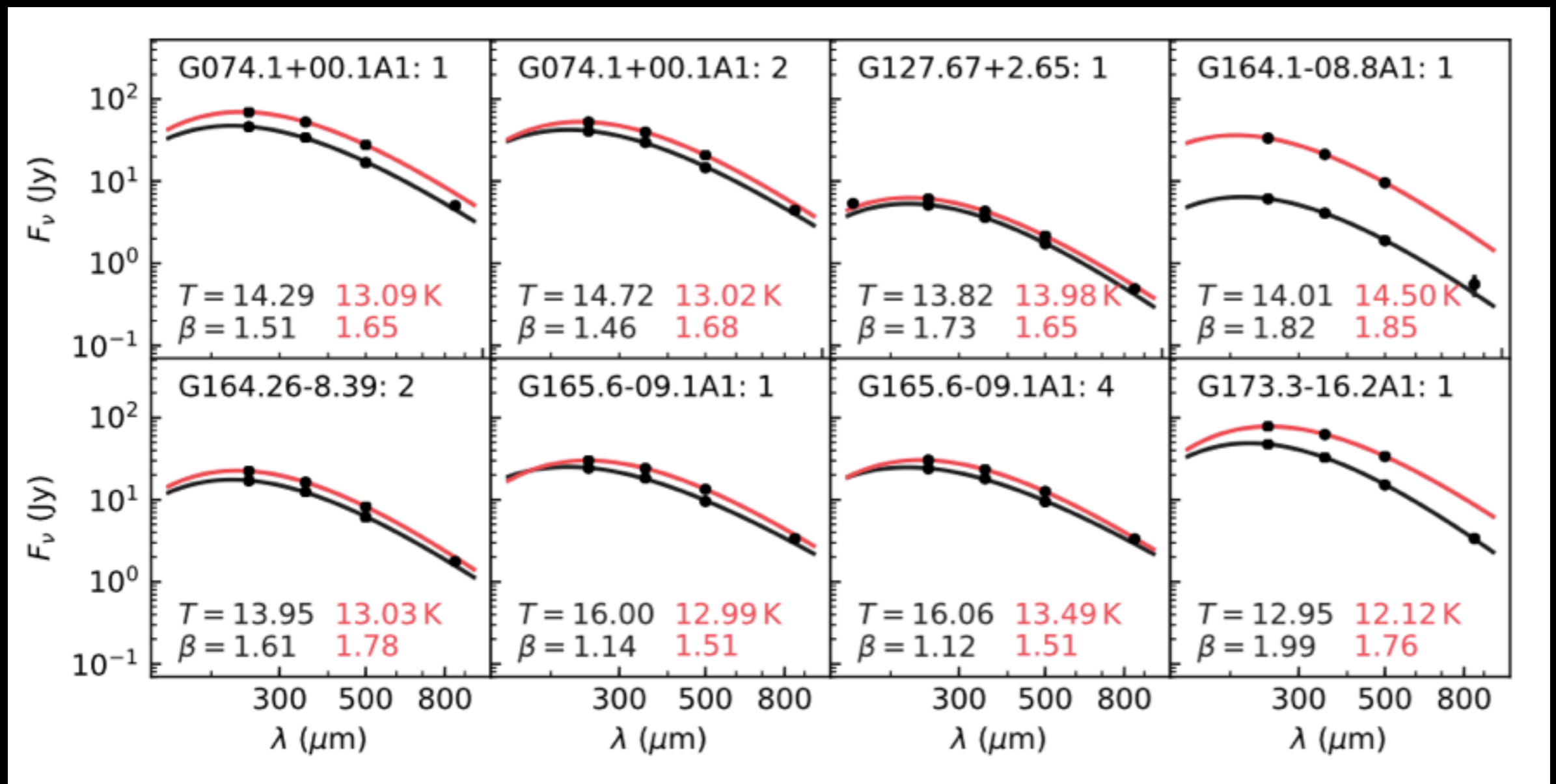
## Role of Filaments

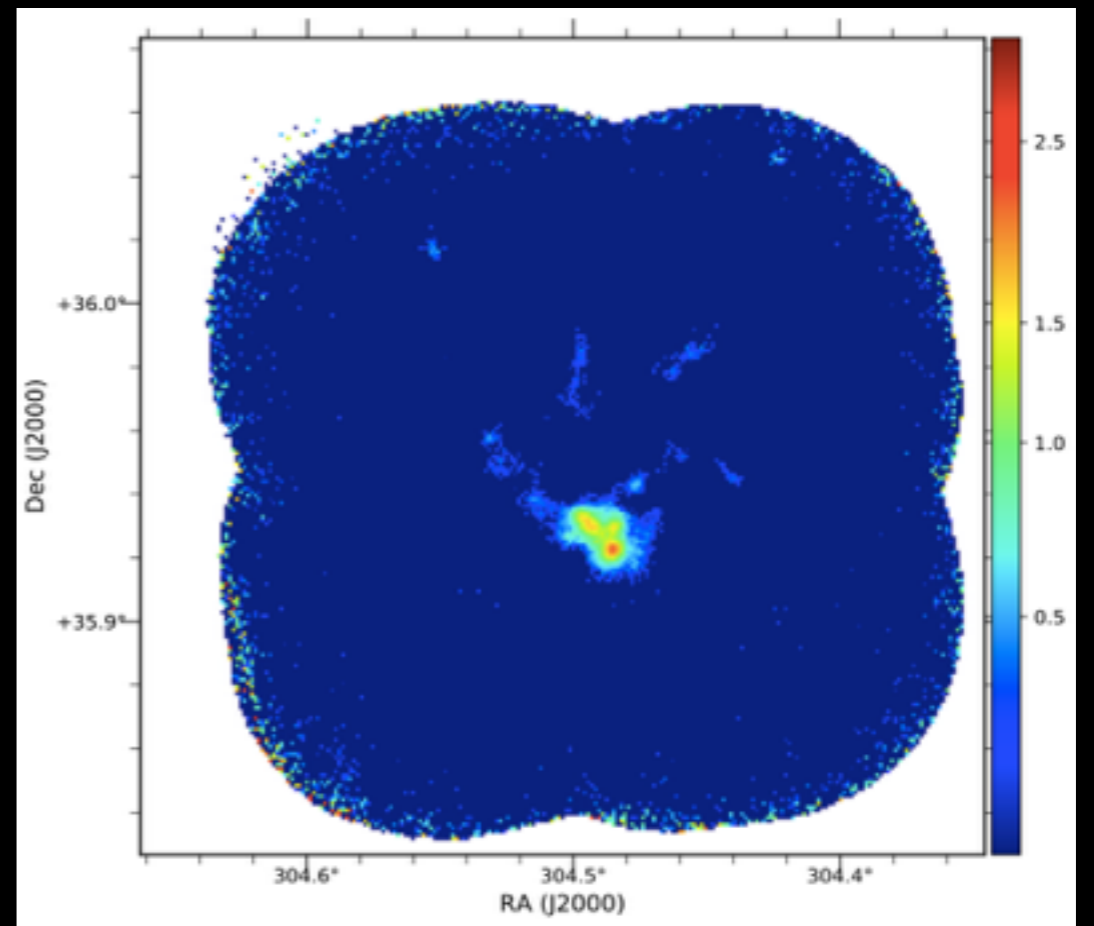
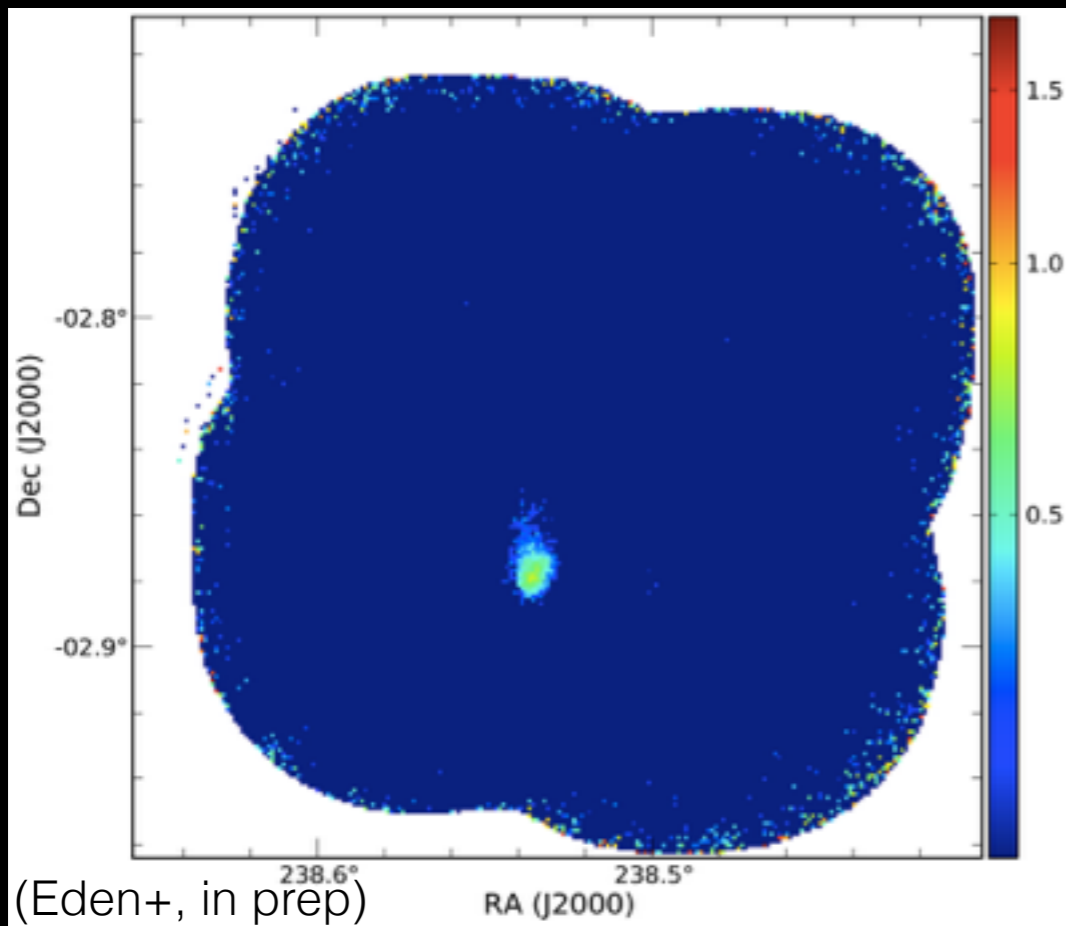
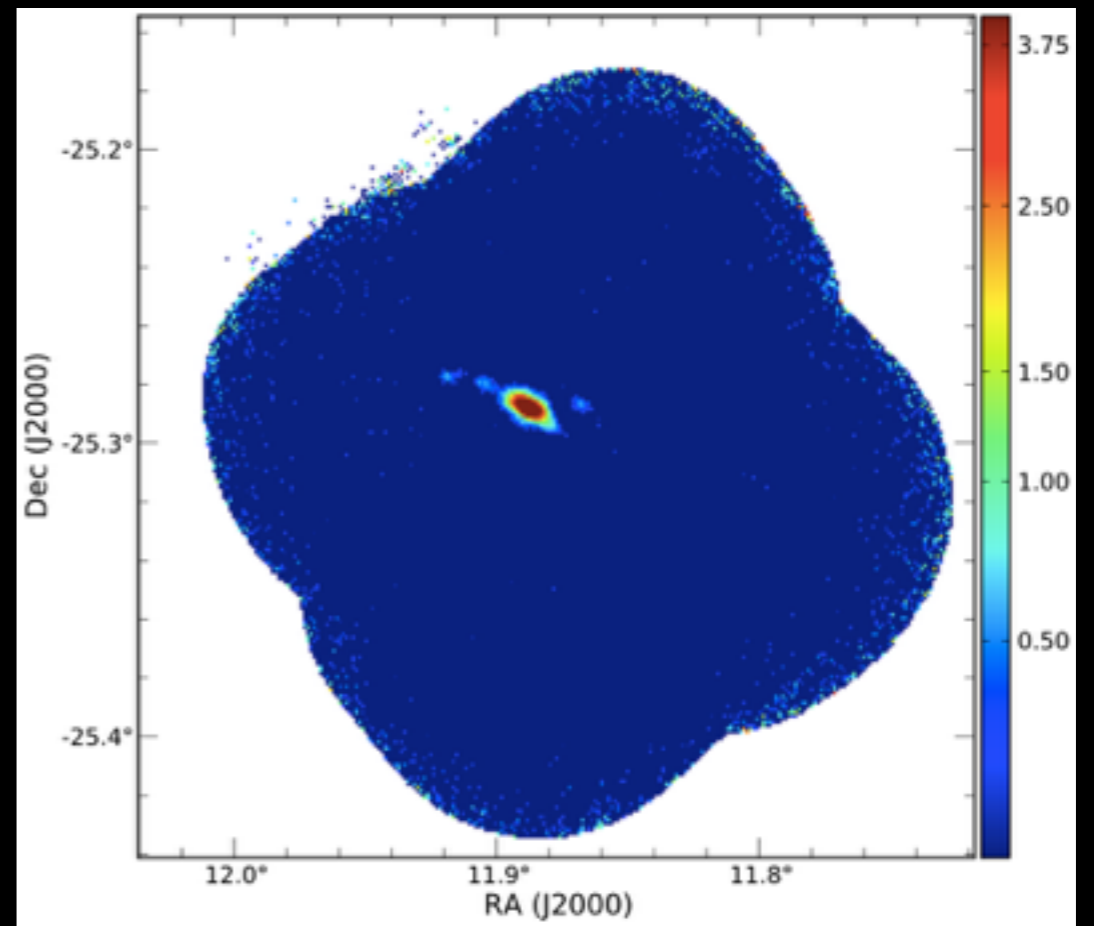
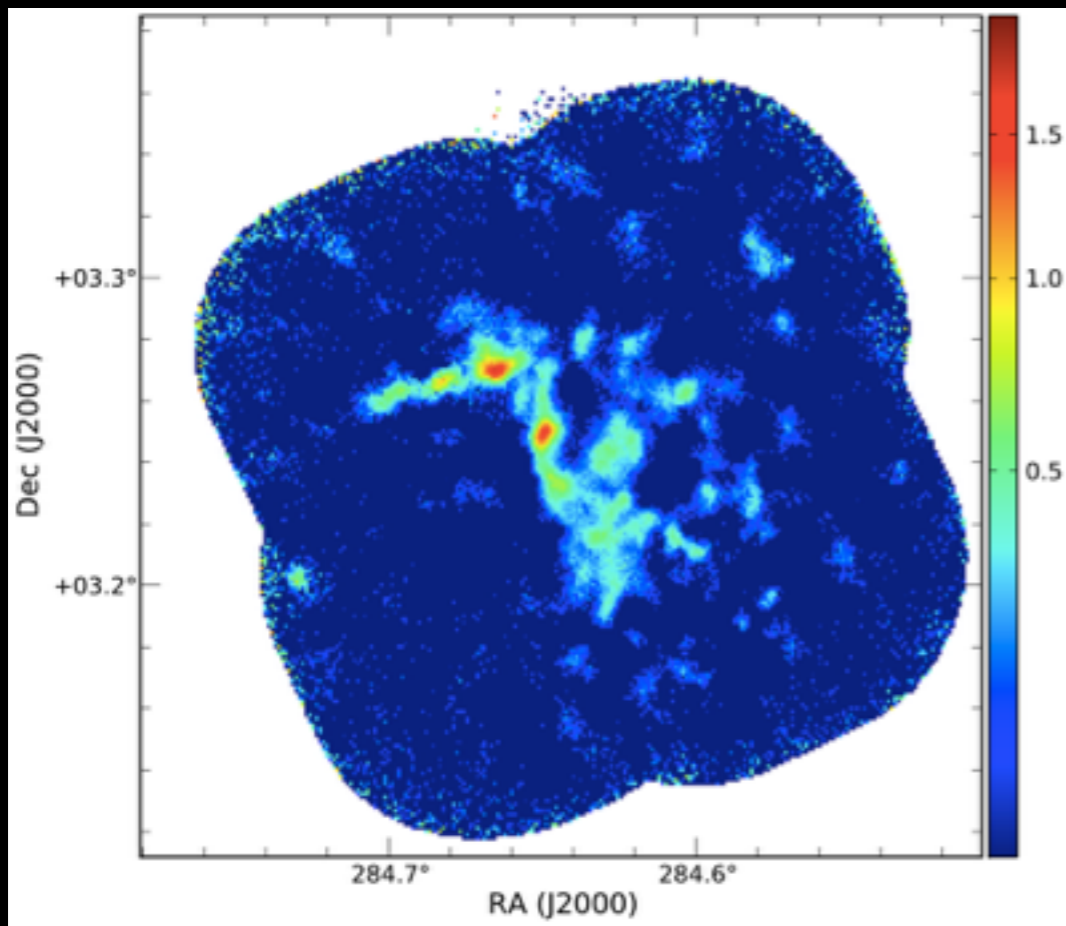


(Liu+18)

# SCOPE Science Goals

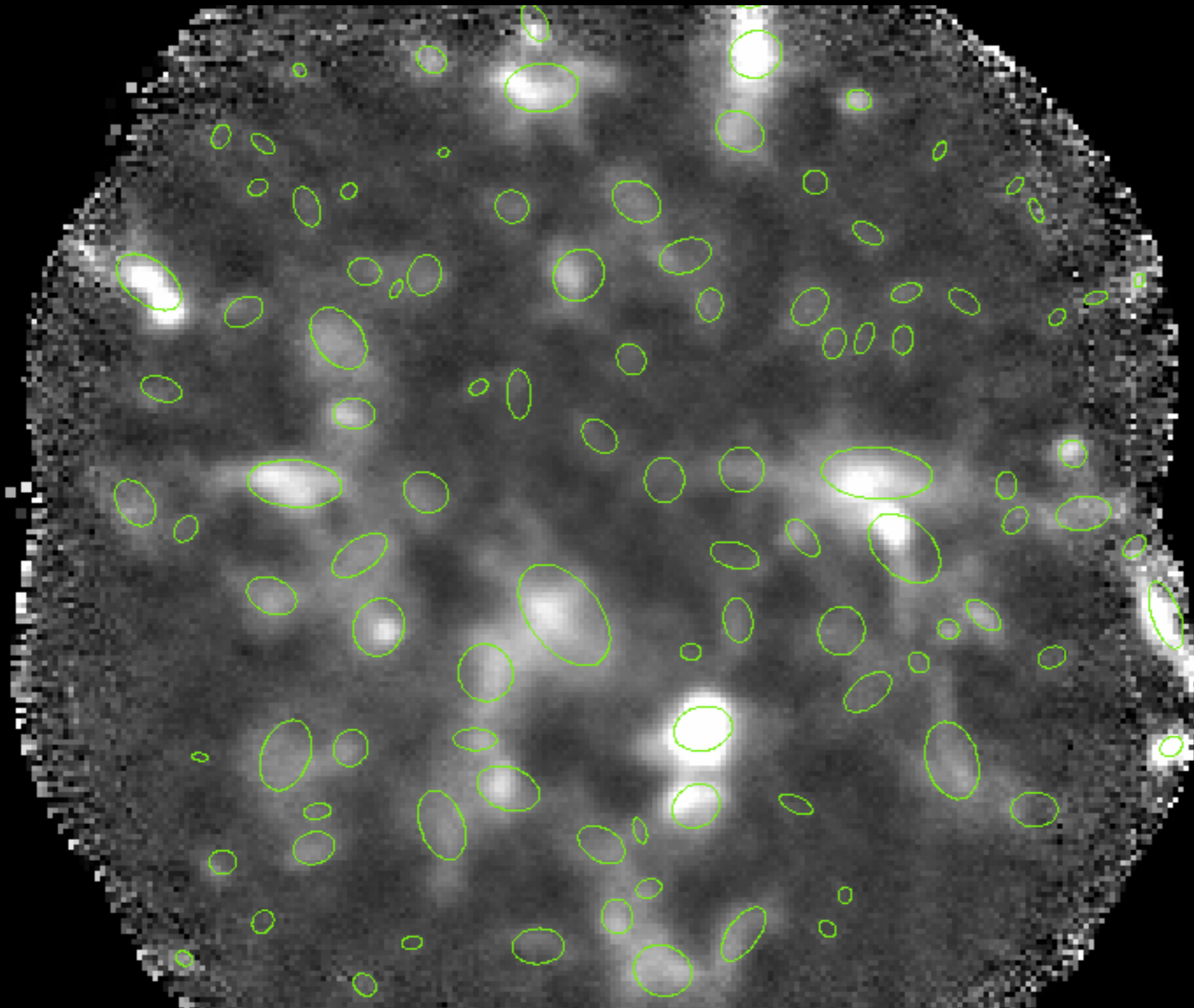
## Temperatures of PGCCs





(Eden+, in prep)

# Compact Source Extraction



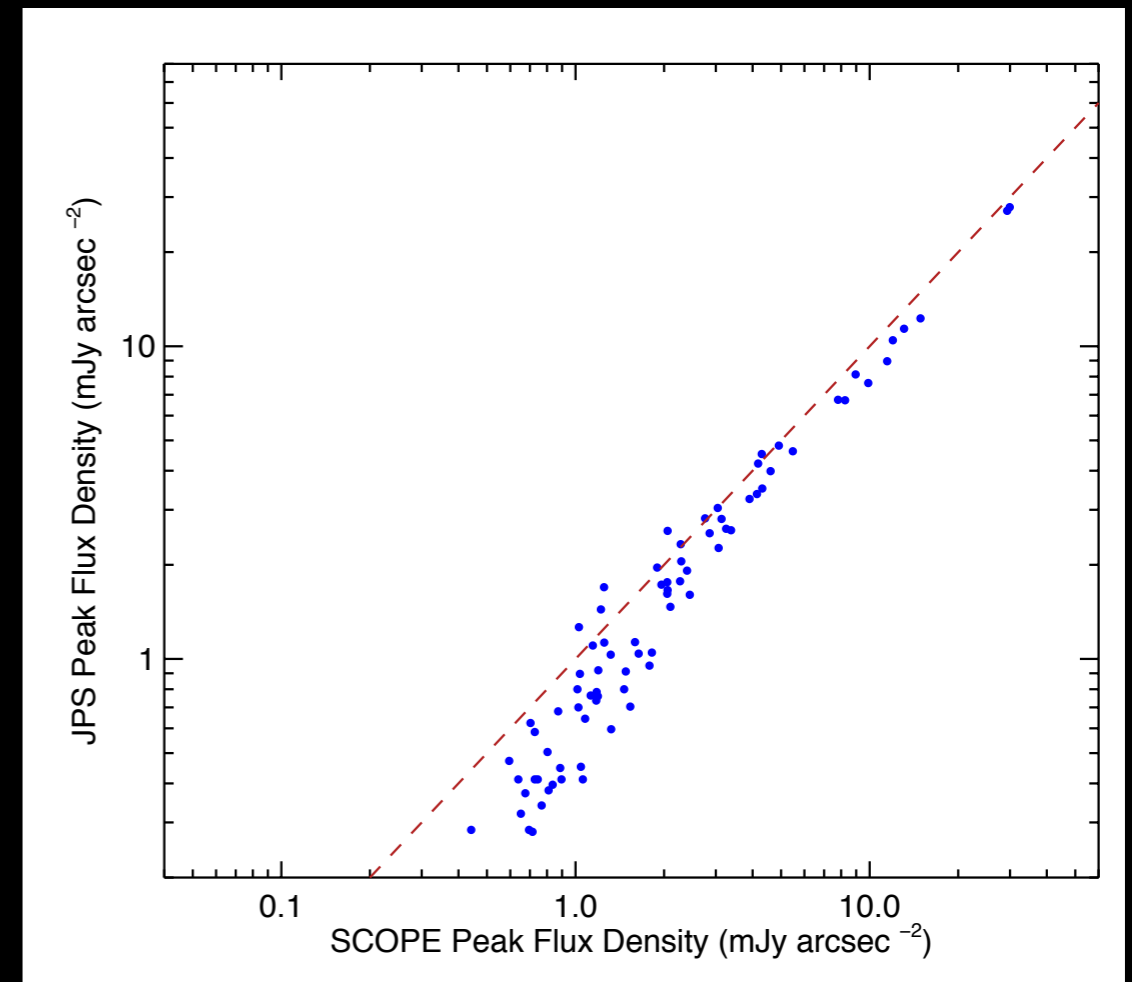
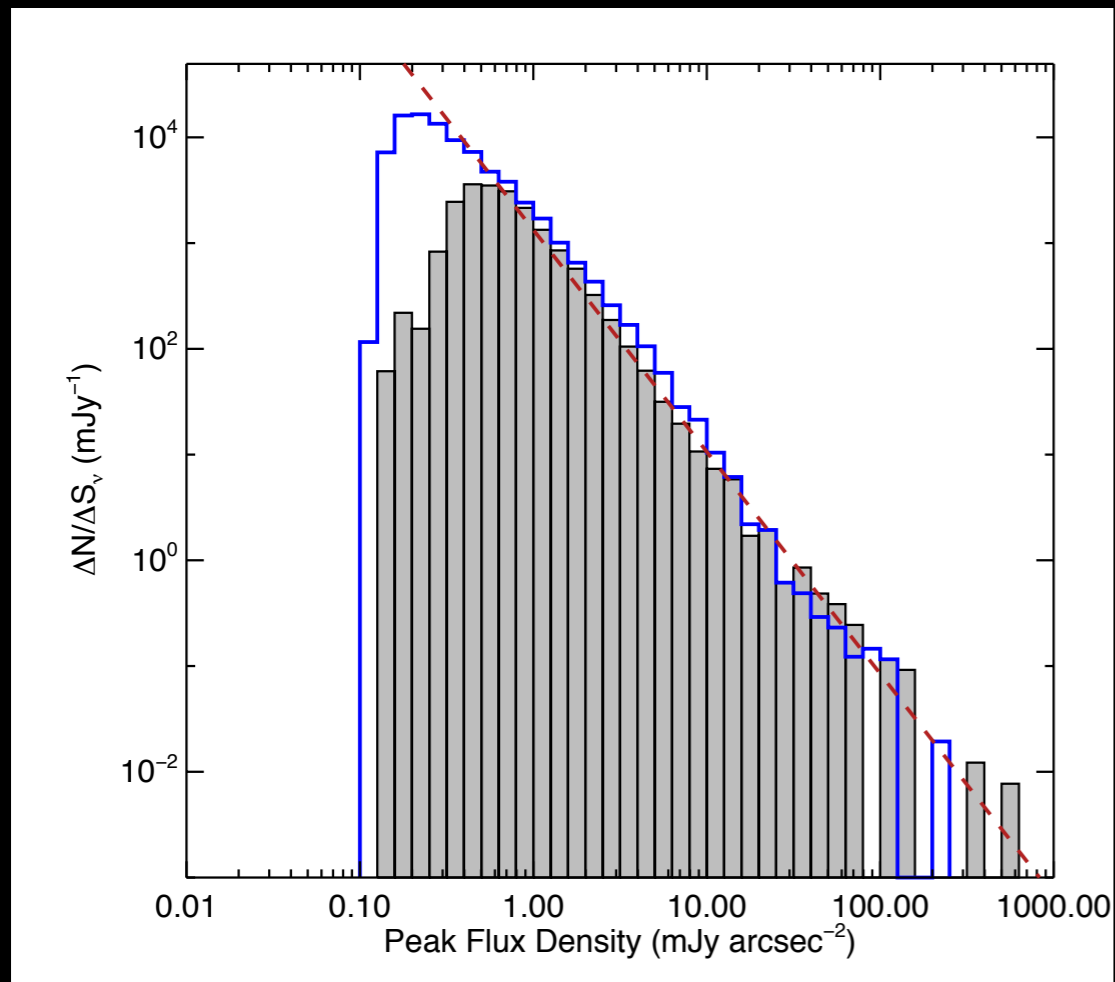
FellWalker

(Berry, 2015)

3528 sources  
towards  
448 PGCCs

# Recovered Fluxes

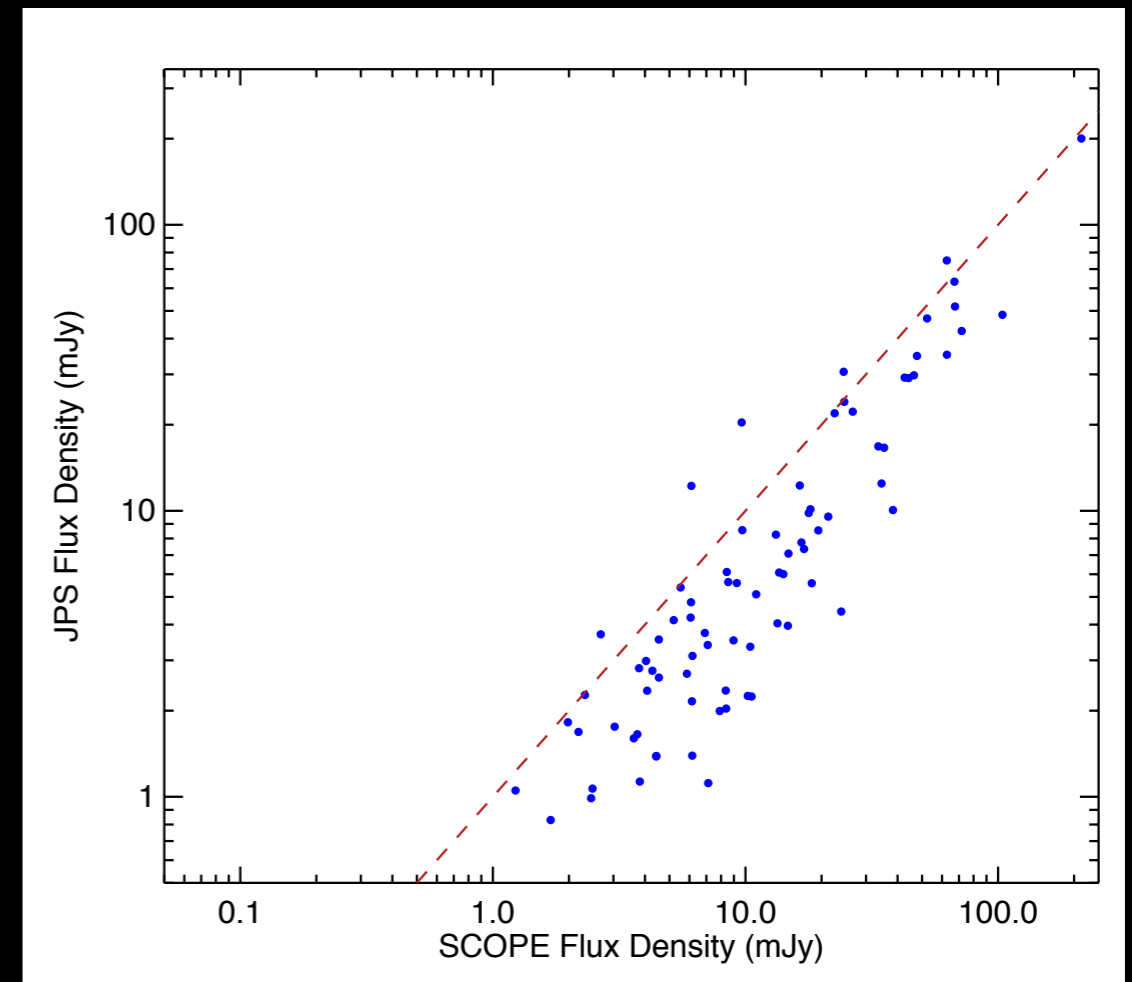
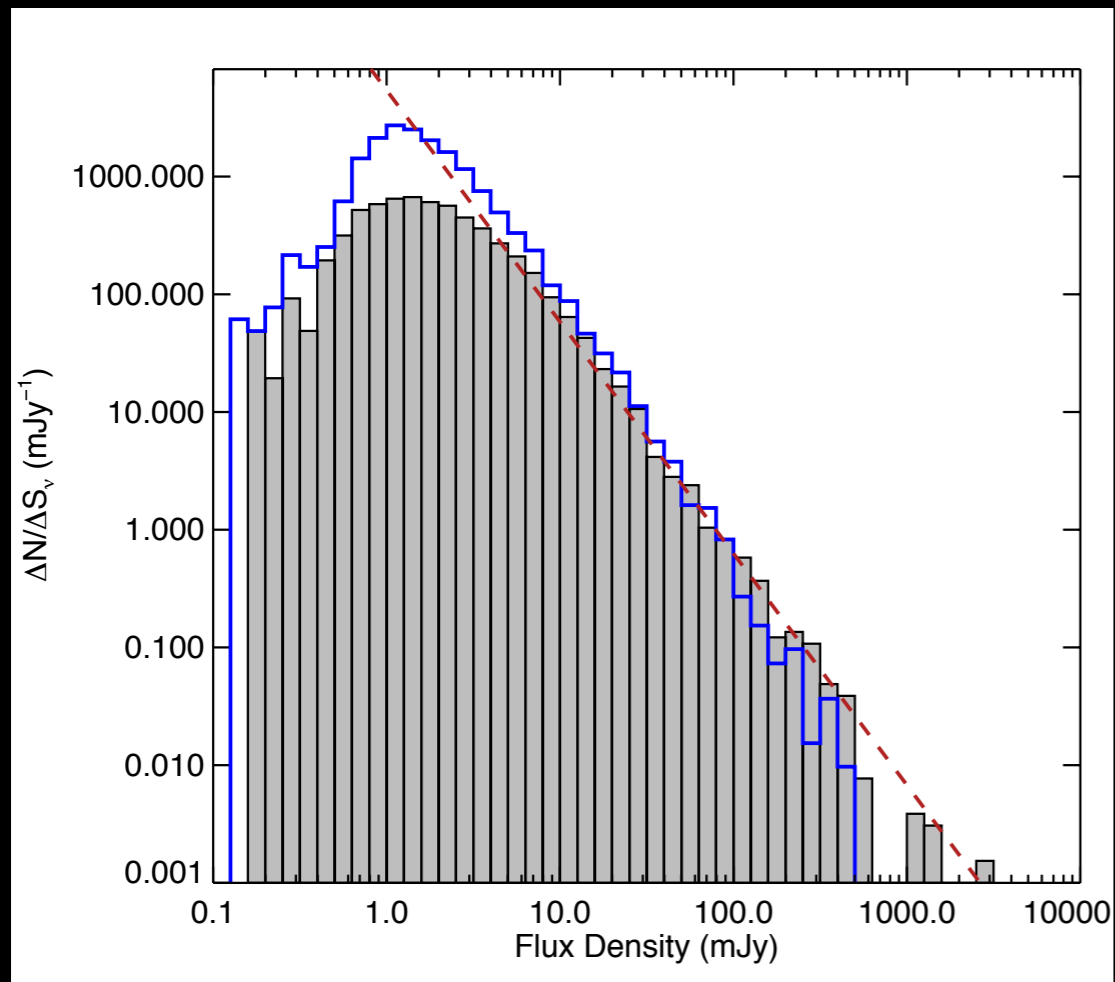
## Peak Fluxes



JPS Fluxes: Eden+ 17

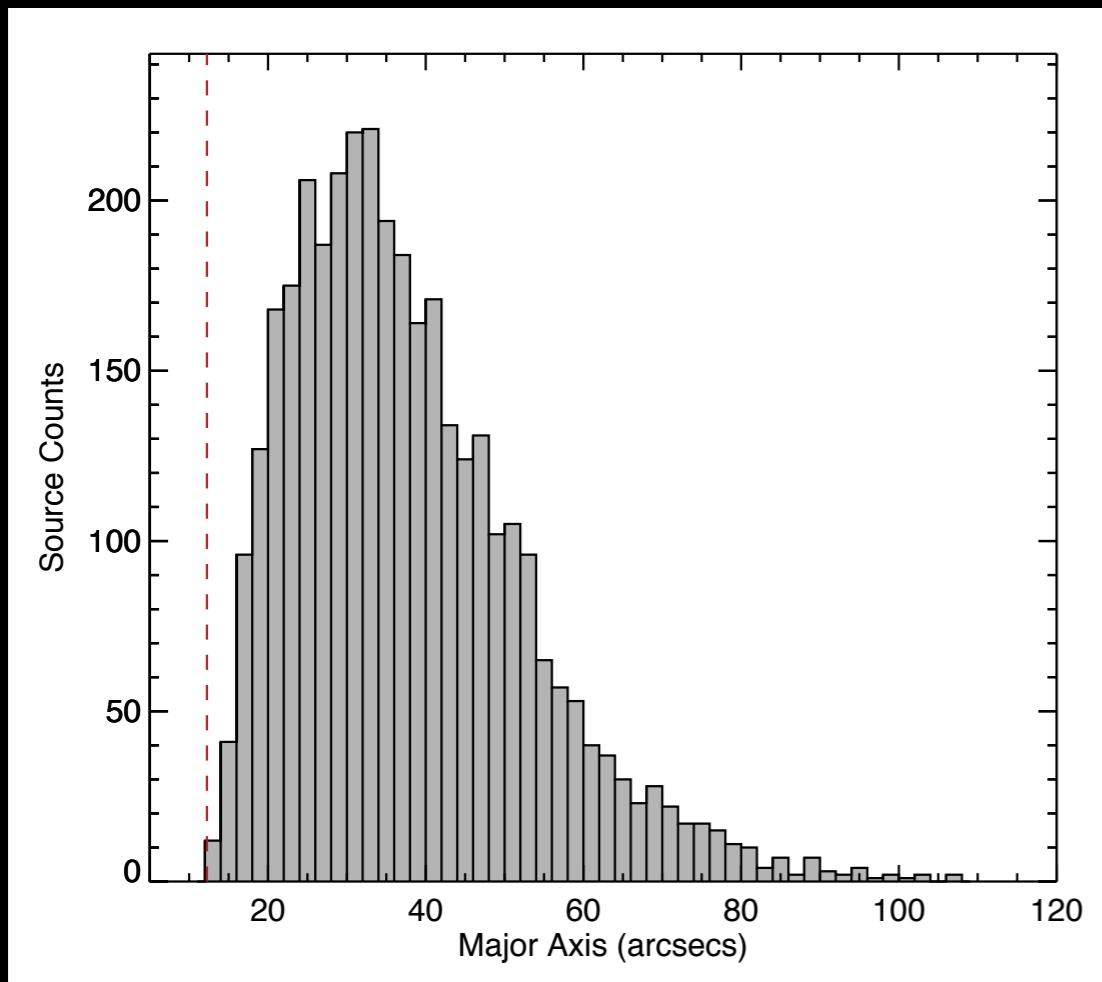
# Recovered Fluxes

## Integrated Fluxes

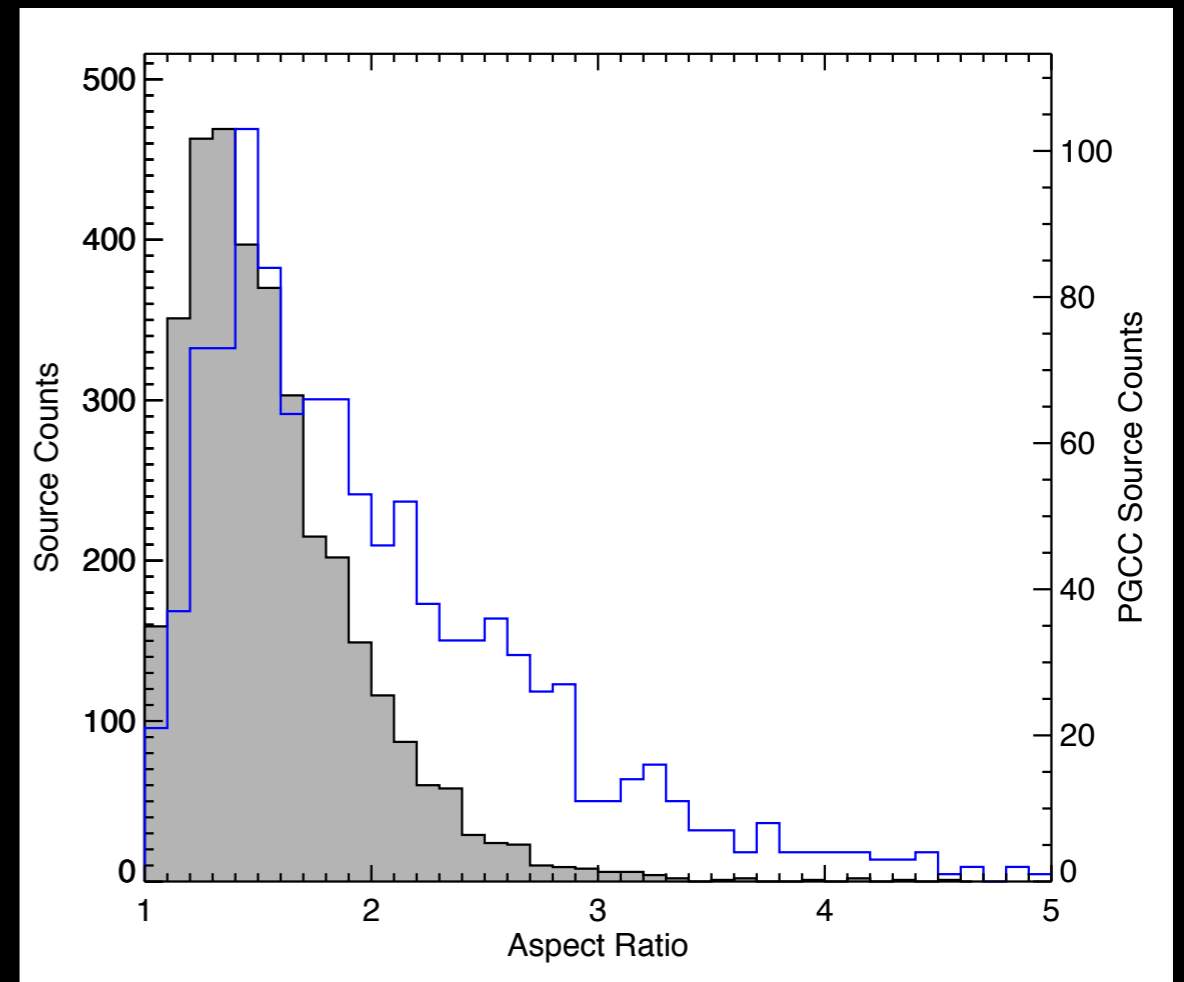


JPS Fluxes: Eden+ 17

# Source Sizes

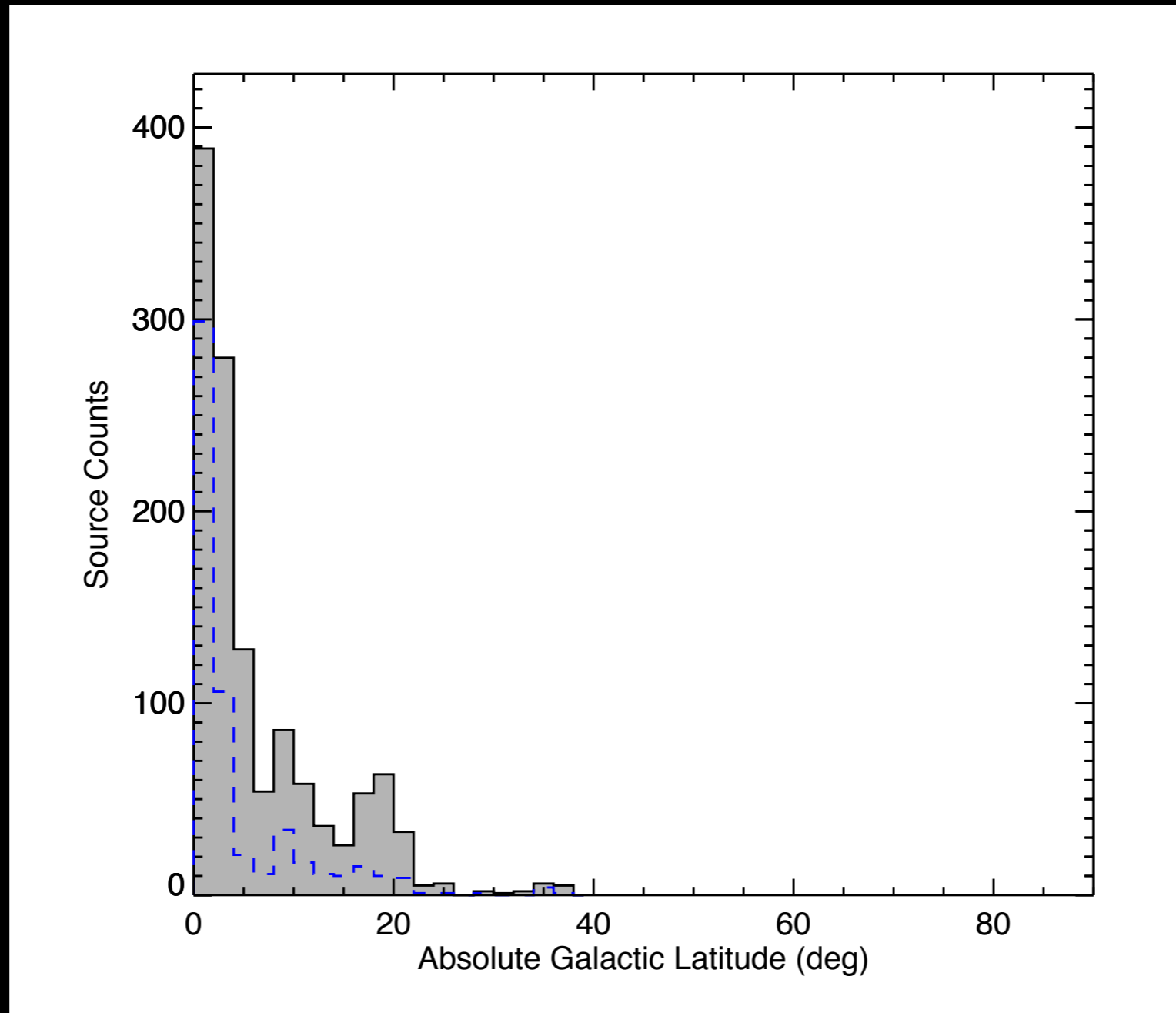


Diameter



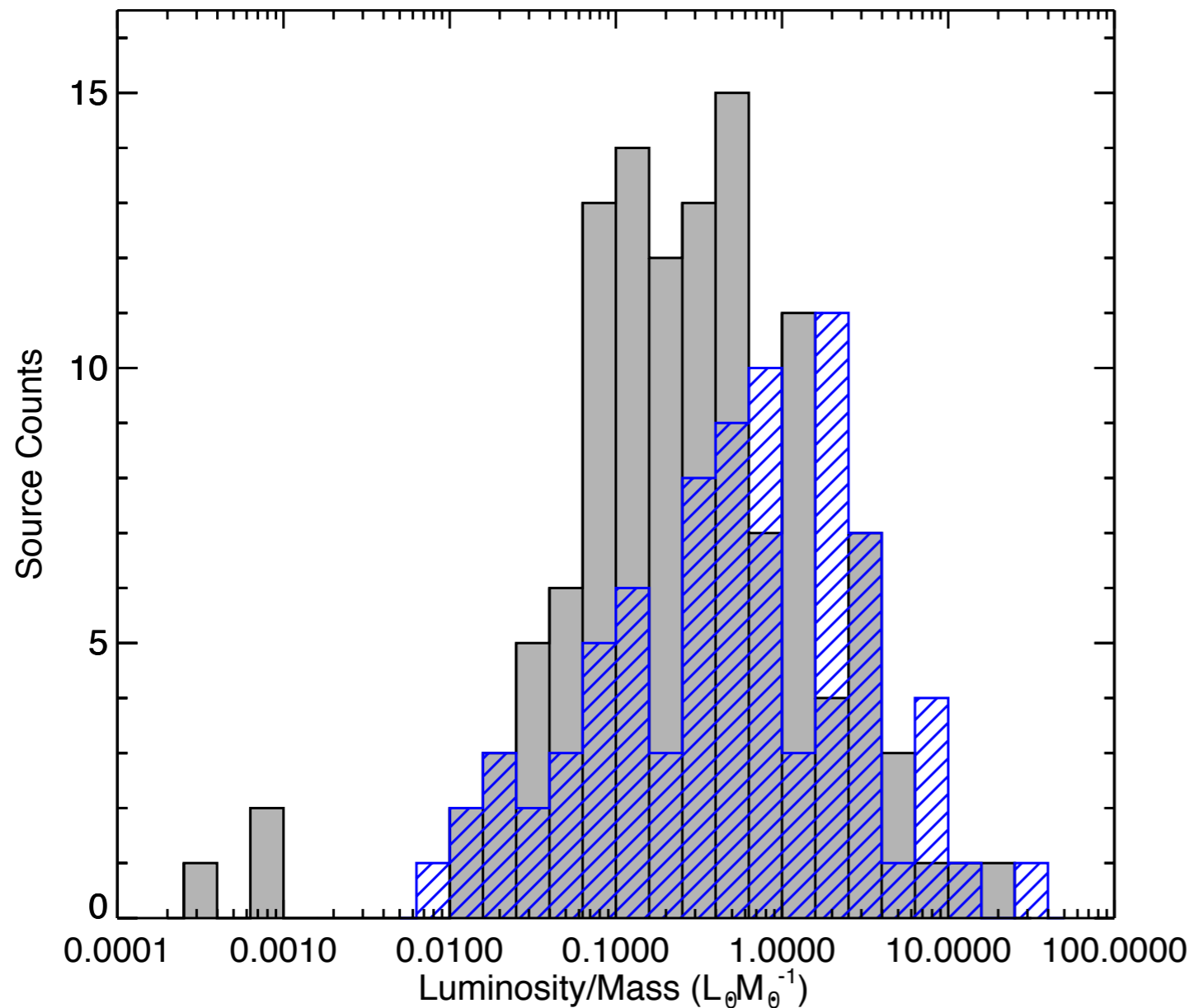
Aspect Ratio

# Detection Rates





# Star formation in SCOPE sources



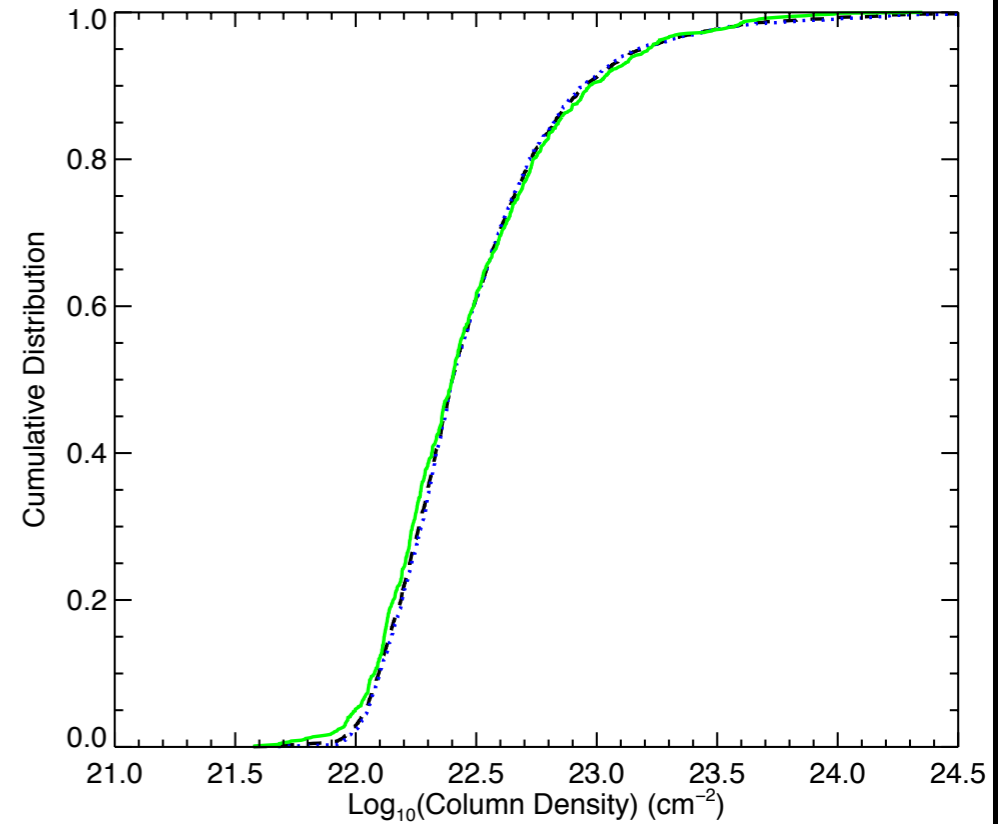
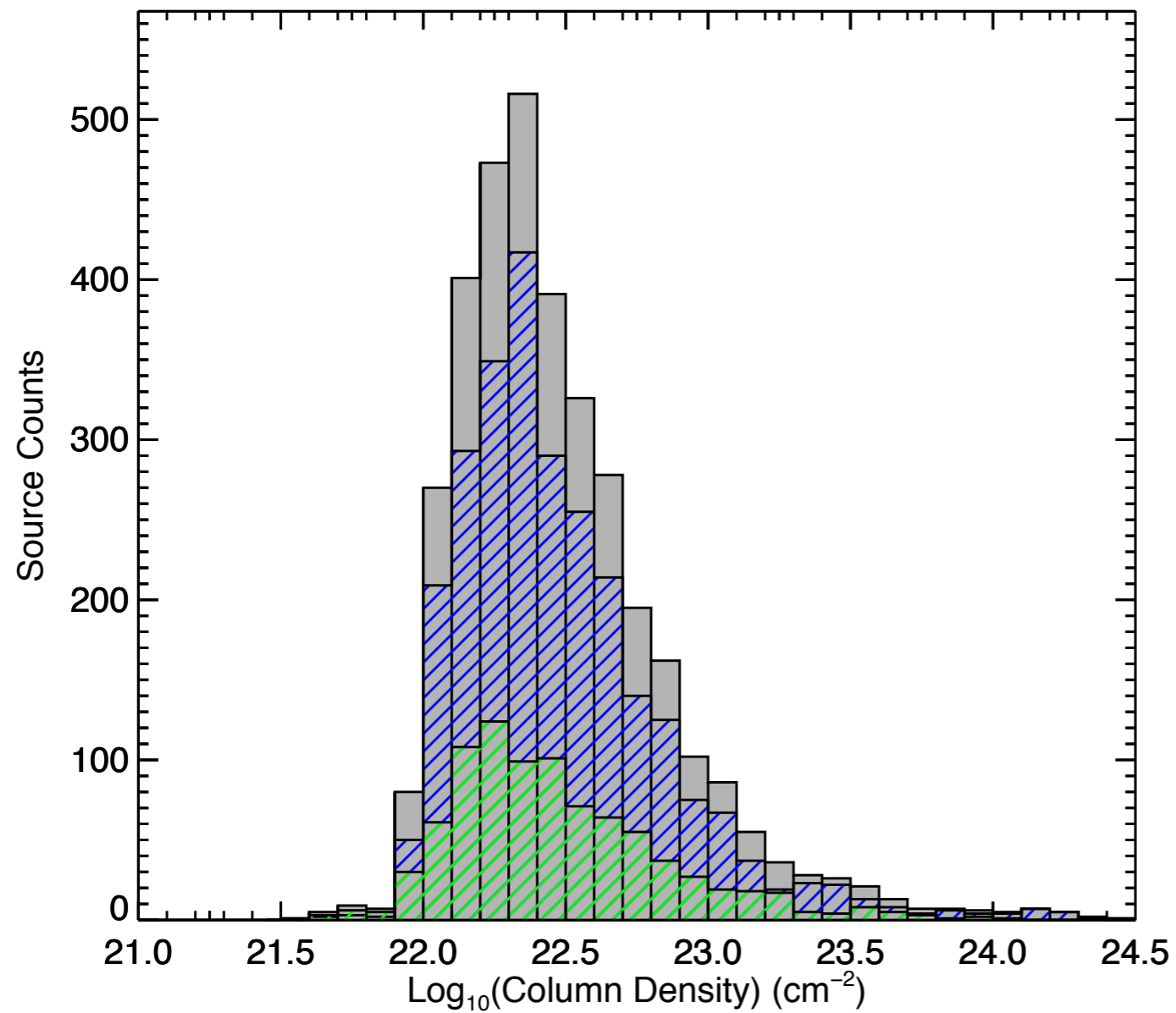
YSOs from Marton+(16)  
catalogue

Mean:  $1.03 \pm 0.23$ ; Median: 0.28

Mean:  $1.80 \pm 0.43$ ; Median: 0.62

Consistent with  
ATLASGAL sample  
in Plane

# Column Densities



Drawn from the same population. However, total SF population different from whole sample

# Catalogue Papers

1. SCOPE Catalogue and survey description (Eden+)
2. Galactic Plane PGCCs (Eden+)
3. PGCCs in Herschel GCC survey (Samal+)
4. High-latitude PGCCs (Liu+)
5. TOP700 - column density limited sample (Wang+)
6. TOP200 - Planck brightest 200 sources (Bognor+)
  - see Rebeke's talk at 16:30
7. Filamentary catalogue (Fich+)
8. Isolated cores (Li+)
9. All JCMT PGCCs (TBA)

# Conclusions

- SCOPE catalogue produced, containing ~3500 sources
- Good flux matching with other JCMT surveys
- No peak in aspect ratio distribution, confirming the substructure within PGCCs
- Star formation not in a different evolutionary state out of the Plane compared to SF in the Plane
- Column density distribution of star-forming sources different to the rest of the sample
- Series of catalogue paper results and studies to follow