# A Detailed Investigation of the HII Region RCW175: from radio to mid-IR wavelengths


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In collaboration with:
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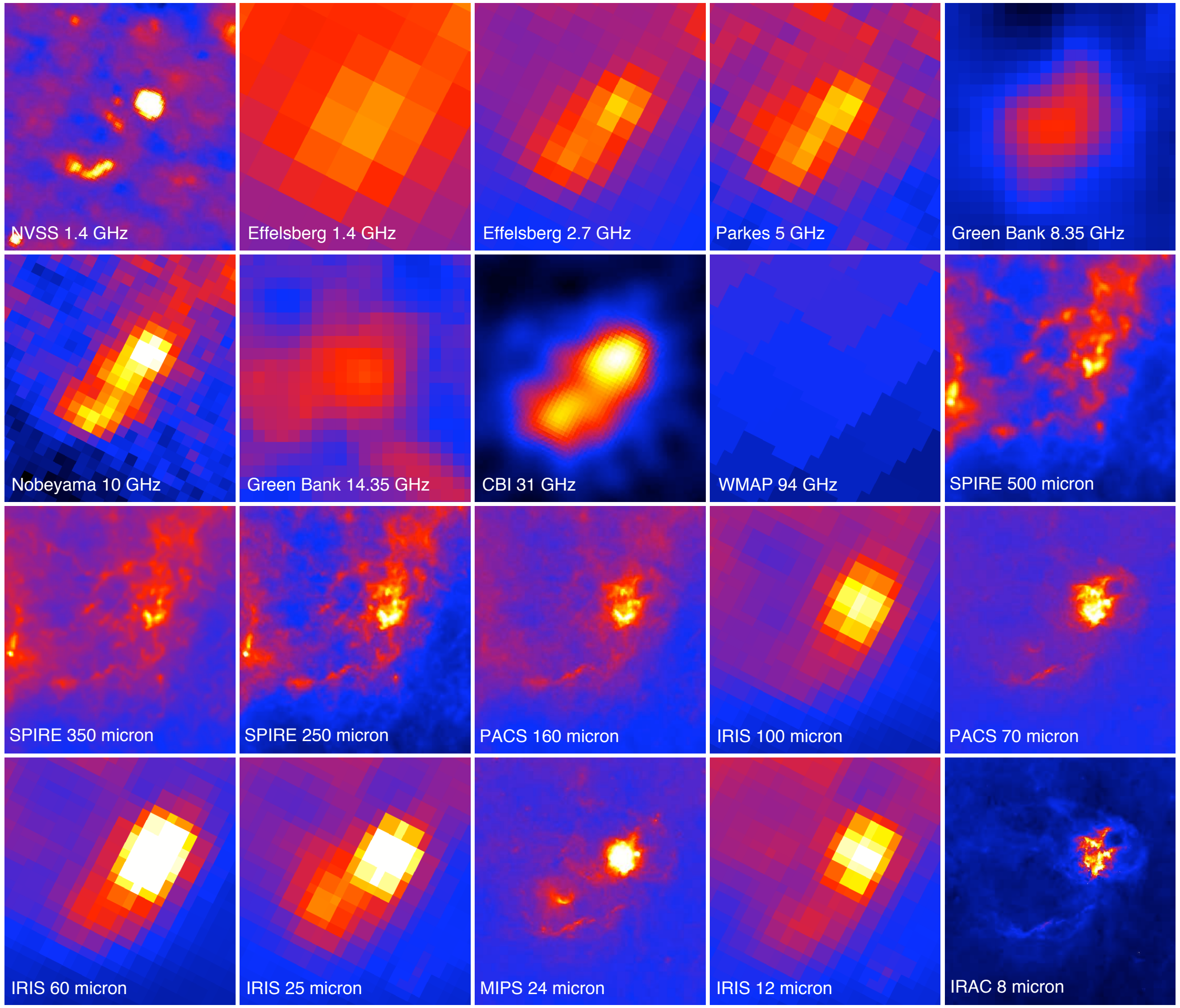
Tibbs et al. (submitted to ApJ)

# RCW175 Observations



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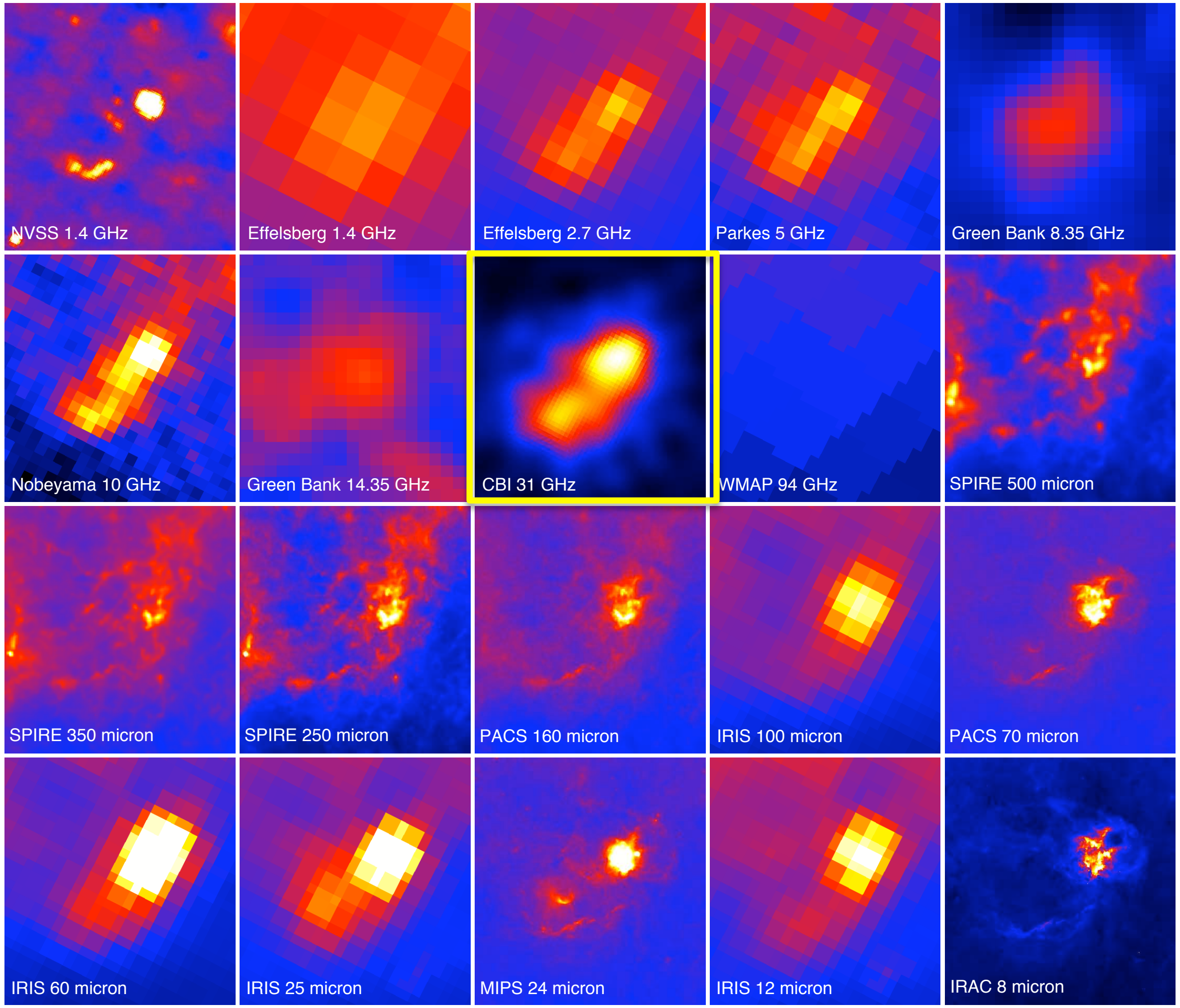
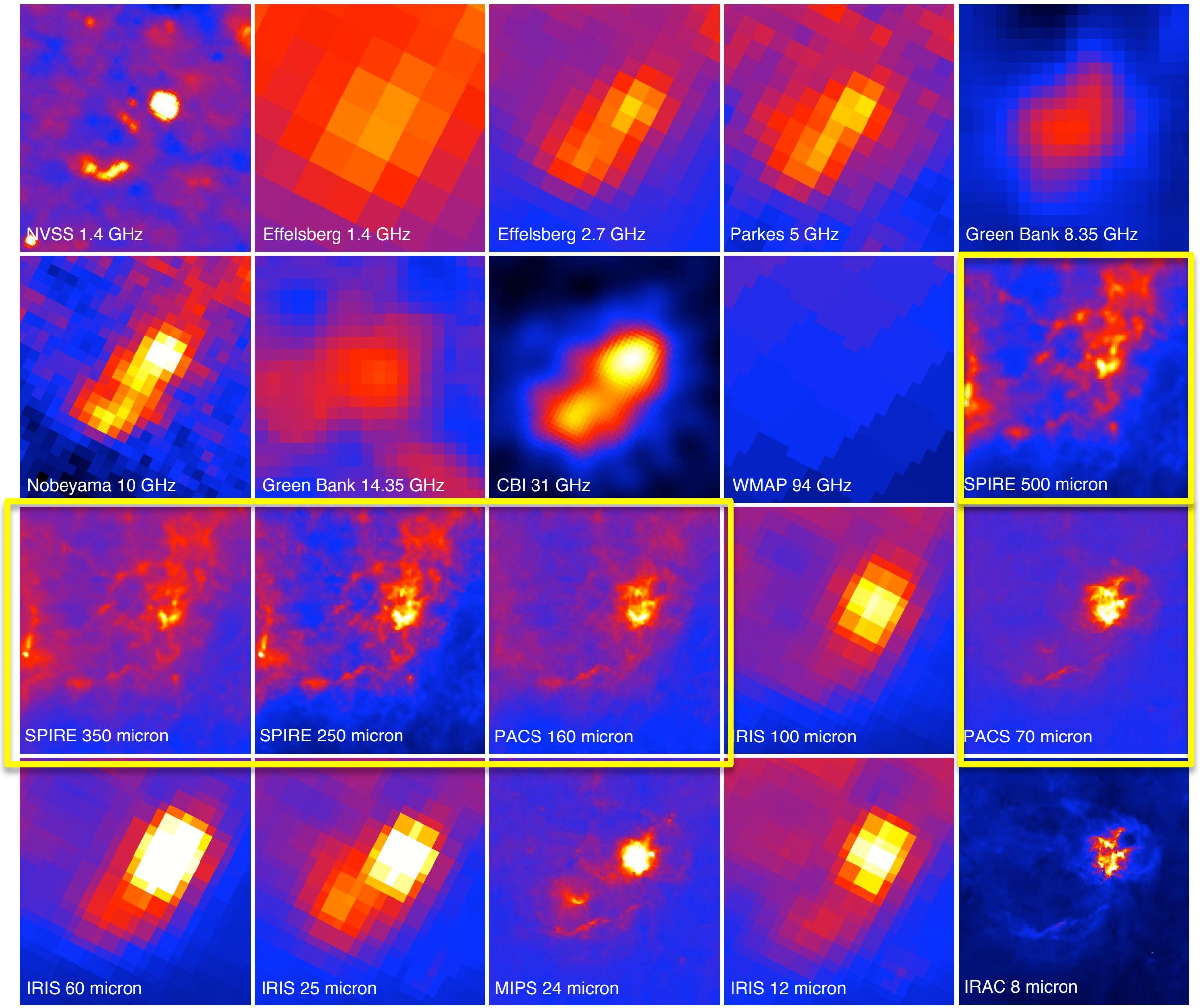



Cosmic Background Imager (CBI) data at 31GHz
(Dickinson et al. 2009)

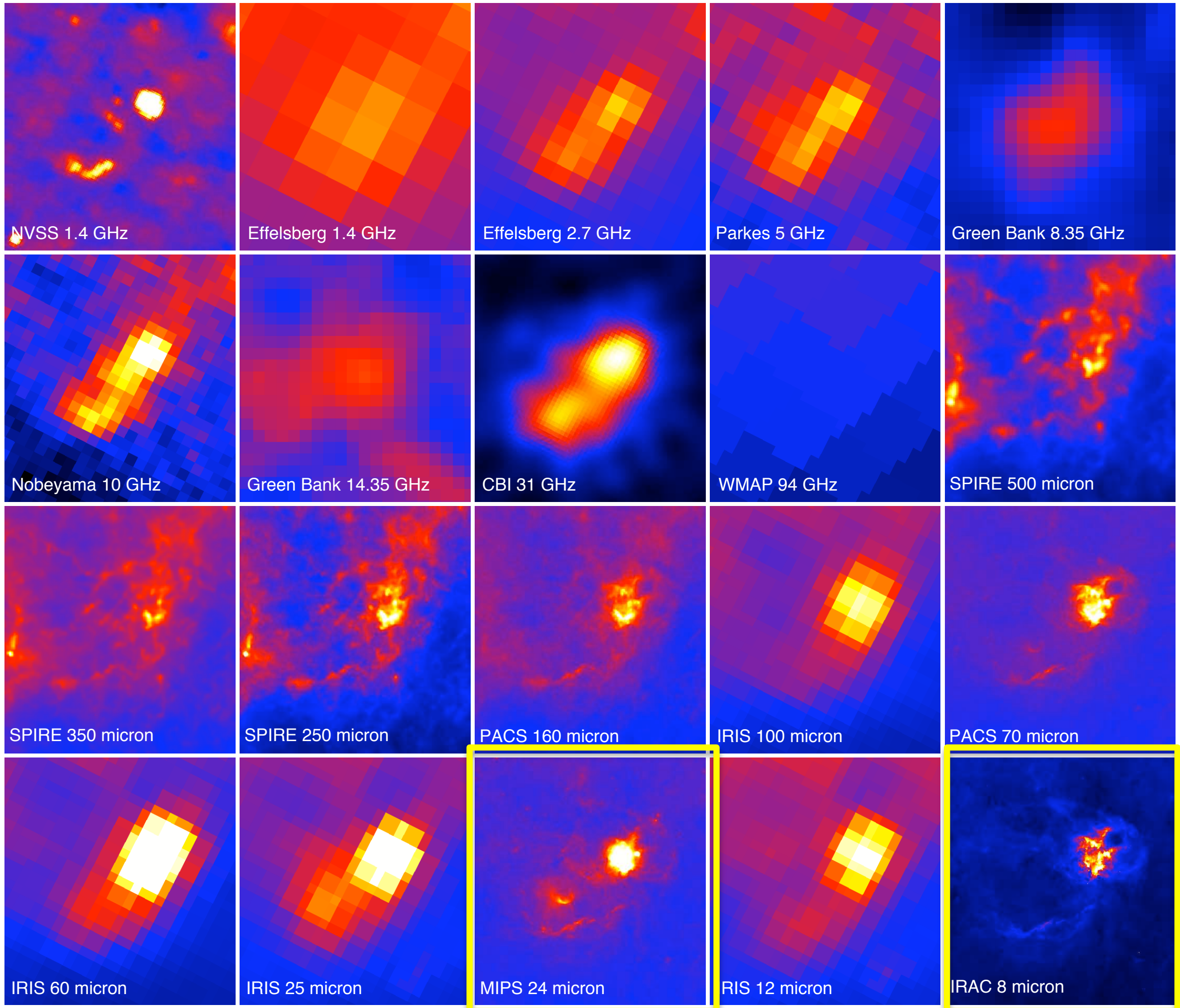
C. Tibbs NAM 2012, Manchester

# RCW175 Observations



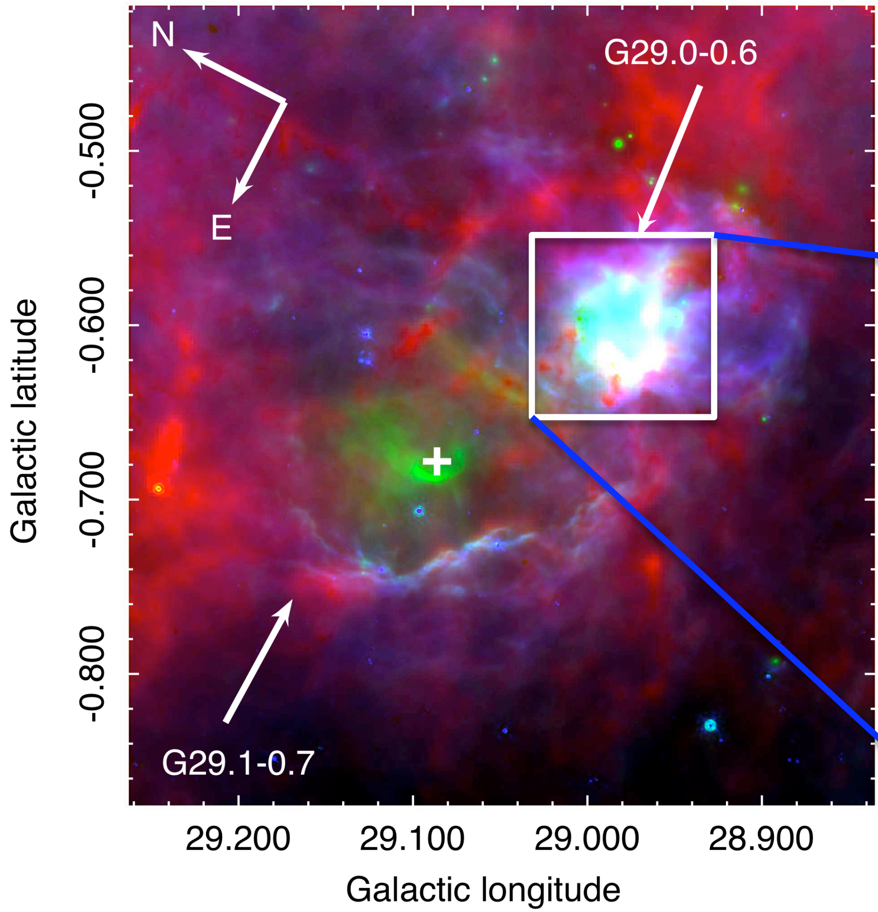

Herschel HiGal 70, 160, 250, 350 and 500μm data
(Molinari et al. 2010)

# RCW175 Observations



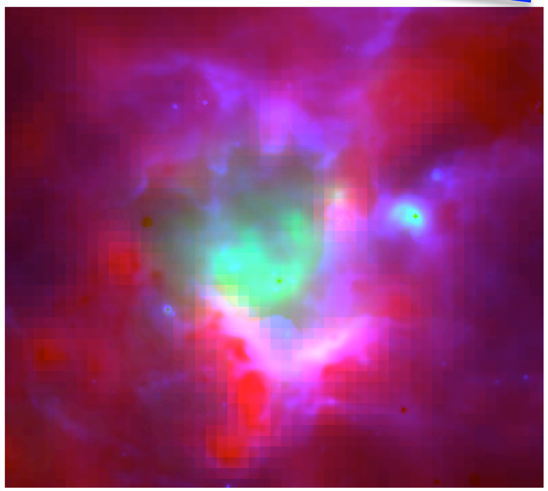

Spitzer MIPSGAL 24μm data (Carey et al. 2009) and GLIMPSE 8μm data (Churchwell et al. 2009)

# Morphology of RCW175



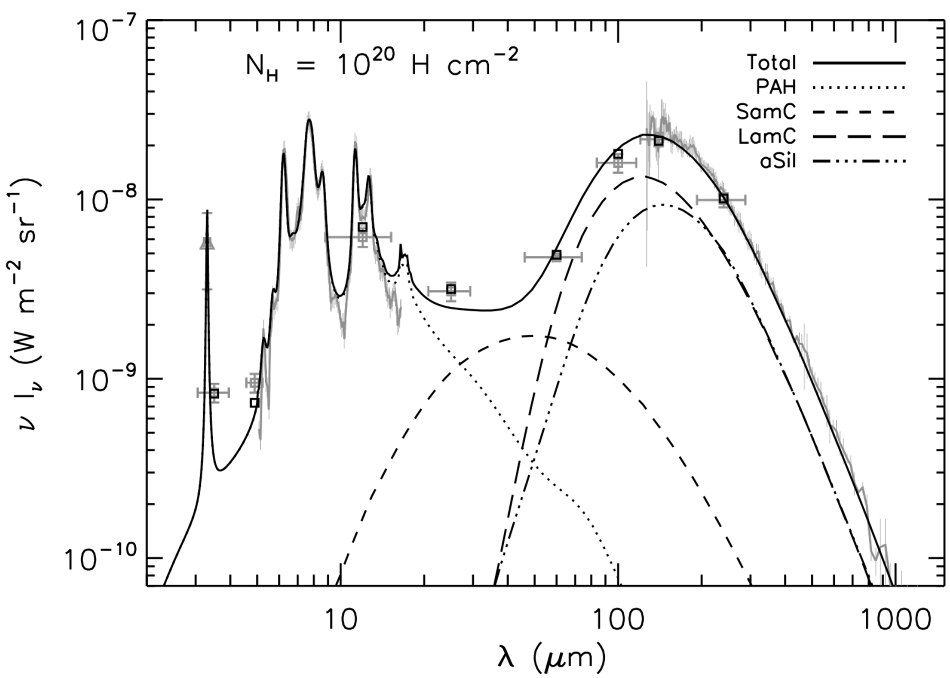

Blue = 8μm, green = 24μm, red = 350μm

- Galactic HII region originally identified by Sharpless (1959)
- Consists of 2 separate components, G29.1-0.7 and G29.0-0.6



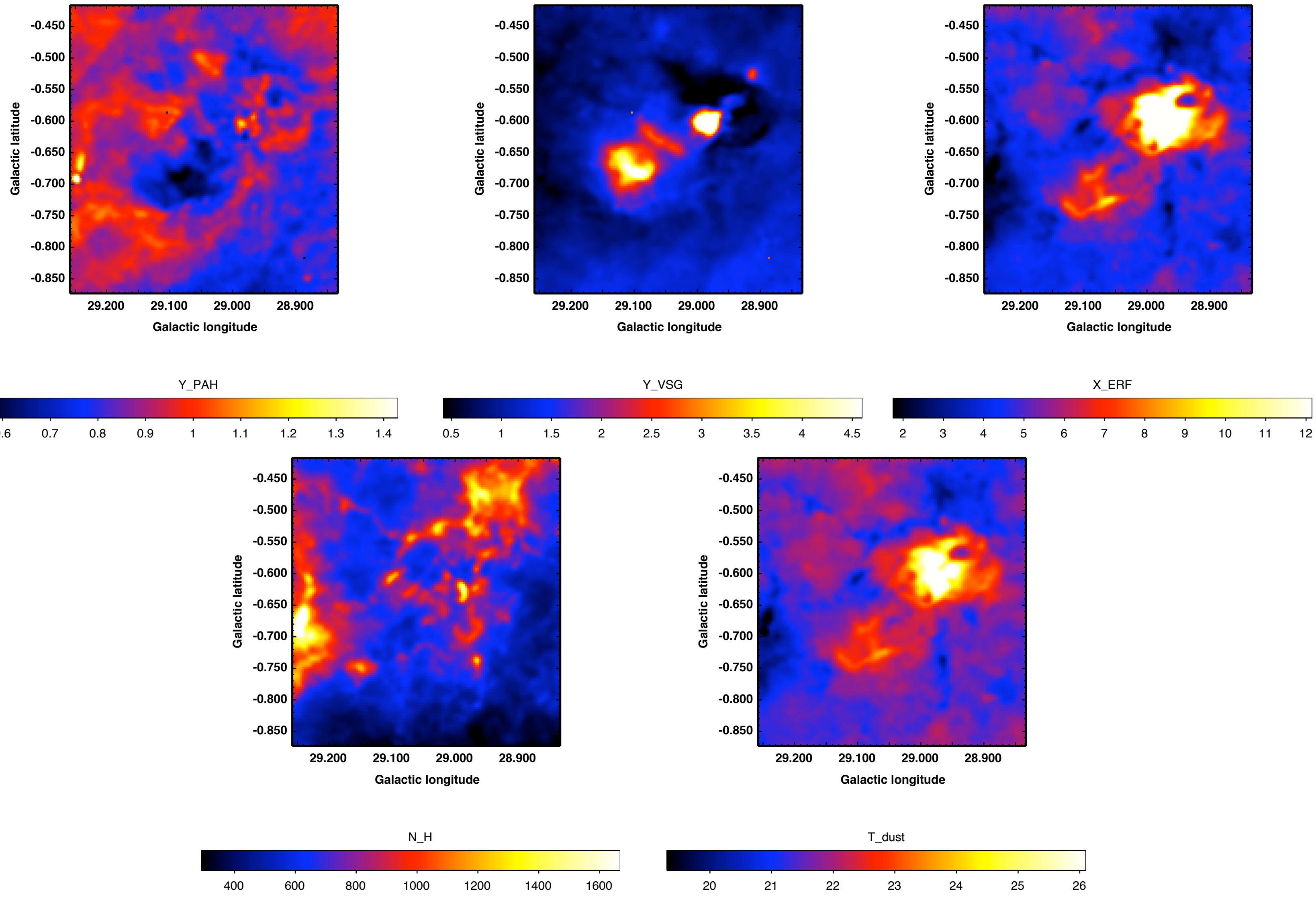
# Dust Modelling

- DUSTEM (Compiègne et al. 2011) is a dust emission model based on the formalism of the Desert et al. (1990) model.
- Previously been used to characterise the dust properties:
  - in the regions of diffuse emission on the Galactic plane (Compiègne et al. 2011)
  - in the Eagle Nebula (Flagey et al. 2011)
  - in the Perseus molecular cloud (Tibbs et al. 2011; see poster 154)

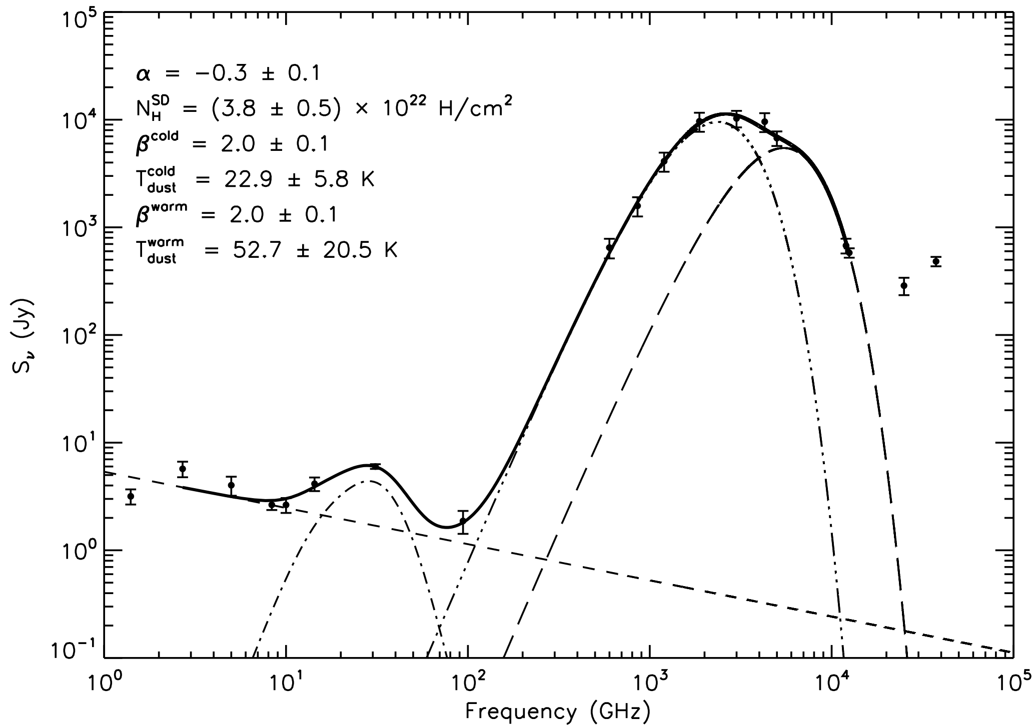



Compiègne et al. (2011)

# Dust Modelling



# SED



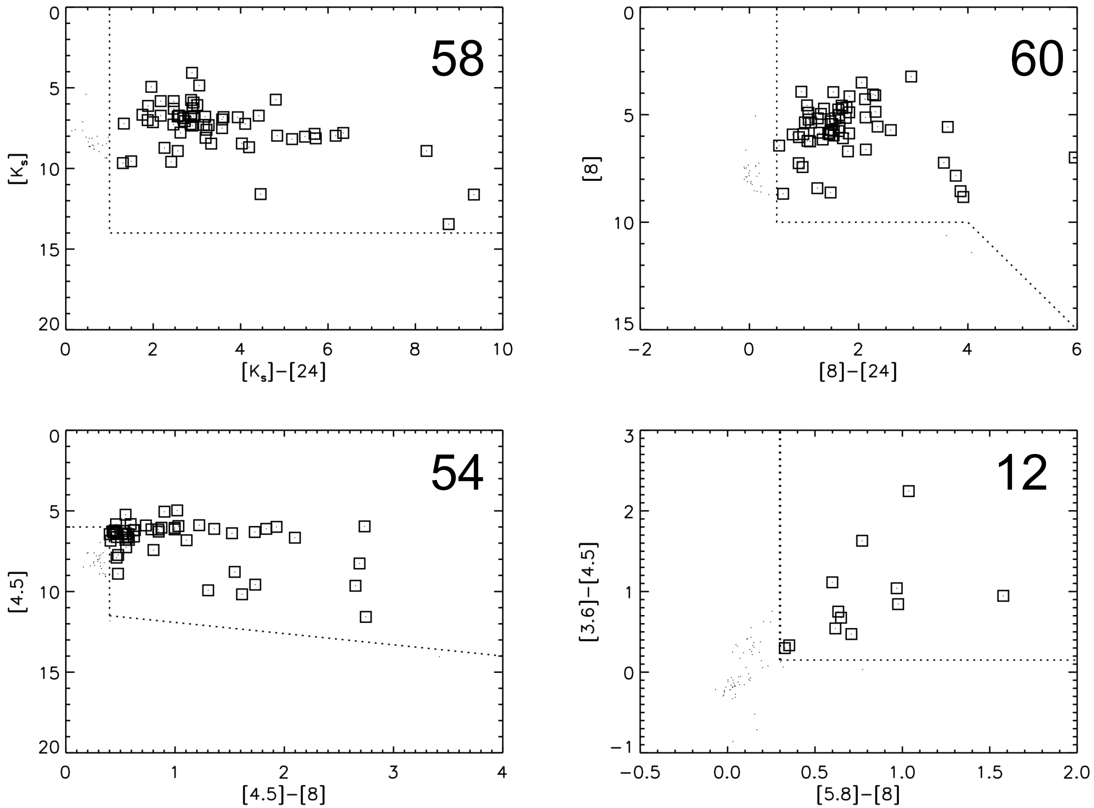

$S_{31GHz}/S_{100\mu m} = 5.8 \pm 1.1 \times 10^{-4}$

~70% of the 31GHz is anomalous

- Compute flux densities of RCW175 from the radio to the mid-IR using aperture photometry.
- This is an update of the SED produced by Dickinson et al. (2009) for this region.
- We simultaneously fit the data for:
  - free-free emission
  - spinning dust emission
  - thermal dust emission
- Possible synchrotron contribution from nearby SNRs.
- We model the thermal dust emission using 2 components to represent the cold and warm dust as we know the entire region is not at one temperature.
- We fit a generic WIM spinning dust model.

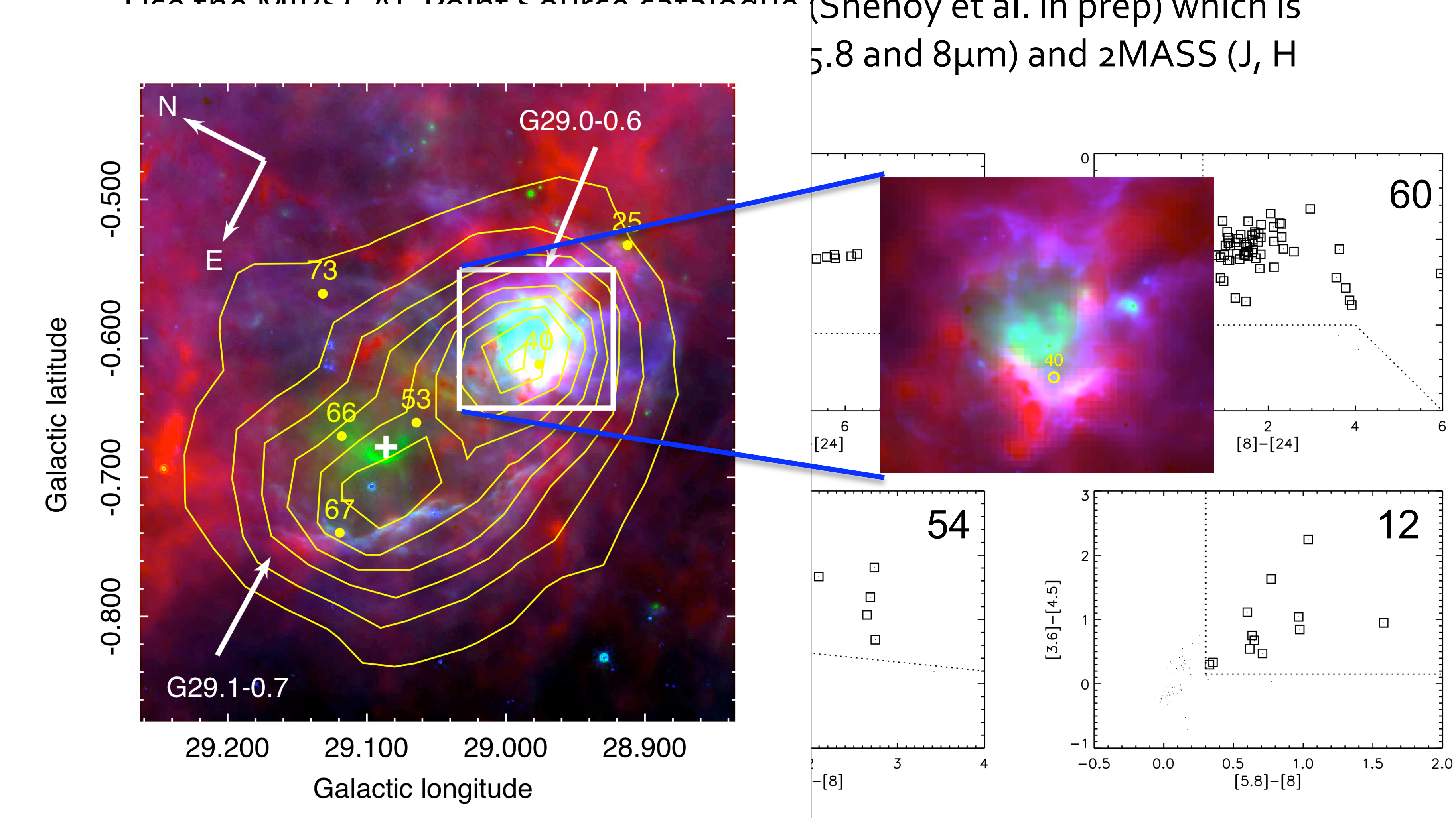
# YSO Candidates

- Use the MIPSGAL Point Source catalogue (Shenoy et al. in prep) which is band merged with the GLIMPSE (3.6, 4.5, 5.8 and 8μm) and 2MASS (J, H and K) source catalogues.
- We select only sources with > 95% reliability, and find 95 sources with vicinity of RCW175.
- To find YSOc we implement a colour-colour selection criteria adopted from Rebull et al. (2010).

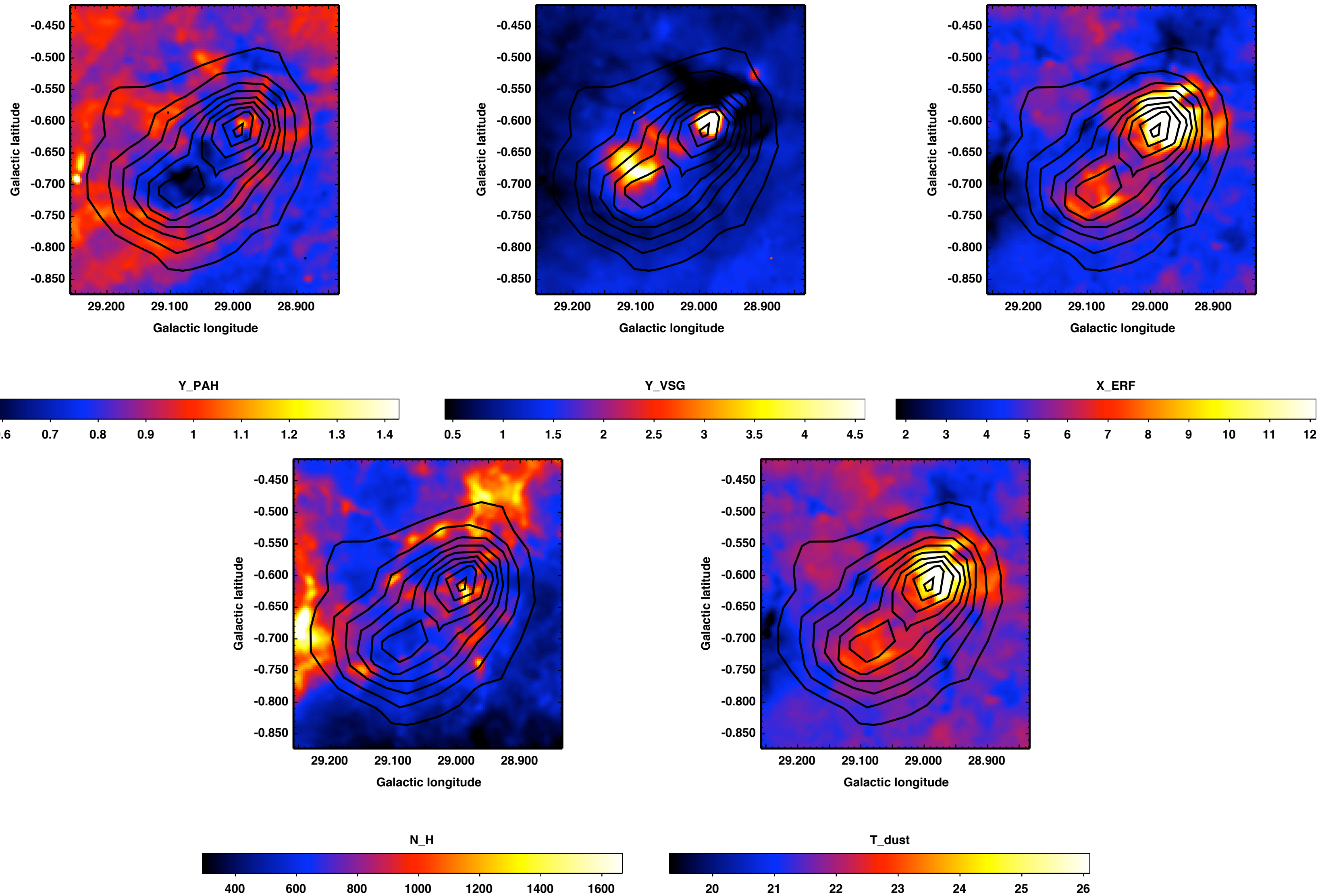


# YSO Candidates

(Shenoy et al. in prep) which is
5.8 and 8μm) and 2MASS (J, H



# Origin of the AME



# Conclusions

- The CBI 31 GHz emission is originating from 2 peaks of AME within RCW175.
  - One of the peaks is located towards G29.0-0.6 and the other is located towards G29.1-0.7.
- The AME is correlated with the exciting radiation field in both components.
  - This suggests that the AME is due to electric dipole emission arising from spinning dust grains spun-up by photon-grain interactions.
- The AME in G29.1-0.7 is not correlated with the PAHs in the PDR and we speculate that the major gas ions may be contributing to the observed spinning dust.