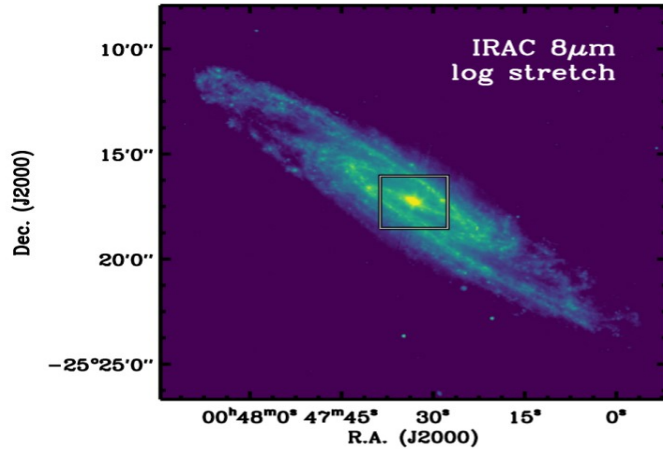


On the thermal structure of the proto-Super Star Cluster 13 in NGC 253

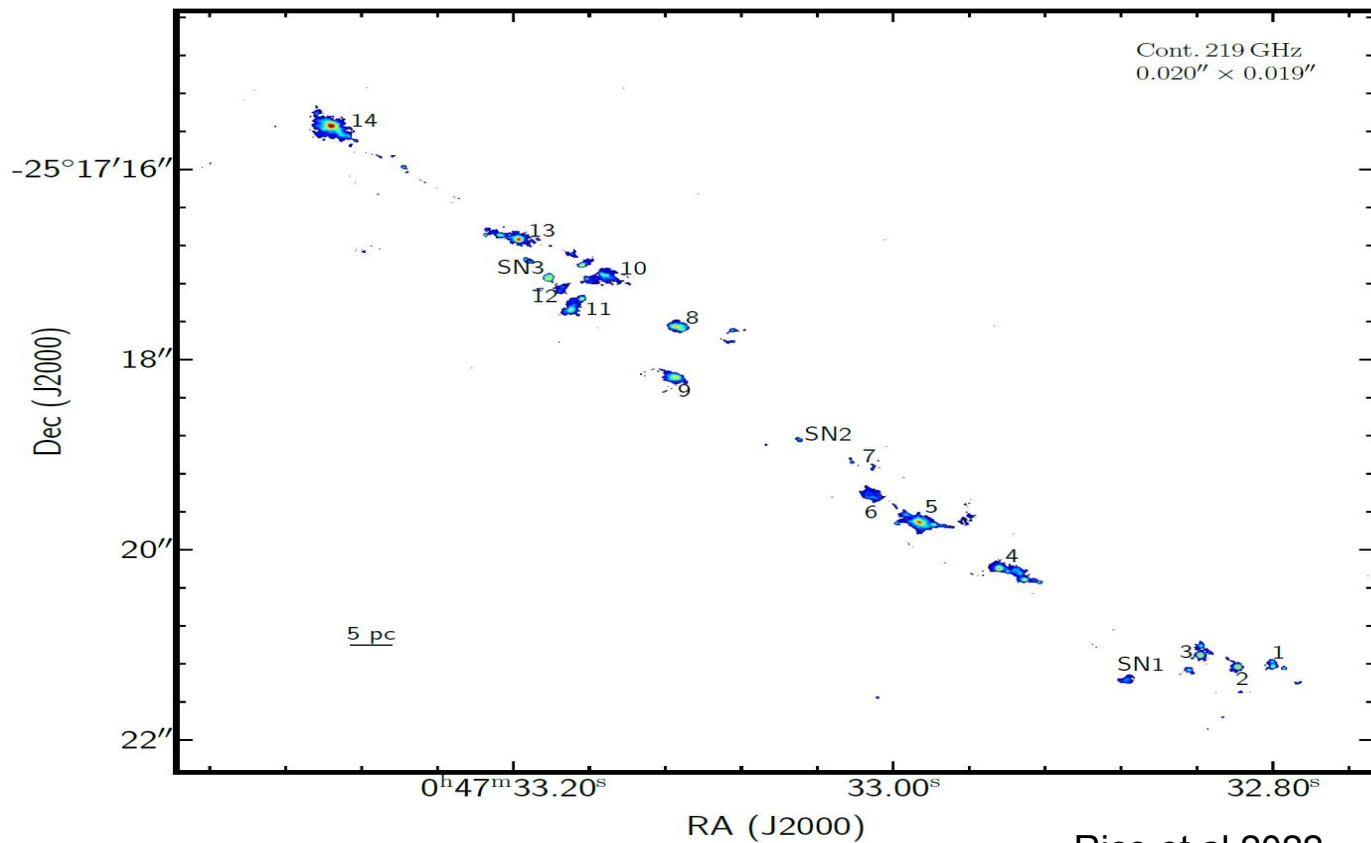
NGC 253 Overview



Leroy et al 2018

- Nearest example of nuclear starburst
 - 3.5 Mpc or 11Mly
- Central star formation rate 30 times greater than Milky Way
- Forming massive (super) star clusters (SSCs)
 - 10^5 Solar masses, 5pc radius, and less than 100 Myr in age

Main Starburst Region

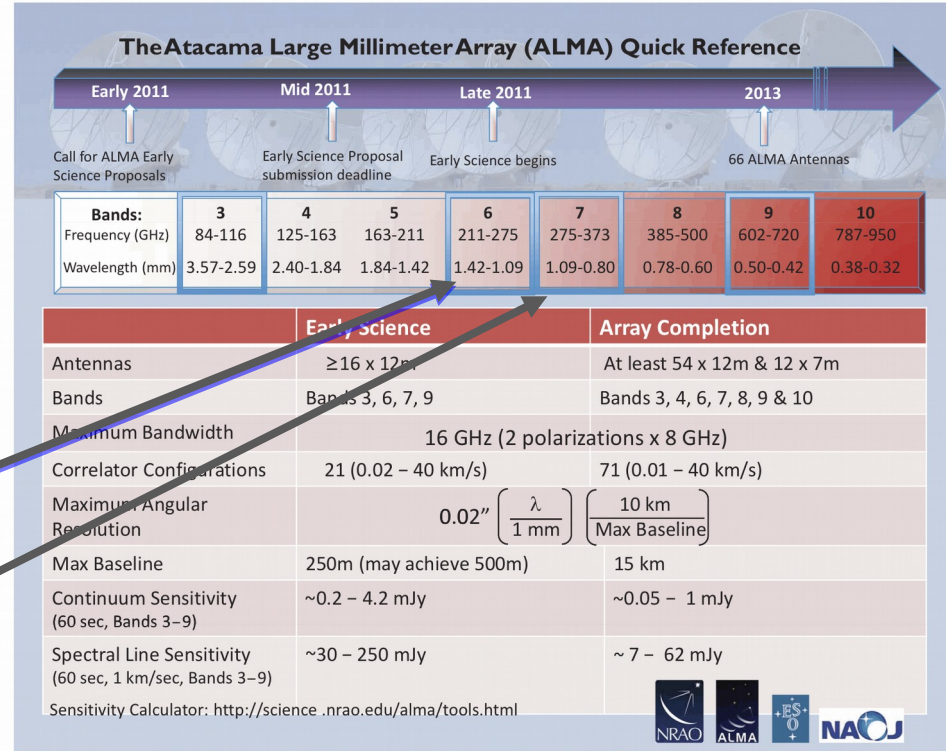


Data for Observations from Alma

- Atacama Large Millimeter Array
- Located in Chile
- Up to 62 Antenas
- Uses interferometry to improve angular resolution
- Focus on HC₃N emission

211-275 GHz

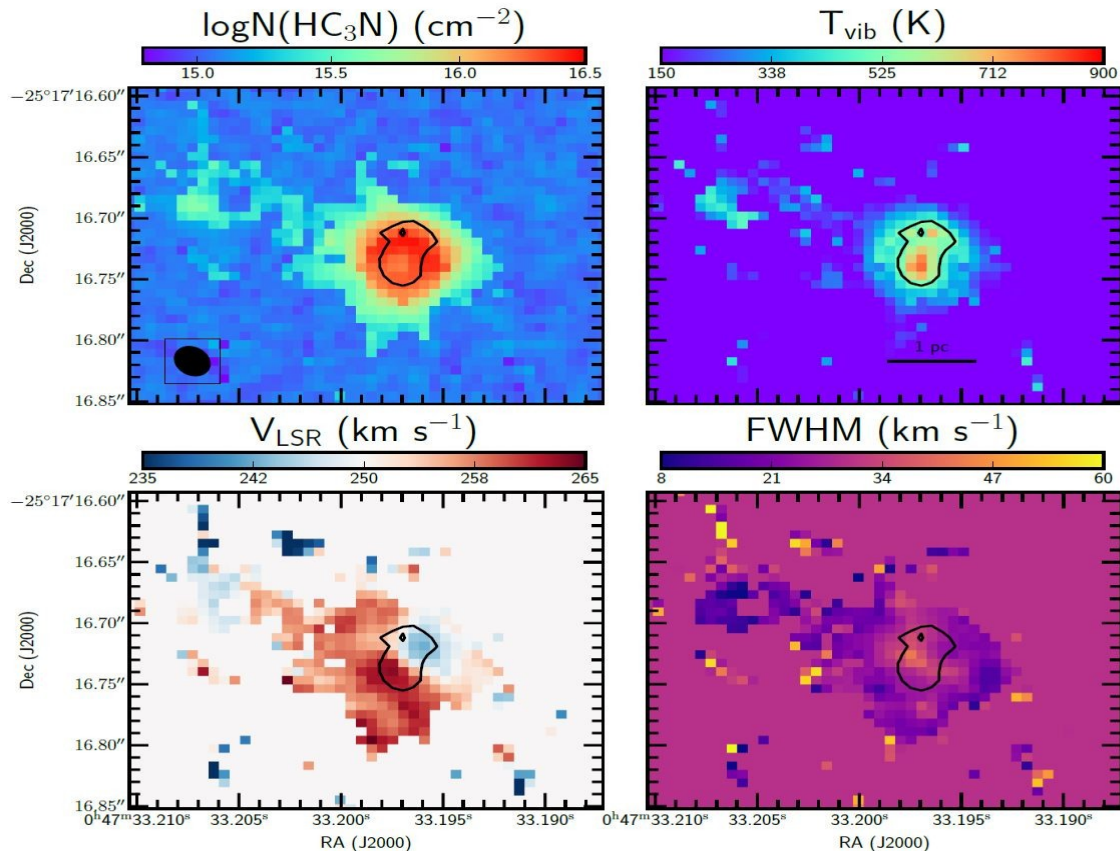
345 GHz



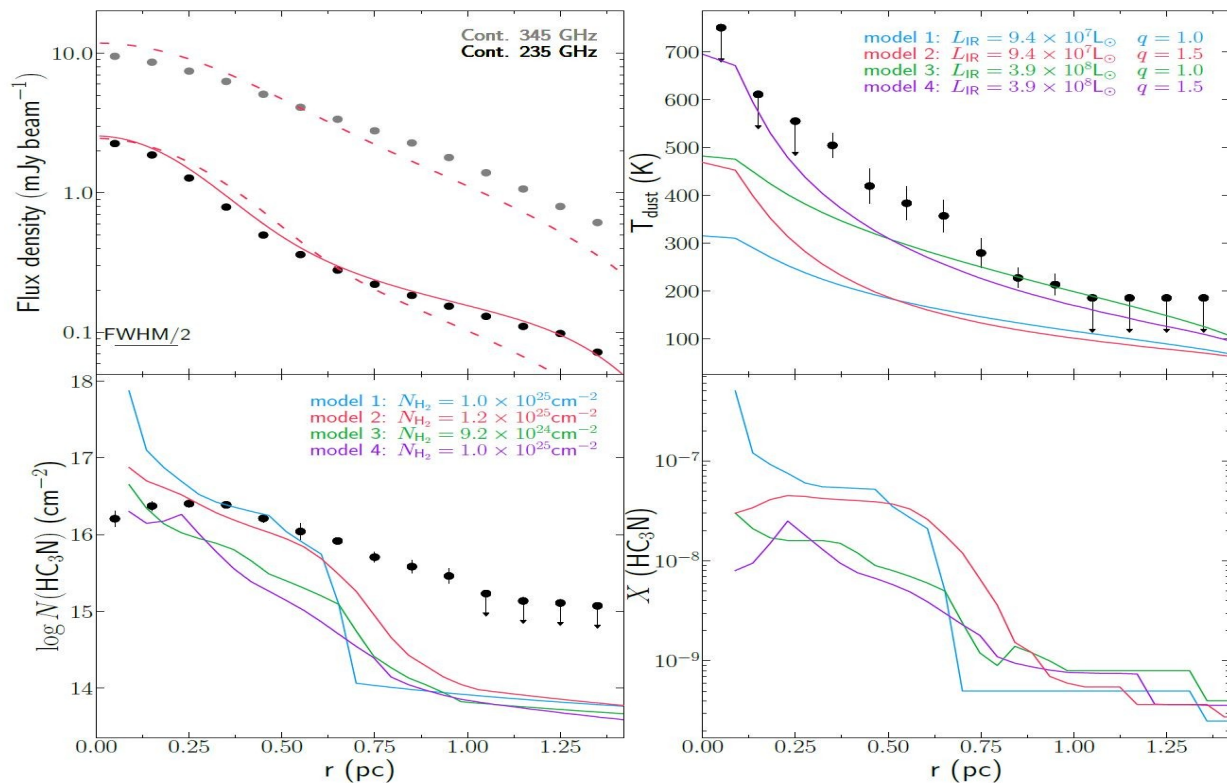
Analysis via SLIM

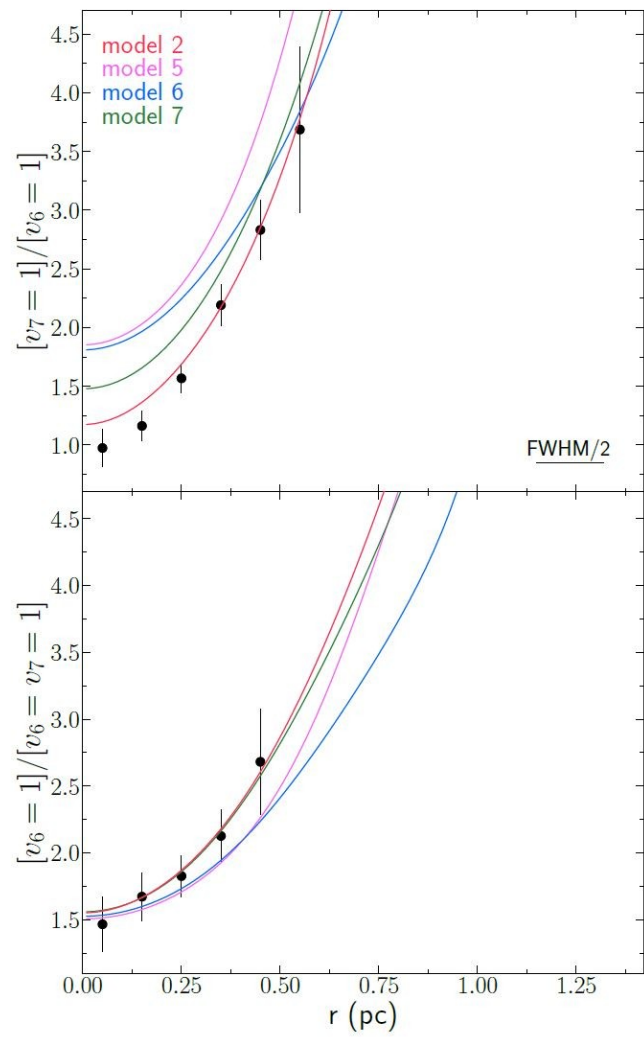
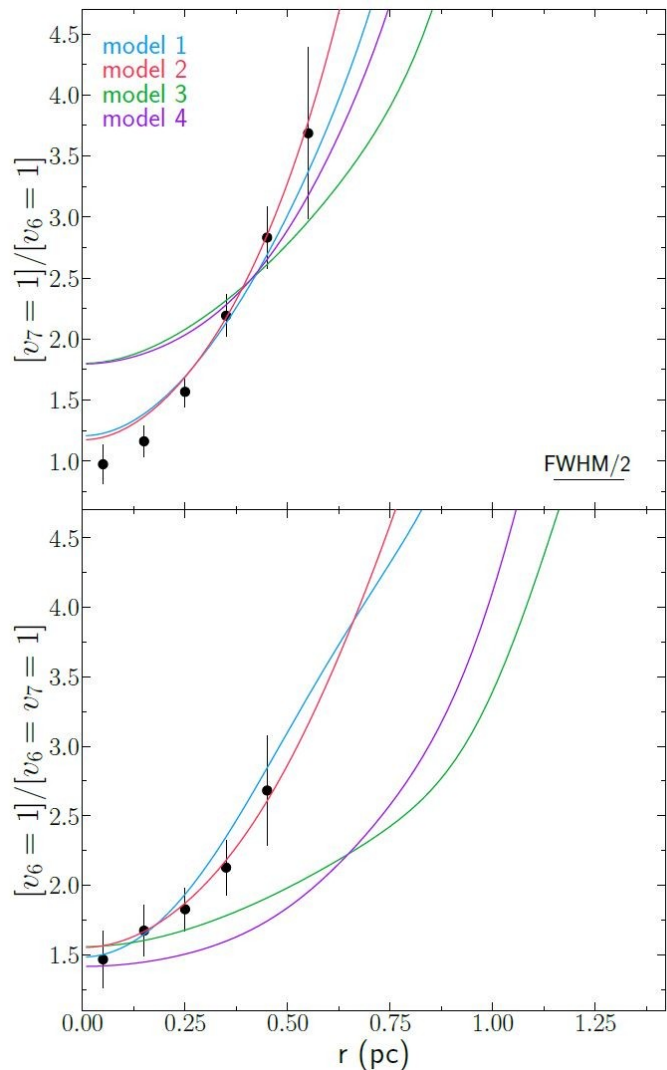
Spectral Line Identification and Modelling

- Top left: column density
- Top right: vibrational temp
- Bottom left: Velocity from
Local Standard of Rest
- Full Width Half Max
velocity



Comparison of Various Star Forming Models





Main Points

- Young Star Cluster in the midst of rapid star formation
- Star formation spread across a 0.9 pc radius
 - Favors a Competitive Accretion Scenario
- Best fit model gives low virial parameter suggesting rapid collapse
- Velocity Structure favors a recent cloud-cloud collision over an outflow