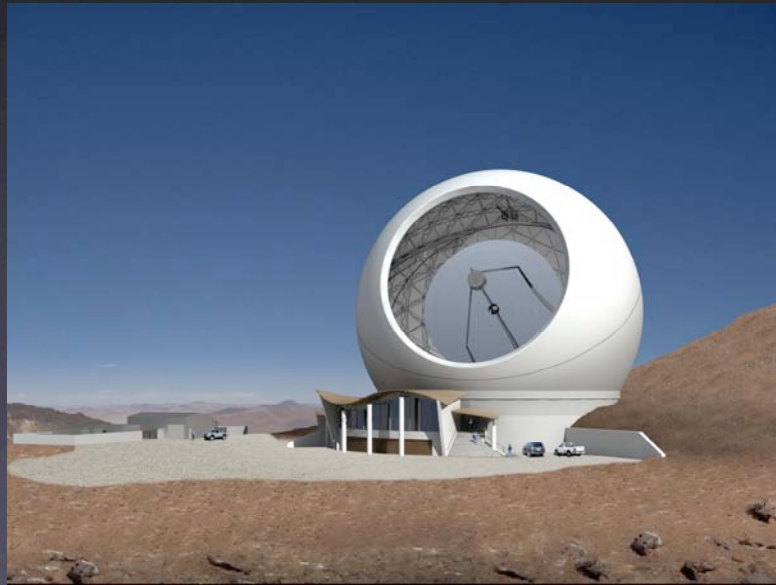


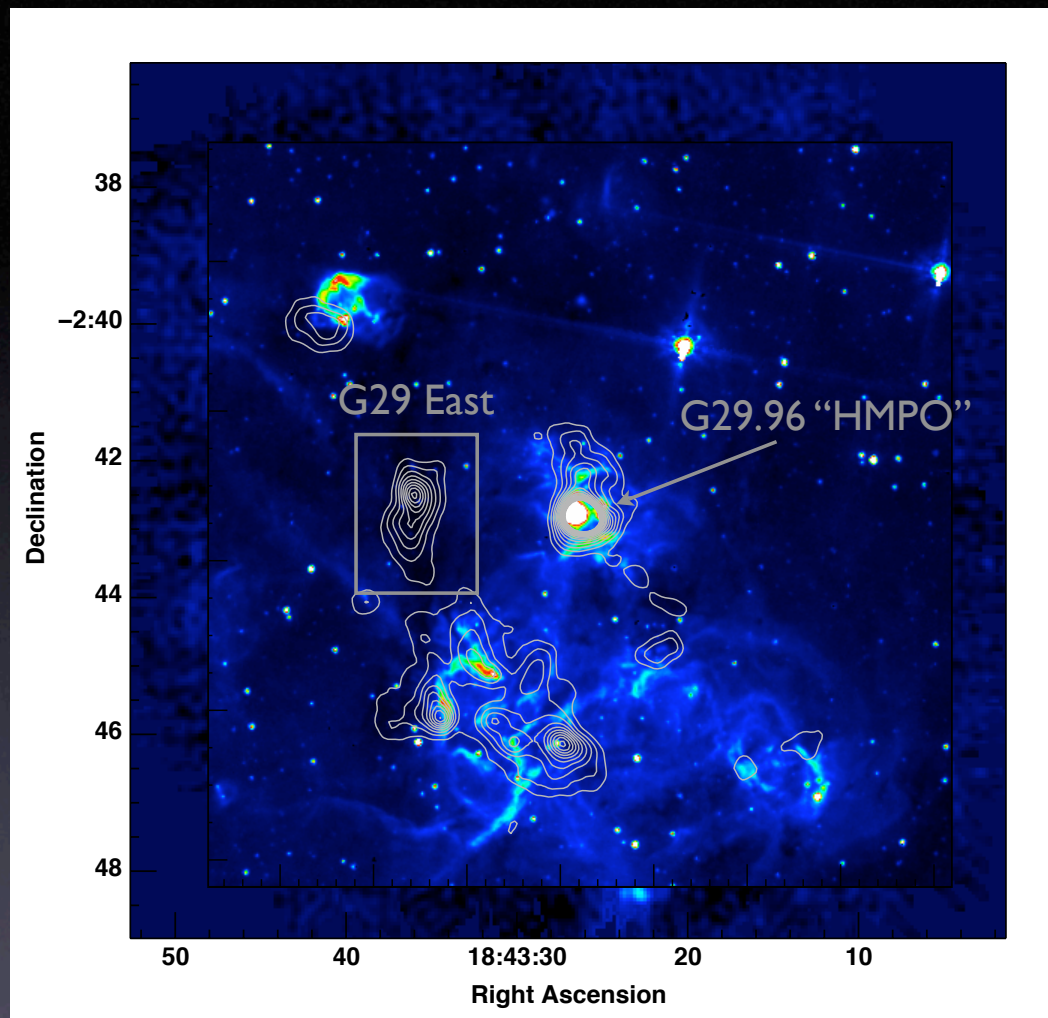
# High-mass star formation with CCAT



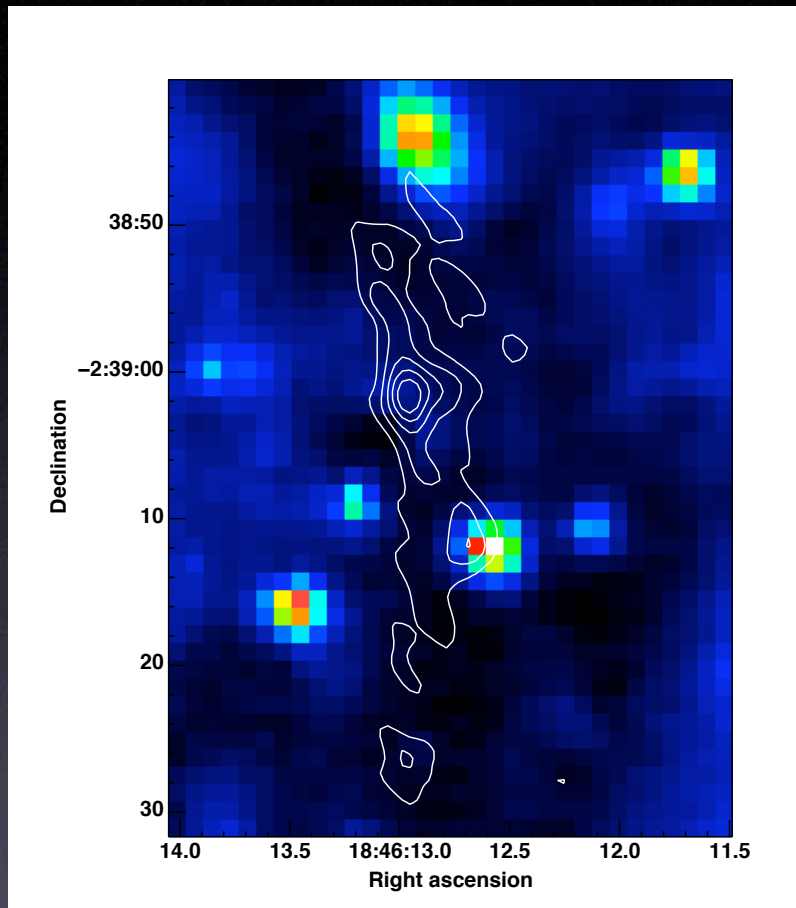
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# The story in 2013...

- SCUBA-2, LABOCA + Herschel Galactic Plane surveys have identified pretty much all the massive star formation in the Galaxy
- At the pre- and proto-cluster level (0.1-0.2 pc) we are pretty much complete to a mass sensitivity of  $\sim$  few  $10^3 M_{\odot}$  and with SEDs from 70 - 850  $\mu\text{m}$
- Can also combine with high resolution IR data from Spitzer, VLT etc, plus mm/sub-mm/radio-waves from CARMA, PdB, VLA, ALMA...
- We *don't* need a wide-field long-wavelength survey machine



SCUBA 850  $\mu\text{m}$  image of G29.96-0.02



## G29 East

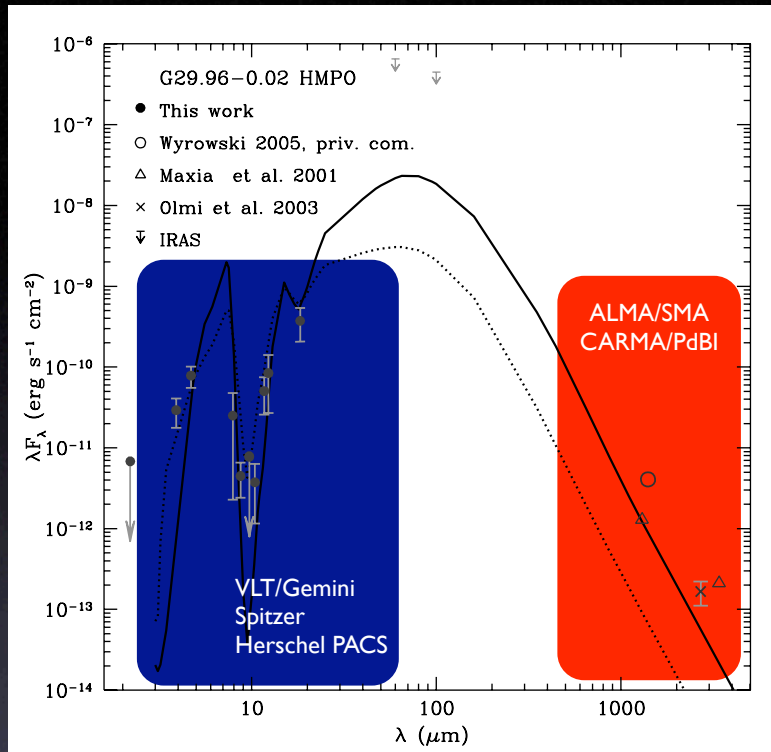
Fragmented chain of massive  
(25-100  $M_{\odot}$ ) clumps

Early stage in formation of  
massive stellar cluster

Brightest clump has methanol  
maser (massive YSO)

PdBI resolution 2.1'' x 1.5''  
similar to CCAT at 200  $\mu\text{m}$

PdBI 1.2 mm continuum contours  
Spitzer 4.5  $\mu\text{m}$  colour scale



De Buizer et al 2005

Biggest problem is lack of arcsec-resolution FIR data

Colder mid-IR dark clumps like G29E should peak @ 200-300  $\mu\text{m}$

Can't adequately constrain temperature, dust emissivity, mass or luminosity of the clumps

Systematic effects in deriving clump mass function (colder clumps are higher mass)

Largest massive star formation driver for CCAT is  
 $\sim$  arcsecond resolution at 200  $\mu\text{m}$