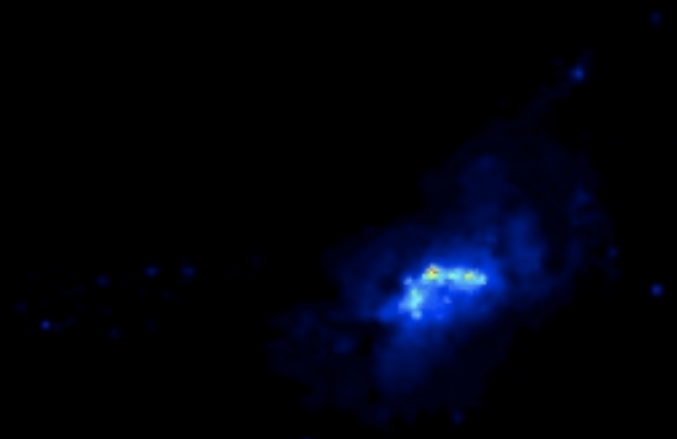
Molecular Clouds associated with Super Star Clusters in Henize 2-10



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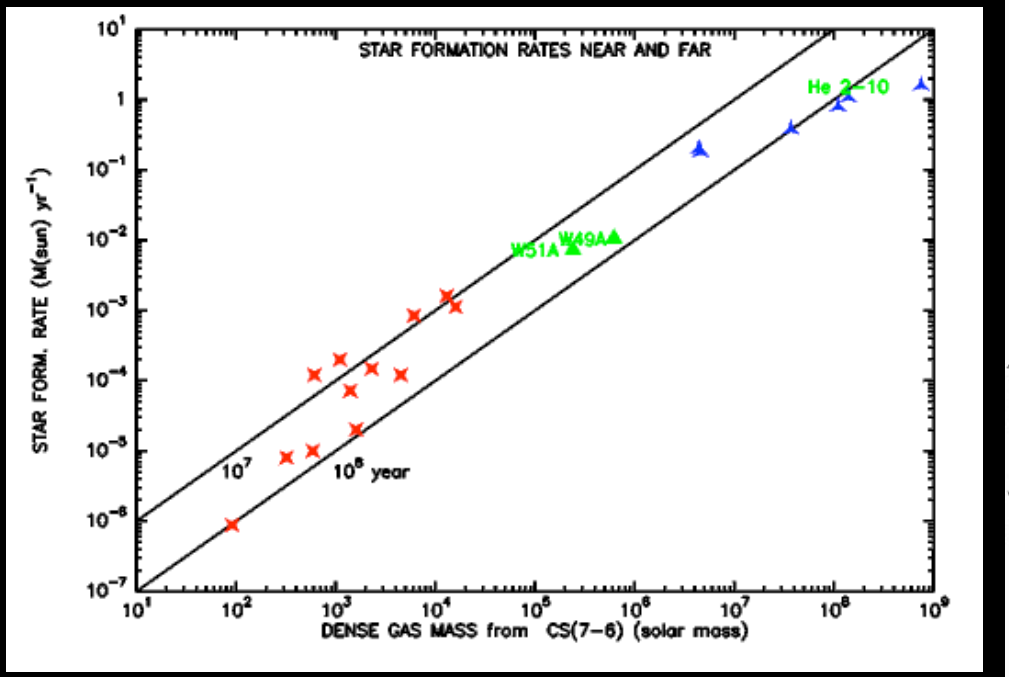
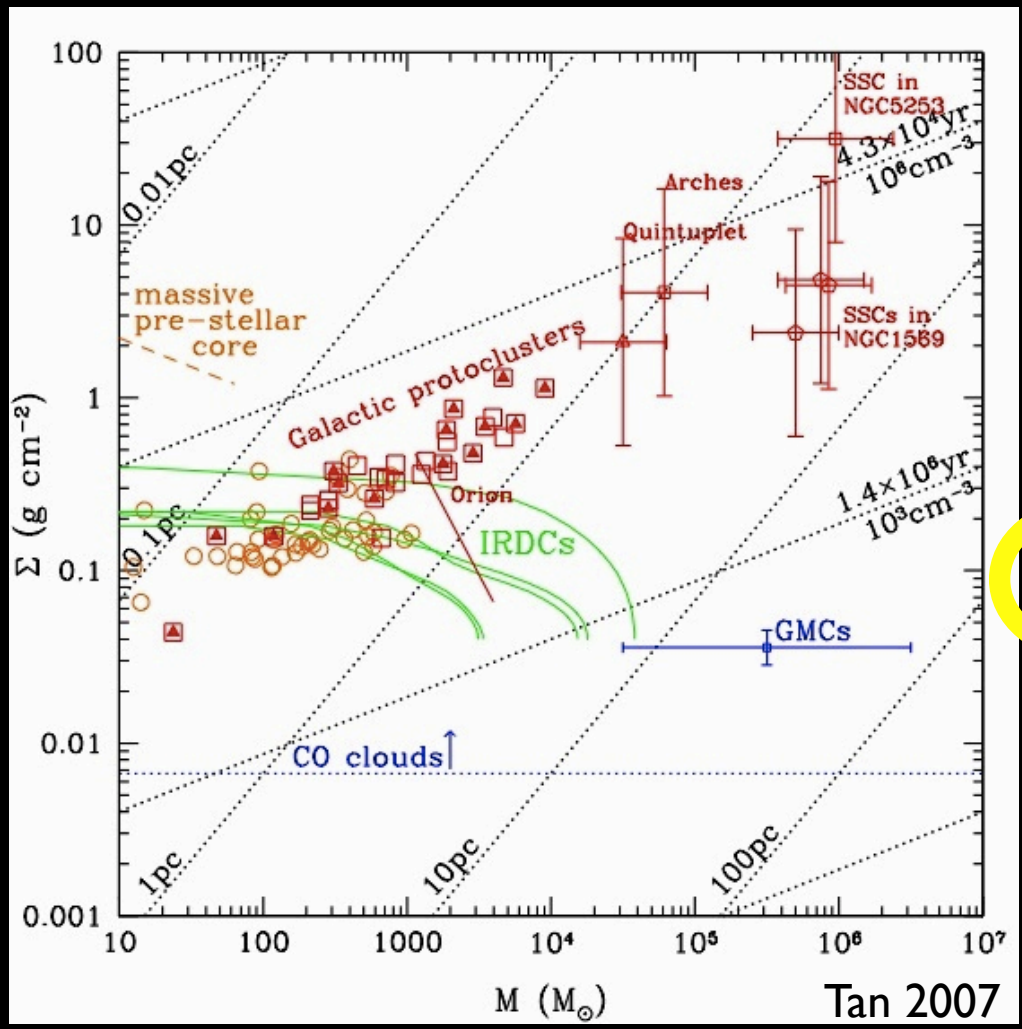
SFR vs. Mass...Near and Far



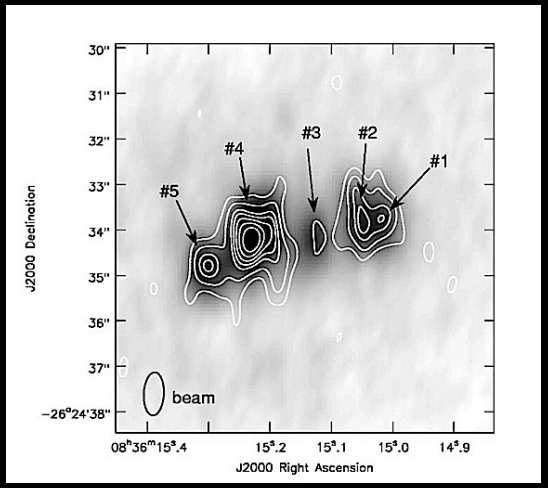
- SFR from the bolometric luminosities
- Dense gas Mass from CS the for galactic obj. and from CO for the extragalactic obj.



Comparing with Galactic high mass star forming regions one expect to find very dense and compact molecular clouds

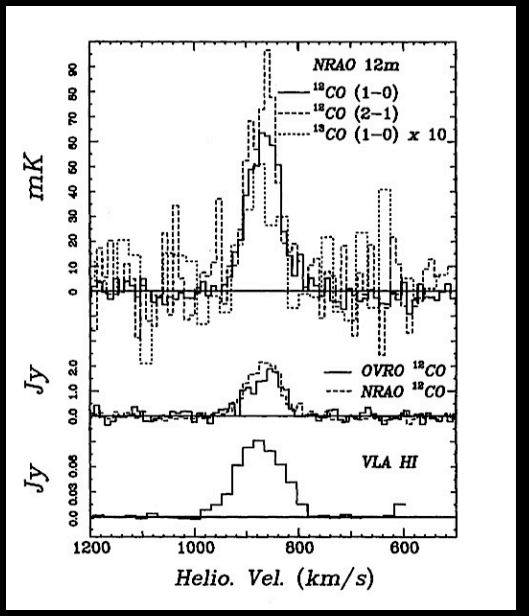
Main problem: great difference in linear resolution between the studies of star formation in our Galaxy and external objects

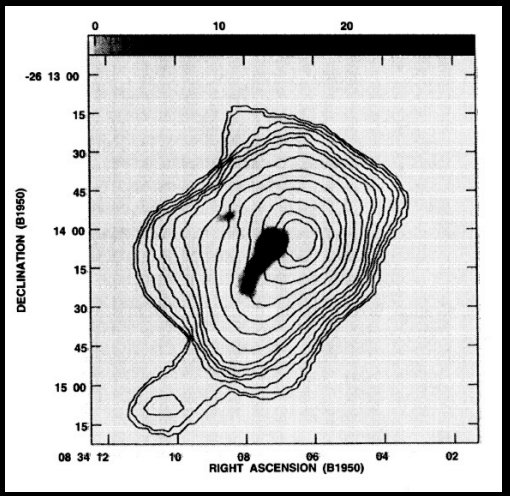
Henize 2-10



VLA 0.7cm contours on 3.6cm gray scale
(Johnson & Kobulnicky 2003)

- Blue compact galaxy - 9 Mpc (z=0.003)
- Dominated by a powerful episode of star formation
- One of the few objects of this kind with a clear CO detection
- High angular resolution images (HST and radio interferom.) resolved the central part in several compact sources (UC HII regions powered by young super massive clusters ➔ ages of few Myr)
- Each super star clusters ➔ M > 10^5 $M_\odot$
- Molecular clouds: extremely dense and compact?

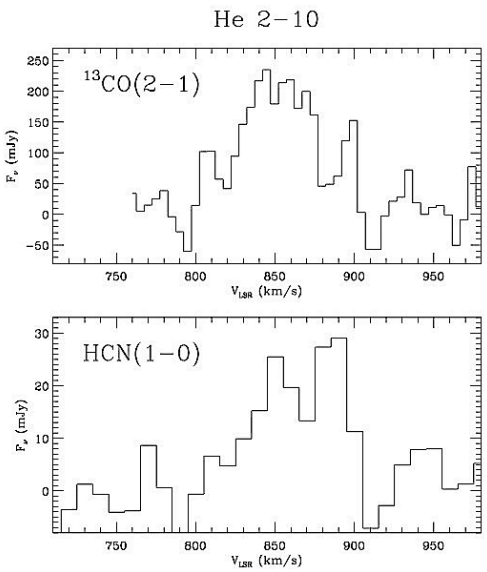




VLA HI (contours) and OVRO CO(1-0) (grey scale)
(Kobulnicky et al. 1995)

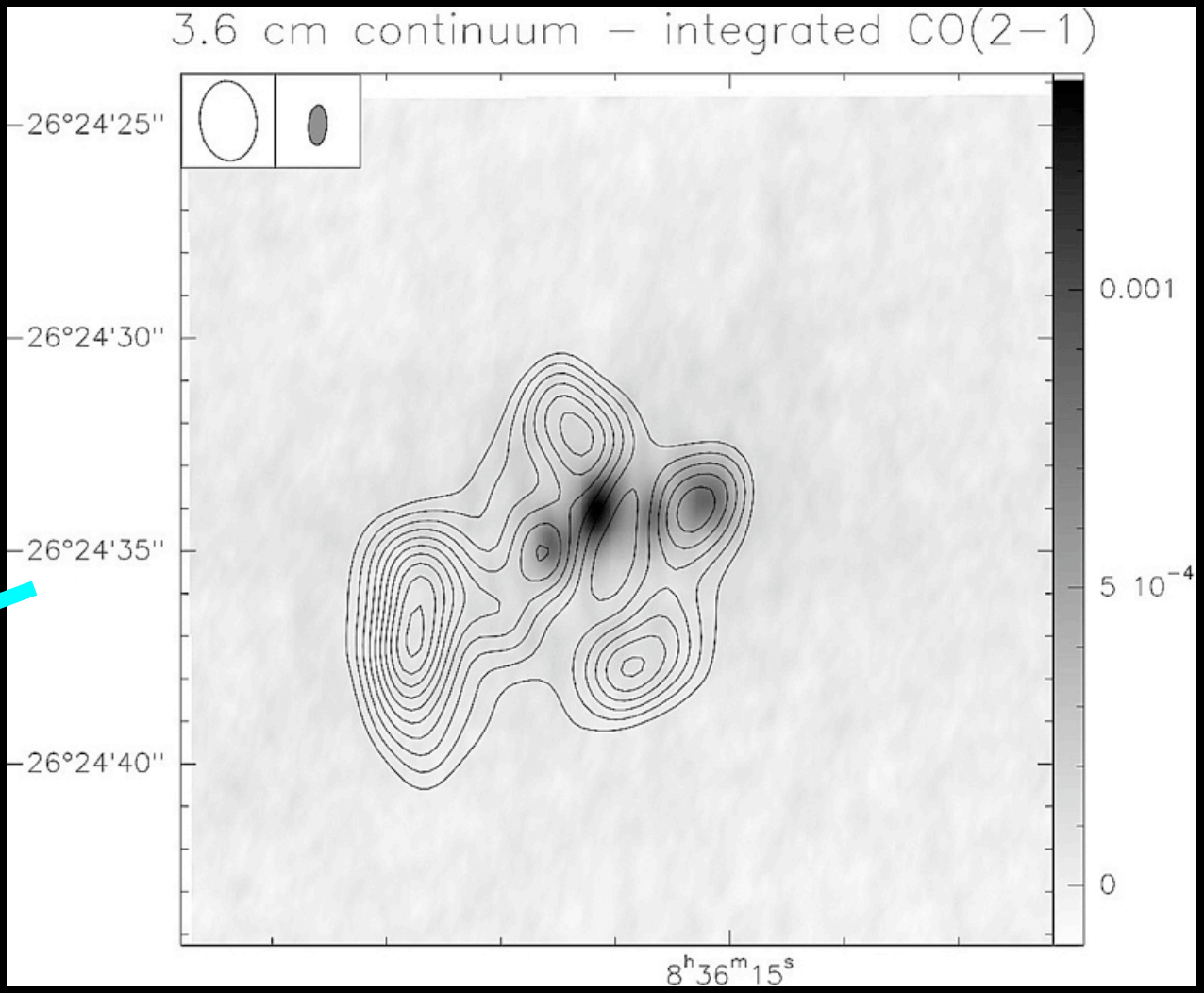
Hα→656 nm
V-band→550 nm
I-band→814 nm

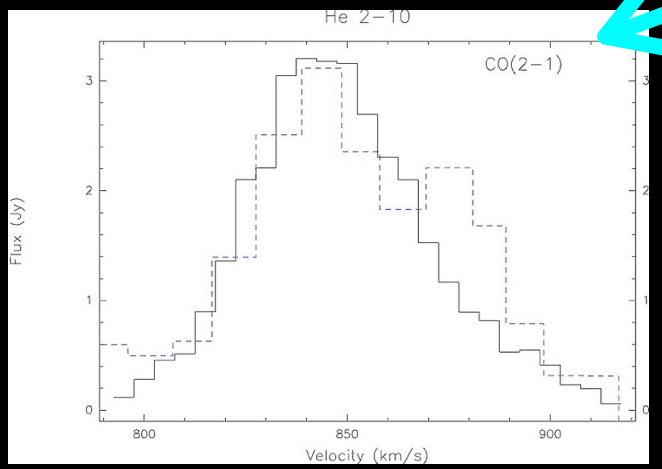
Observations



30m-IRAM observations of ^{13}CO(2-1) e HCN(1-0)

Feb.&Mar. 08 - SMA observations of CO(2-1) at 1".33 x 1".88 res. → 60 x 80 pc





Contours → CO(2-1) integrated map, from 4 Jy/beam (5σ) by 1
Grey scale → VLA 3.6cm continuum (Johnson & Kobulnicky 2003) - 0".44 x 0".95

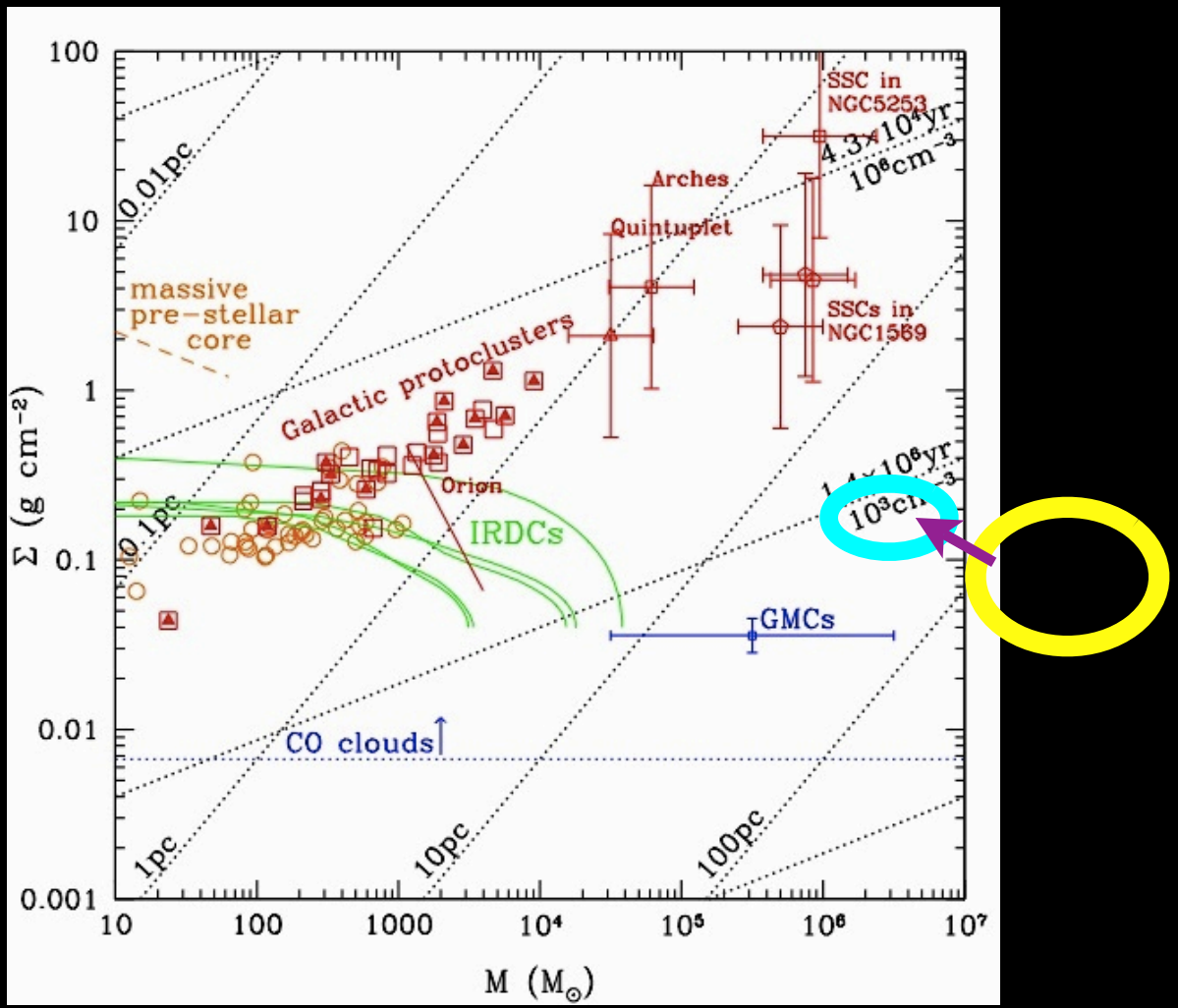
Identification of the clouds

$M_{vir} \propto \Delta R * \Delta v^2$, $M_{mol} \propto X * F_{CO}/R * v^2$ (R=CO(2-1)/CO(1-0))

X = conversion factor from CO line strength to H_2 column density

$\Sigma = M_{clump}/(A_{clump})$

Tan 2007



* Several clouds identified from the CO(2-1) emission, with masses of ~ 2-9 10^6 $M_\odot$ and column densities of ~ 0.09 - 0.2 $g*cm^{-2}$
* A first step to resolve molecular clouds associated with the super star clusters
* For this aim higher resolution observations and higher density tracers are necessary
* Does these objects correspond to the Galactic GMCs??

Conclusions and Future Work

- SMA observation with 1".33 x 1".88 resolution, correspondent to 60 x 80 pc
- Clouds identified from the CO(2-1) emission:
  - Masses of ~ 2-9 10^6 $M_\odot$
  - Column densities of ~ 0.09-0.2 $g * cm^{-2}$
- Does these objects correspond to the Galactic GMCs??
- Future higher resolution observations