

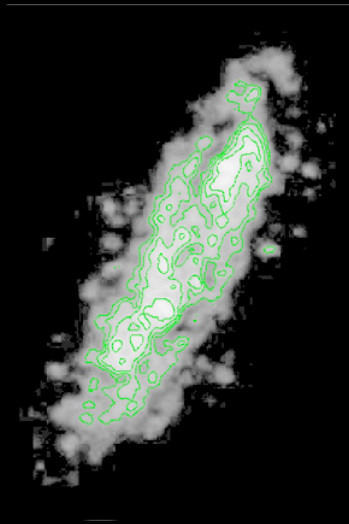
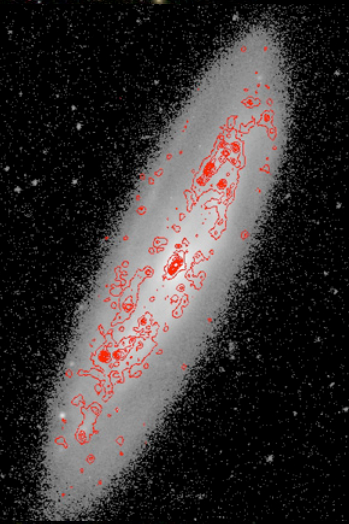
Environmental Effects on the Star Formation in Nearby Galaxies

Work in progress ...

- 1) Local Supercluster ($H\alpha^3$)
- 2) Coma Supercluster (SDSS)

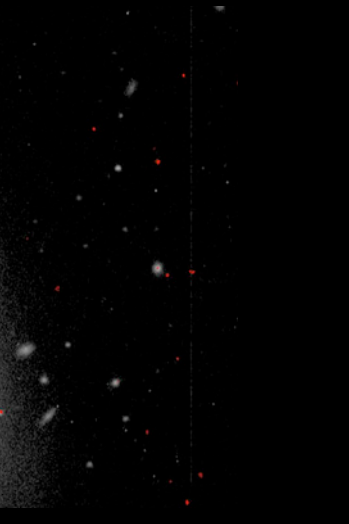
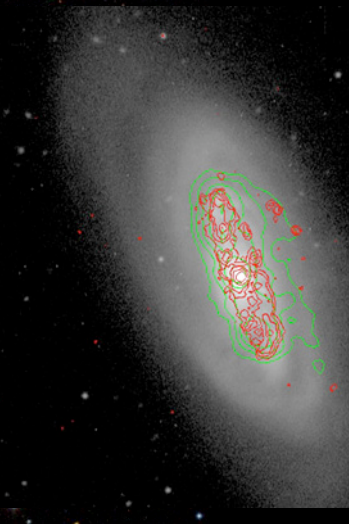
G. Gavazzi (Milano Bicocca)
A. Boselli (Marseille)
S. Fabello (MPA)
M. Fumagalli (UCSC)
V. Galardo (Milano Bicocca)
F. Grossetti (Milano Bicocca)
& ALFALFA team

SFR@50 Spineto July 8-09



NGC 4192
 $\text{HI}_{\text{def}}=0.3$

.... Beside morphology segregation, an environmental effect easy to quantify for spiral galaxies is HI depletion (ram pressure stripping)

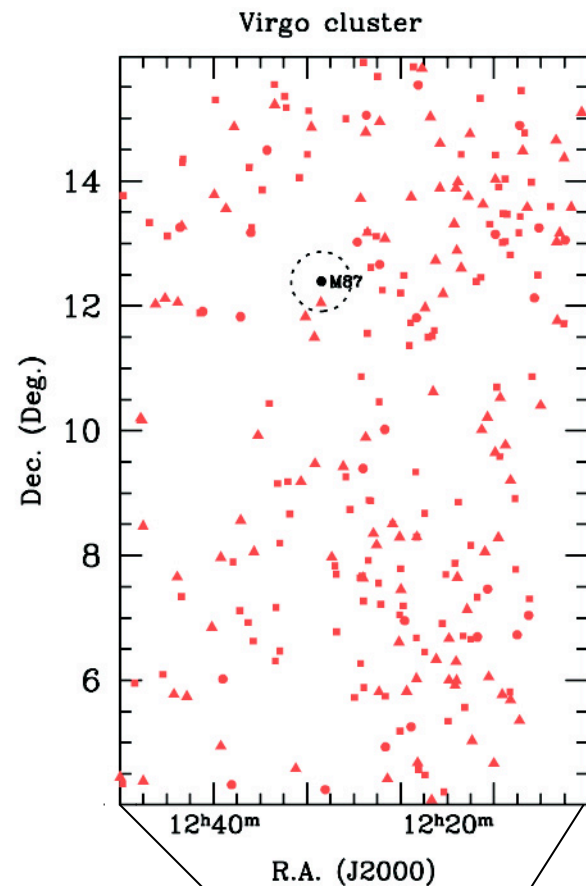
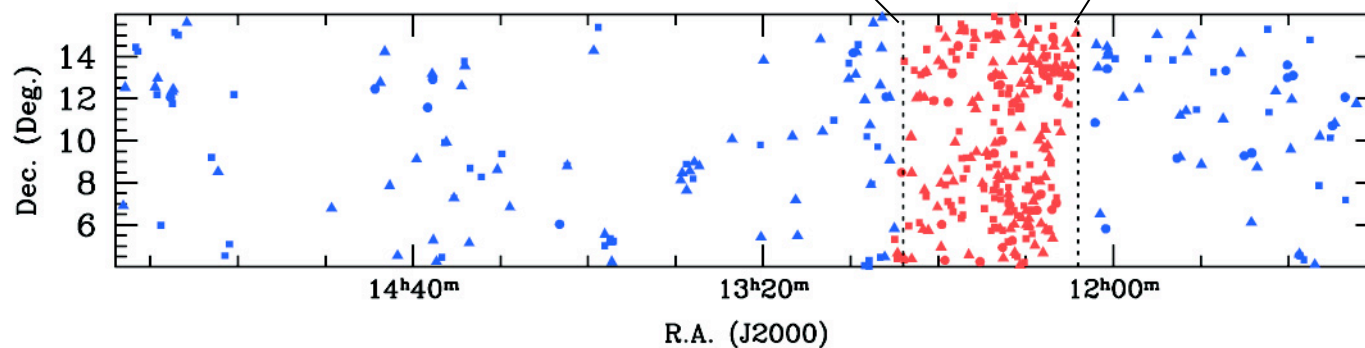


NGC 4569
 $\text{HI}_{\text{def}}=1.0$

in Virgo
315 HI targets
(Unlimited flux)
 $cz < 3000$ km/s

Gavazzi+08

out Virgo
211 HI targets
With $S > 0.7$ Jy km/sec
 $cz < 2000$ km/s



ALFALFA

526 HI targets
 $s/n > 5$

Giovanelli+05

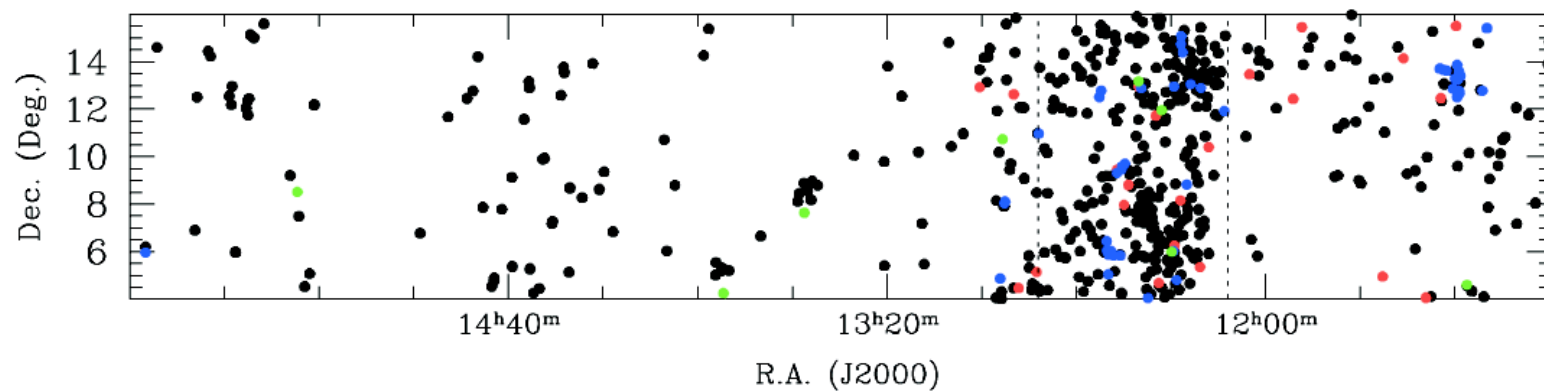
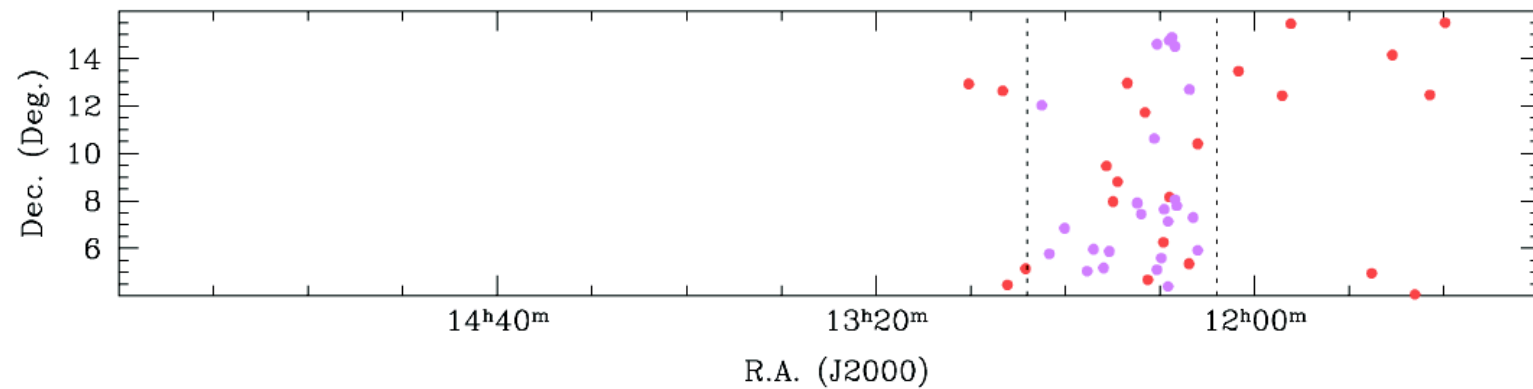
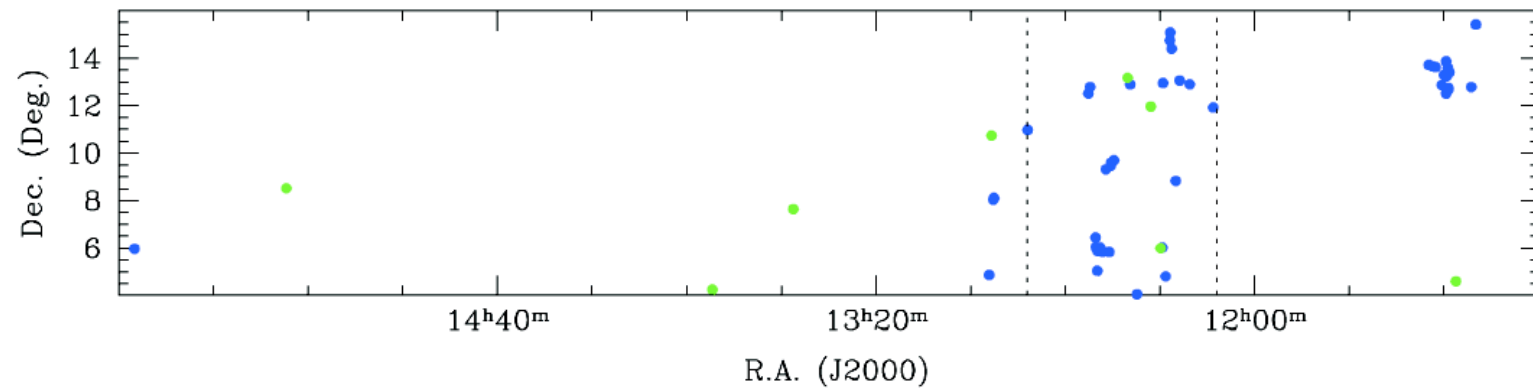
$H\alpha^3$ Work in progress ...

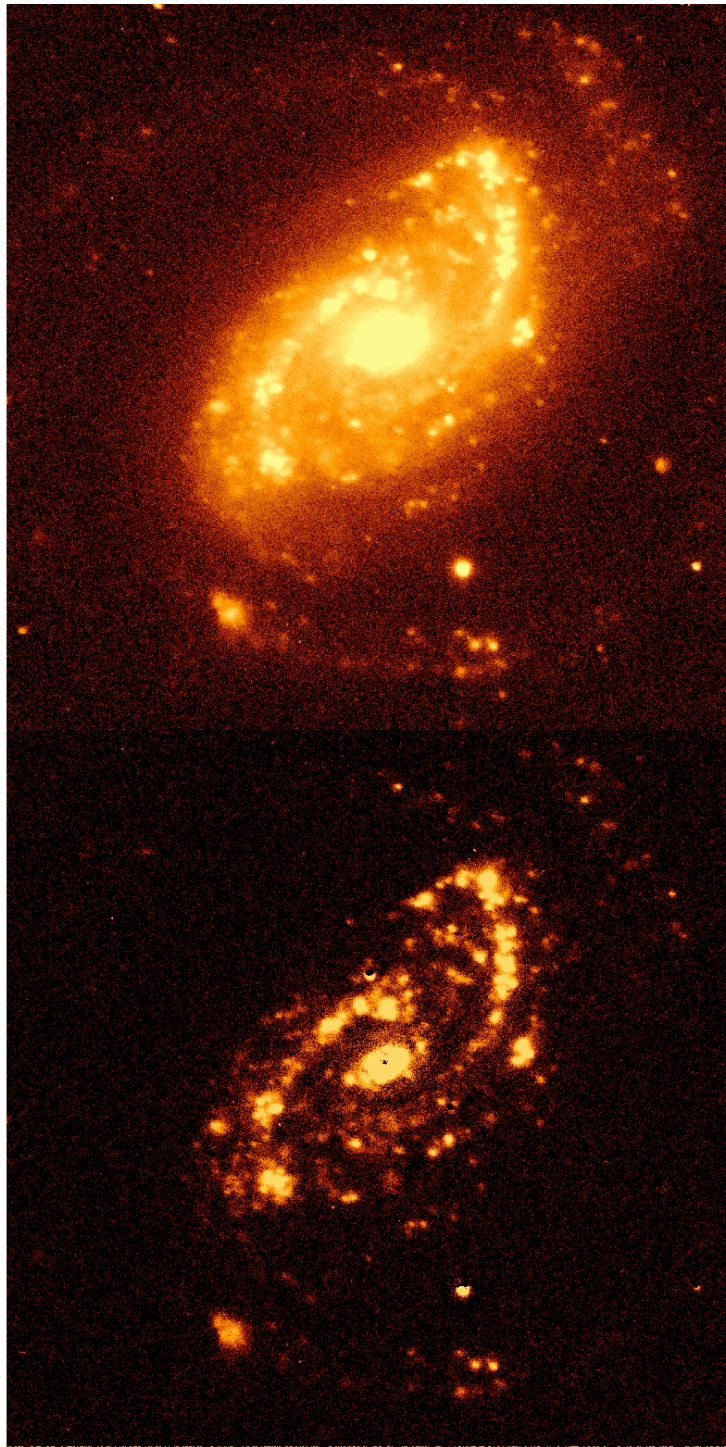


$H\alpha$ imaging follow-up survey of ALFALFA-2006-2009 (may) @SPM (Mx)
(Gavazzi et al. in prep.)

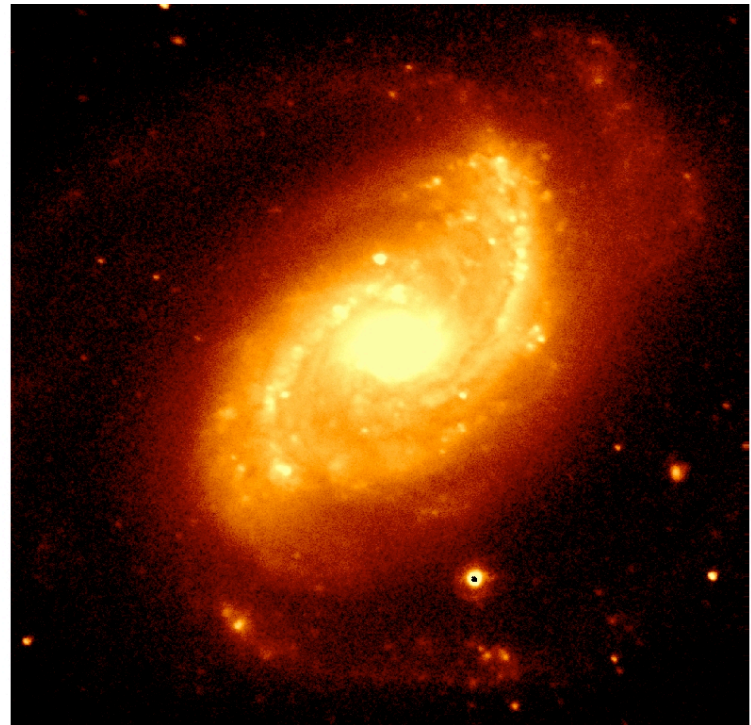
H α ³

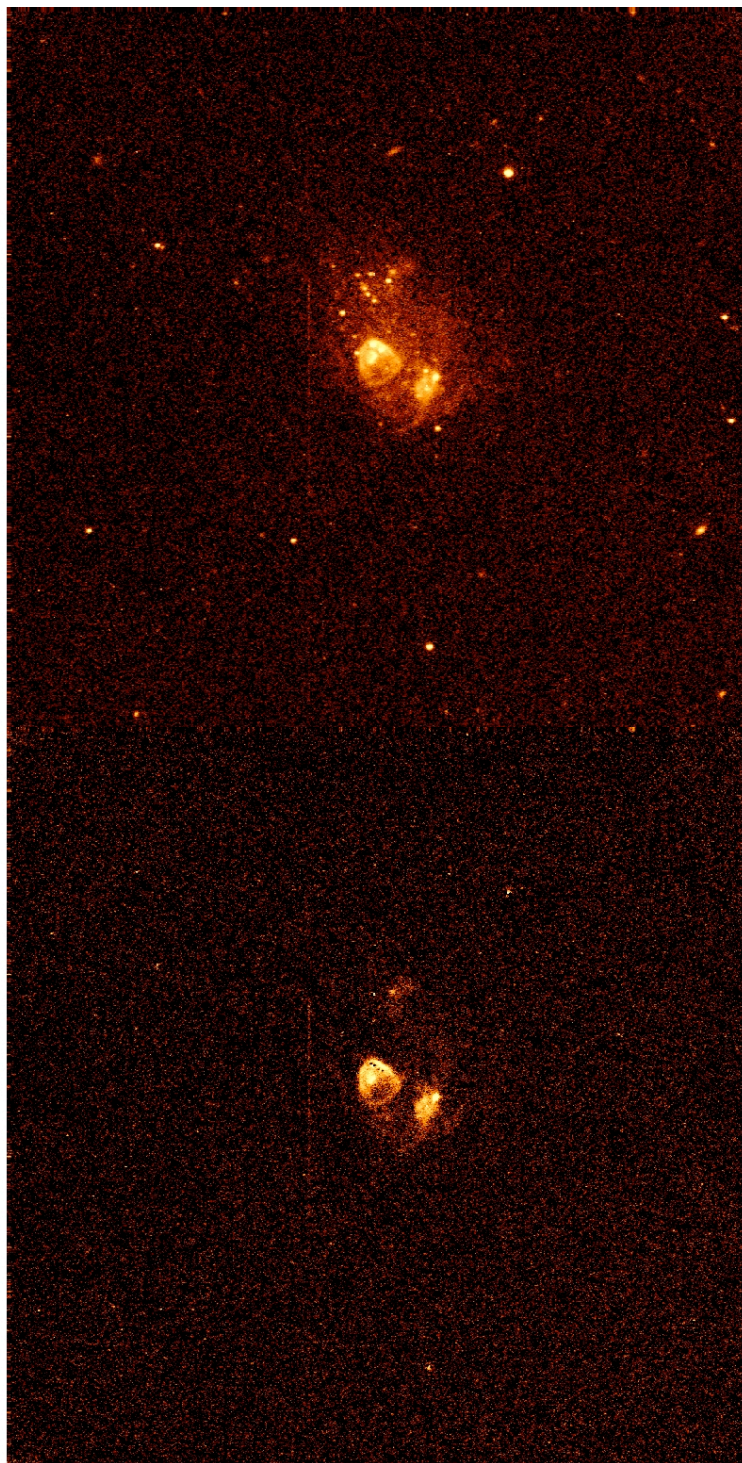
424 observed 48 dark or too faint 22 not observed 8 near star or z
@may 2009
24 not observed S<0.7Jy



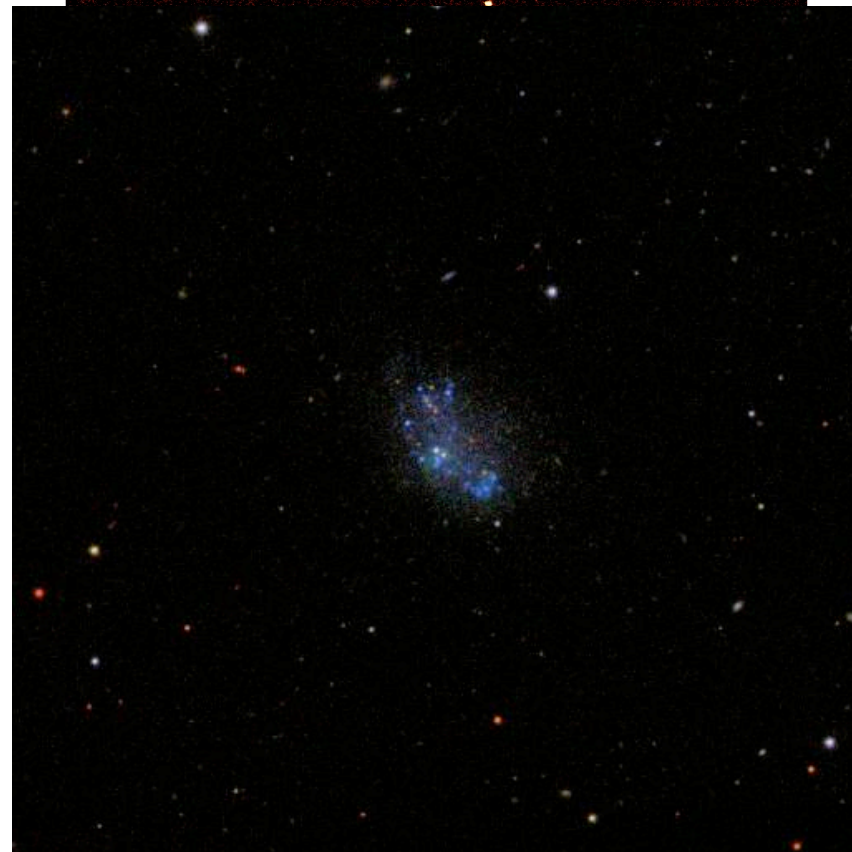
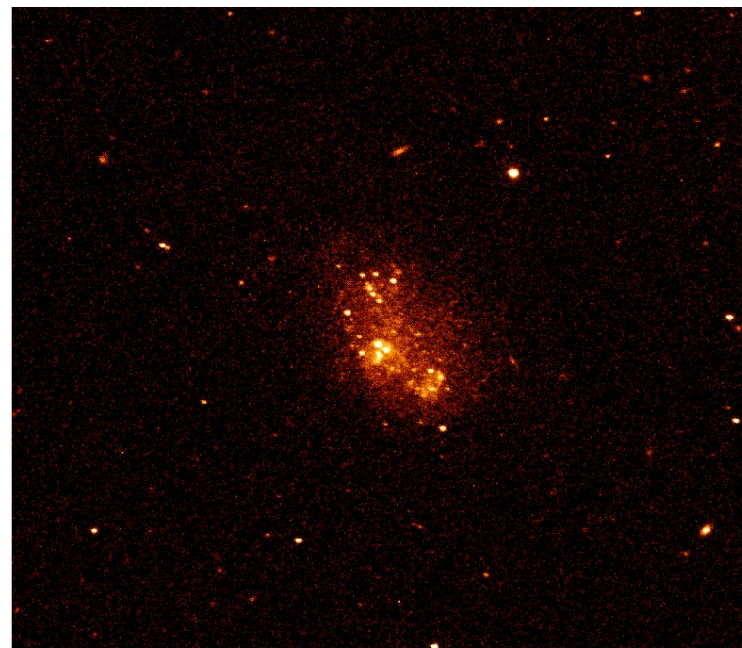


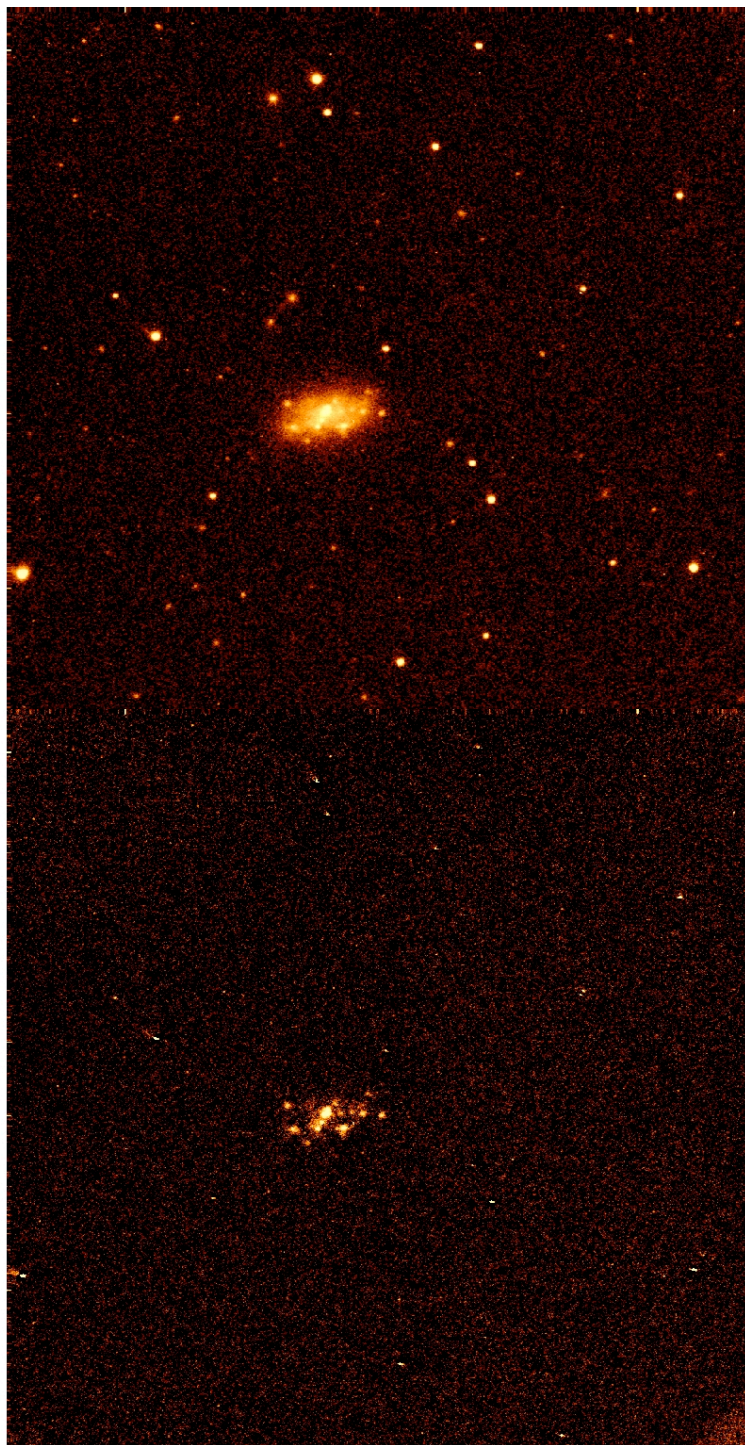
N5248



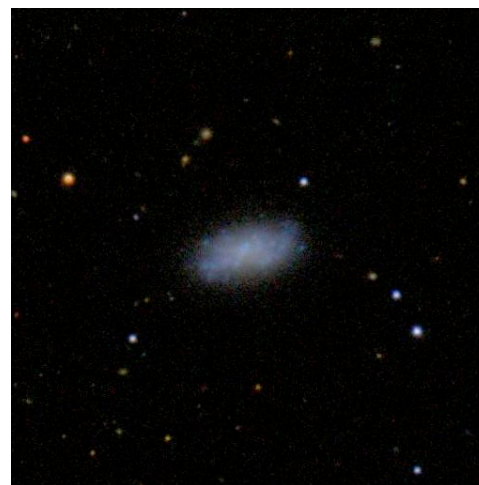
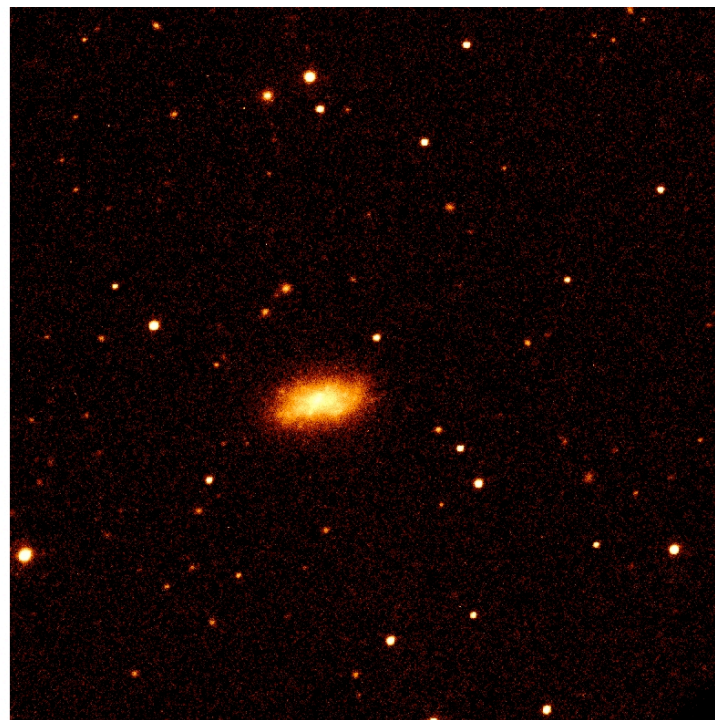


GR8

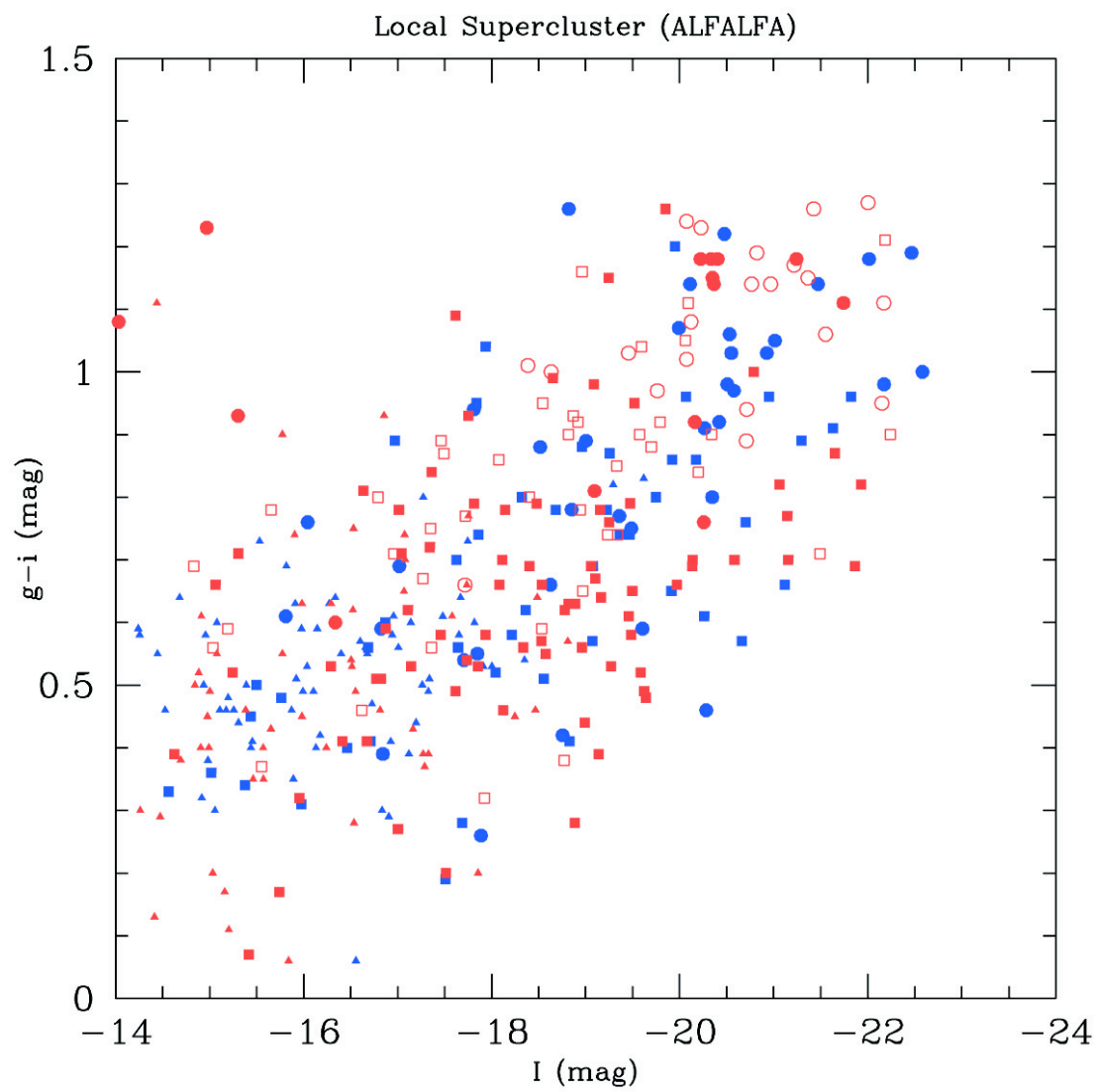




A222260

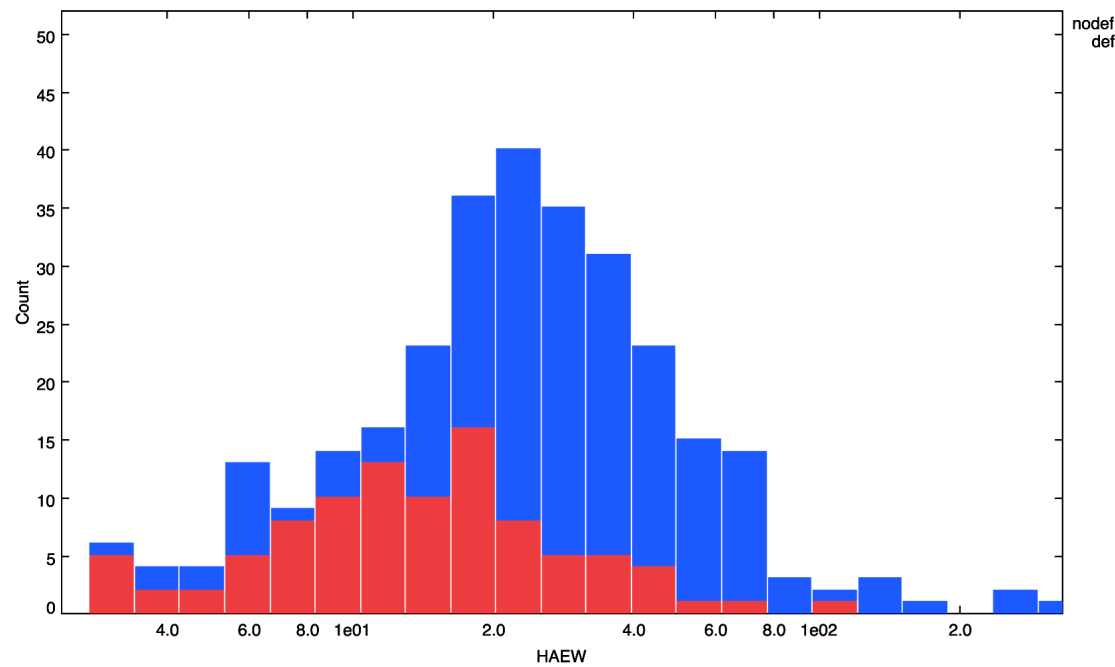


Color-mag HI selected

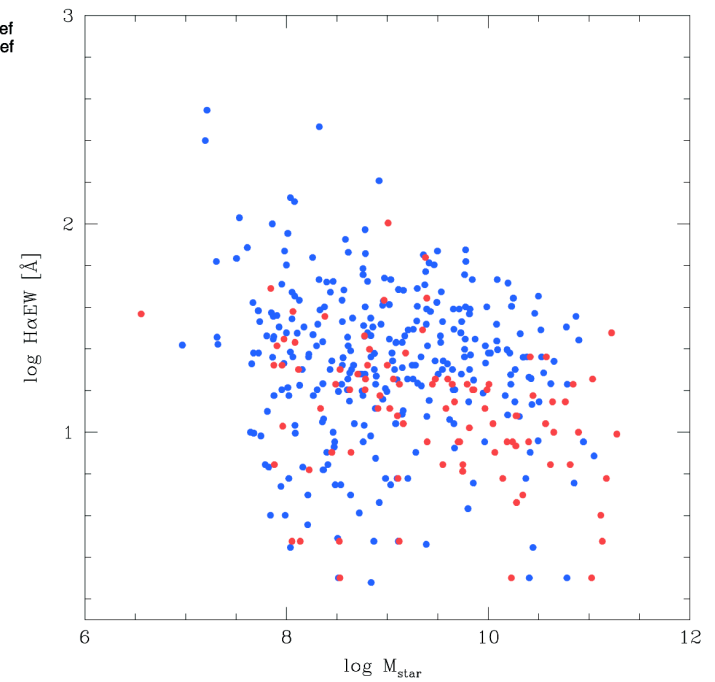


Work in progress ...

H α EW freq.



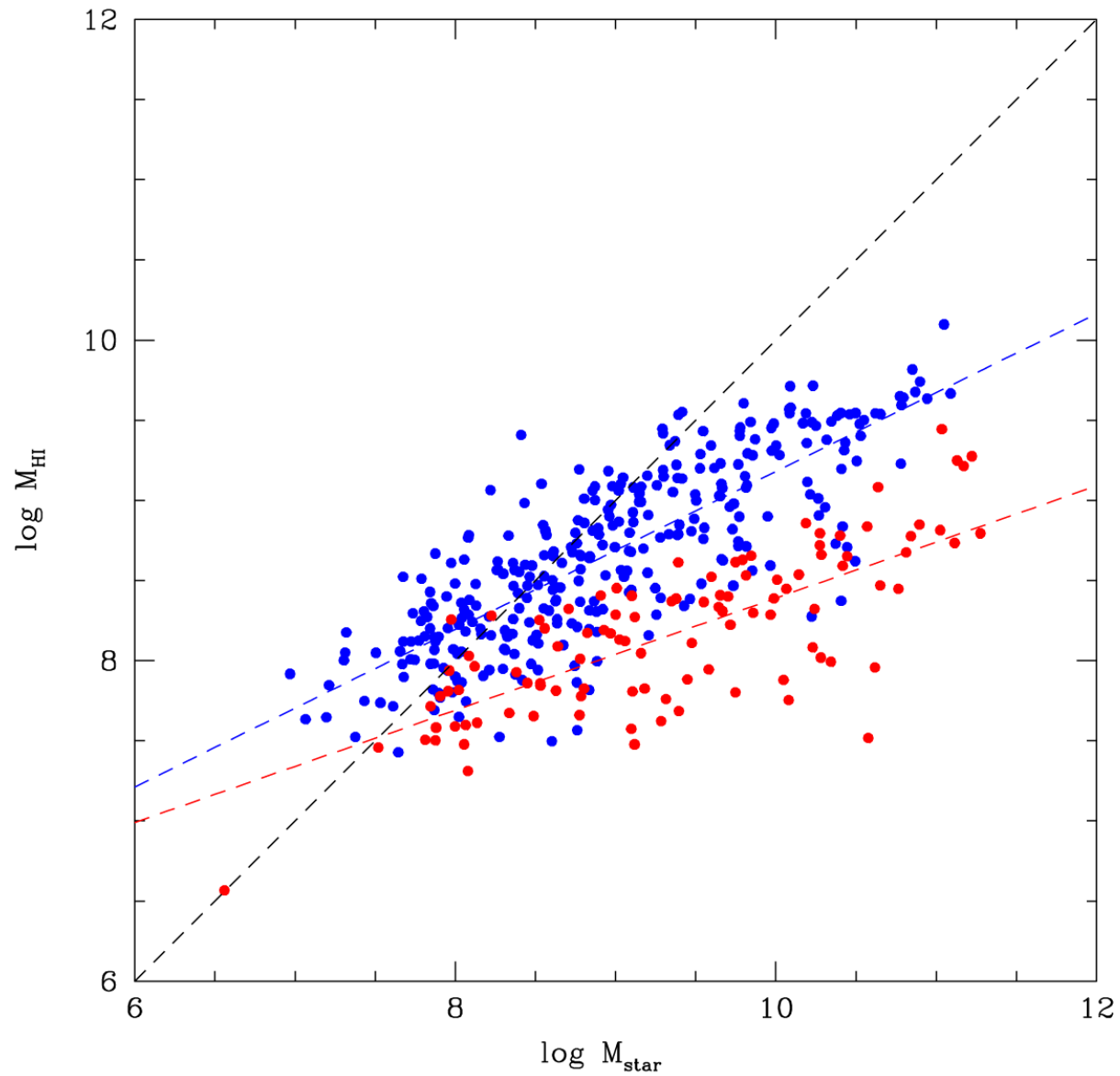
H α EW vs. Stellar mass



defHI<0.5

defHI>0.5

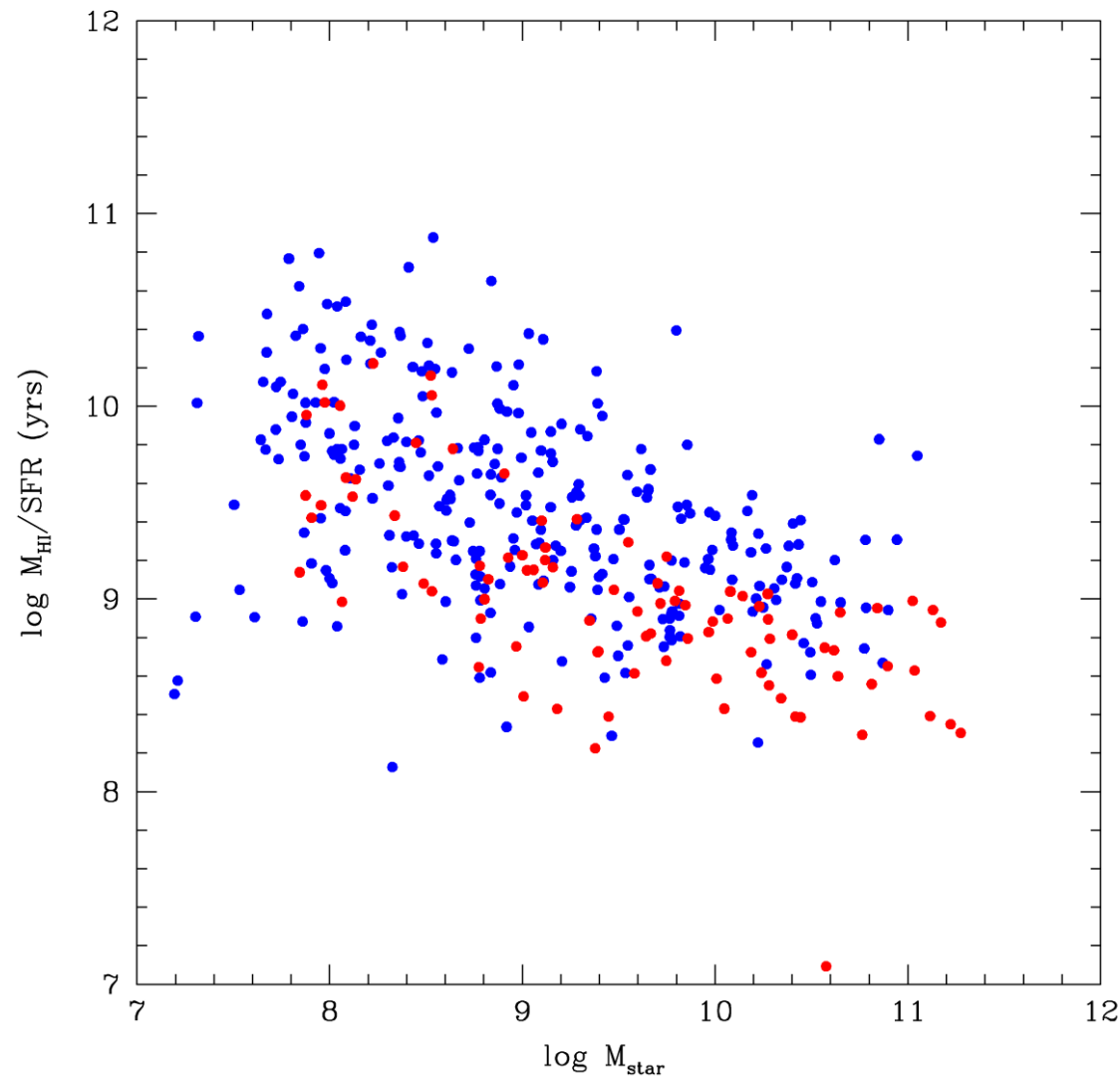
HI Mass vs. Stellar Mass



$\alpha \text{ defHI} > 0.5 = 0.35$

$\alpha \text{ defHI} < 0.5 = 0.5$

Gavazzi+07



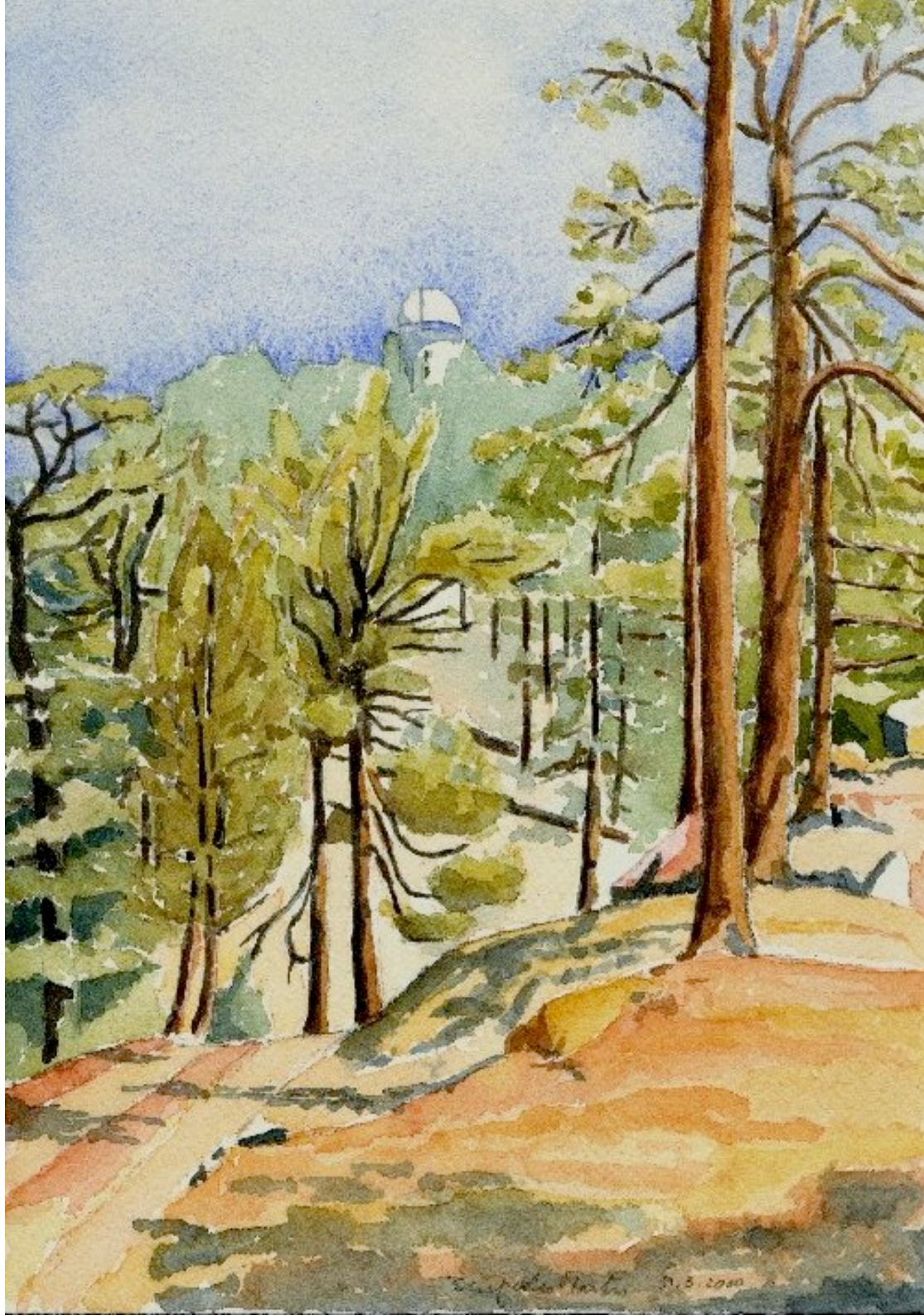
Depletion time
($\tau = M_{\text{HI}}/\text{SFR}$)

vs. stellar mass

$\text{defHI} > 0.5$

$\text{defHI} < 0.5$

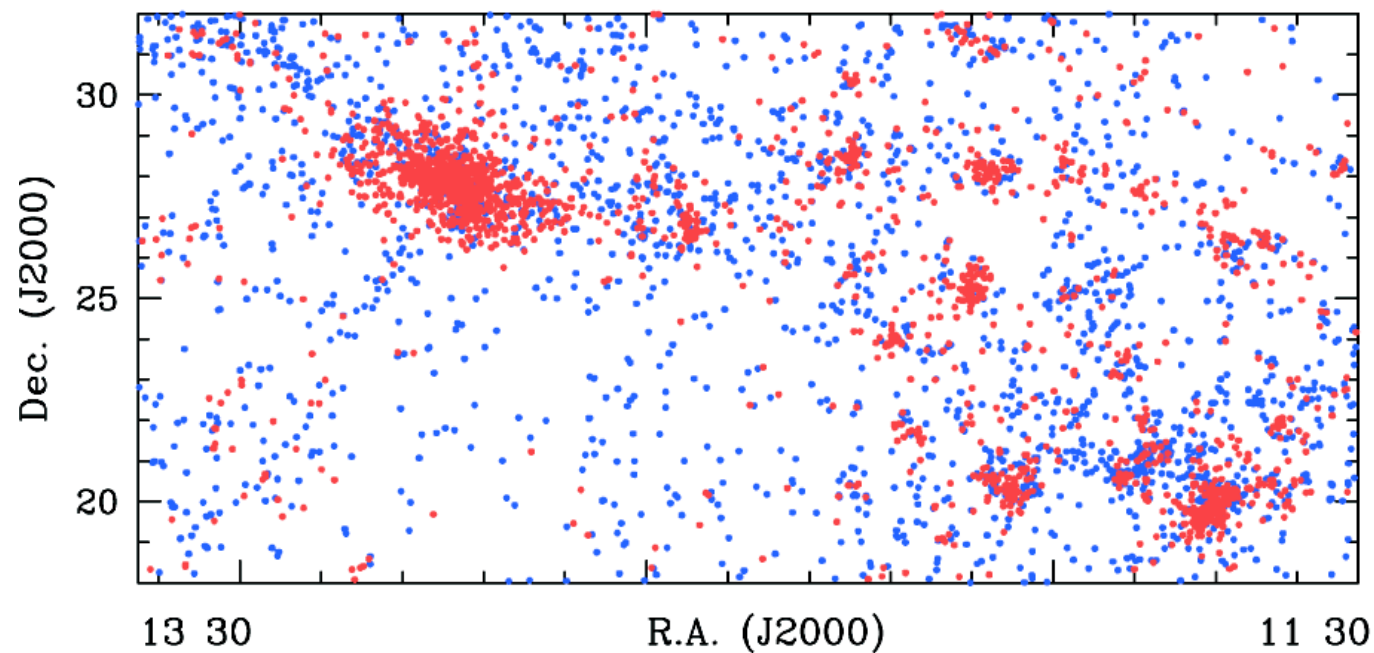
For the relation HI/H2 see:
Fumagalli&Gavazzi 08
Fumagalli+09



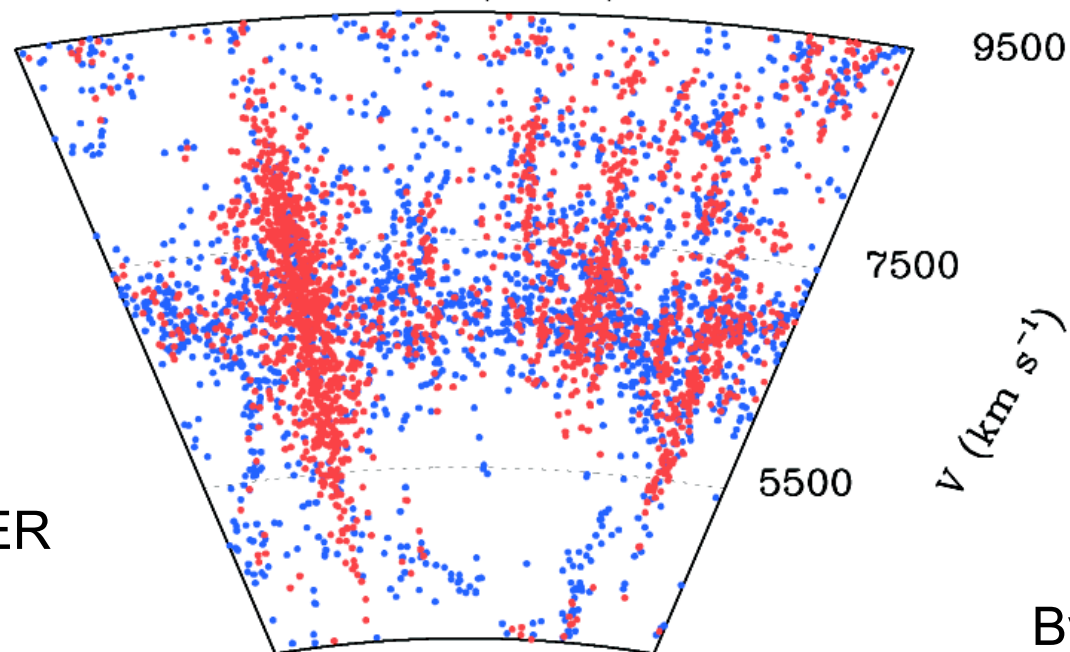
$H\alpha^3$

More to come

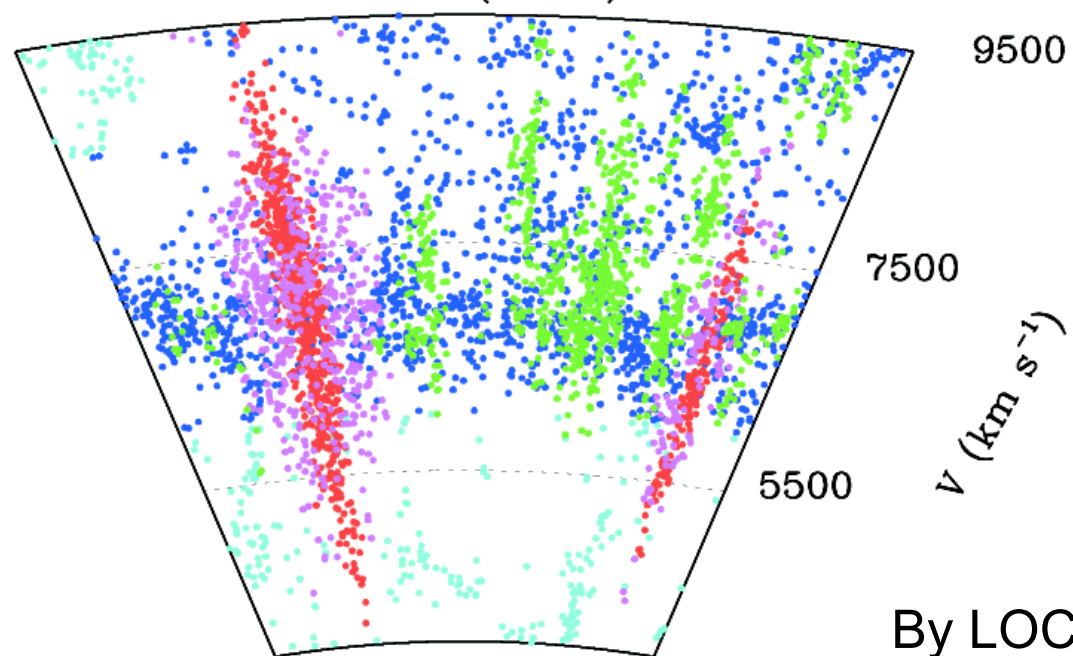
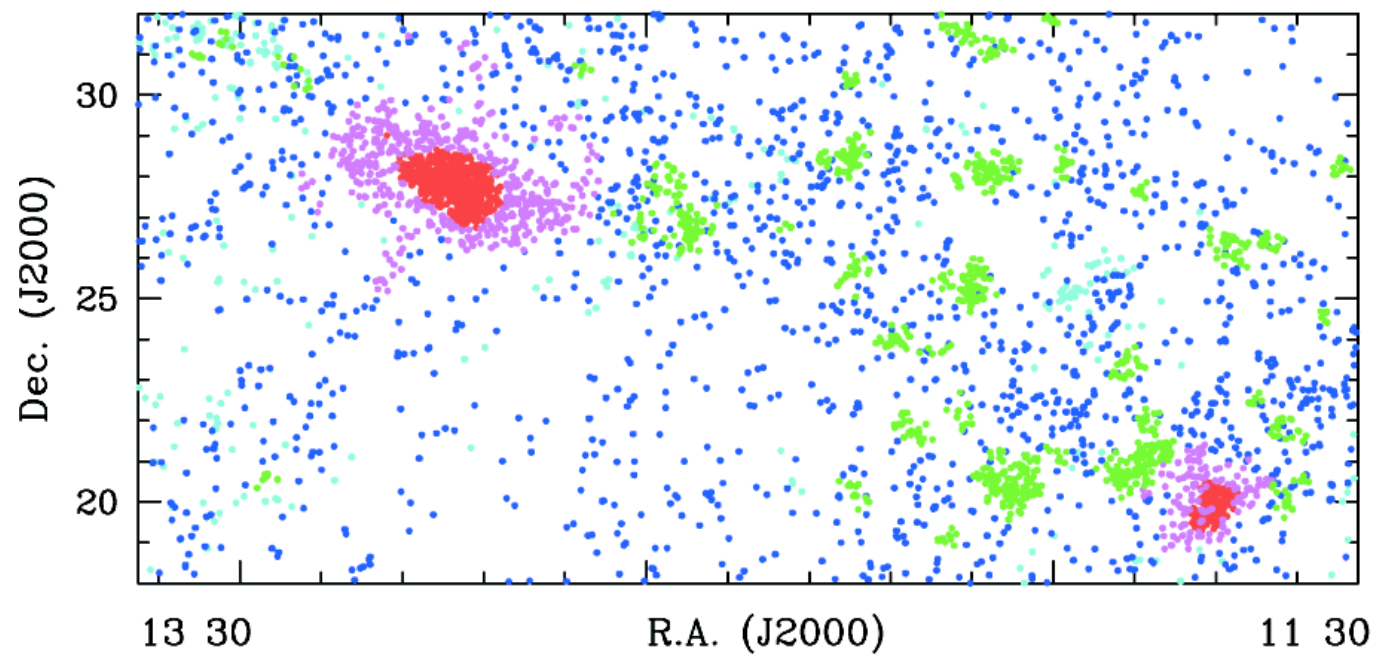
Gavazzi et al. (in prep)

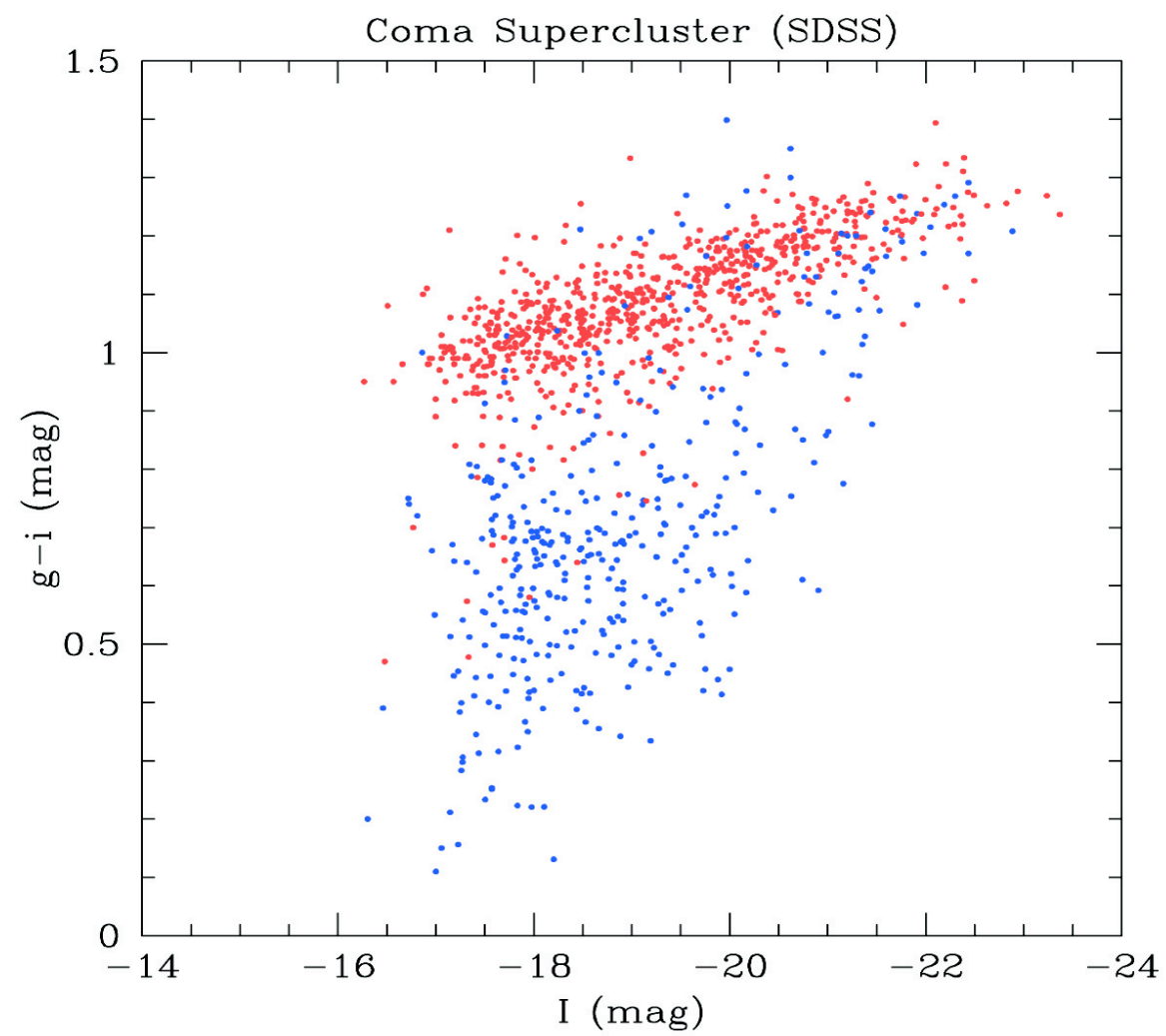


COMA
SUPERCLUSTER

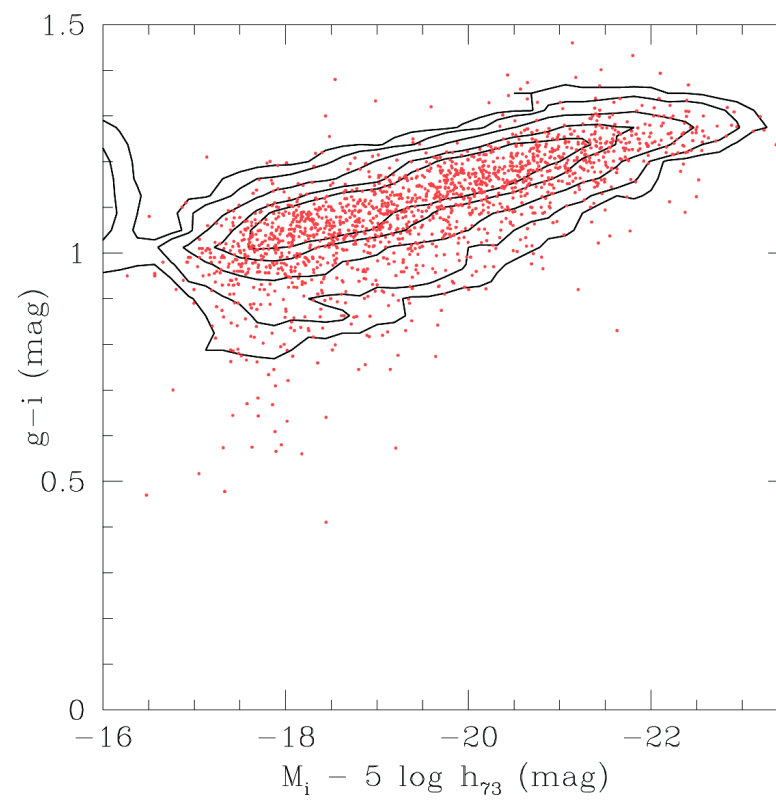
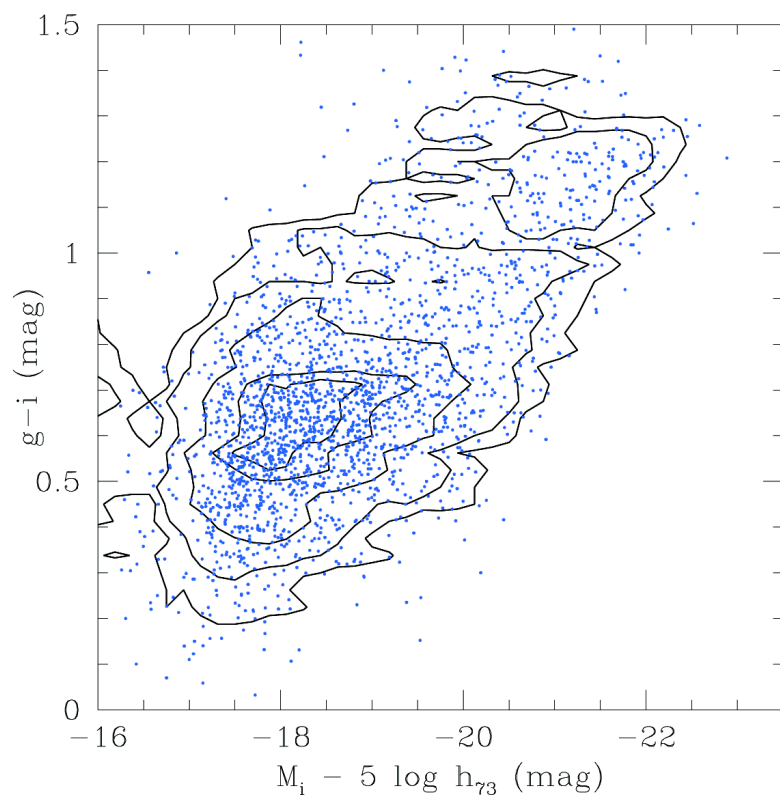


By TYPE



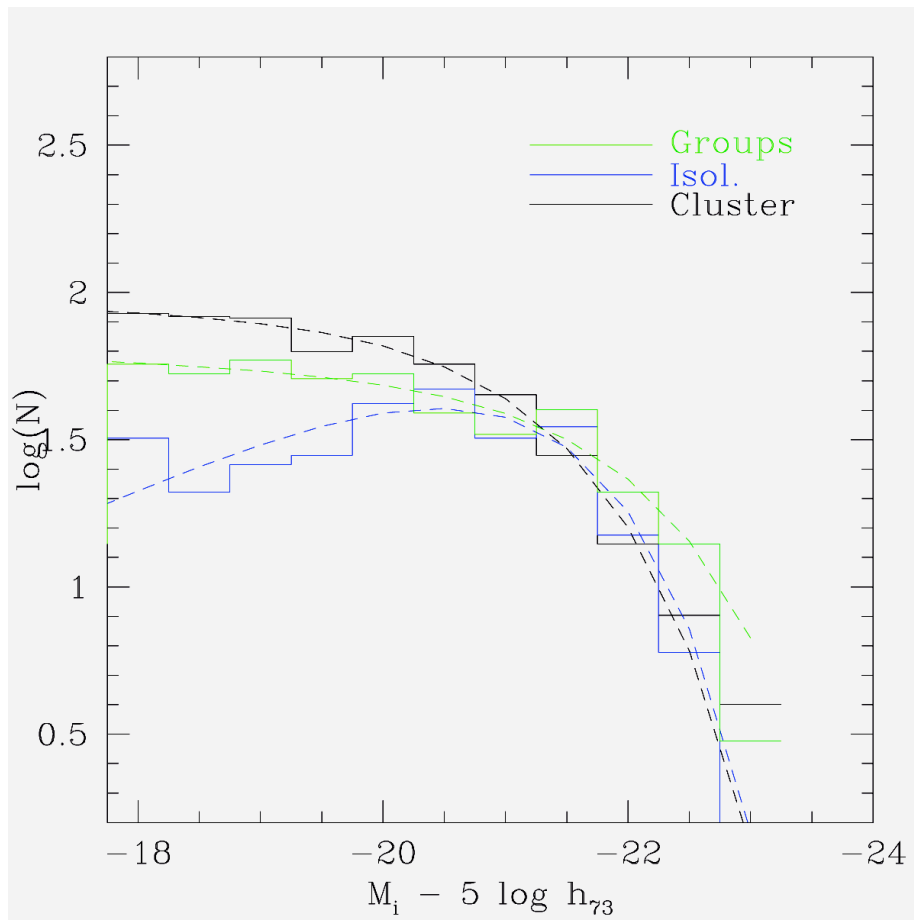


Color Magnitude (type)

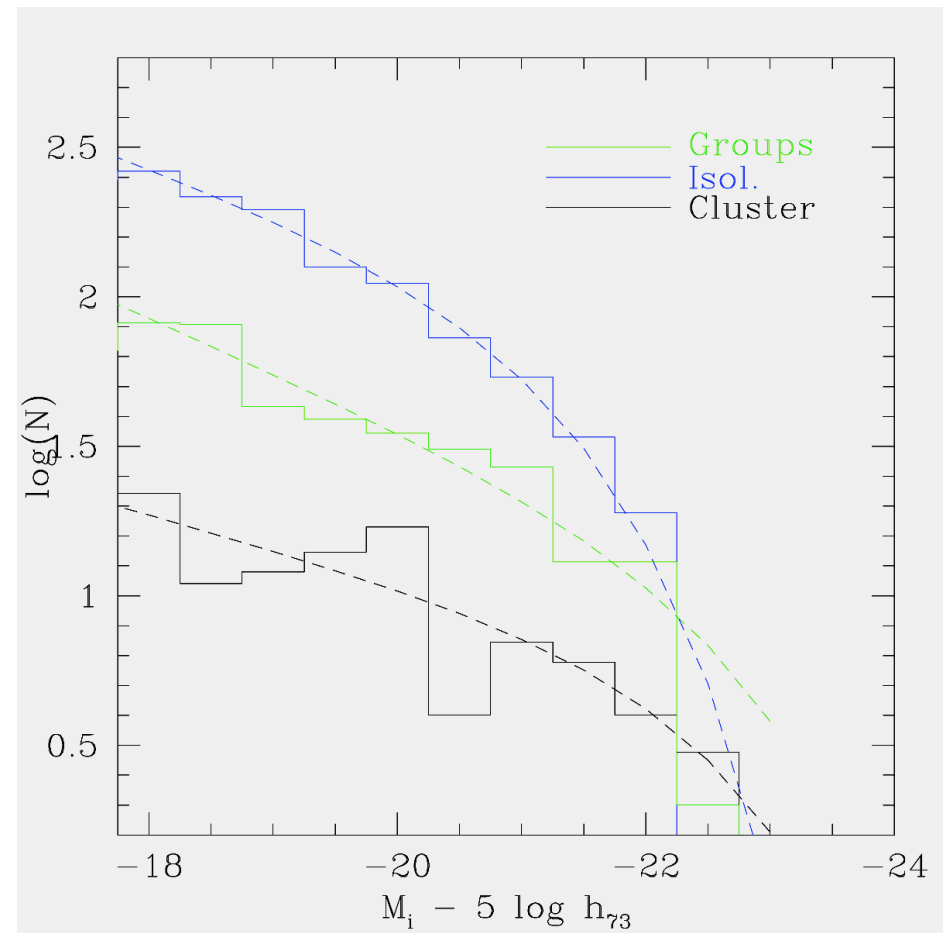


Luminosity Functions

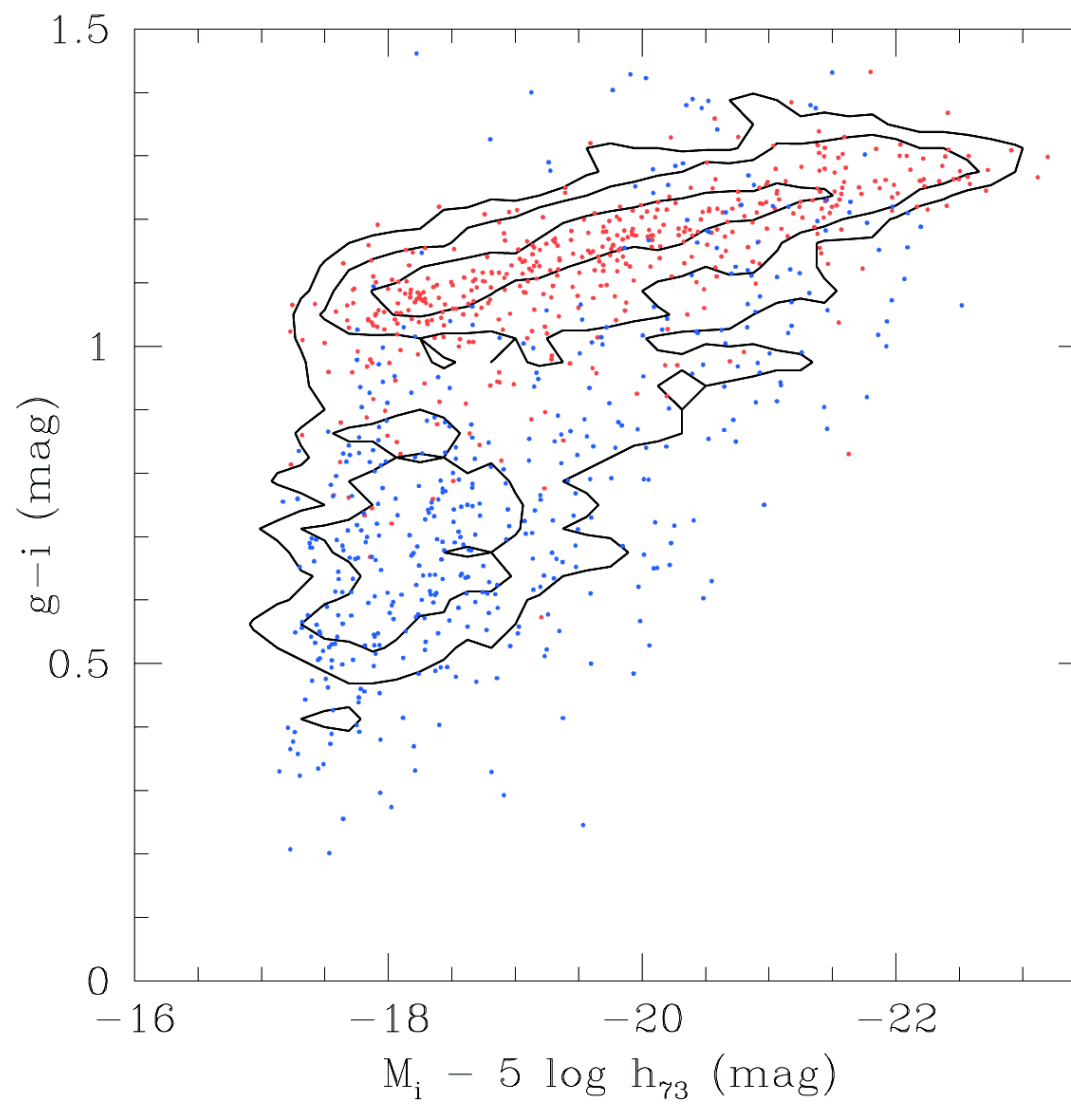
Early type



Late type

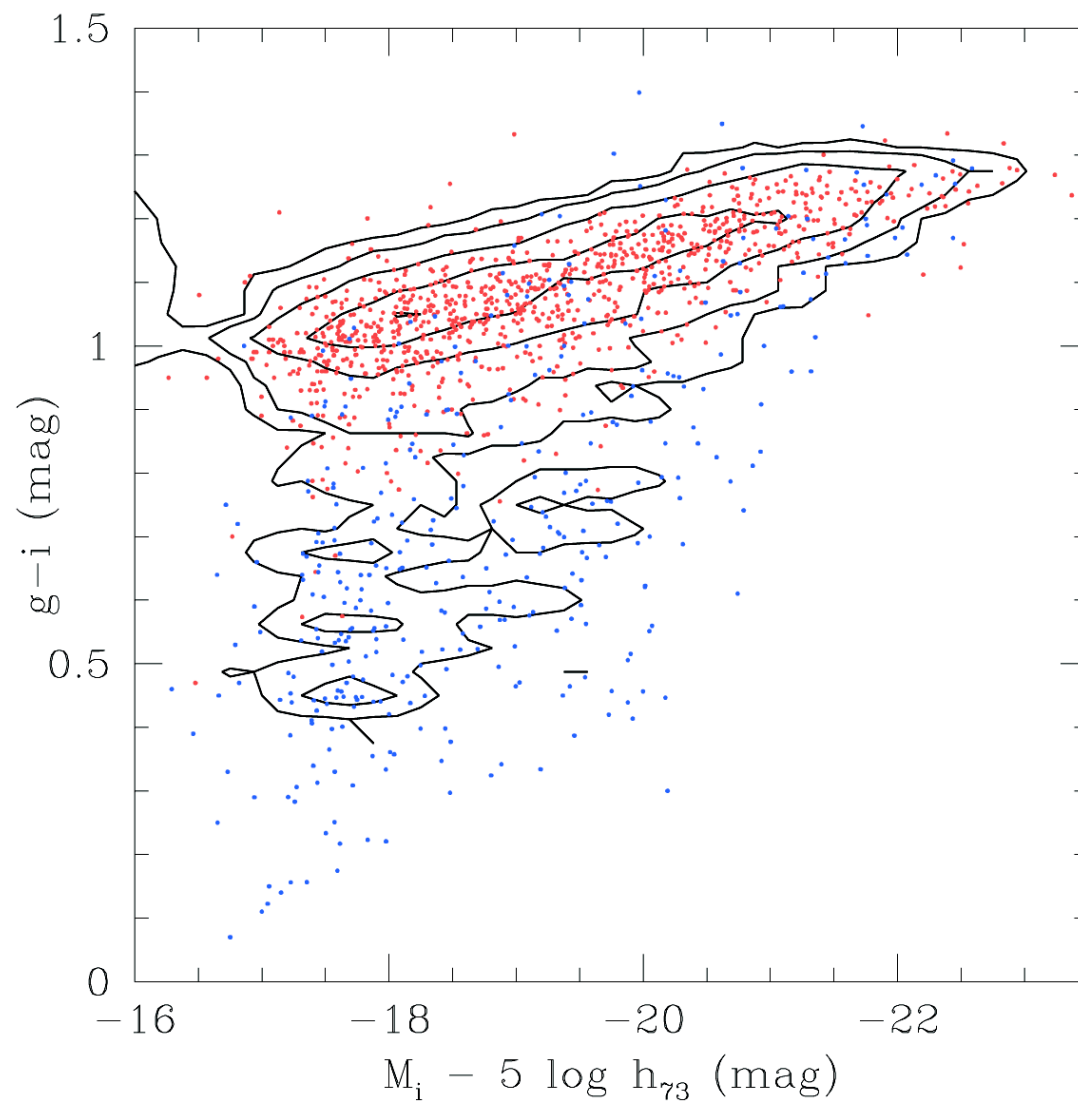


Color Magnitude



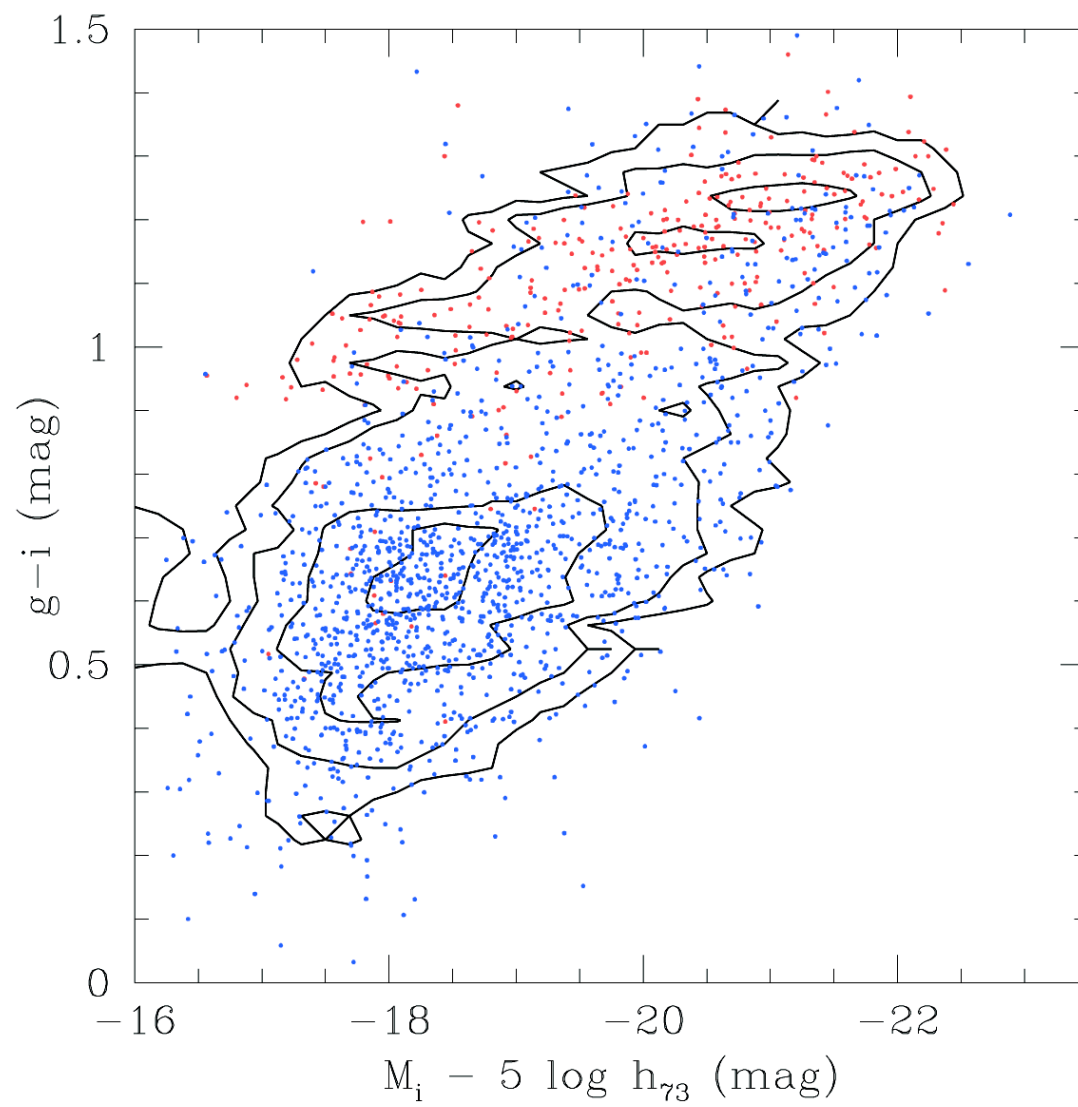
Groups

Color Magnitude



Clusters

Color Magnitude



Isolated

Conclusions

Environmental transformations occurring at present epoch in dense environments consist of effective removal of the HI gas from the outer parts of galaxies.

- 1) Their star formation is quenched due to exhaustion of fuel
- 2) dwarf (blue) galaxies that are currently falling onto clusters have SF quenched ($\Delta g-I=+0.5$) leading to their transformation from:

Irr-BCD **dE**
Low mass blue sequence -----> **(same) low mass red sequence**
(no mass growth) (Boselli+08)

Unlike mechanisms occurring at past epochs ($1 < z < 2$) that were effective at shaping the galaxy sequence at high luminosity (cold streams...merging ...downsizing),
irrespective of the environment

