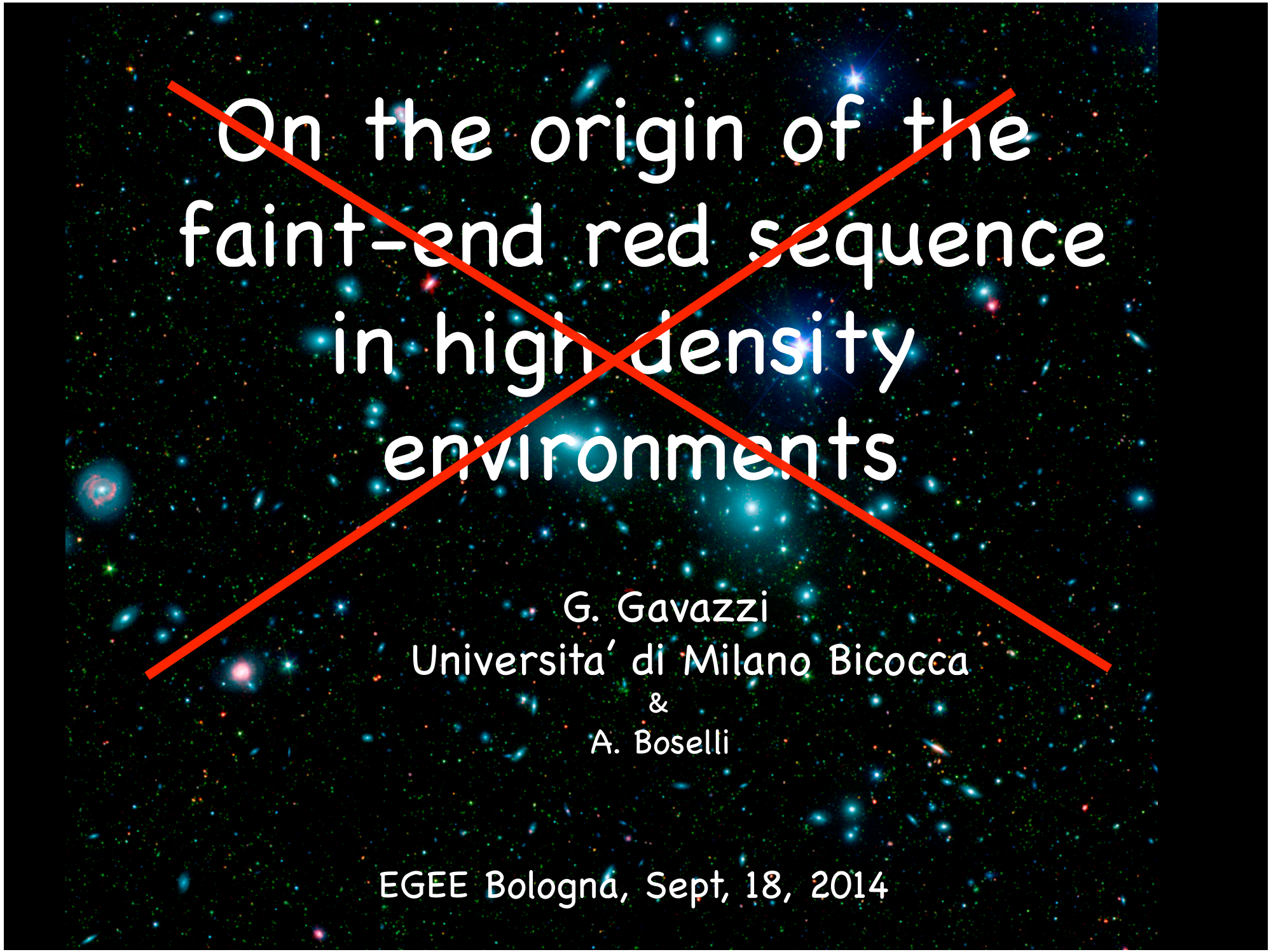
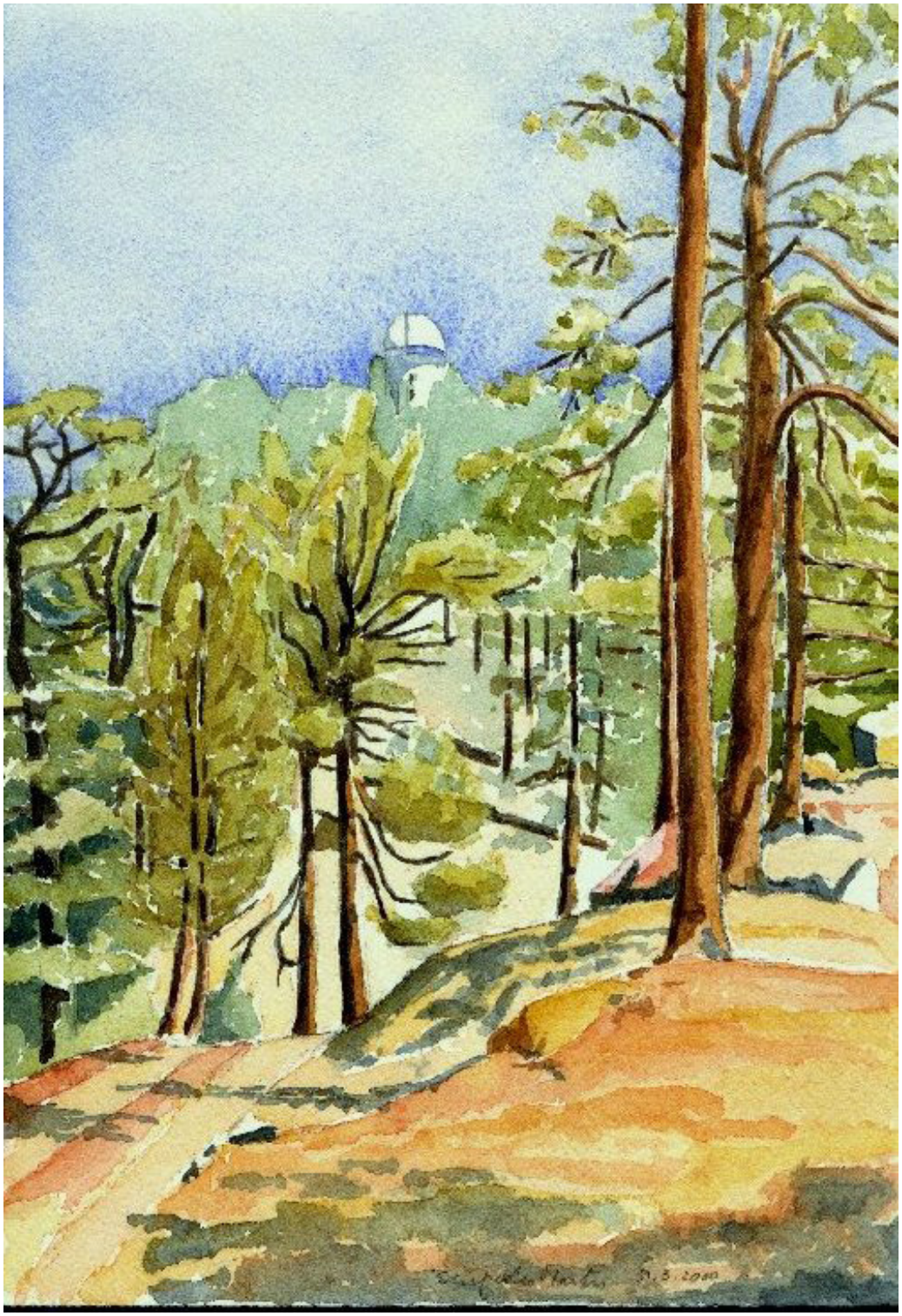

On the origin of the faint-end red sequence in high density environments
G. Gavazzi
Universita' di Milano Bicocca
&
A. Boselli
EGEE Bologna, Sept, 18, 2014



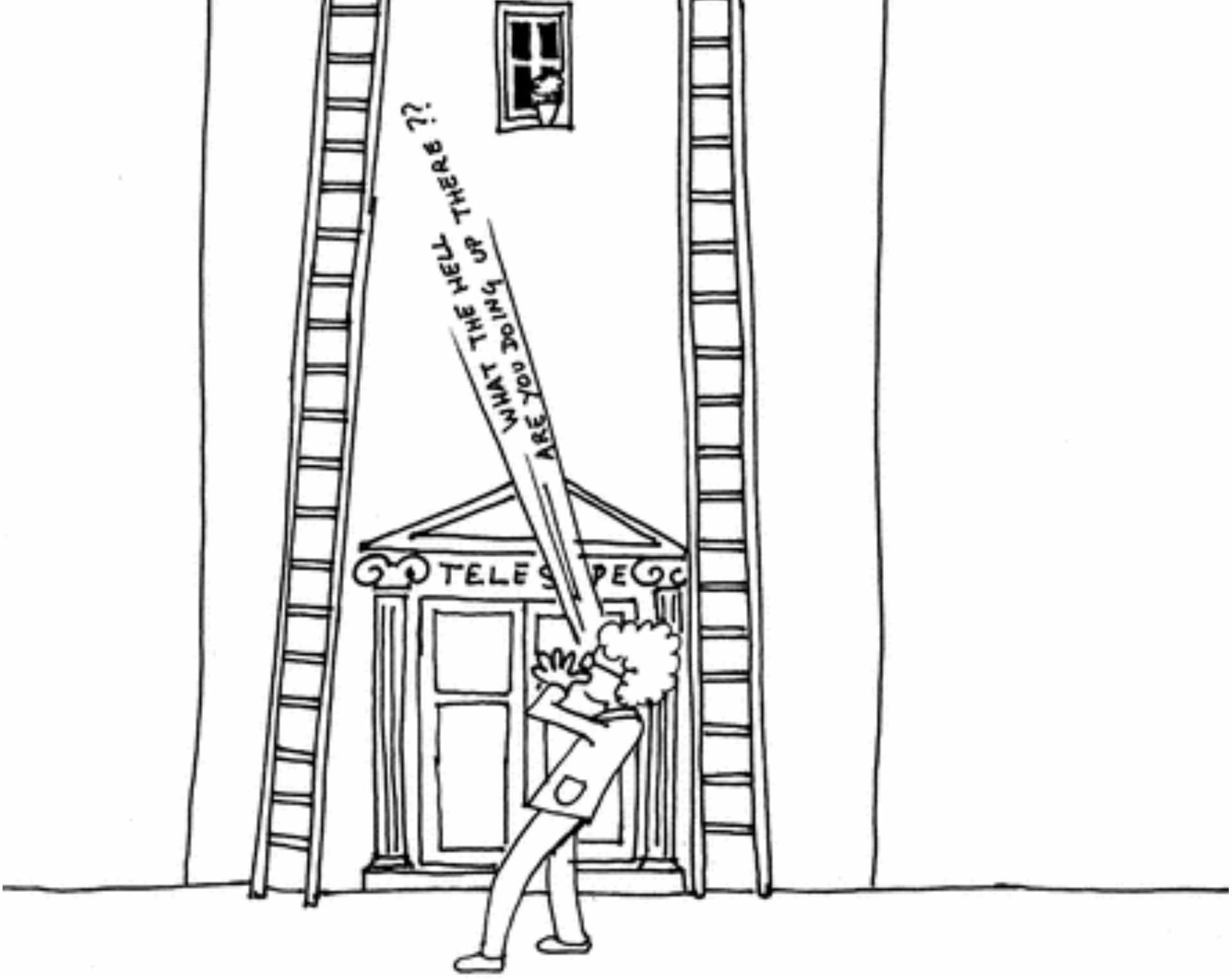
"Smoking guns in Local (z=0) clusters"

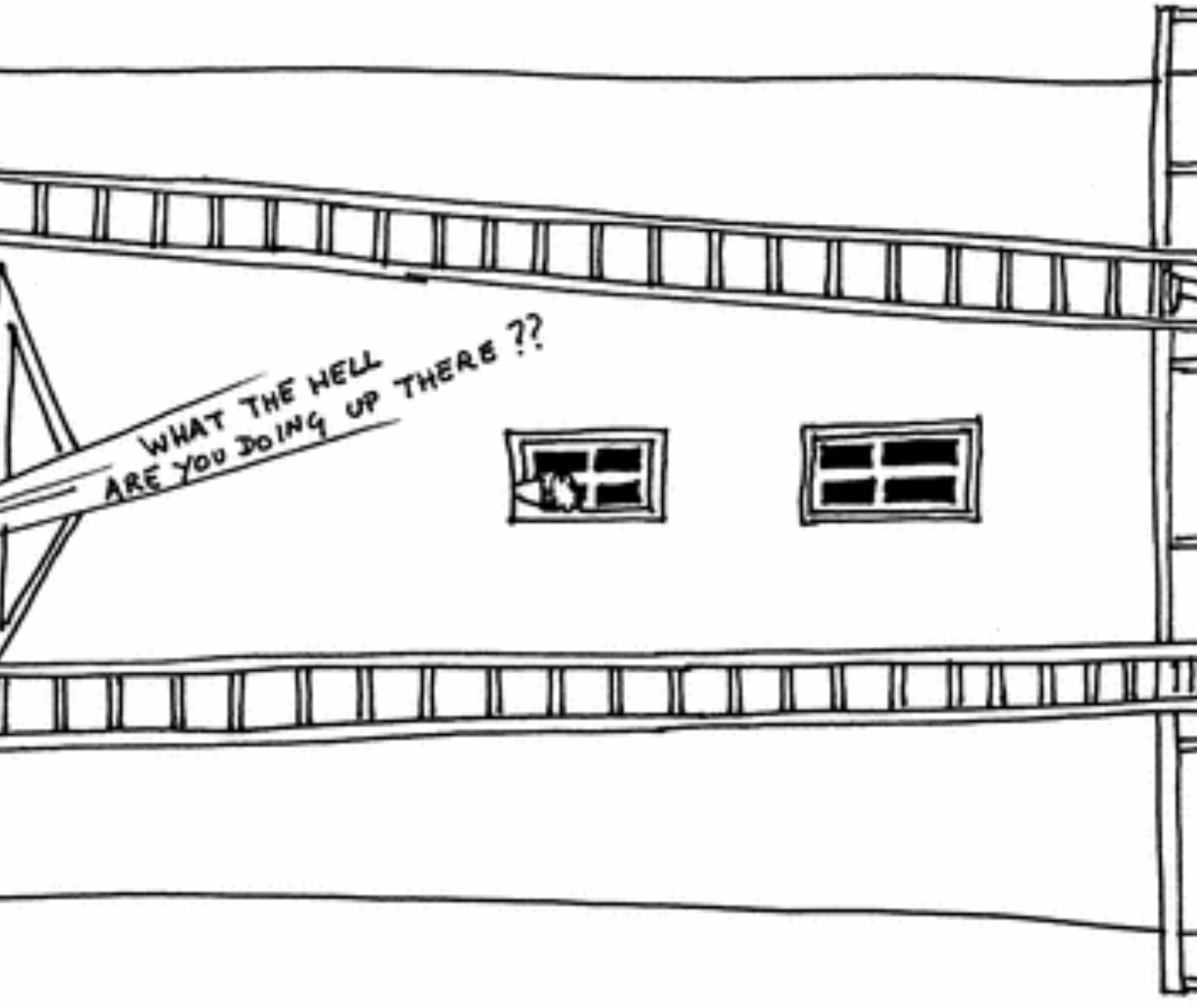
G. Consolandi, M. Fossati, M. Fumagalli, A. Boselli, M. Yagi, M. Yoshida

- I tool

- Significant infall of satellites on galaxy clusters
exists up to z=0.

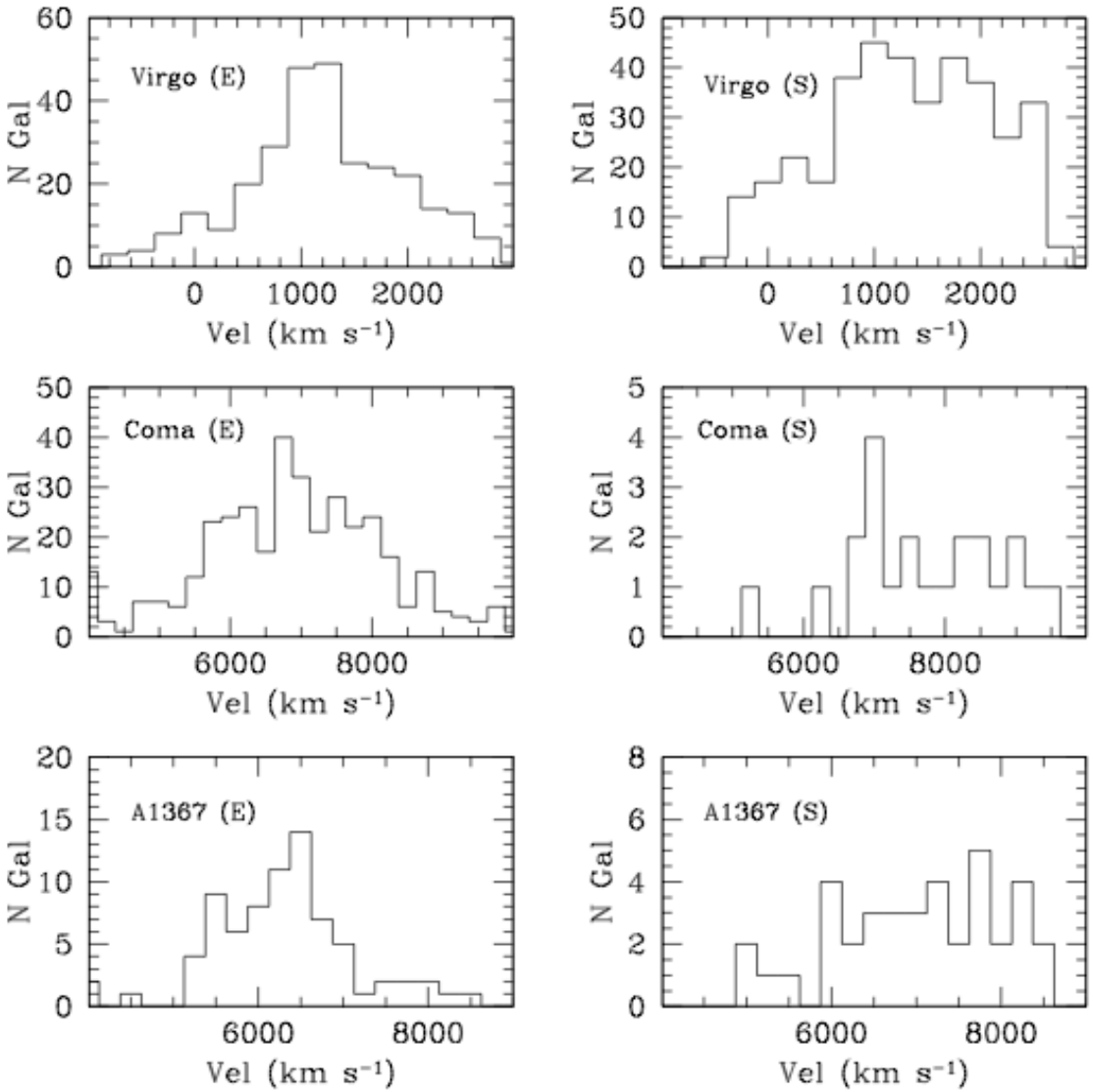
.... click on your favourite cosmological simulation


WHAT THE HELL ARE YOU DOING UP THERE ??


WHAT THE HELL
ARE YOU DOING UP THERE ??


WE WERE TOLD TO STICK UP A ΛCDM SIMULATION... IT'S MORE "CONCORDANT" AND A LOT CHEAPER.

I tool Velocity anisotropy

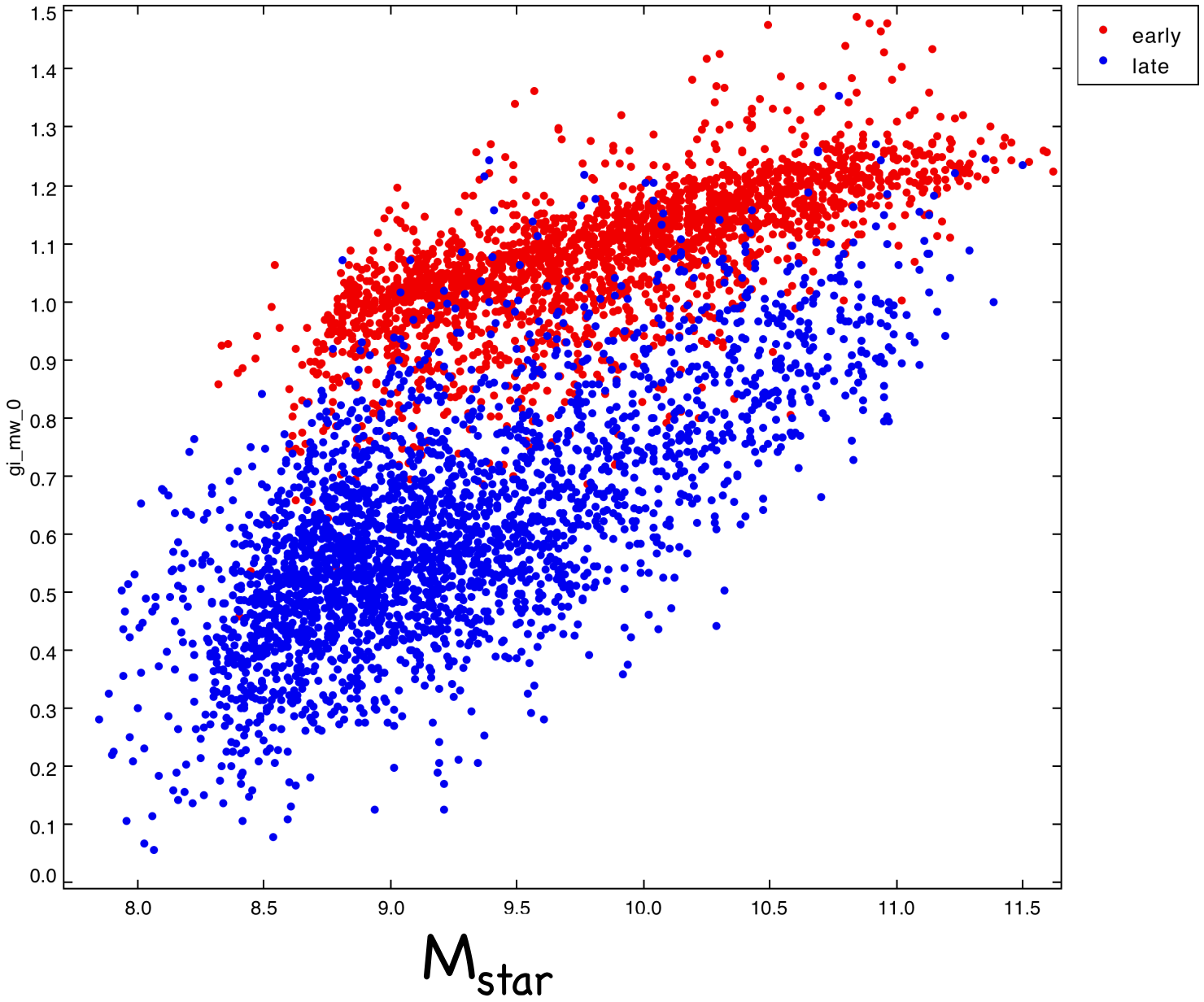


... galaxy infall..

II tool: the color/mass relation

SDSS

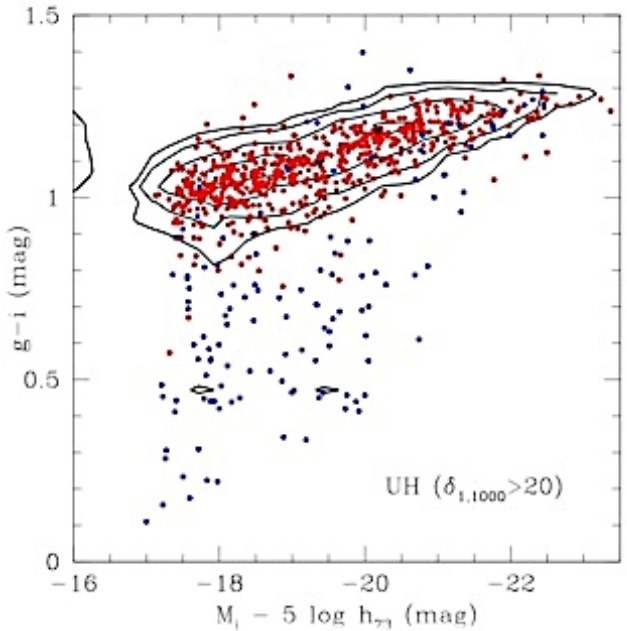
$g-i_o$

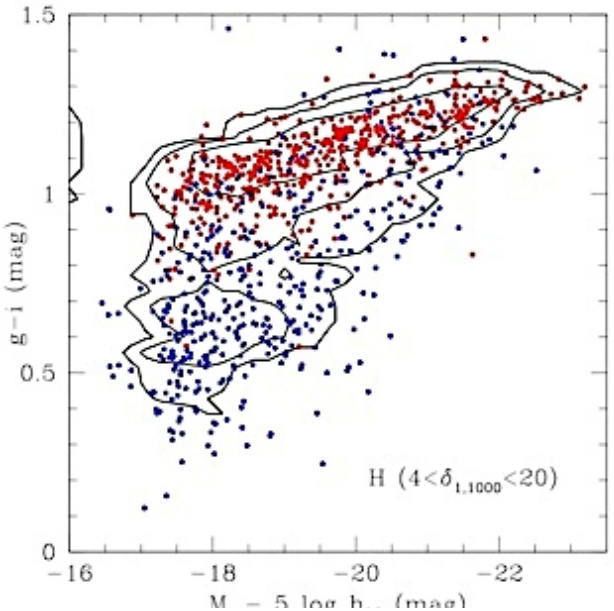


M_{star}

Density slices (Gav+10)

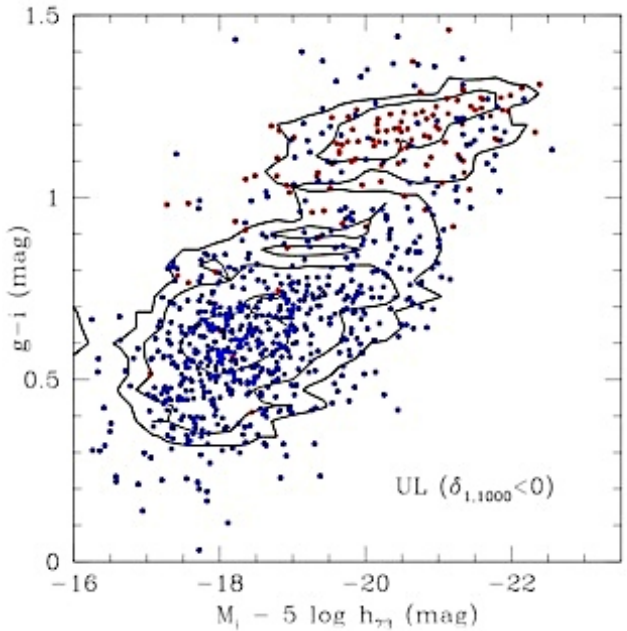
Cluster Cores

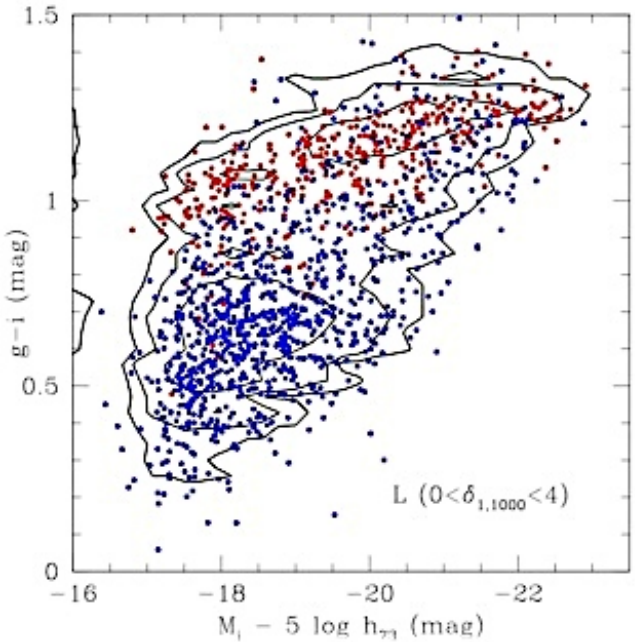




Groups & Cluster Oustkirts

Isolated

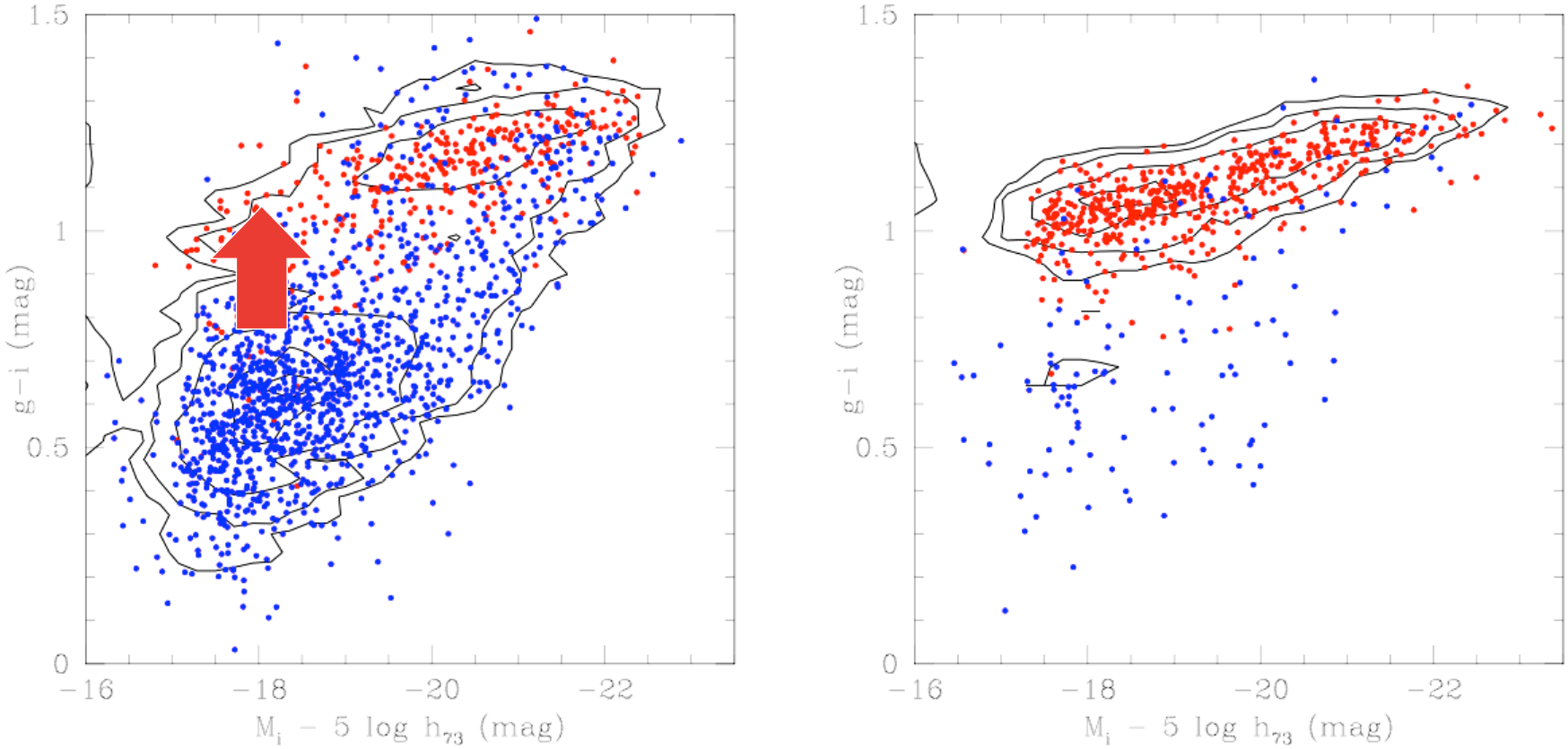




Loose Groups

field

clusters



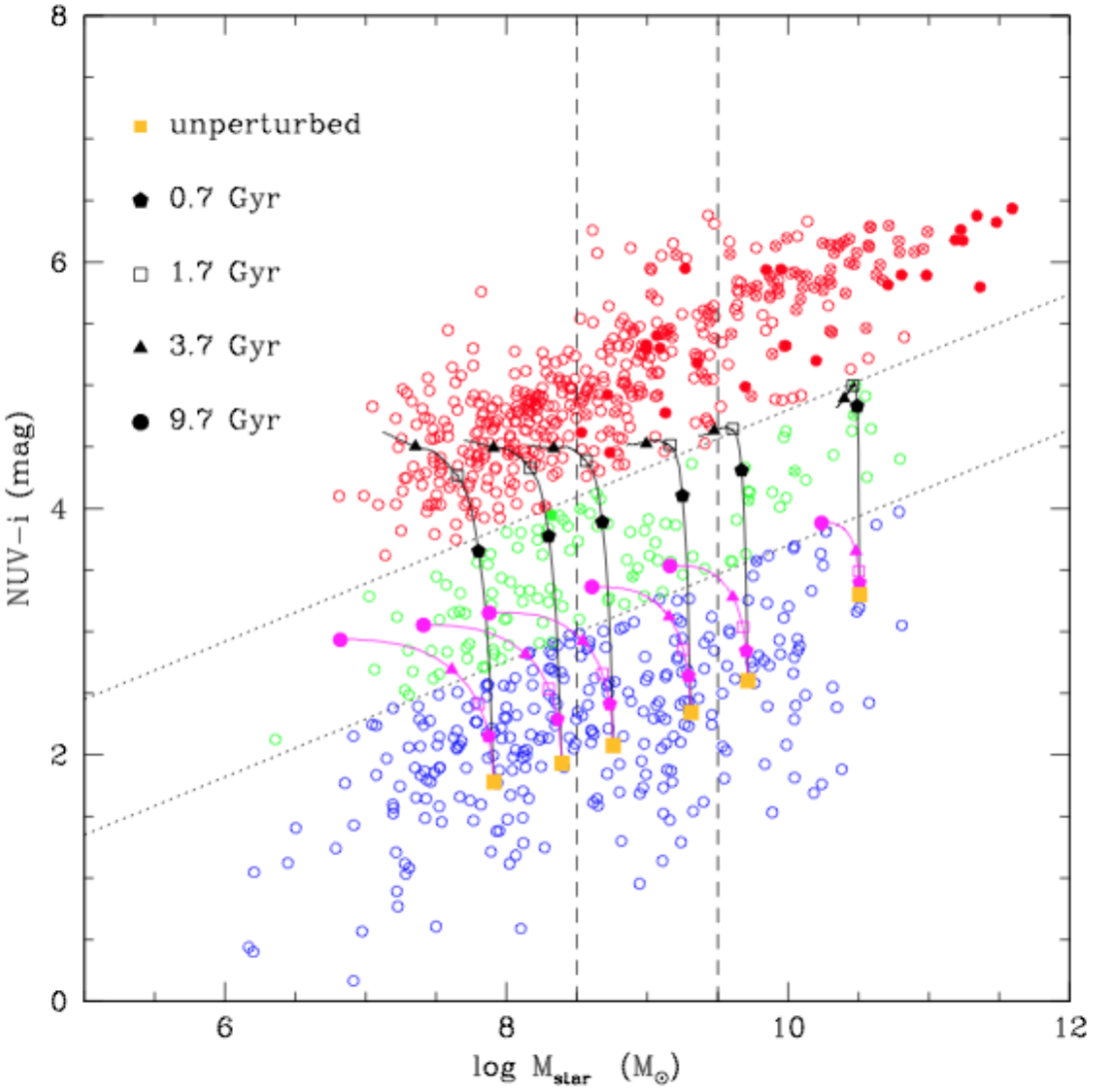
•Infall of galaxies from the cosmic web into clusters (and groups) produces quenching of star formation, thus their transformation from late (blue) to early (red) sequence.

•At z=0 the process affects mainly low-mass systems

•In clusters the quenching of star formation takes place on short timescale

(Gav+10)

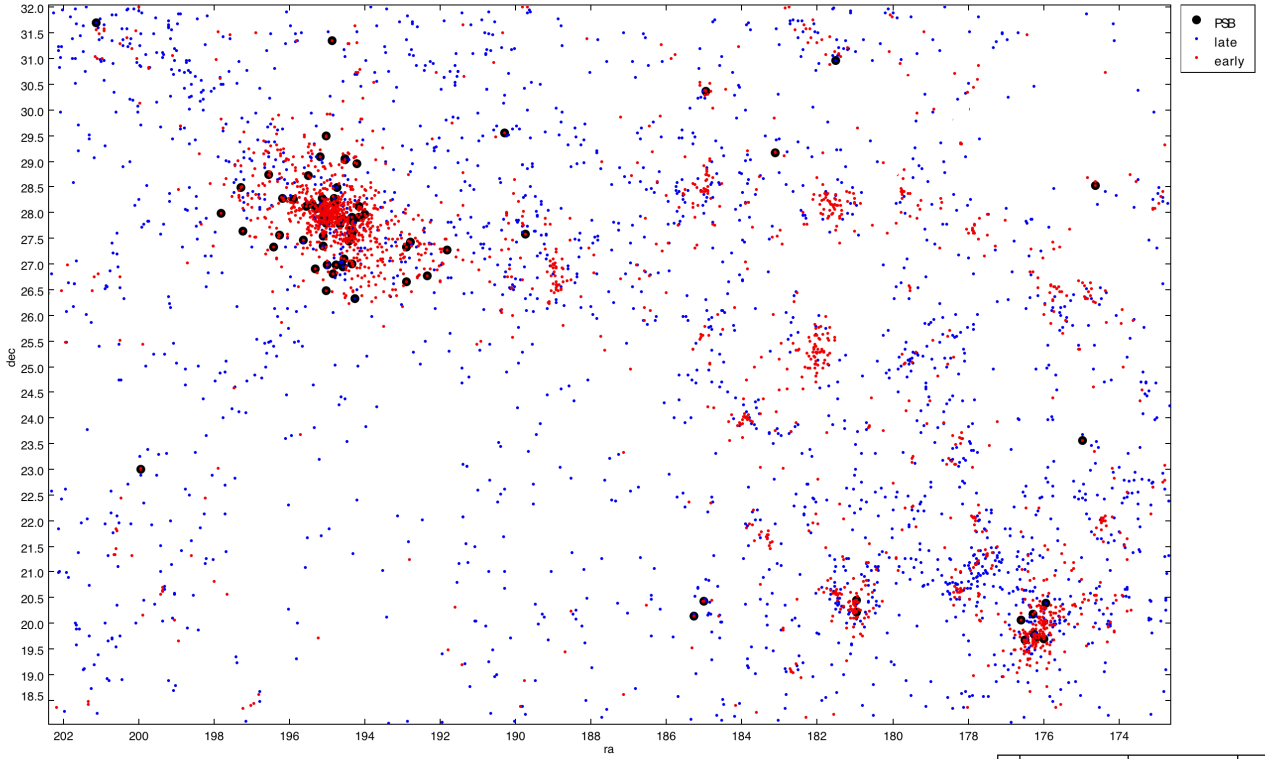
III tool: Models



Black lines: Ram pressure

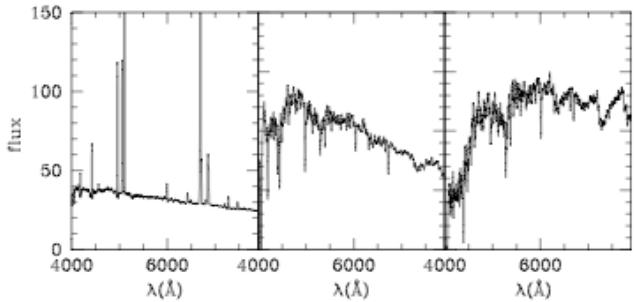
magenta lines: starvation

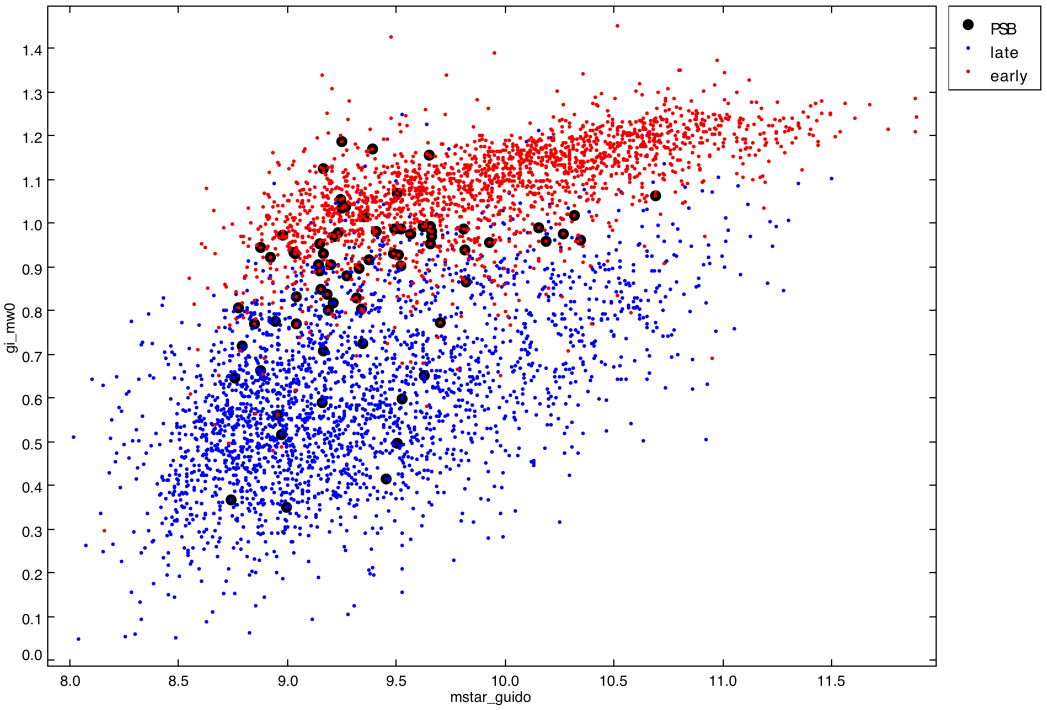
(Boselli+Boissier+14)



PSB

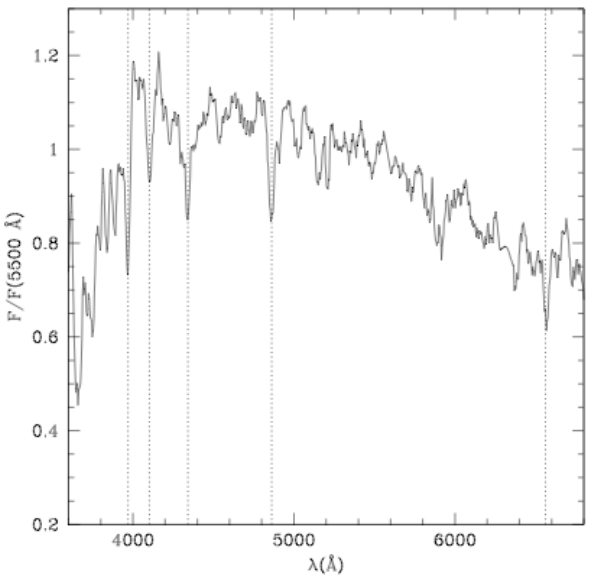
BCD PSB dE





VCC1217

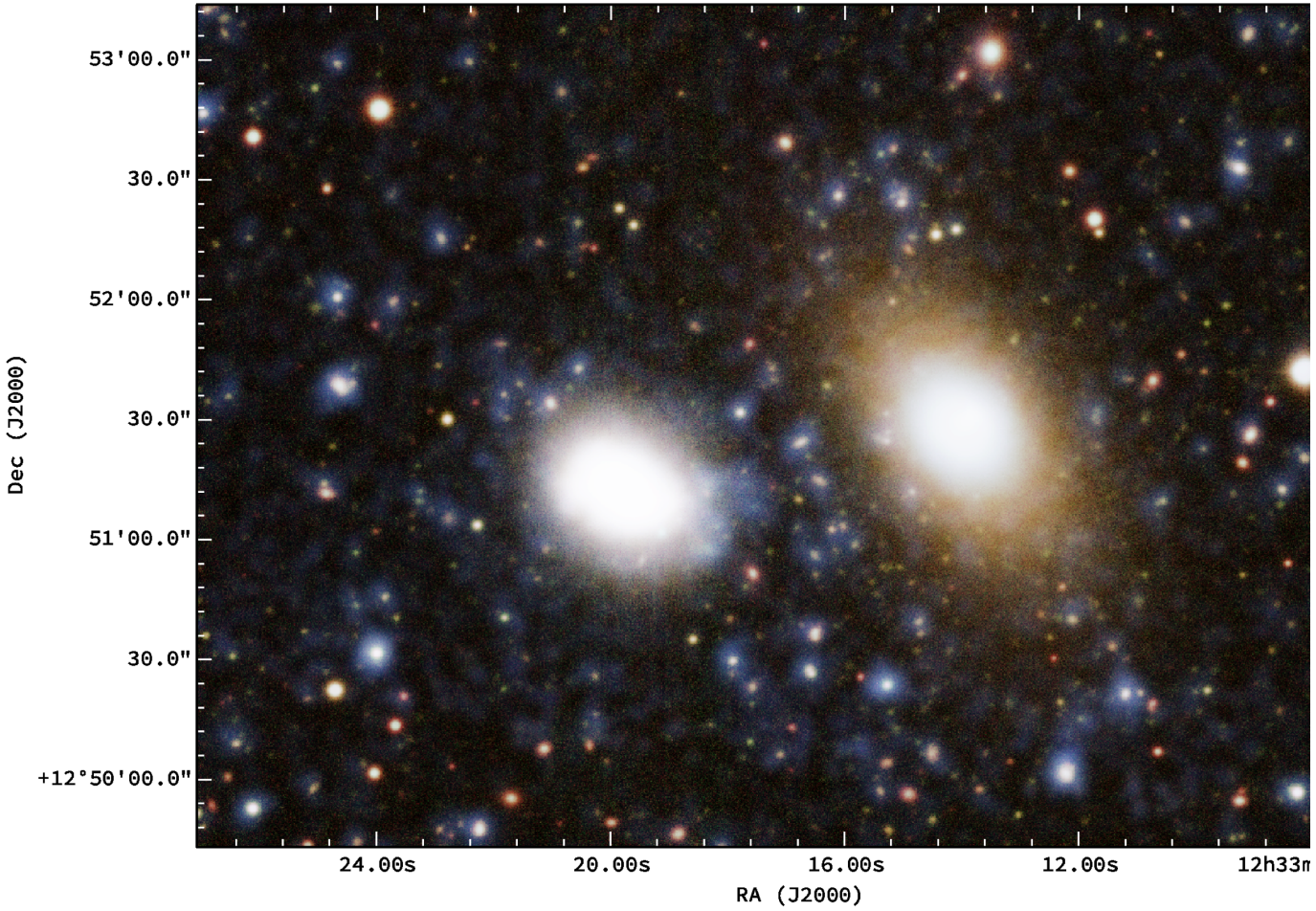
Fumagalli+11
Hester+10

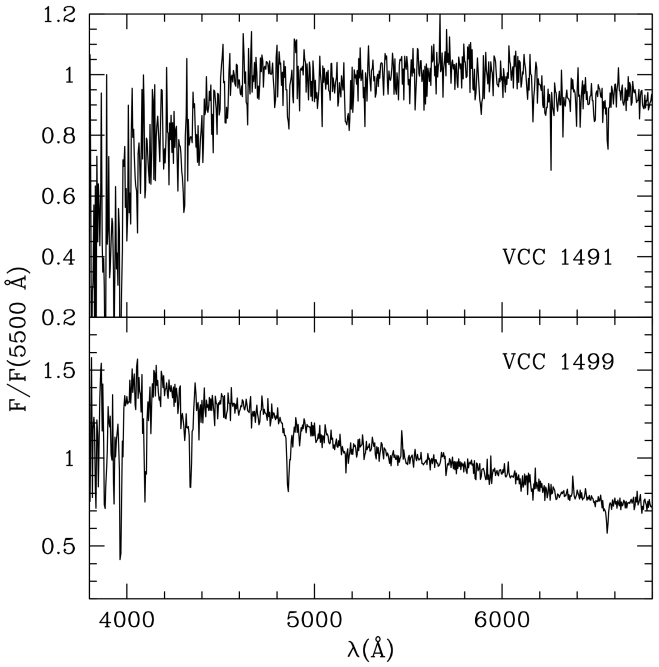


VCC 1491+1499

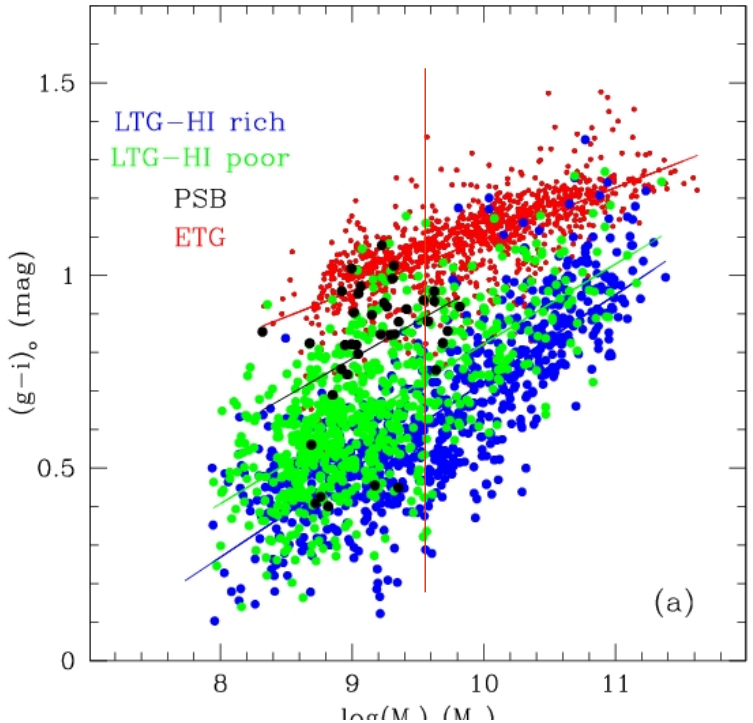
Large fraction of dEs in Virgo are fast rotators with TF similar to spirals of similar Vrot

Toloba et al. (2009, 2011)

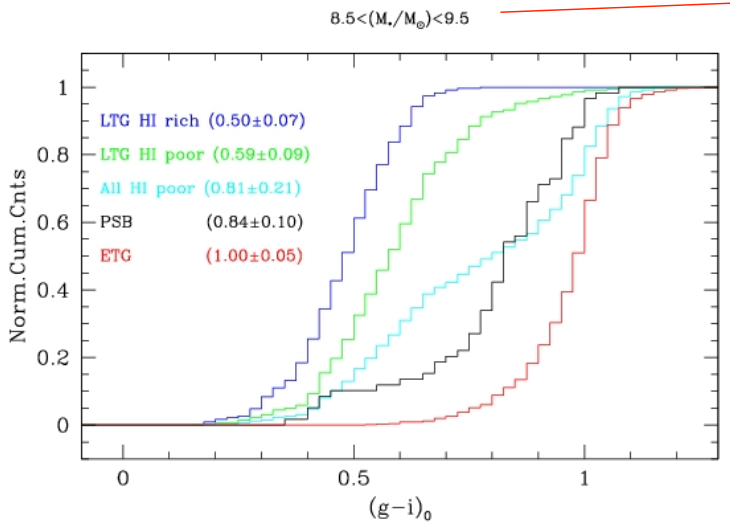




IV tool: gas content



(Gav+13)

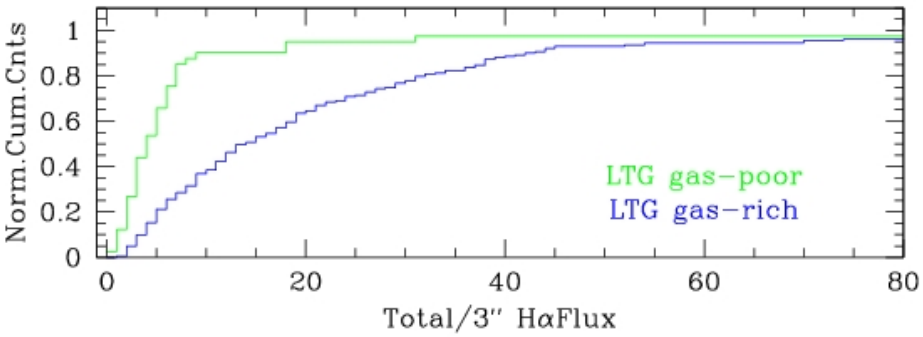


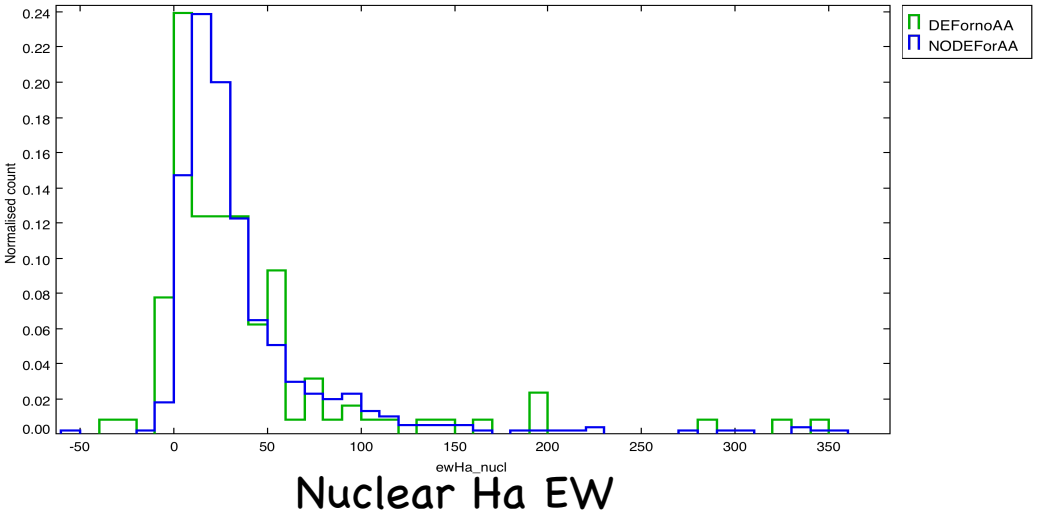
remark !!!

$M_* \leq 10^{9.5}$

For massive galaxies this pattern dosen't hold !!!!

Star formation radius





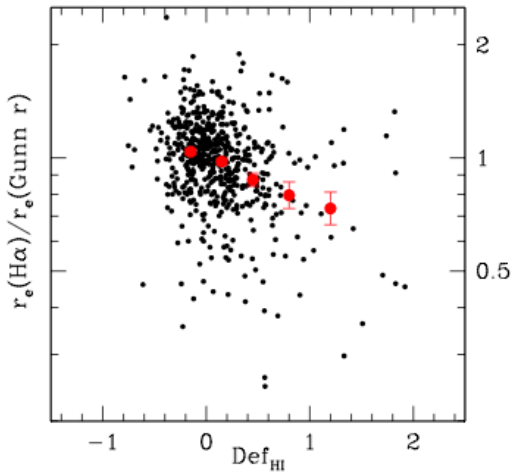
Nuclear Ha EW

Ha sources are significantly smaller in HI poor LTGs (nuclear)

....But nuclear SF is as high in HI rich & poor LTGs

Even strongly gas deficient LTGs retain some nuclear star formation:
The gas truncation proceeds outside-in

(Gav+13)



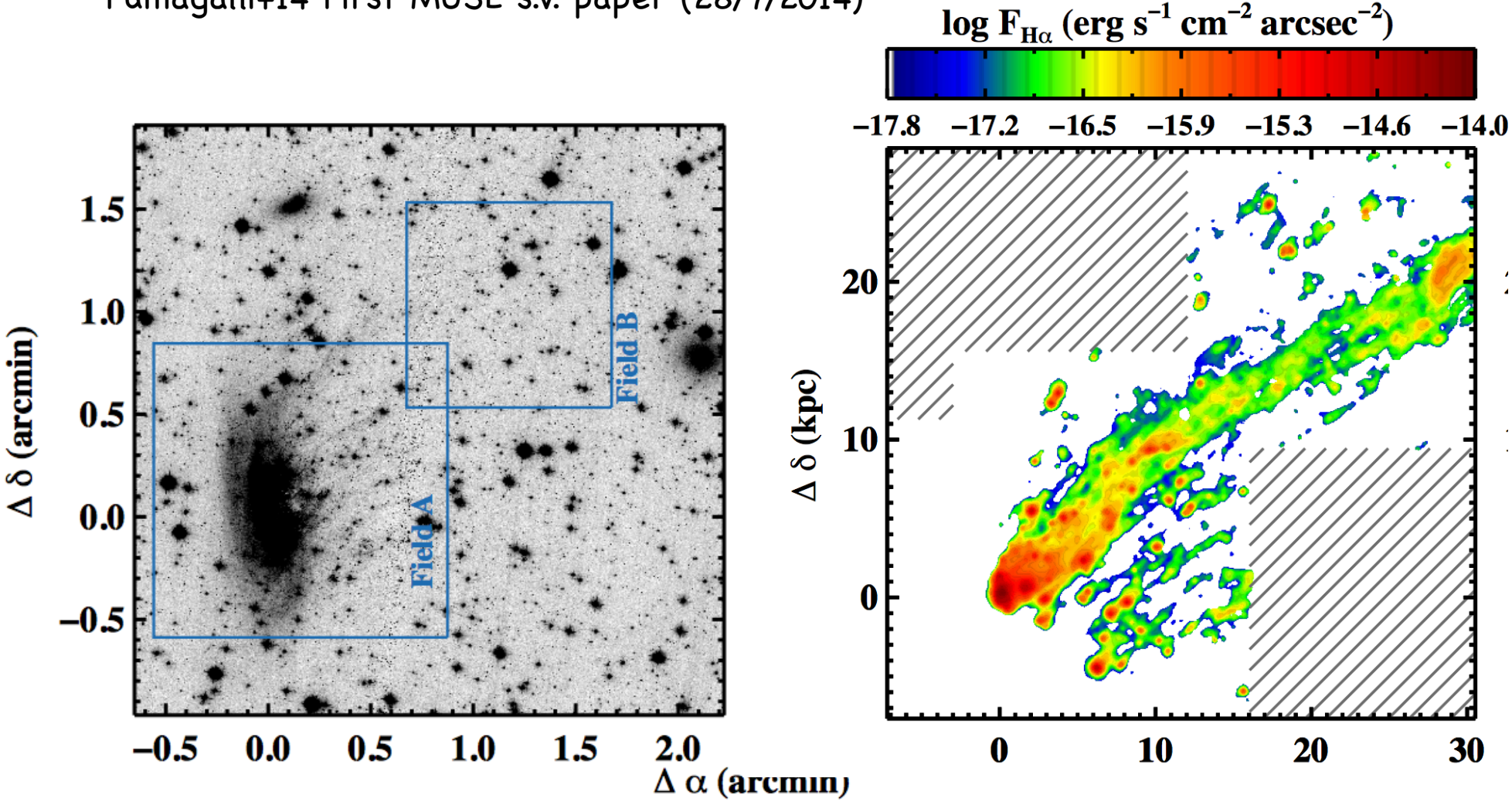
(Fossati+13)

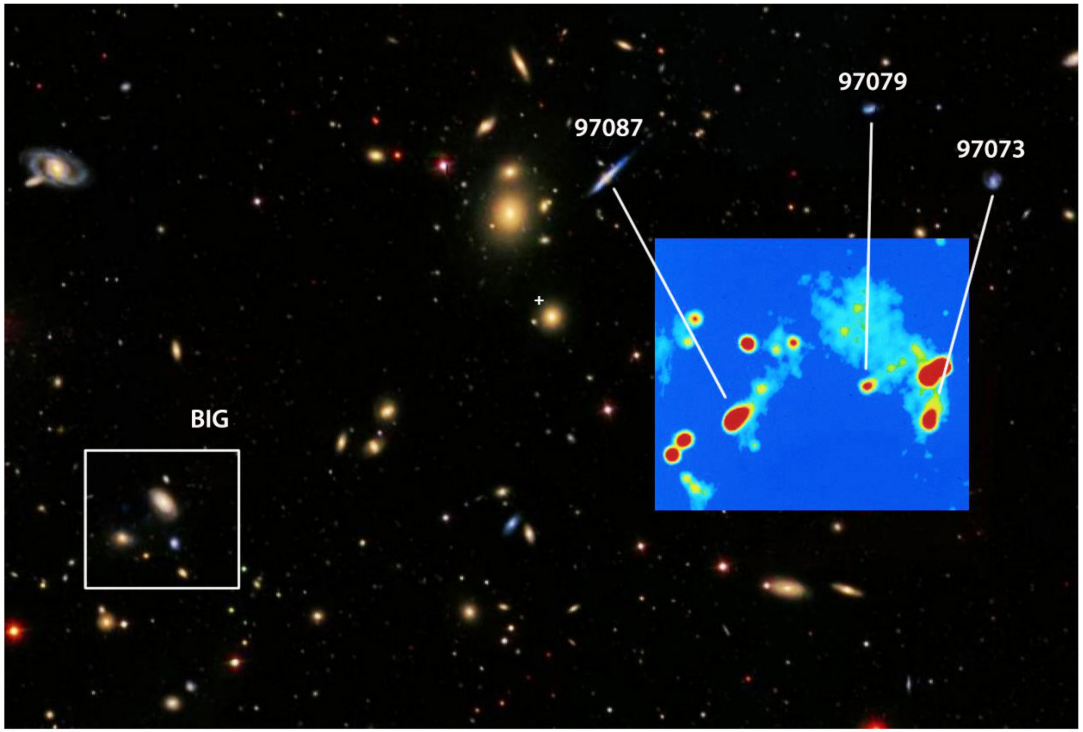
Signature of ram-pressure

Smoking guns

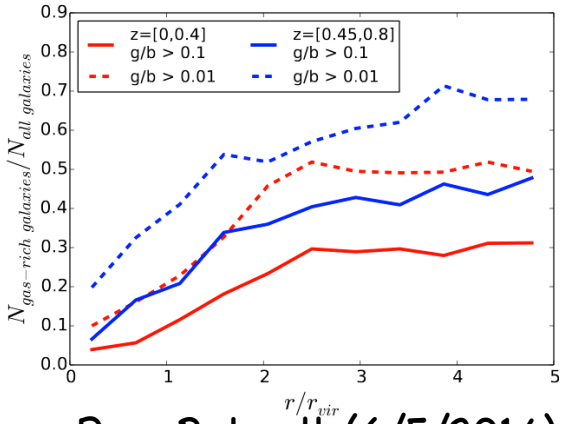
ESO137−001 in Norma cluster

Fumagalli+14 First MUSE s.v. paper (28/7/2014)

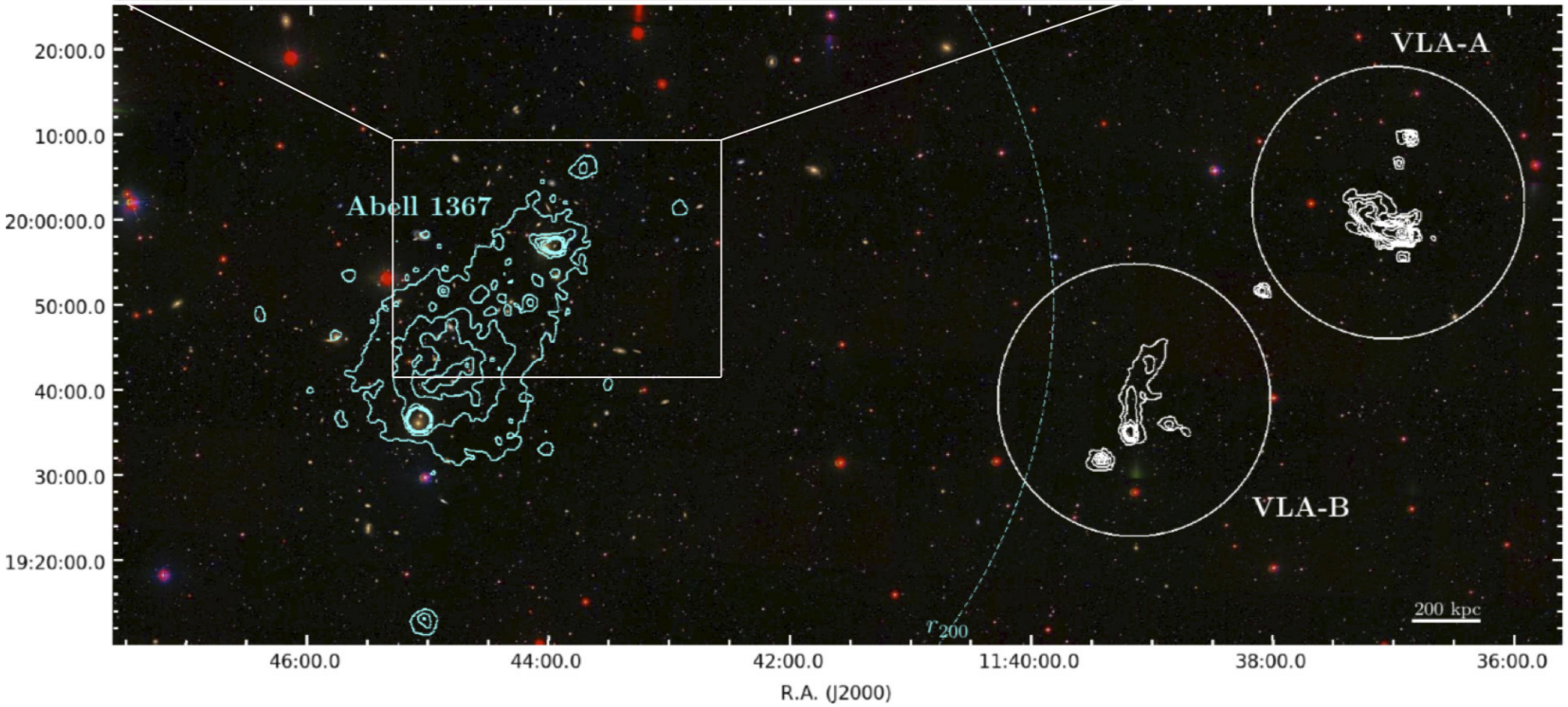




A1367

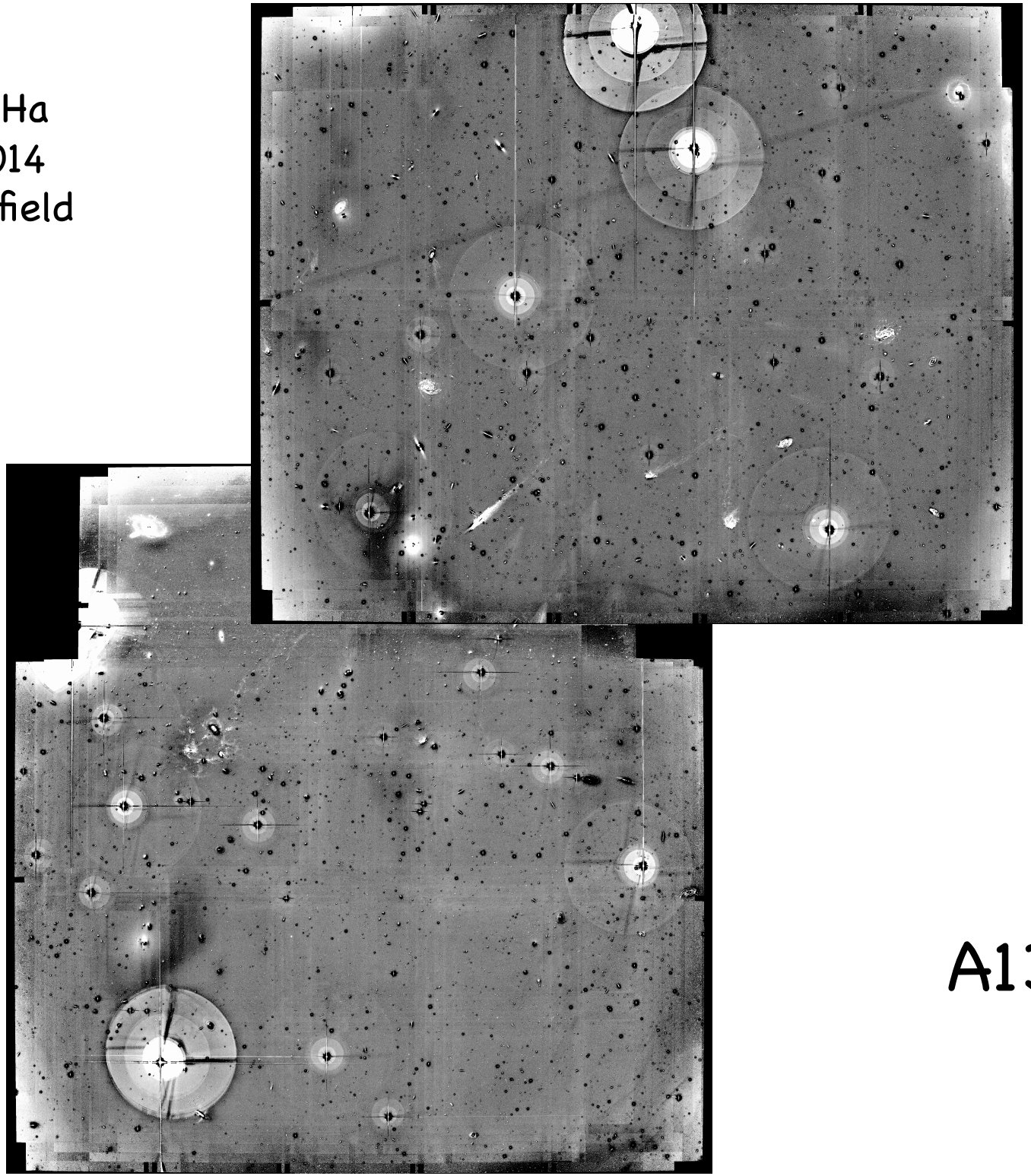


Cen, Pop, Bahcall (6/5/2014)



Scott+2012

Subaru Ha
April 2014
3h per field



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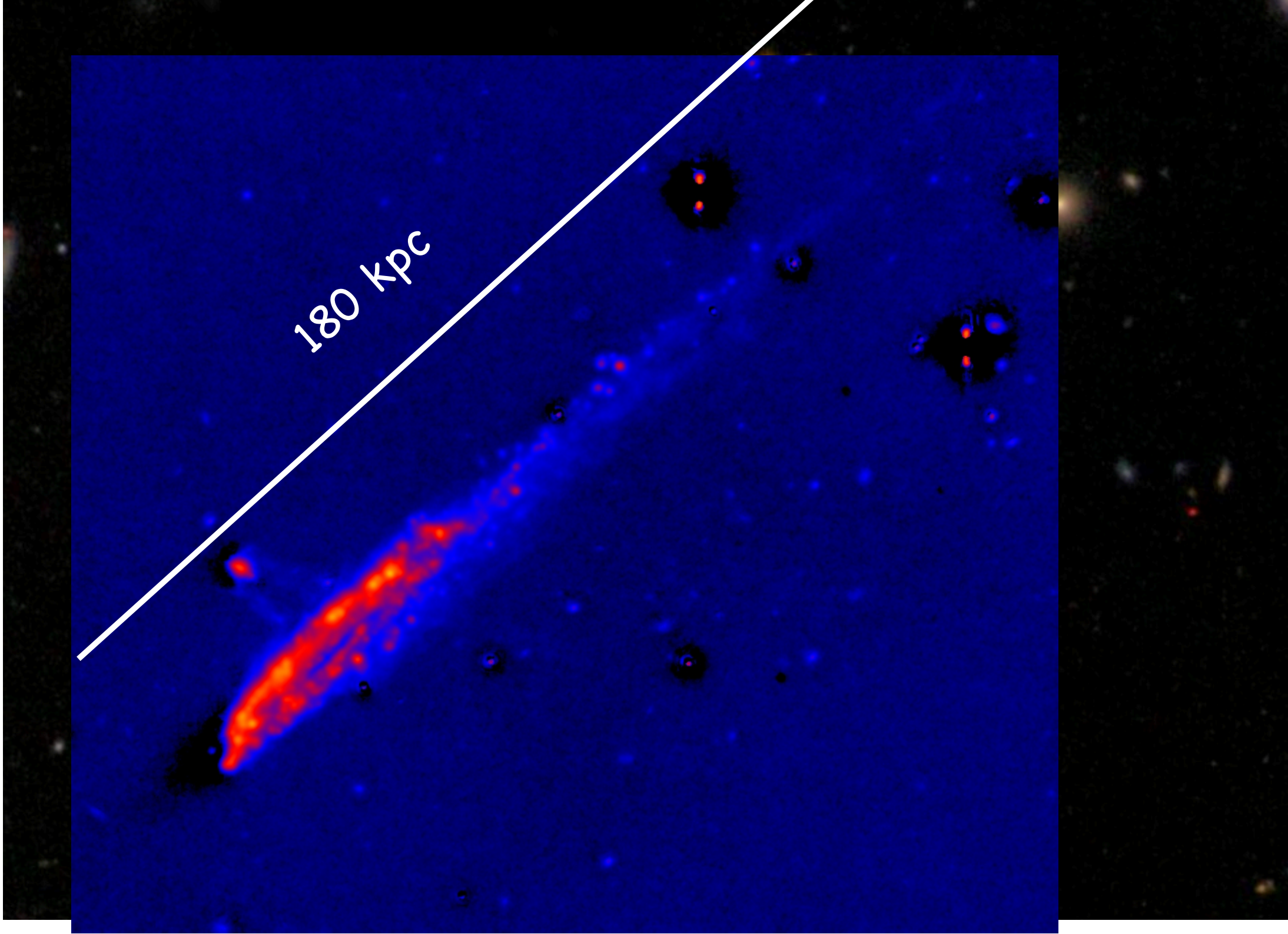
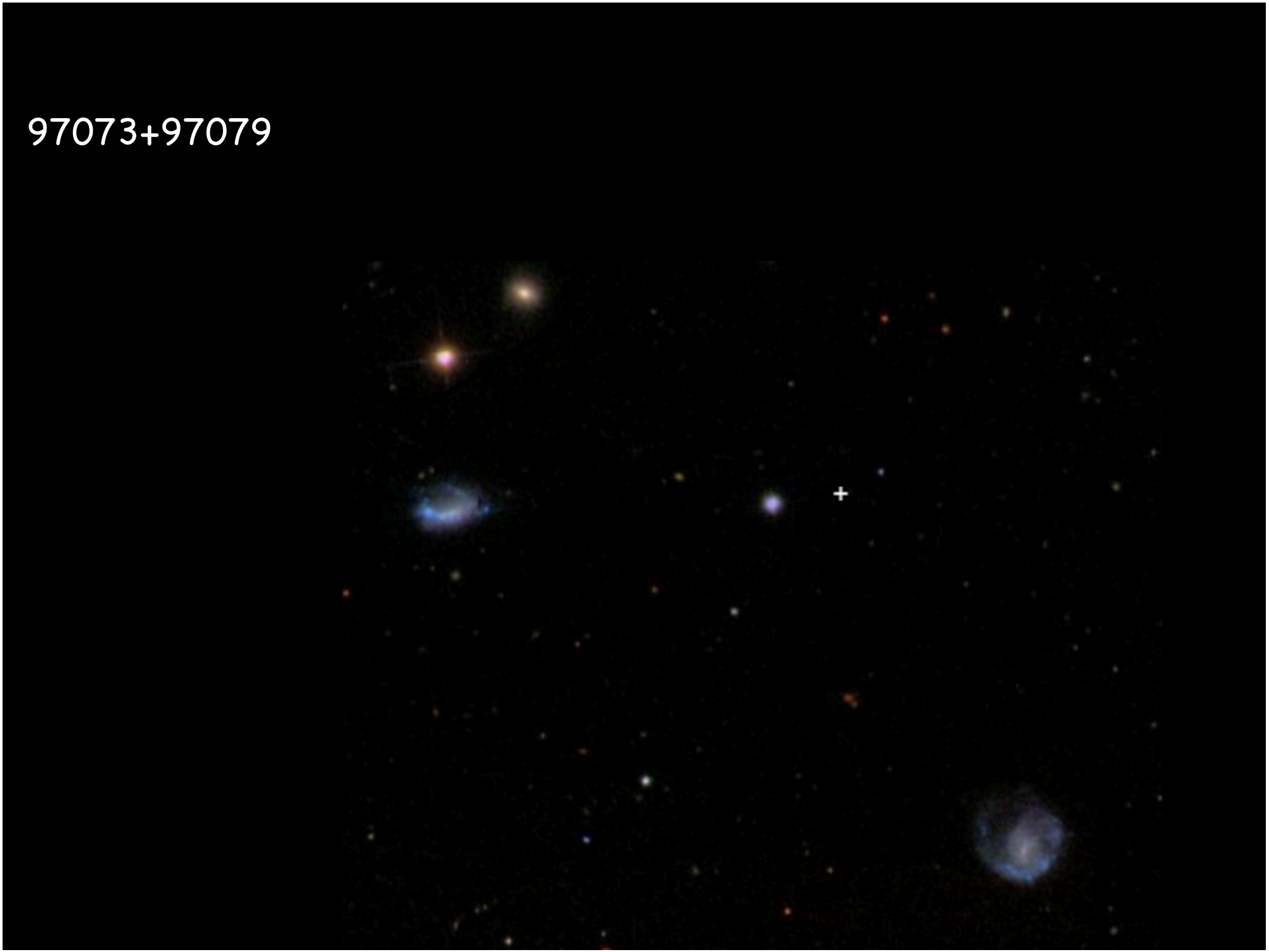
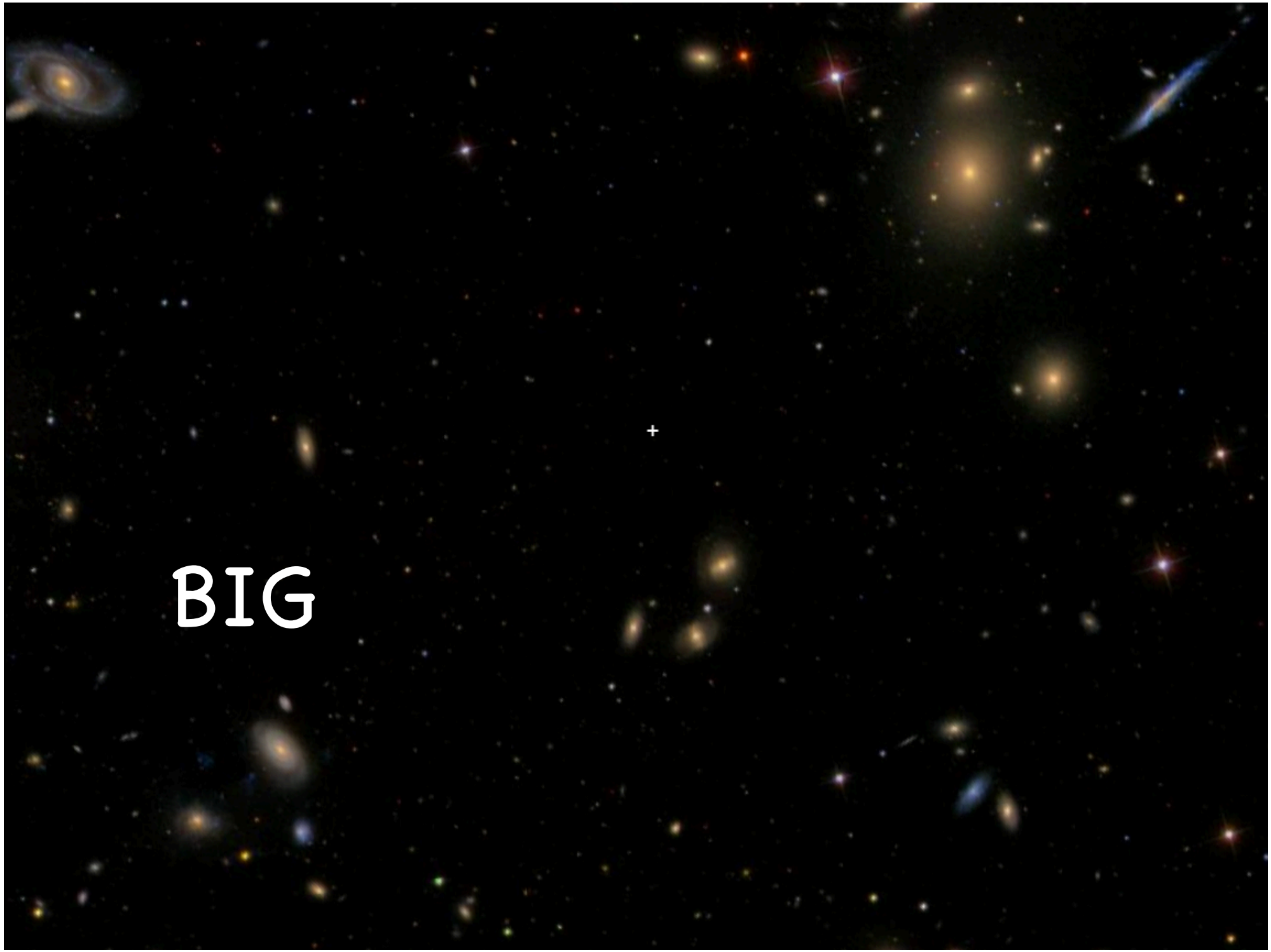
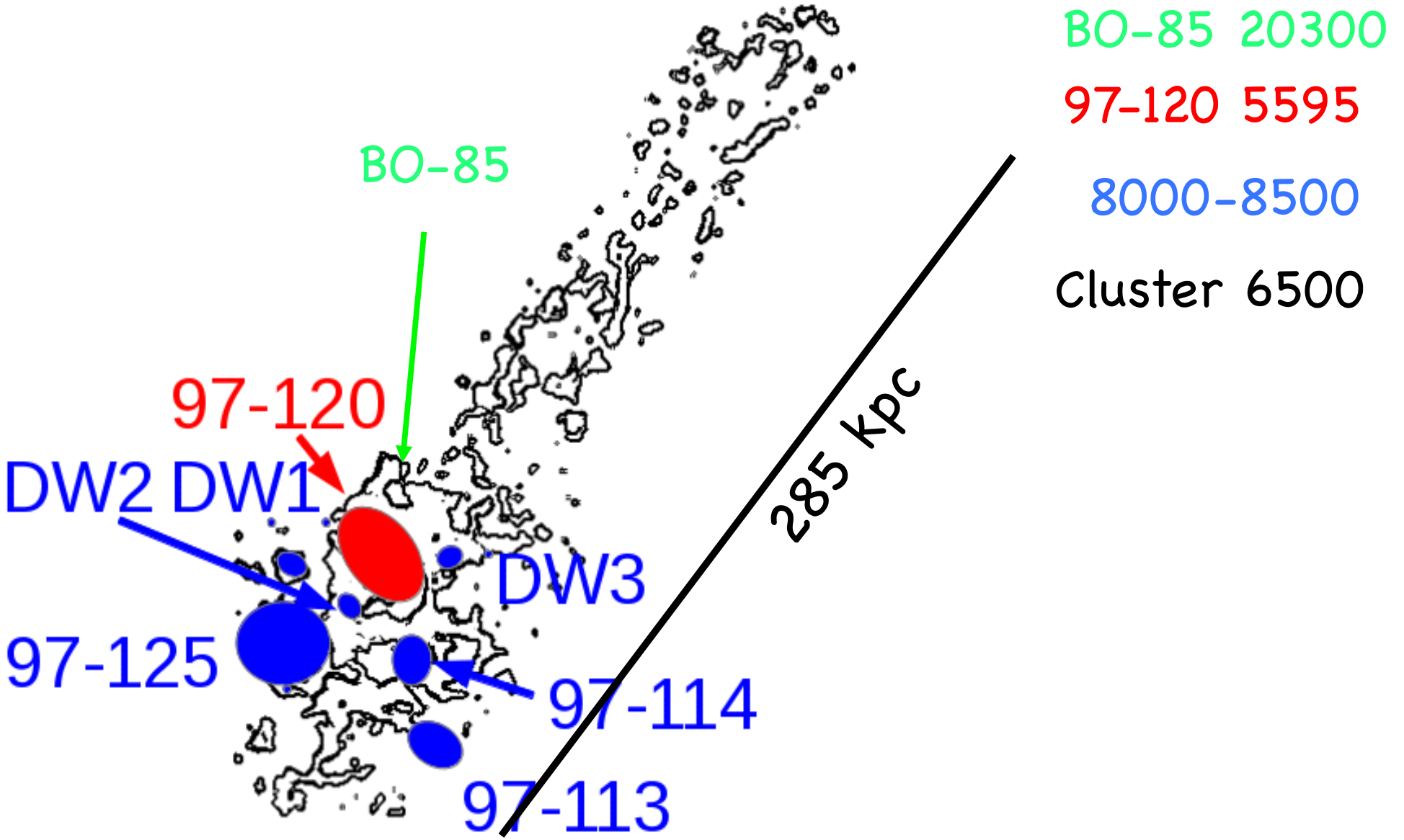
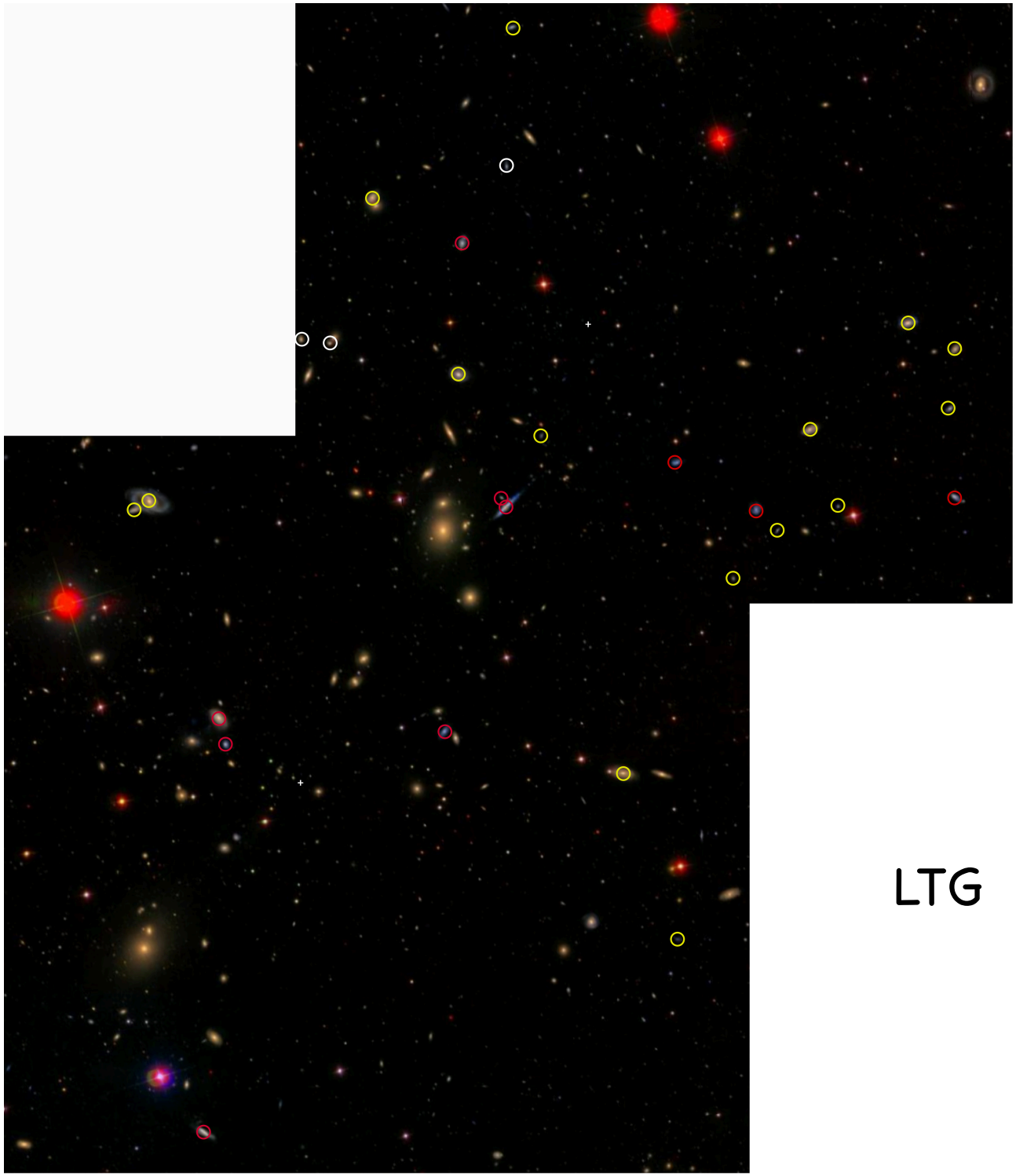

180 kpc


97073+97079


BIG


BIG
BO-85 20300
97-120 5595
8000-8500
Cluster 6500
BO-85
97-120
DW2 DW1
DW3
97-125
97-114
97-113
285 kpc



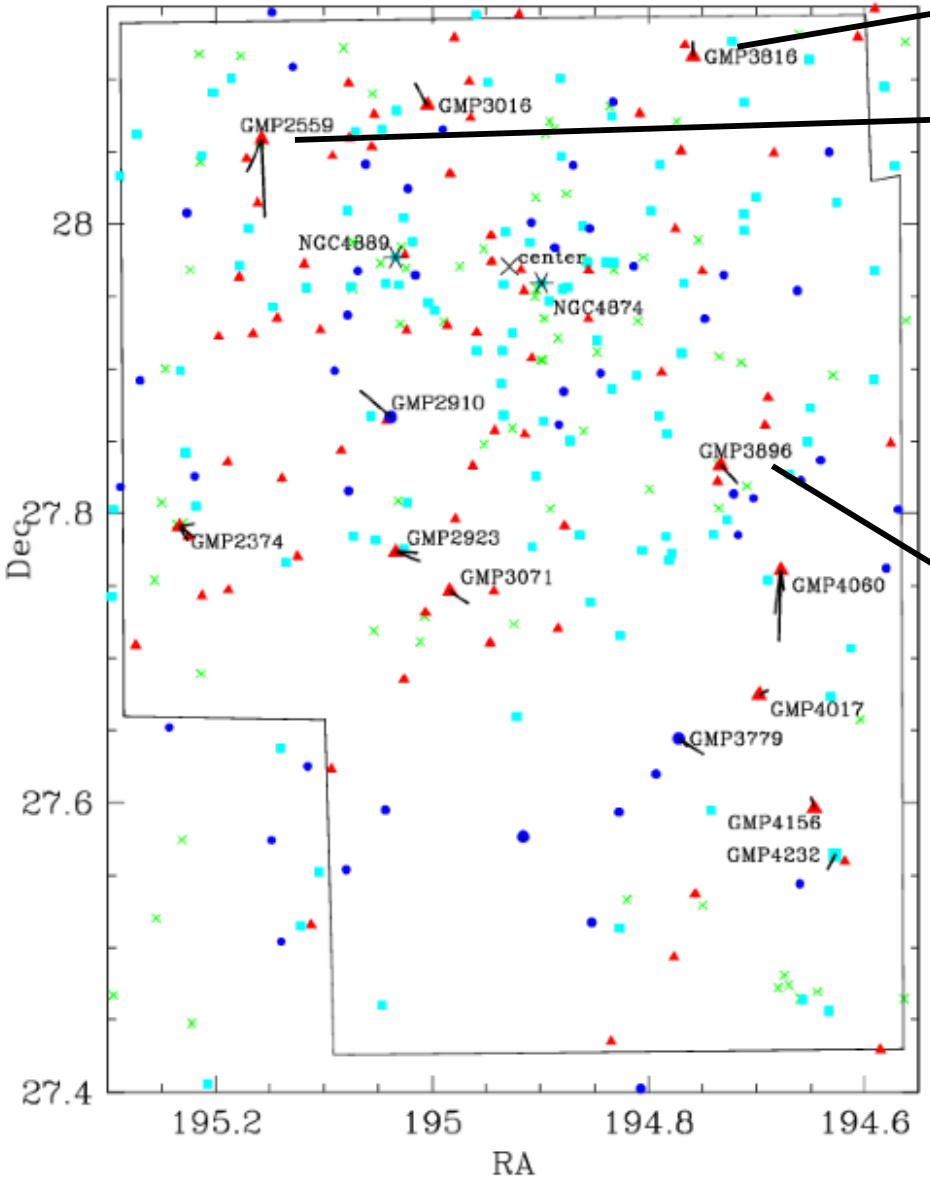
A1367

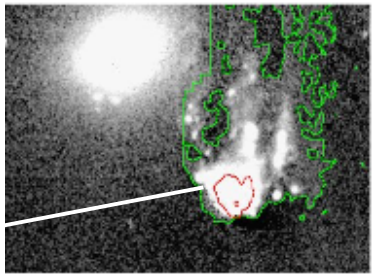
LTG

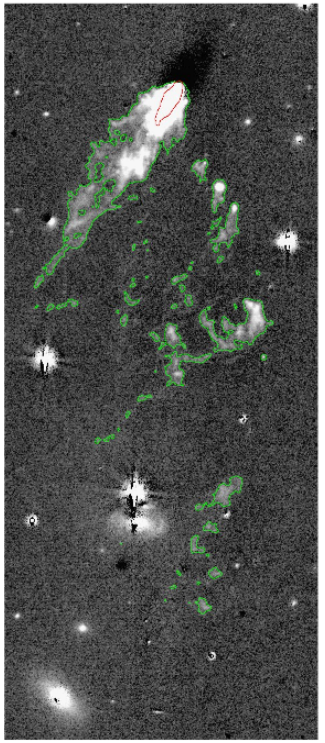
cometary

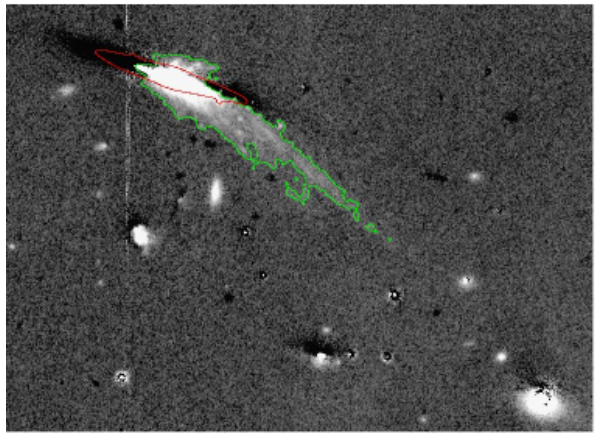
No cometary

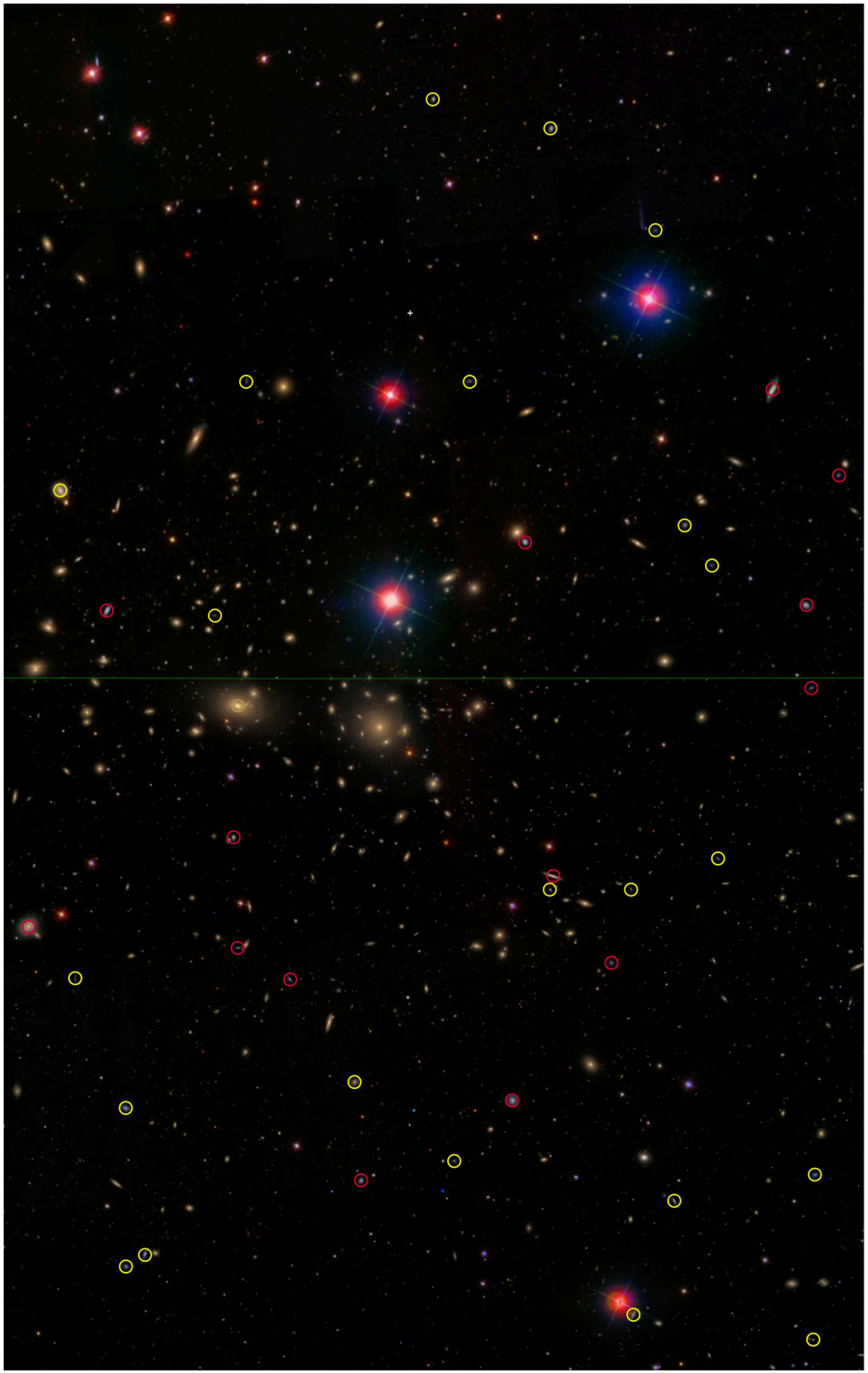
Coma Subaru (Yagi+10)











coma

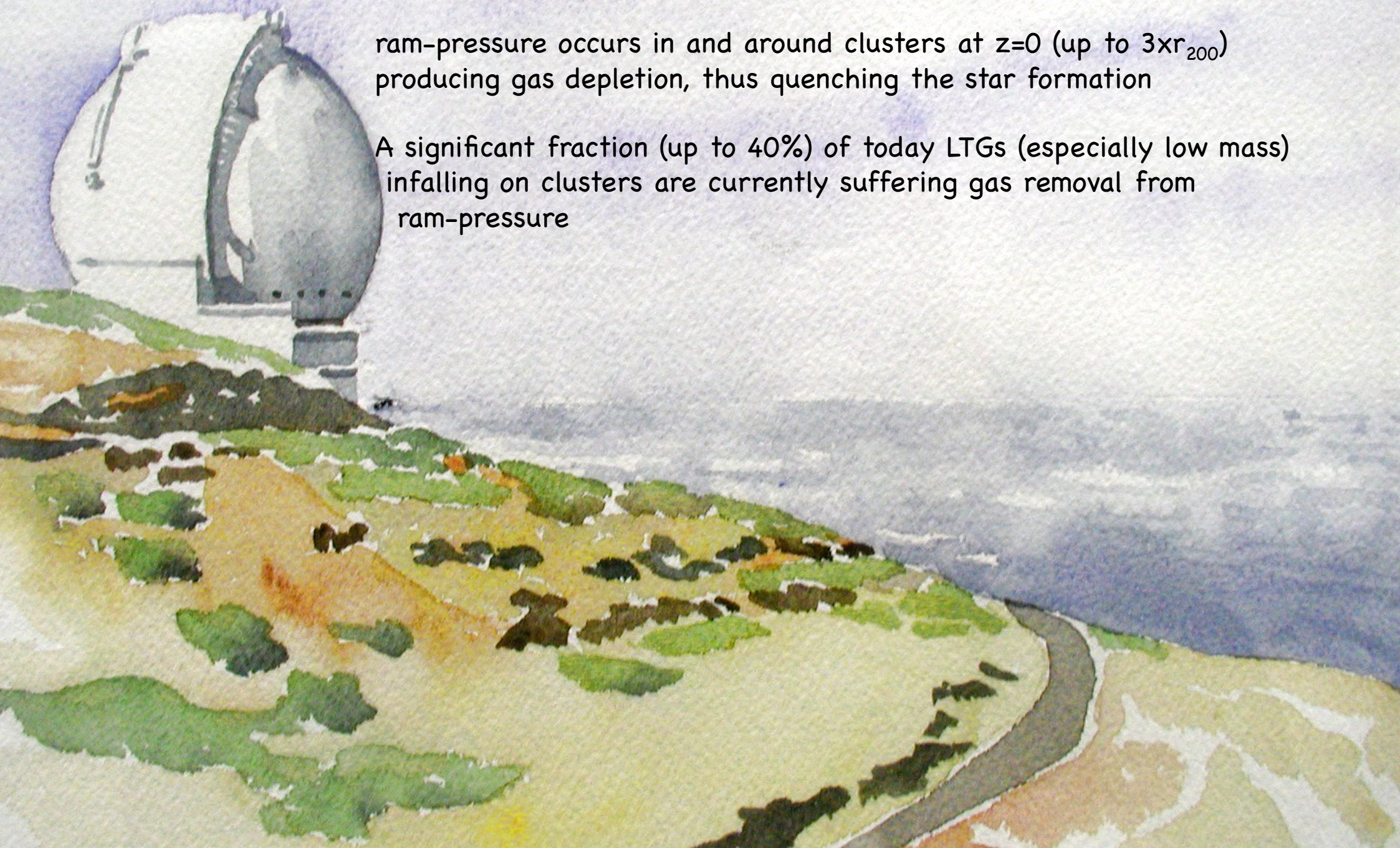
LTG

cometary

No cometary

27/64 (42%) LTGs display extended asymmetric ionized gas!

Take home ....



ram-pressure occurs in and around clusters at z=0 (up to $3xr_{200}$) producing gas depletion, thus quenching the star formation

A significant fraction (up to 40%) of today LTGs (especially low mass) infalling on clusters are currently suffering gas removal from ram-pressure