On the formation of the largest galaxies in the local Universe

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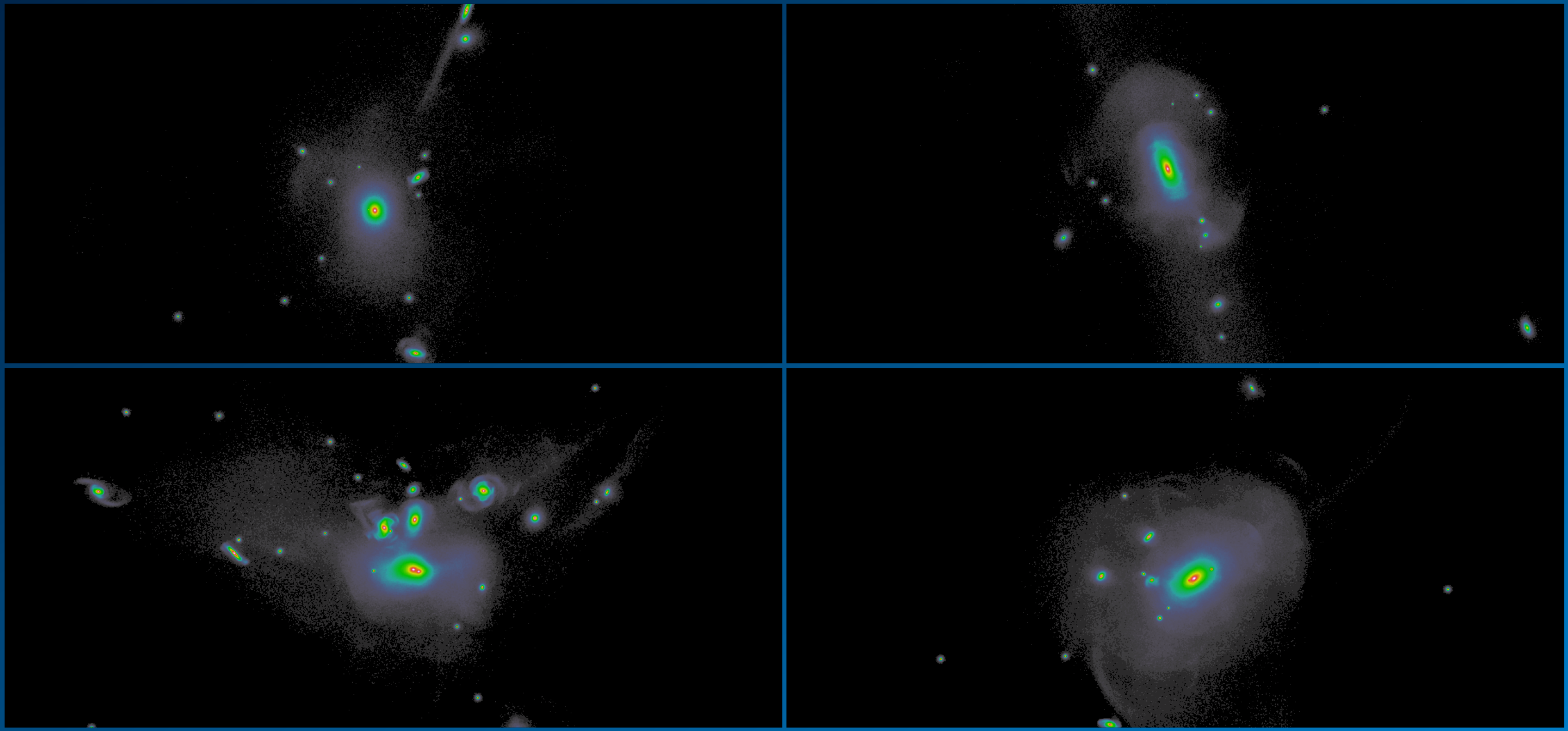
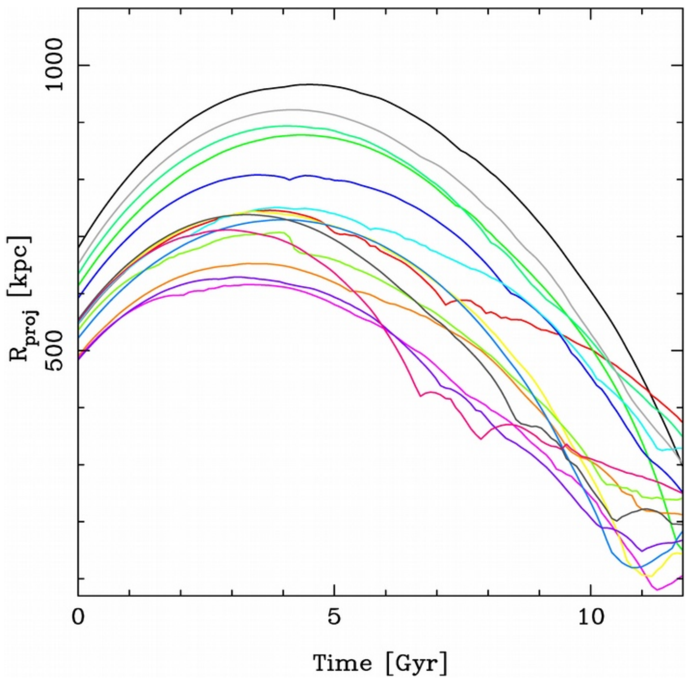


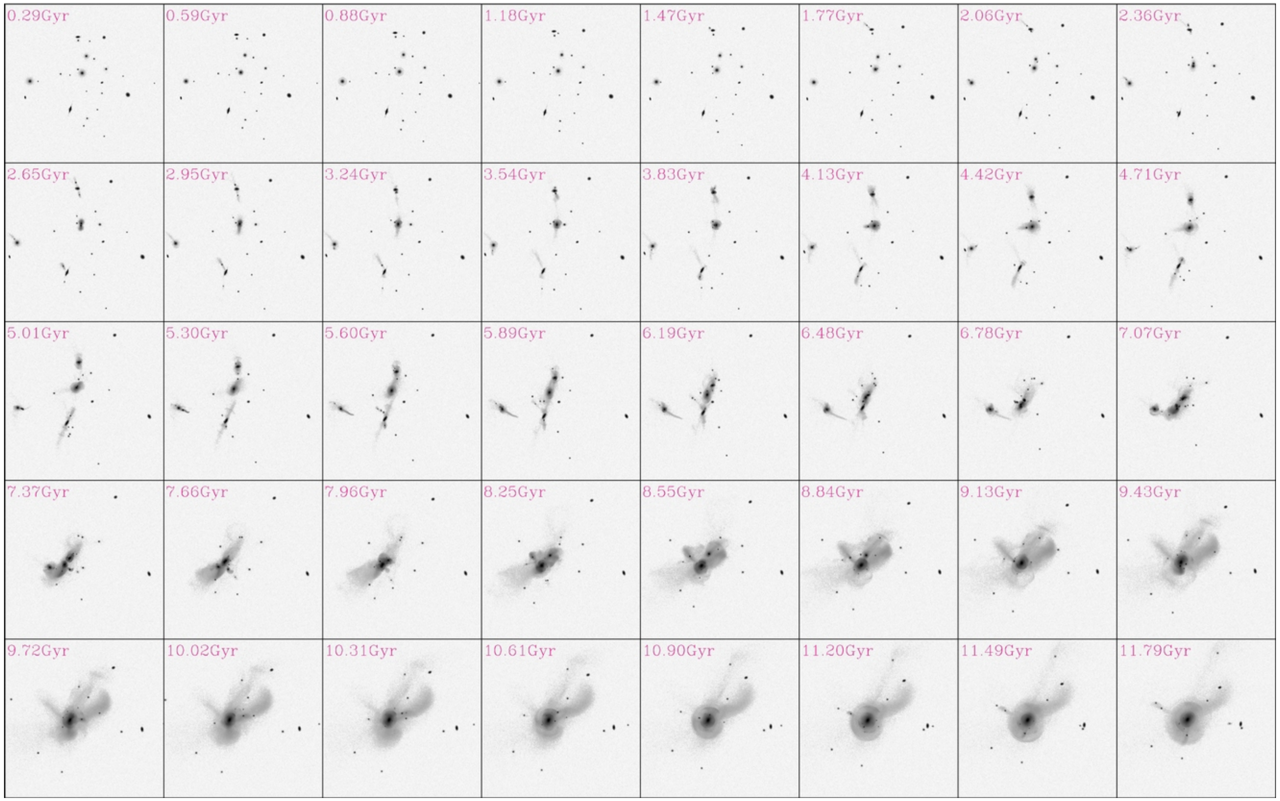


48 groups $O(5\mathrm{x}10^6$ particles)

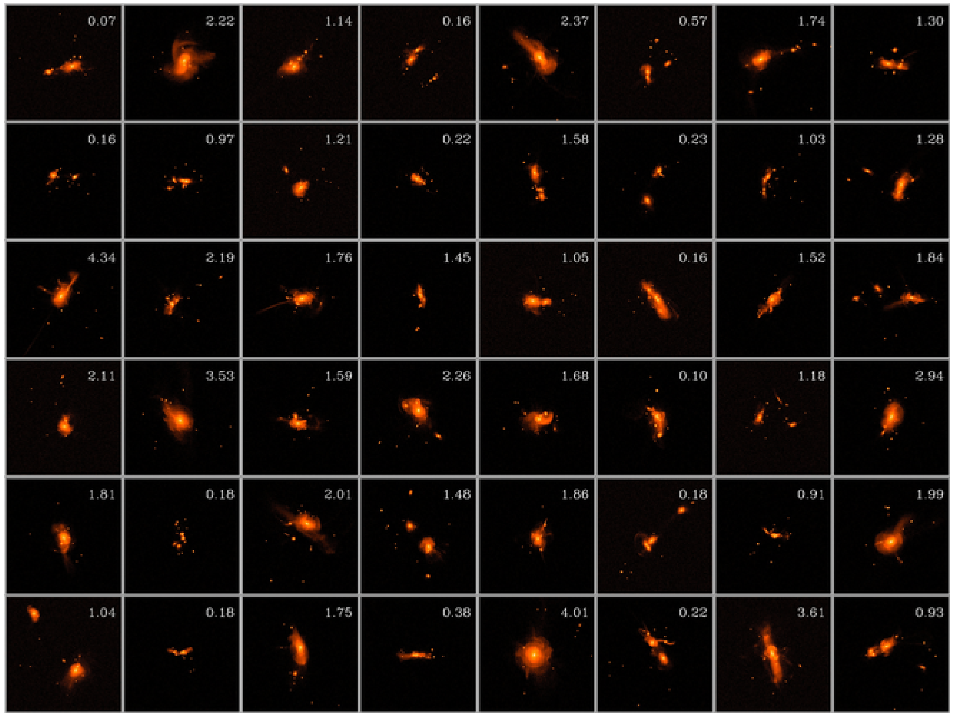
Ngal=25

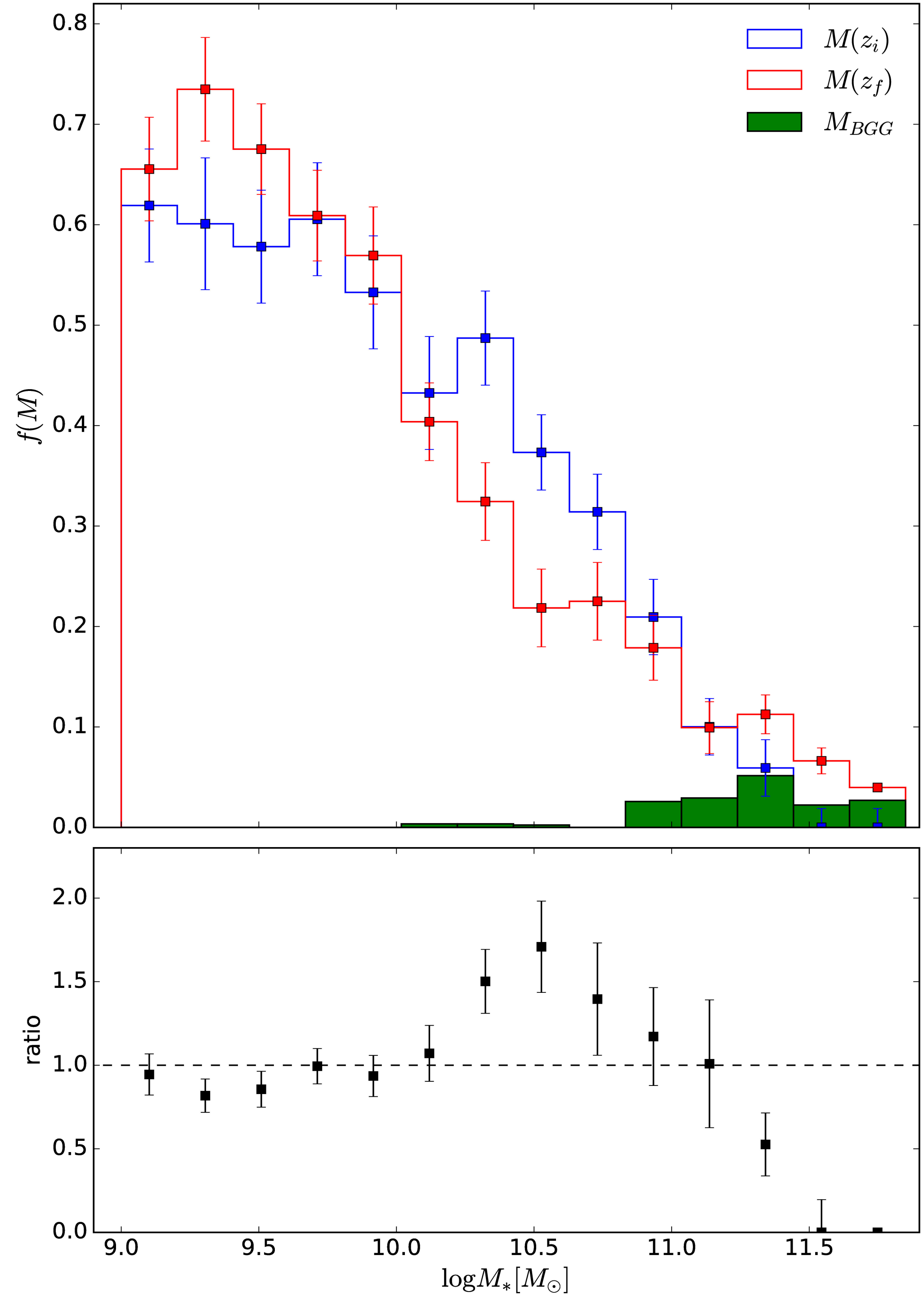
Groups: Isolated overdensities.
Expand linearlly
Non-linear collapse
Masses drawn from a Schechter LF (α=-1, $M^*=10^{12}M_\odot$)

Evolution from z=3 to the present epoch



Growth of a BGG





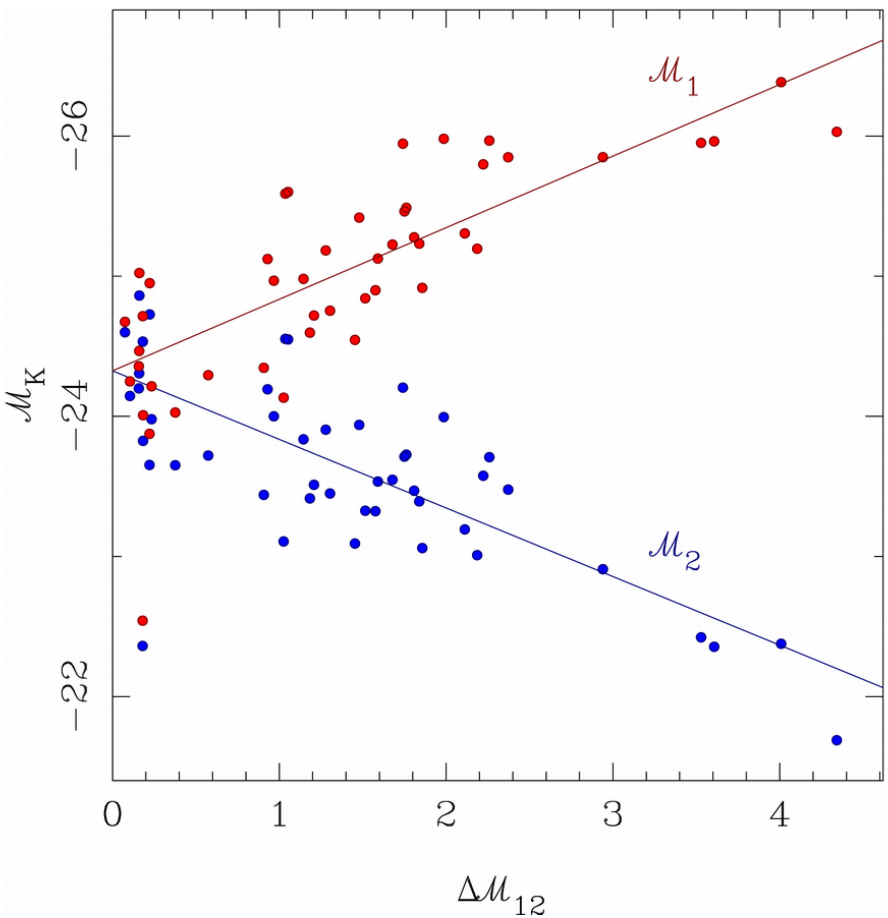
Luminosity (mass) function evolution

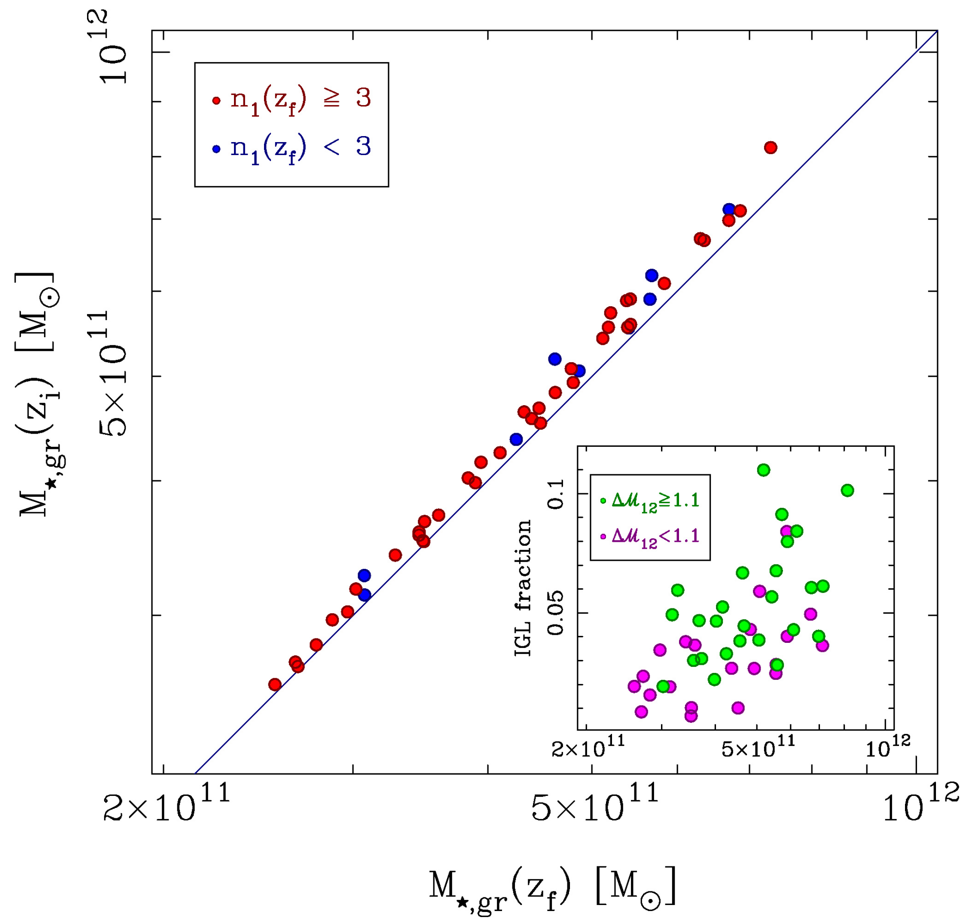
48 groups O(5x10^6 particles) Ngal=25

Stacked luminosity function.

Hump at the high end mass. Dearth at intermediate masses (same position as GEMS or HCGs)

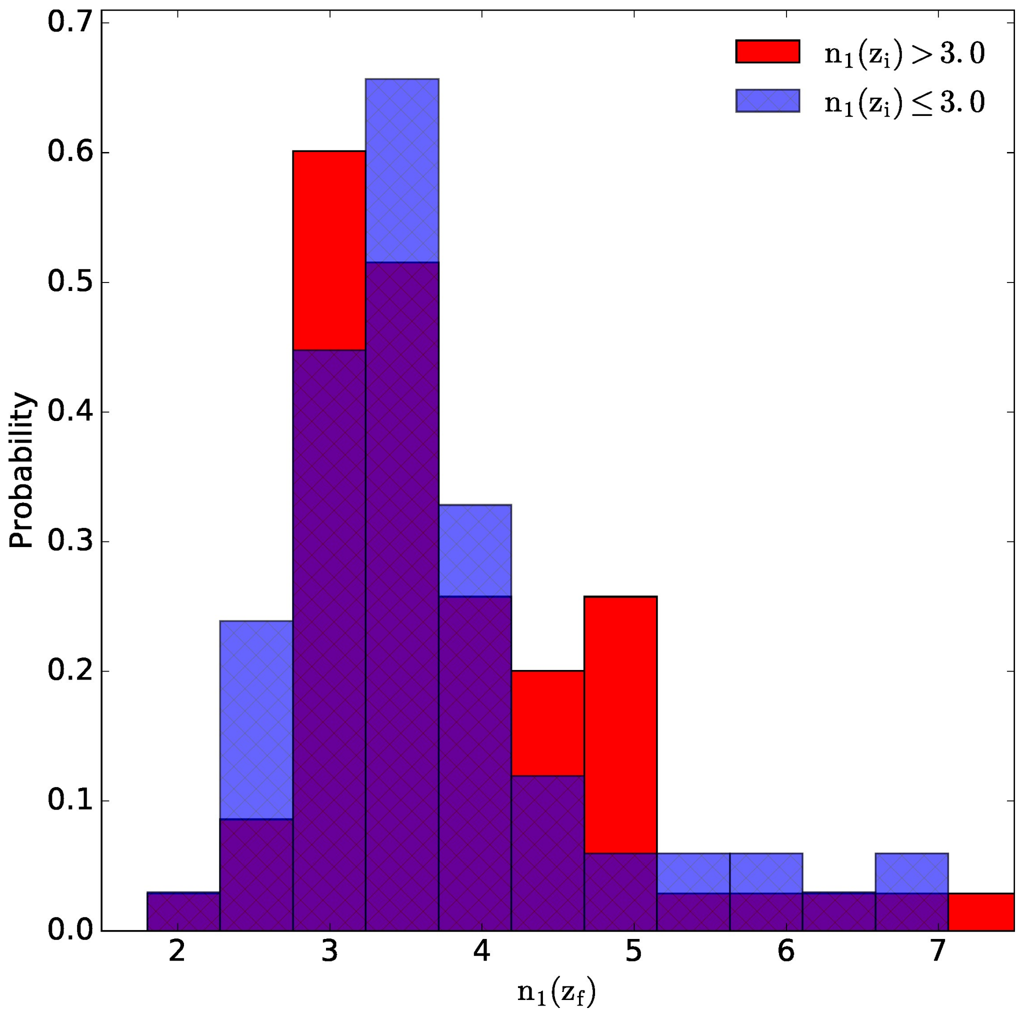
Continous interaction results in a magnitude gap between the two brightest galaxies. Its extent matches that observed in real groups

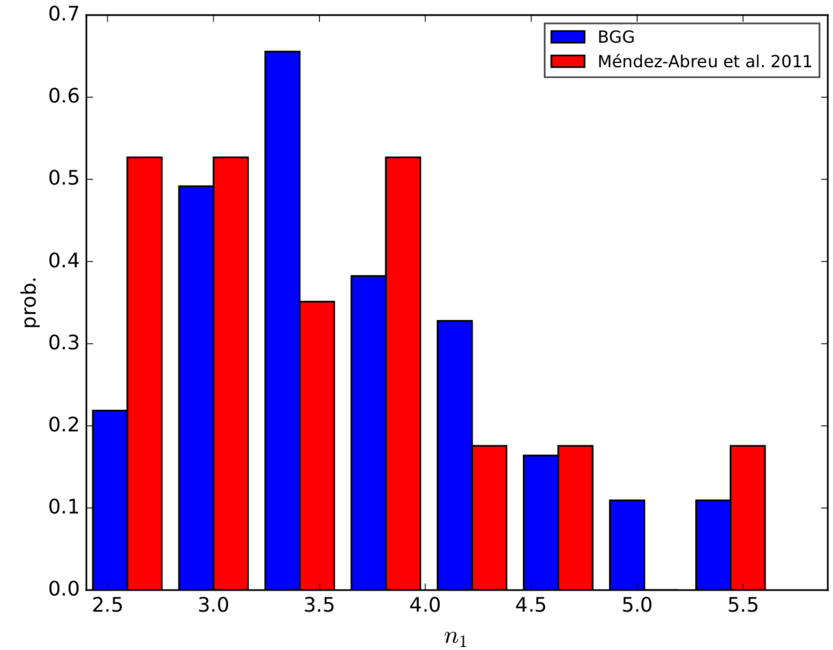


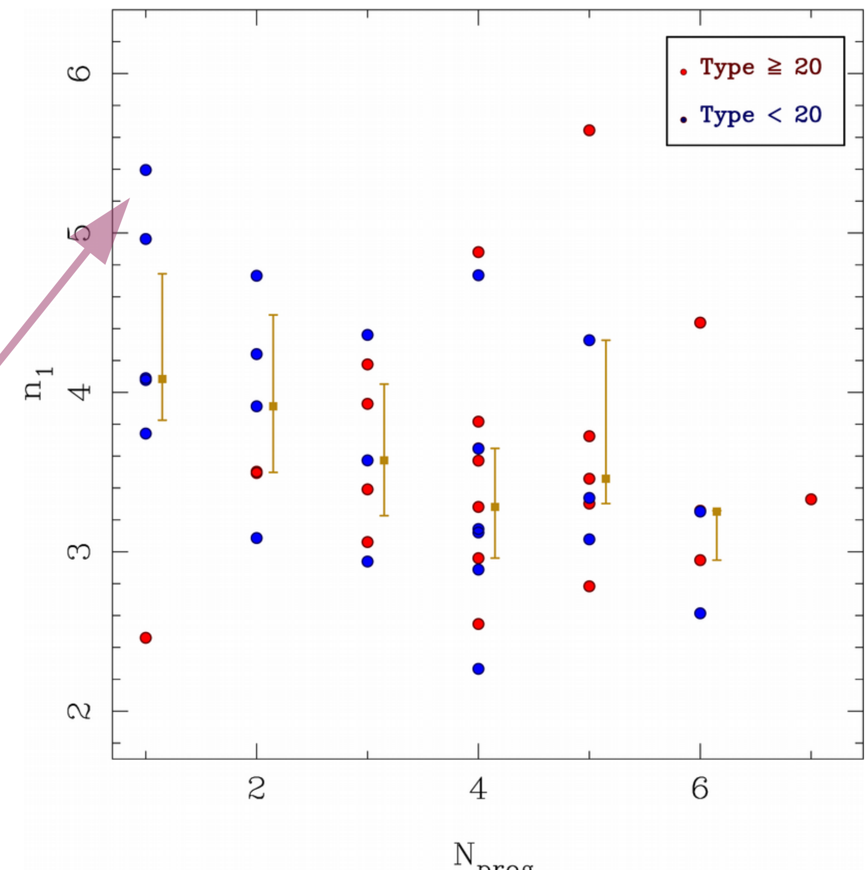


The total stellar mass associated to galaxies in the final groups is found to be smaller than that at z=3,

An intragroup mass component appear. For our groups it amounts for at most 10% of the total stellar mass.

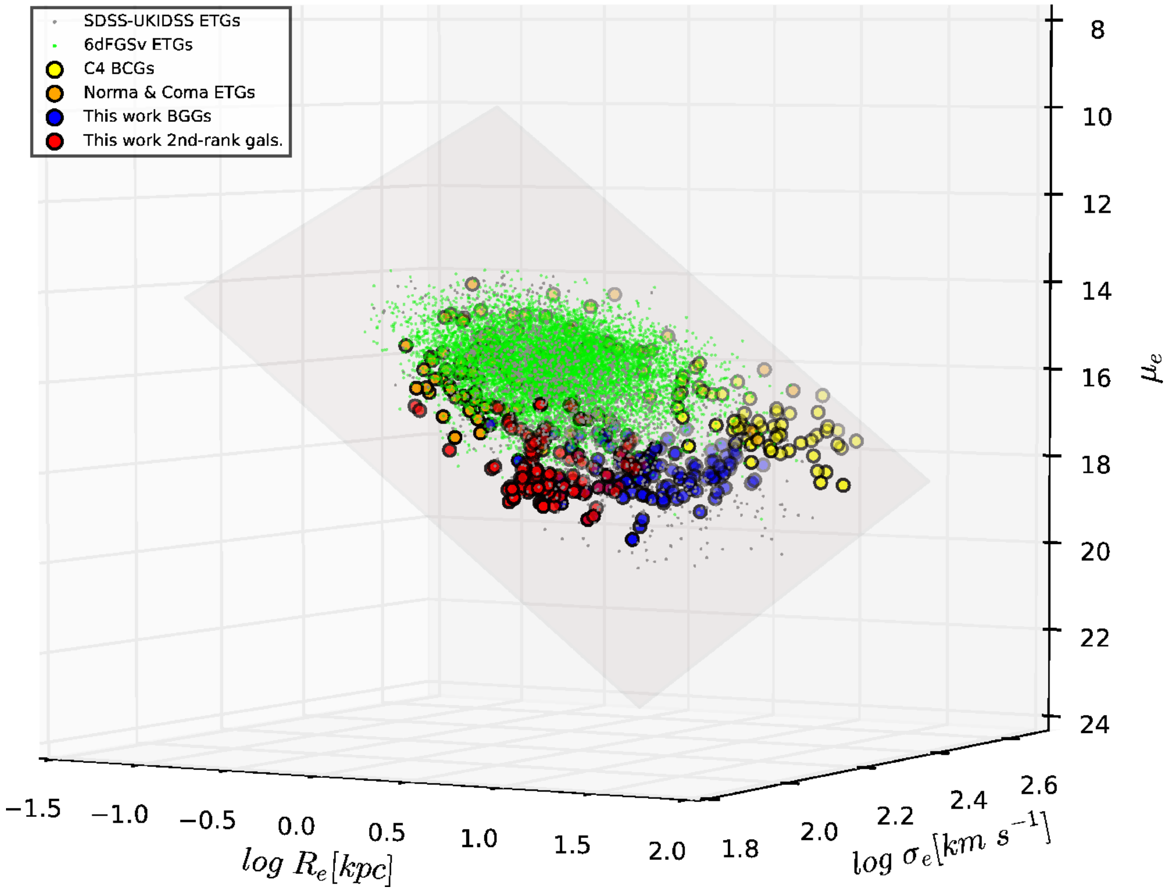






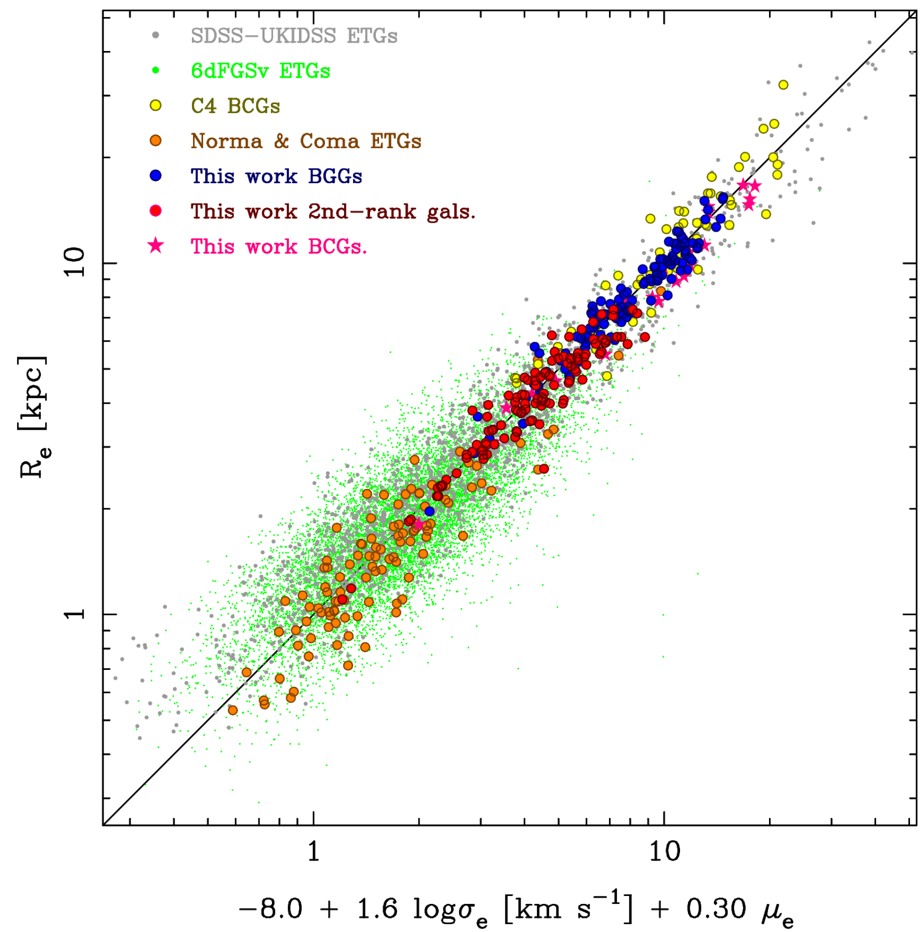
Sérsic profile: Ellipticals, end product of multiple mergers.

A few cases (low mass) are the results of tidal interaction via minor merging.

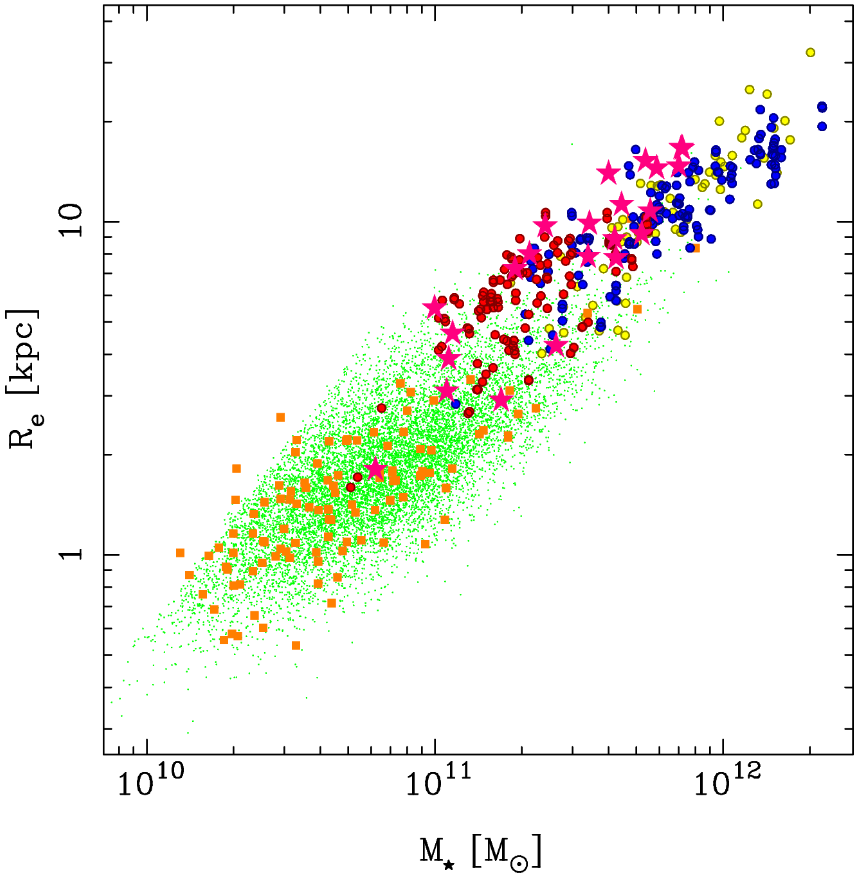


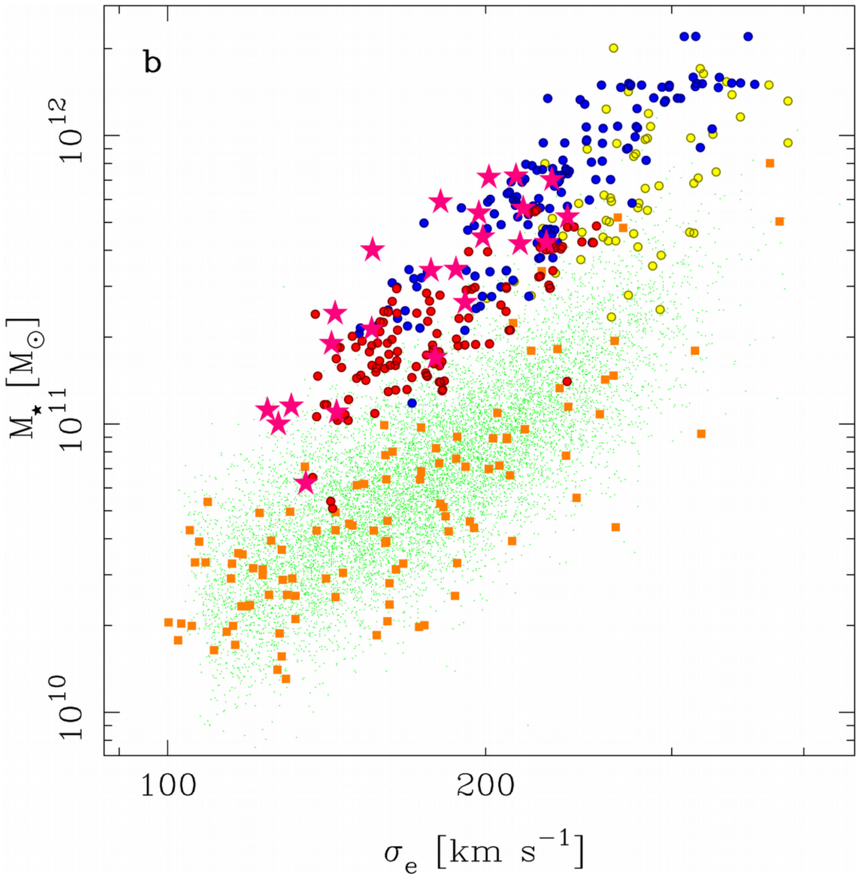
BGGs follow a well defined fundamental plane

log R_e = (1.60 ± 0.05) log σ_e +
+ (0.75 ± 0.02) μe /2.5 − 8.0 ± 0.2 ,



The coefficients match the slopes and normalization to the observations of low-z ellipticals





Our simulations of previrialized groups provide evidence of the viability of hierarchical collisionless merging as a route to the formation of BGG

Models reproduce well the main global properties of galaxies and their parent groups. Among others,

- Luminosity function evolution
- ΔM_{12} IGL
- Sérsic index
- Fundamental plane Mass-Radius FJ relation