Probing Galaxy Quenching Mechanisms using the EAGLE Hydro-Simulations

Michelle Furlong

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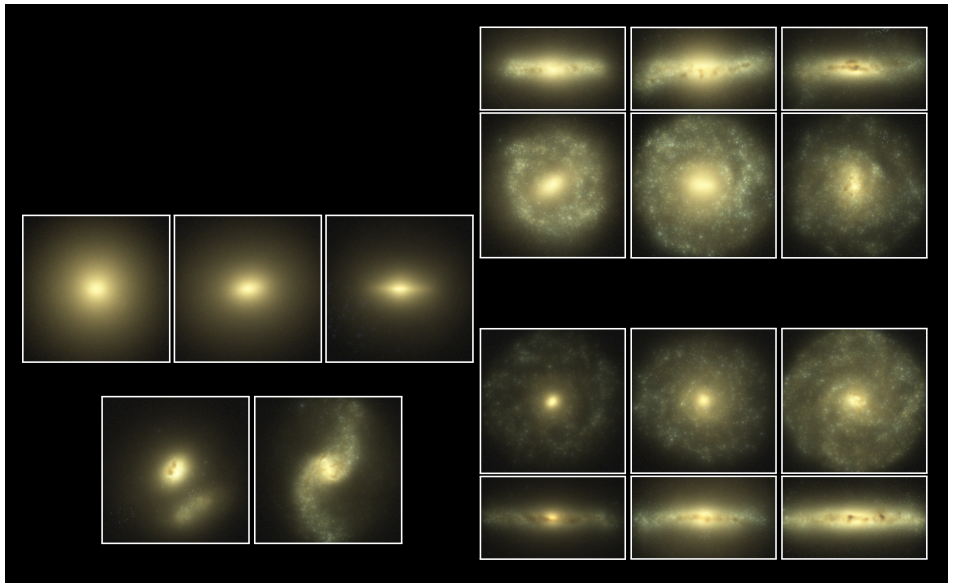
James Trayford, Carlos Frenk, John Helly, Adrian Jenkins.
Leiden: Rob Crain, Joop Schaye.
ROW: Claudio Dalla Vecchia, Ian McCarthy, Craig Booth…
+ Virgo Consortium

DiRAC VIRGO ICC Institute for Computational Cosmology PRACE

EAGLE: Evolution and Assembly of GaLaxies and their Environments

- Overview of the simulation
- Evolution of galaxy properties in the simulation
- Environmental quenching
- Quenching of the massive galaxies
- Summary

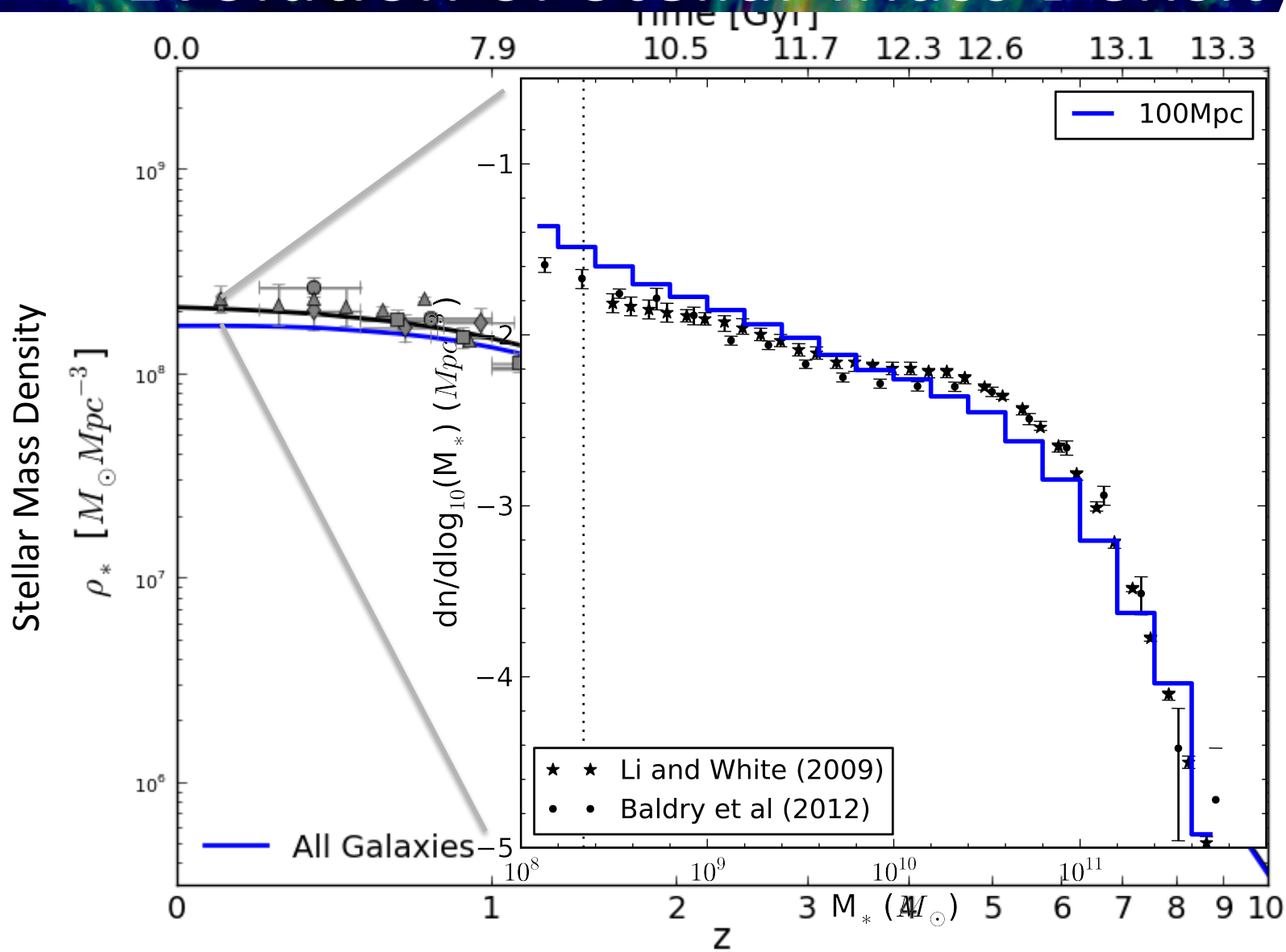


arXiv:1407.7040

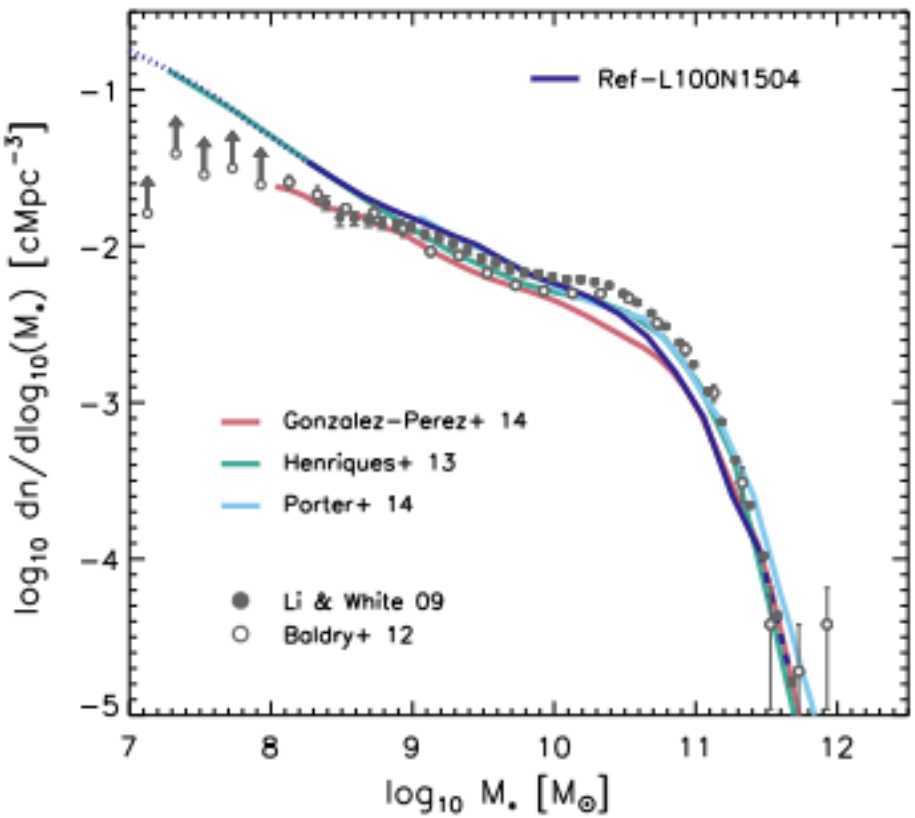
EAGLE: Evolution and Assembly of GaLaxies and their Environments

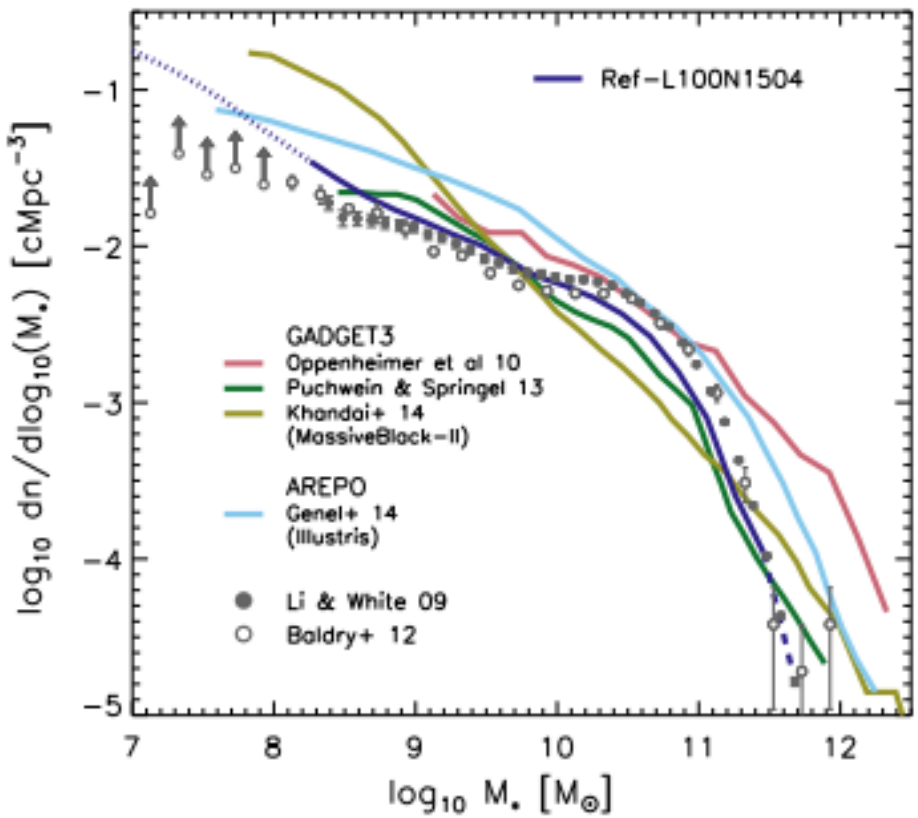
- SPH: Anarchy Implementation
- Planck Cosmology
- Resolution 10^6 solar masses
- 25, 50 and 100 Mpc boxes
- Advanced subgrid physics
  - Star formation
  - Cooling
  - Chemical evolution
  - Stellar feedback -> thermal
  - AGN feedback -> ang. mom.
- Evolution to redshift 0

Comparison with Observations: Evolution of Stellar Mass Density



Aside: Stellar Mass Function





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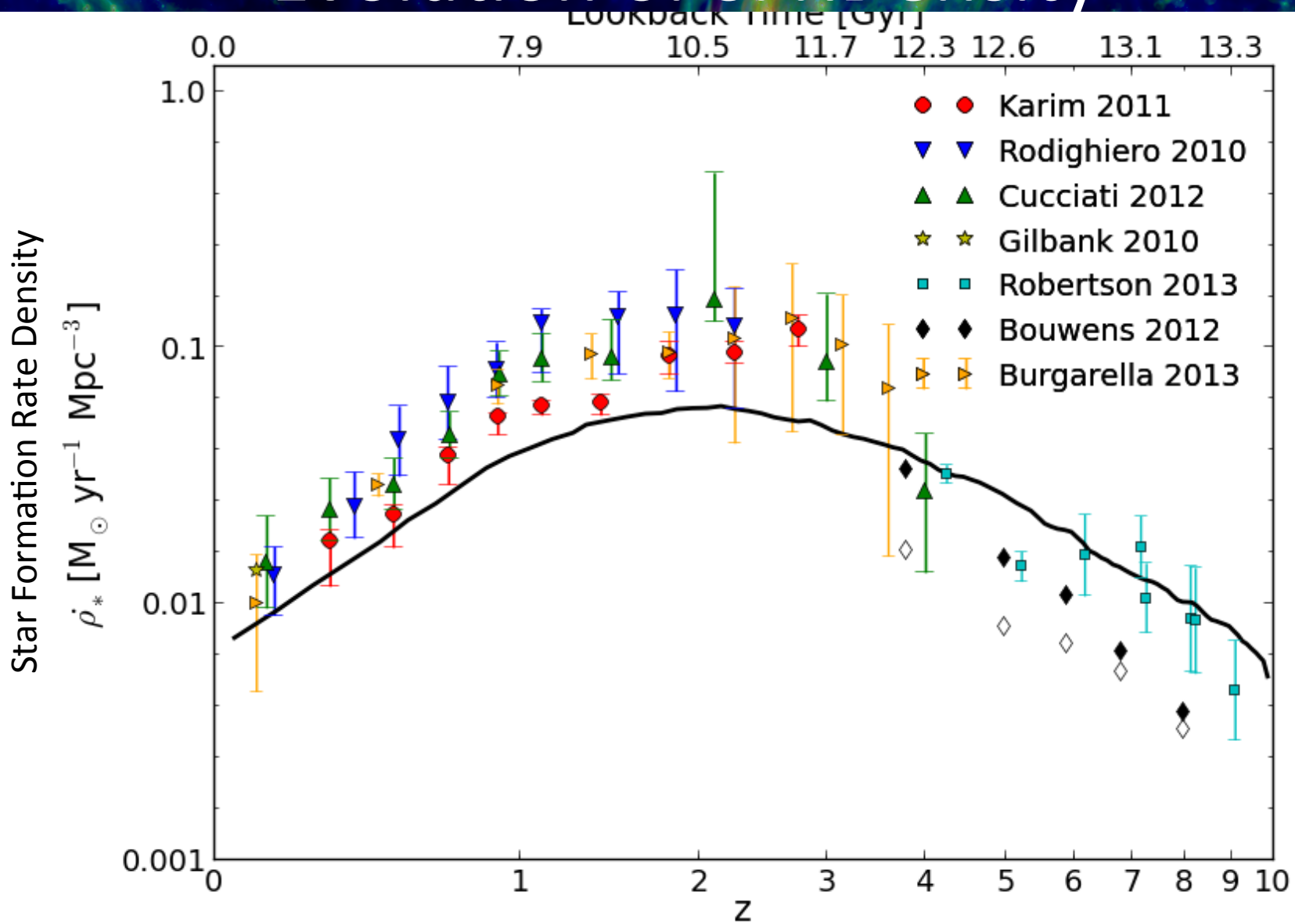
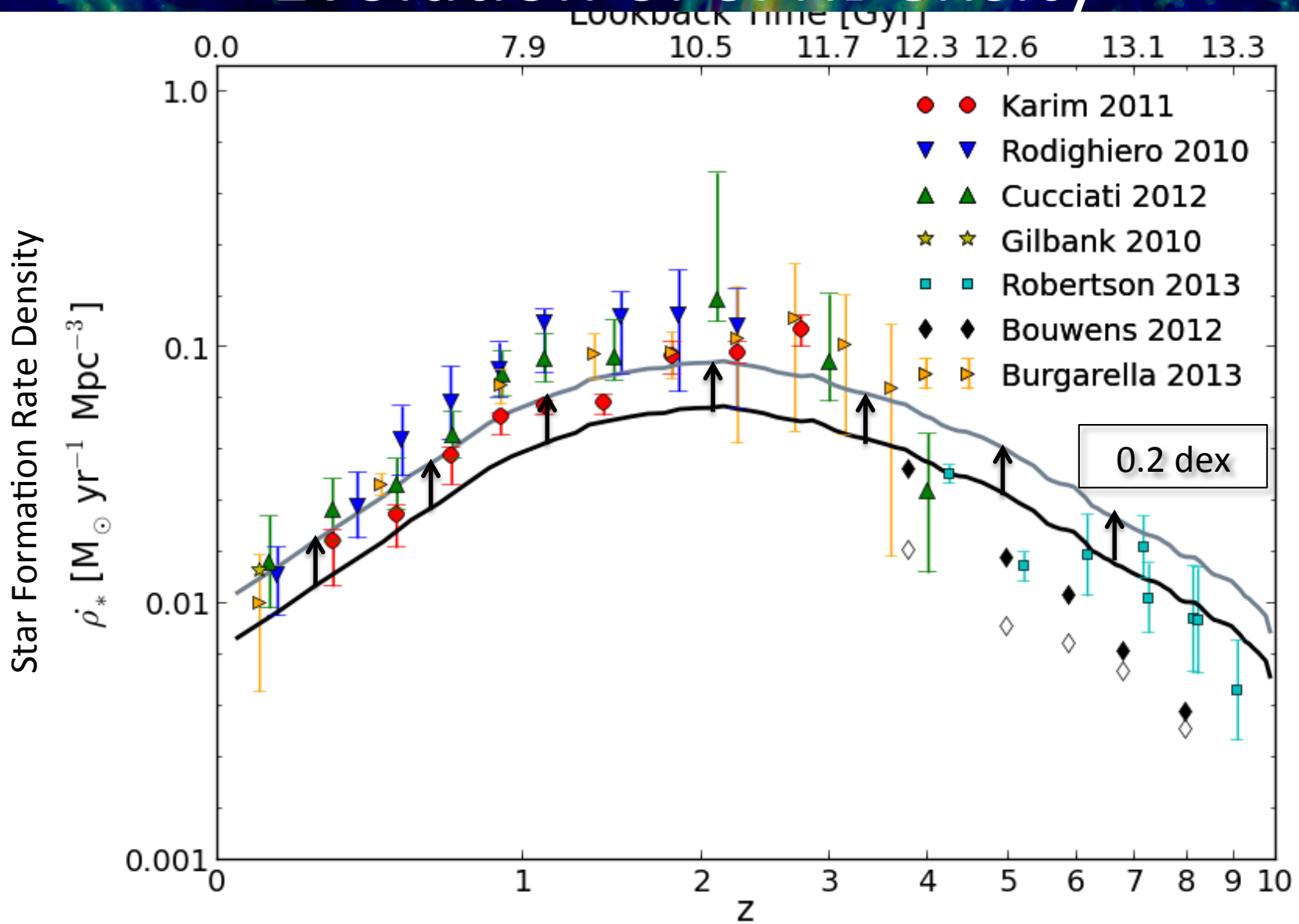
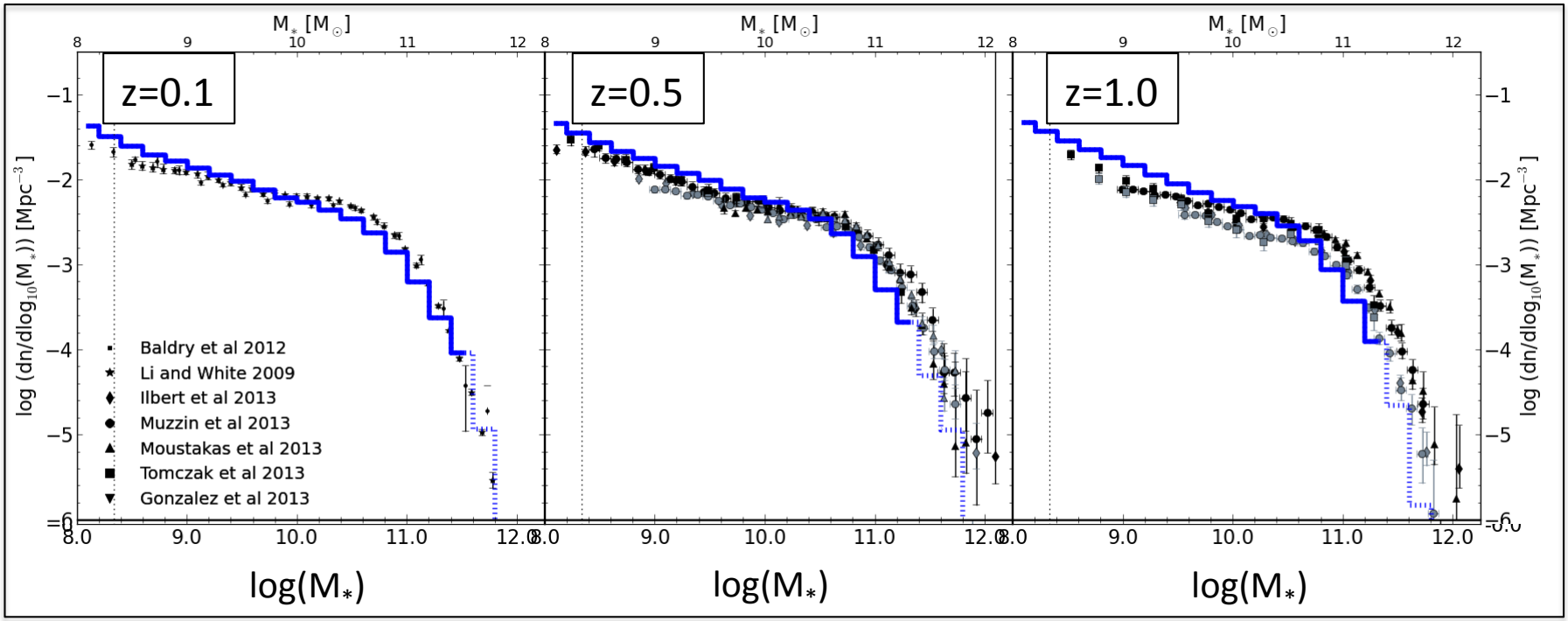
Comparison with Observations: Evolution of SFRDensity



Comparison with Observations: Evolution of SFRDensity



Evolution of Galaxy Properties: Stellar Mass



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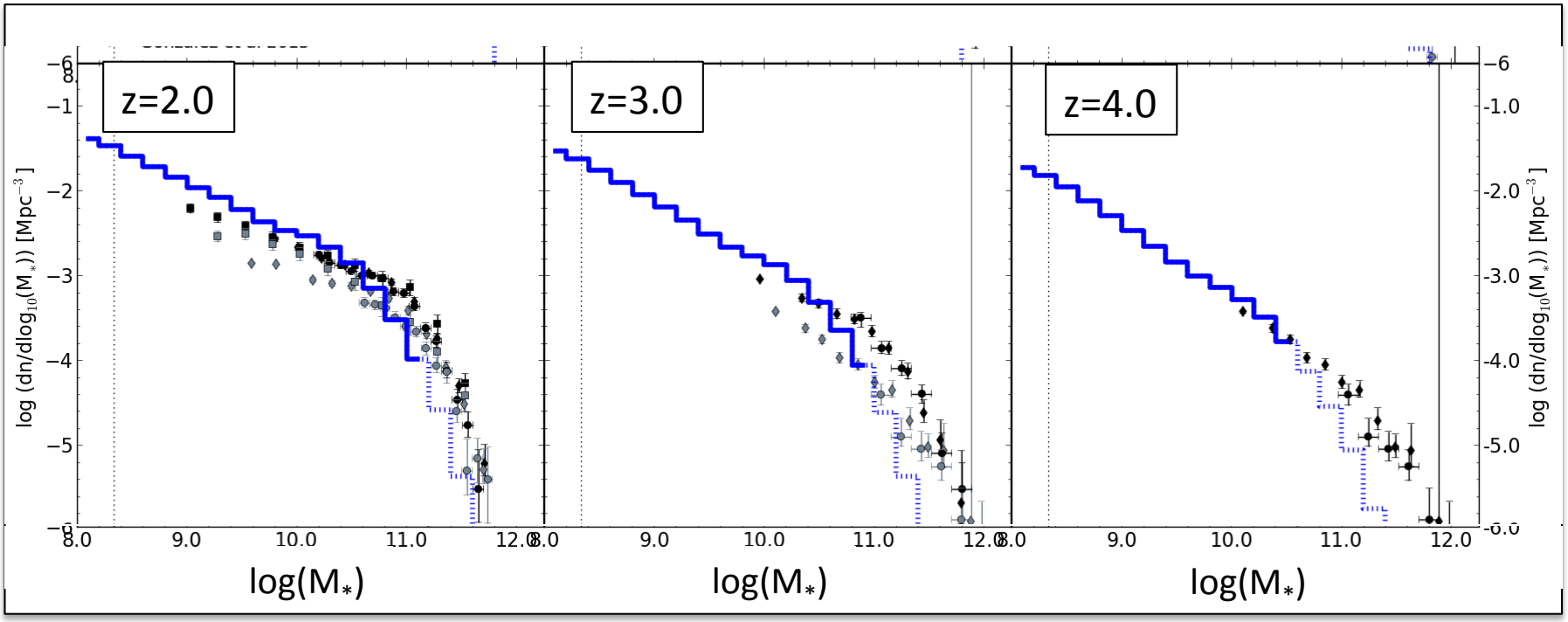
Evolution of Galaxy Properties: Stellar Mass



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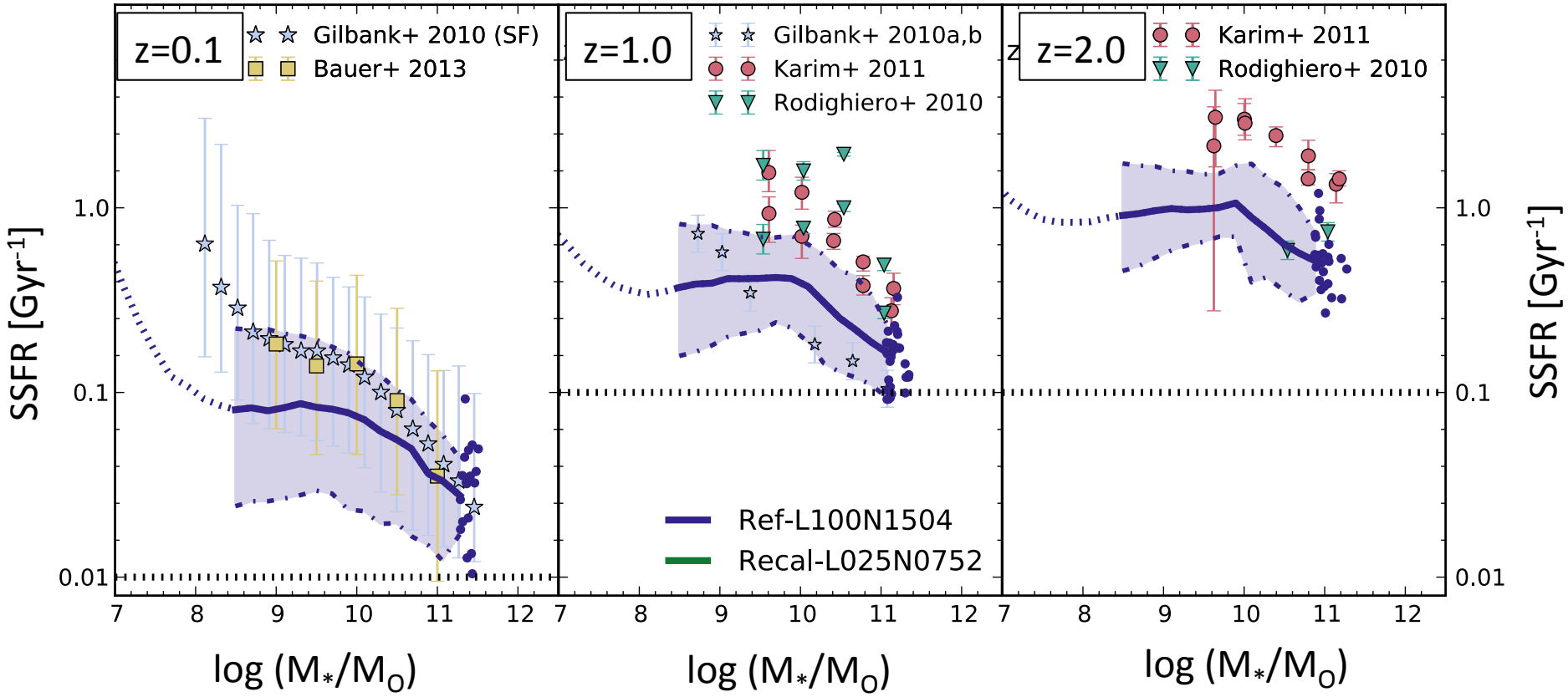
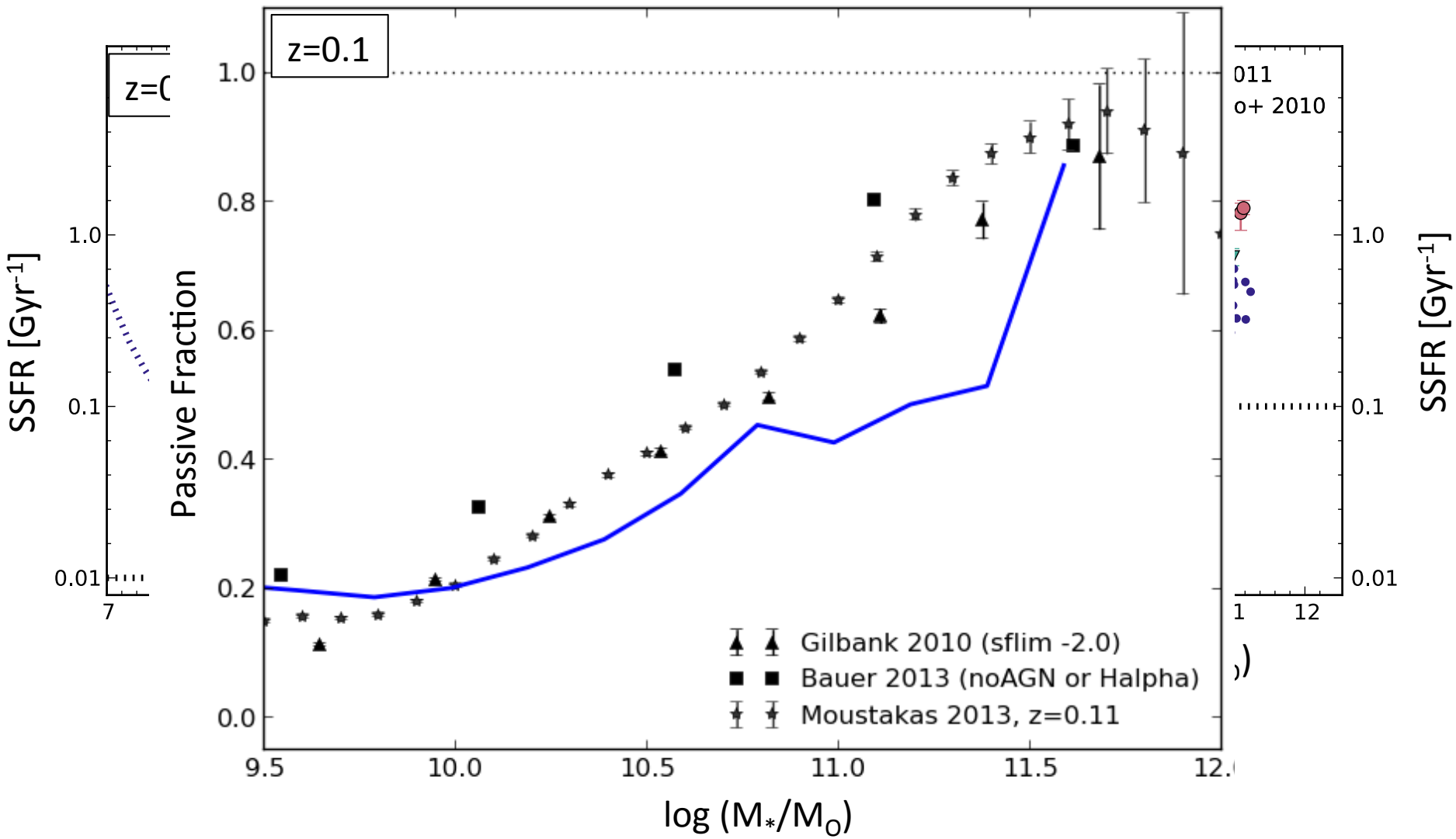
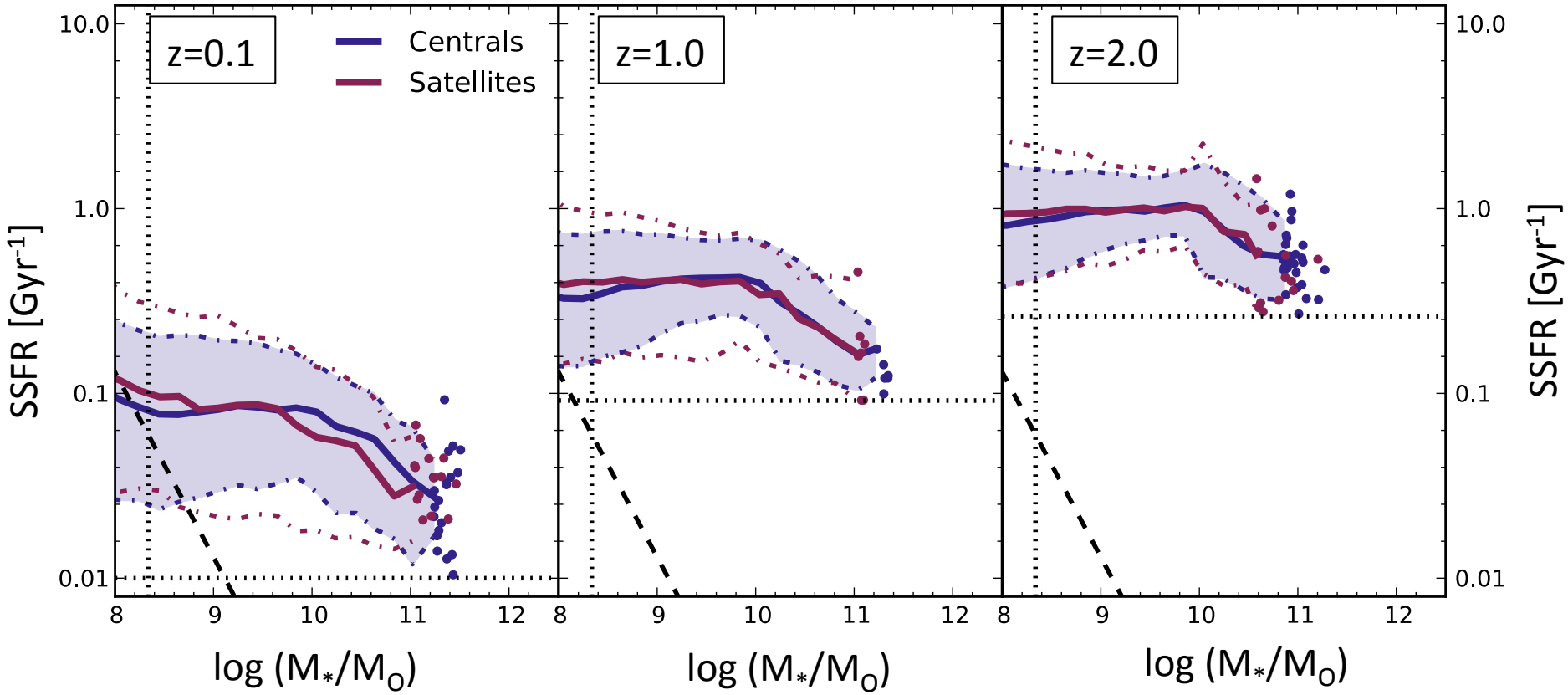
Evolution of Galaxy Properties: Specific Star Formation Rates



Evolution of Galaxy Properties: Passive Fractions



Environmental Quenching



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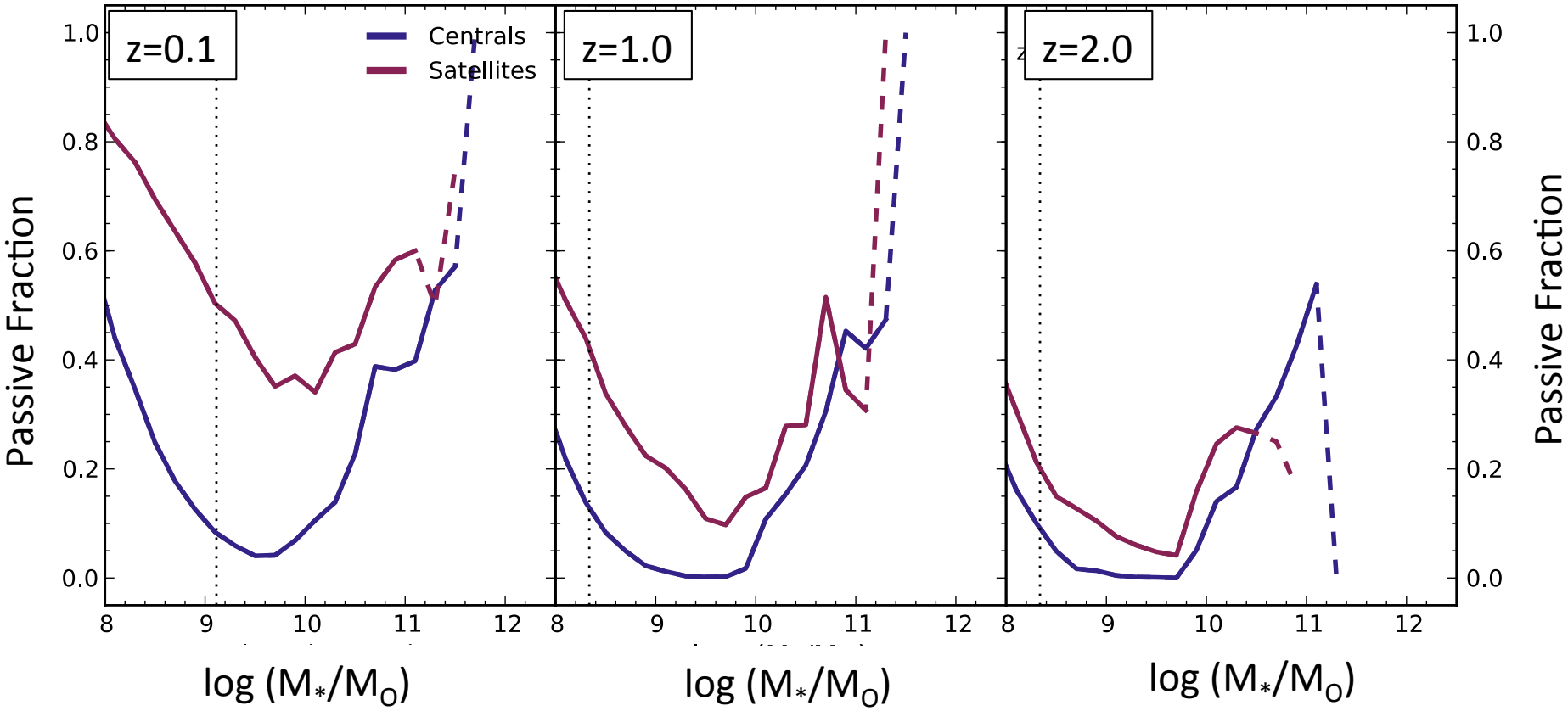
Environmental Quenching



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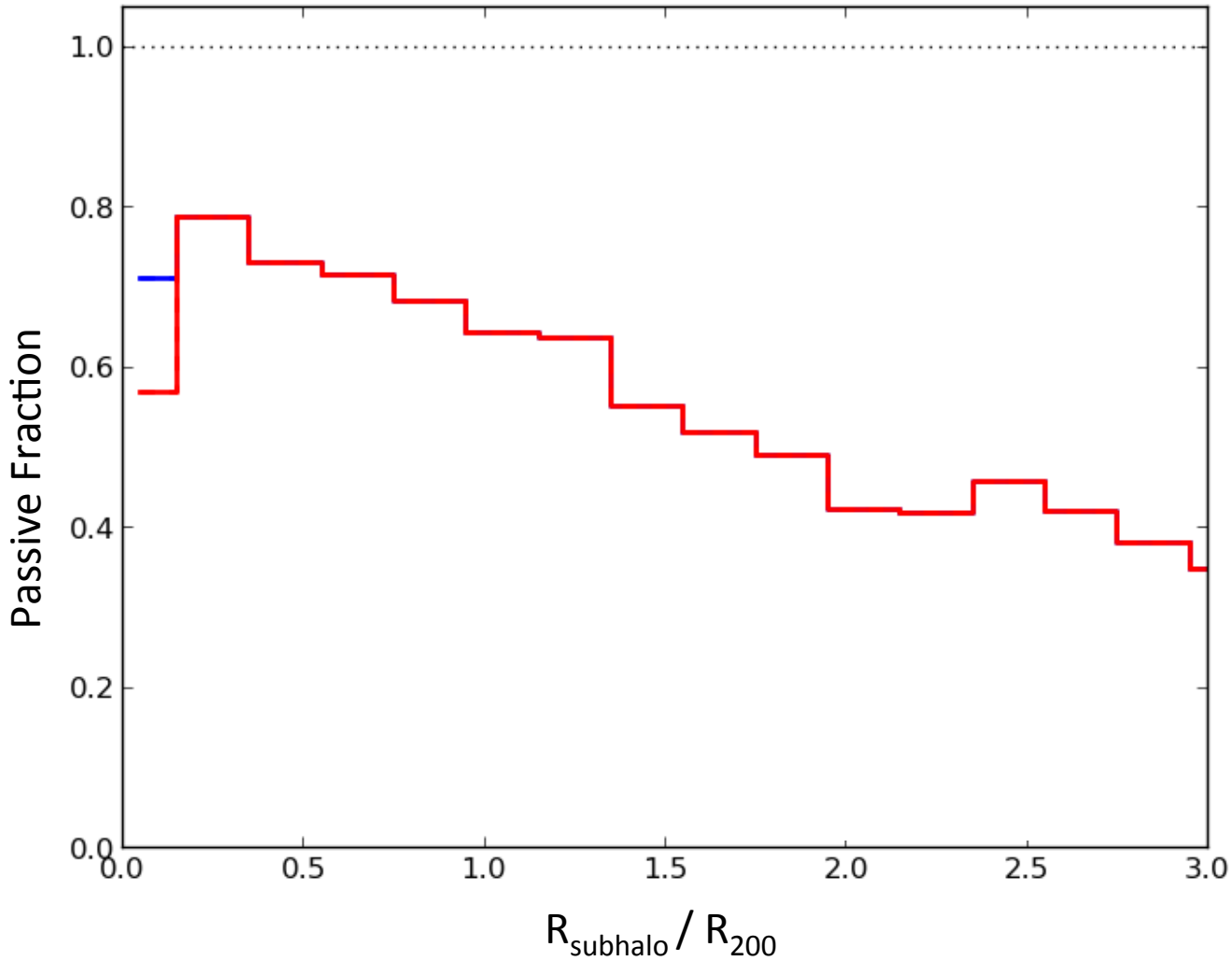
Environmental Quenching



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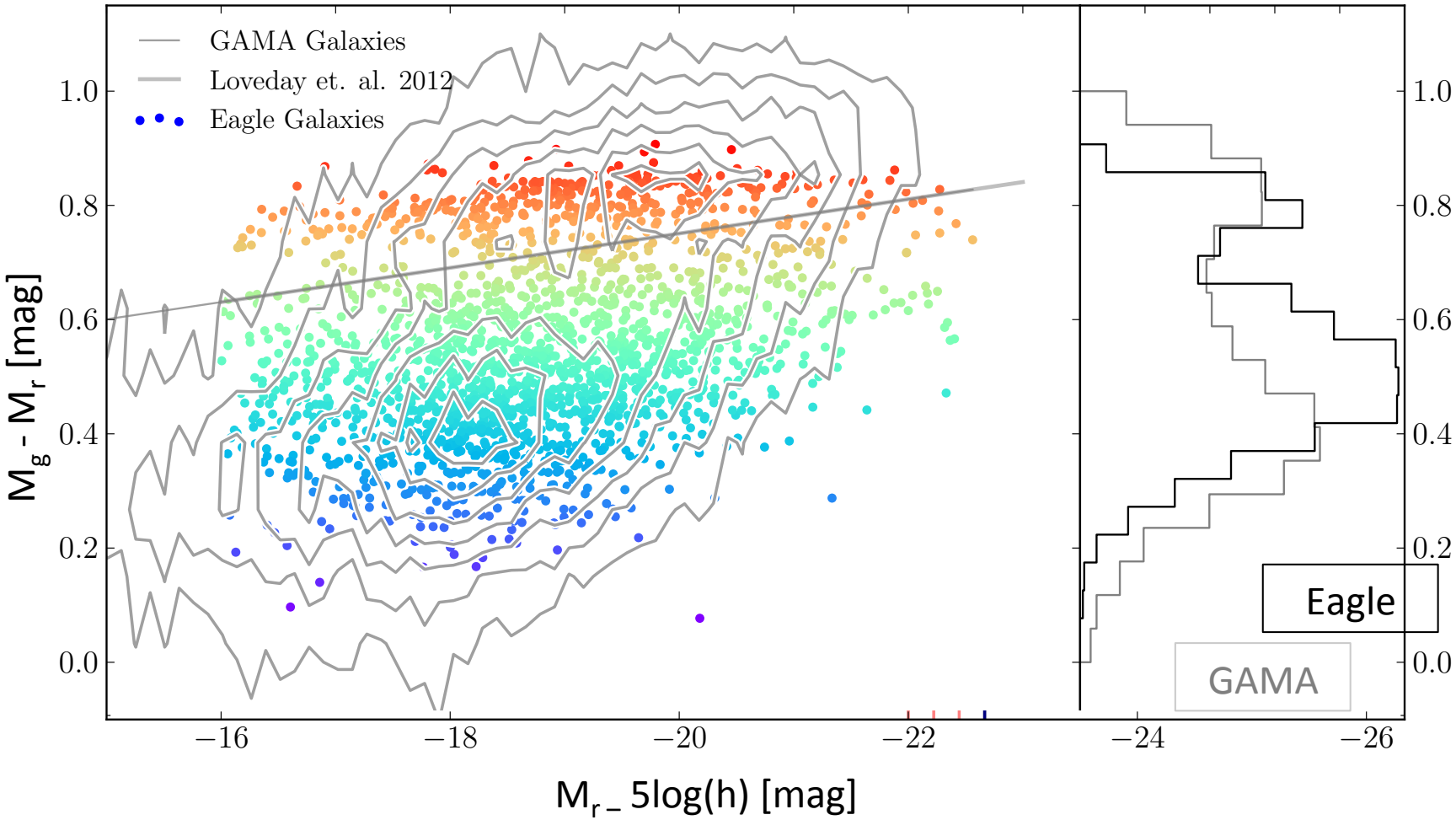
Quenching of Massive Galaxies



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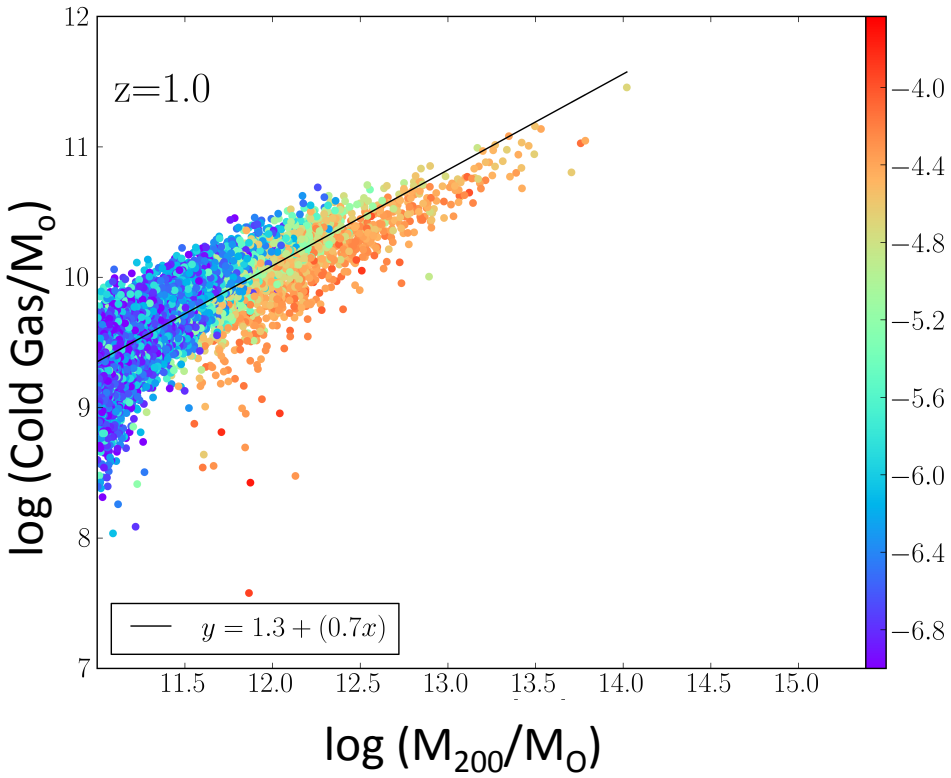

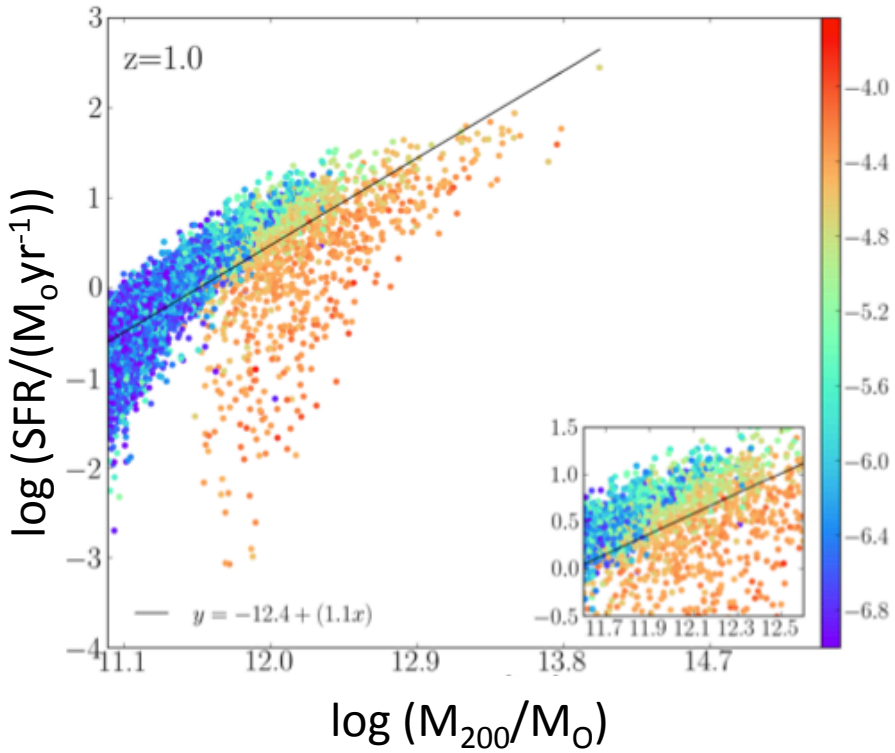

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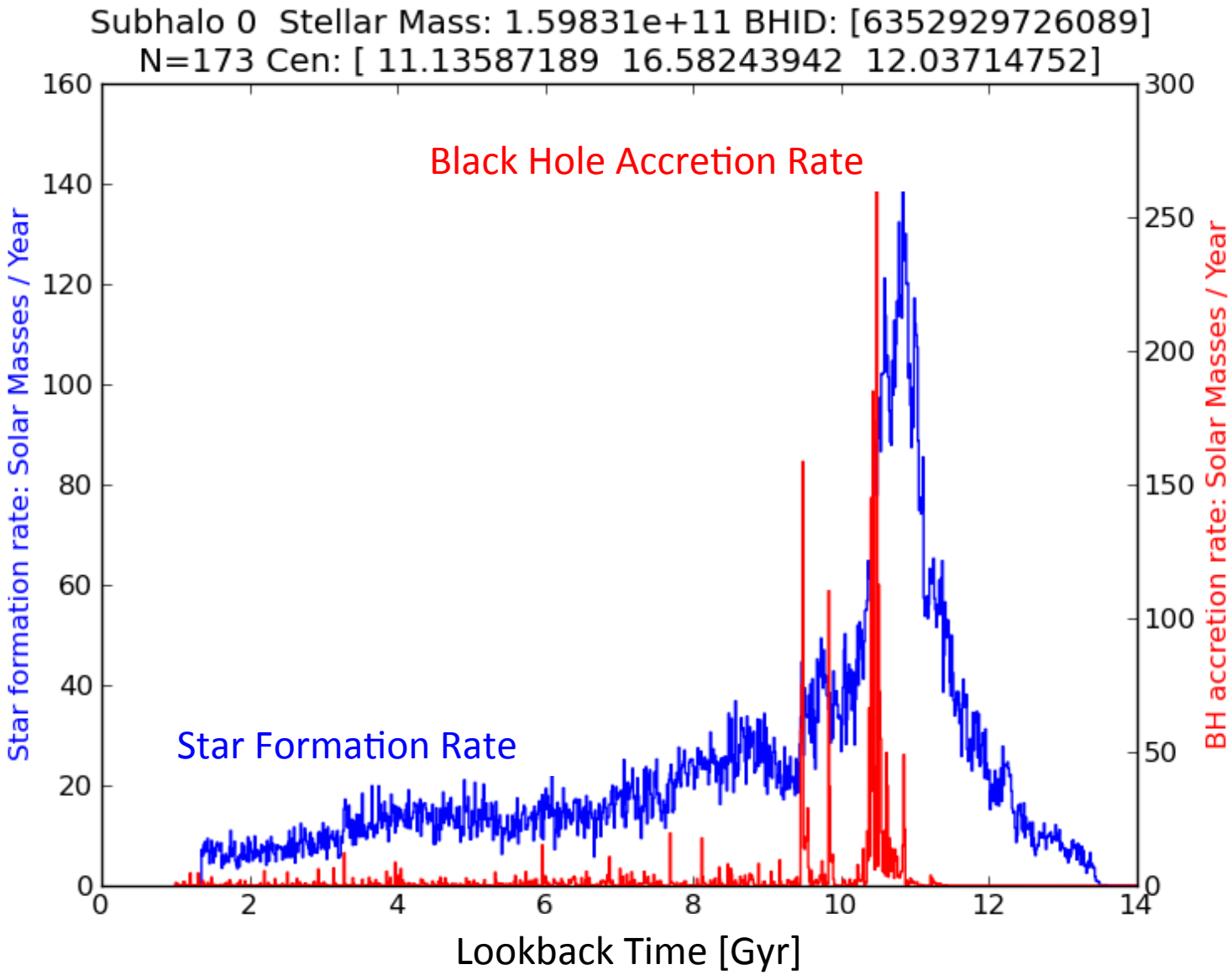

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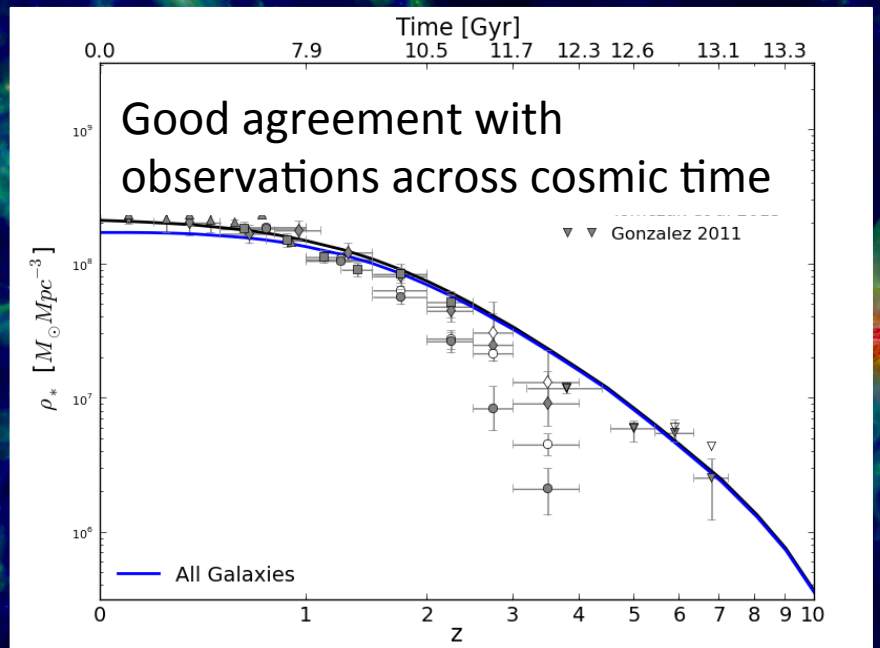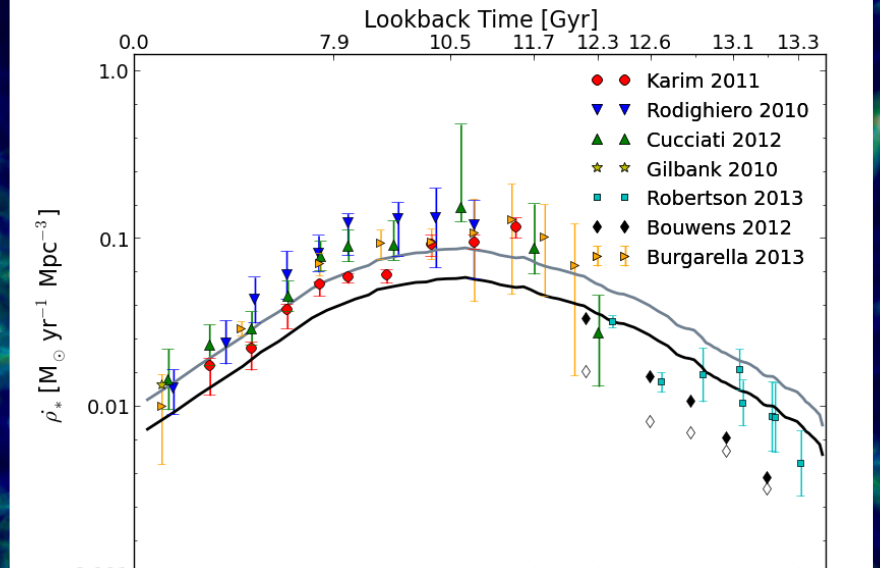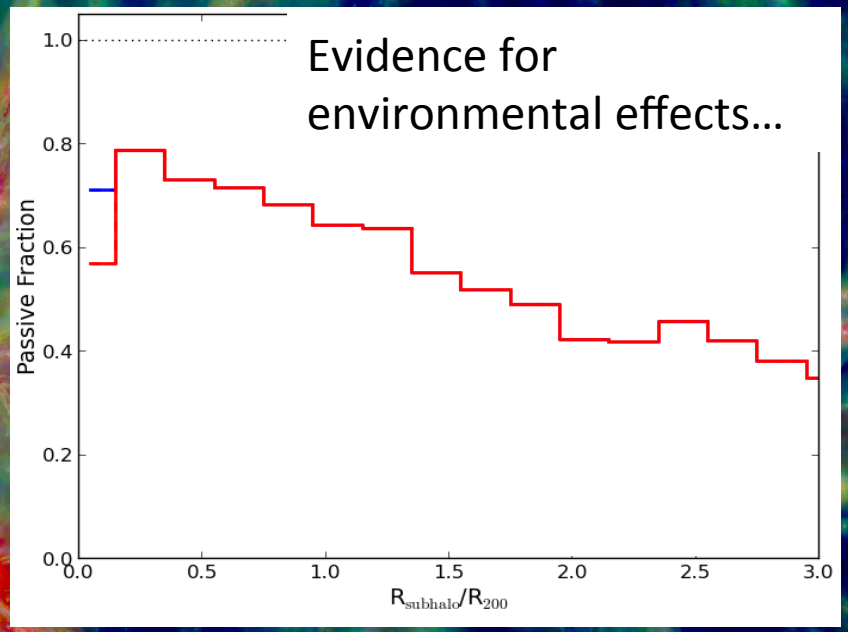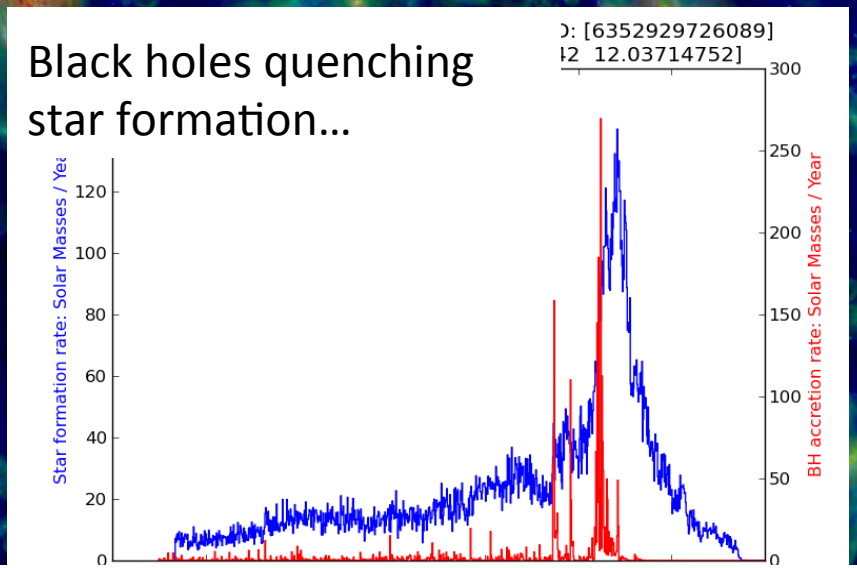
The EAGLE Project