

# Central & Satellite Quenching: A theoretical perspective

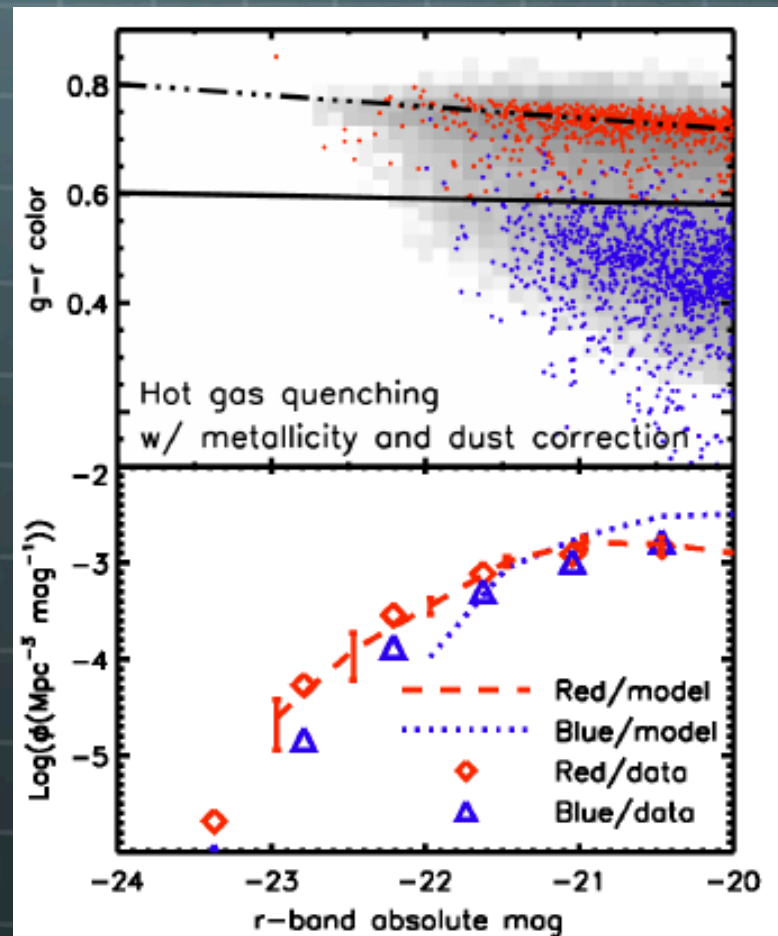
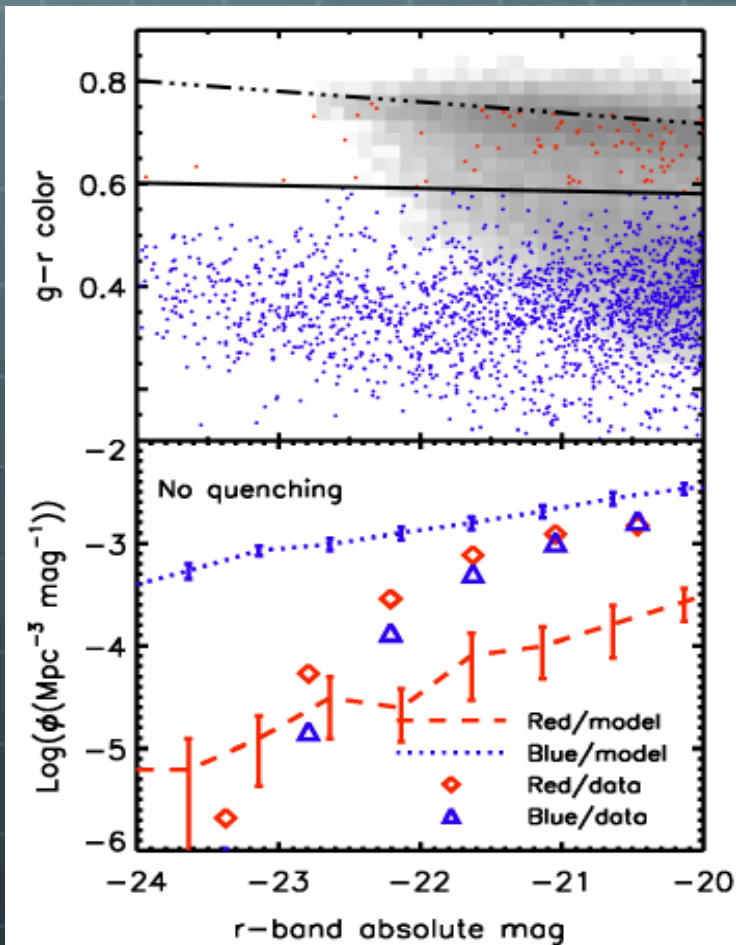
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# Keeping hot gas hot produces correct red sequence, red/blue mass function

Before

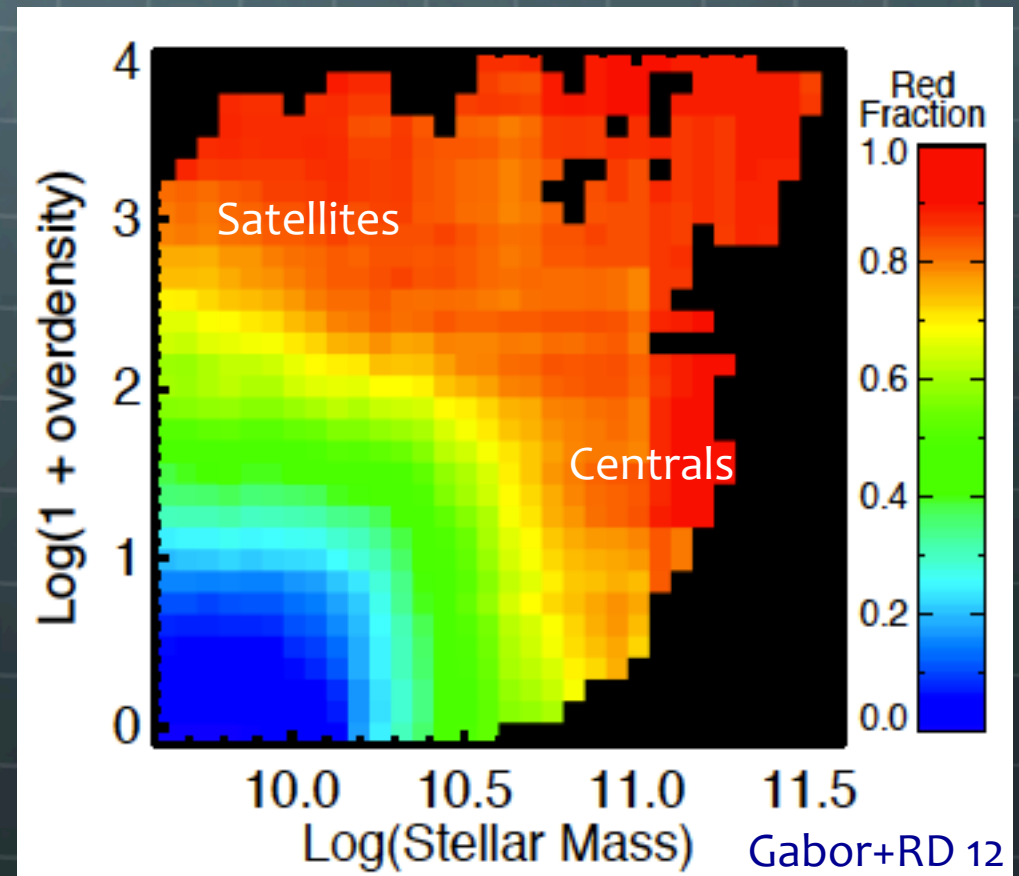
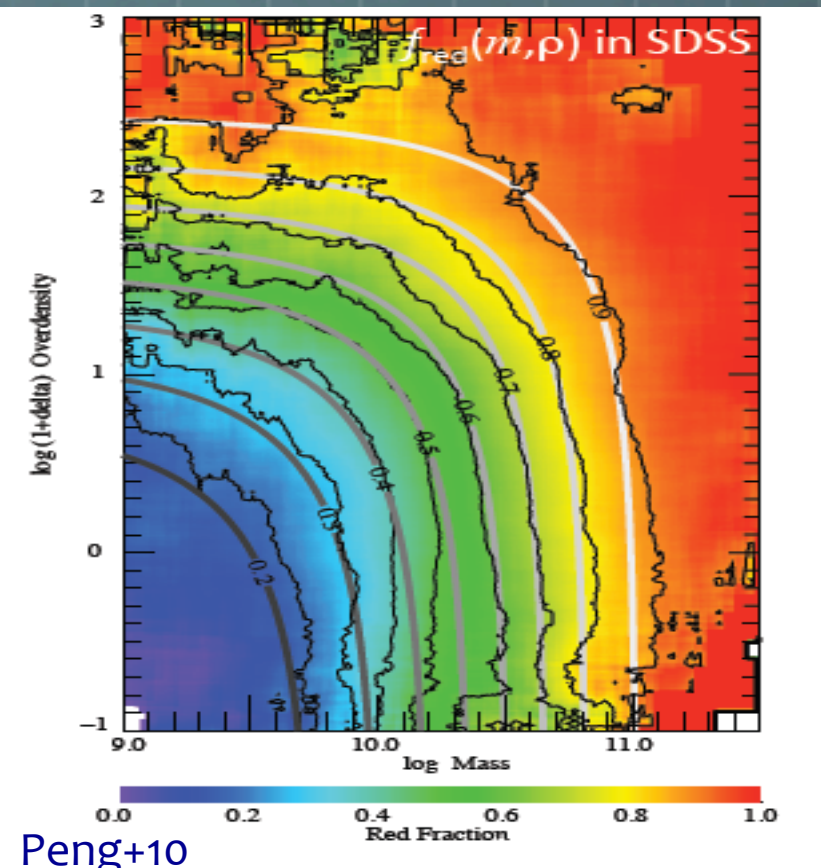
Gabor+RD 12

After



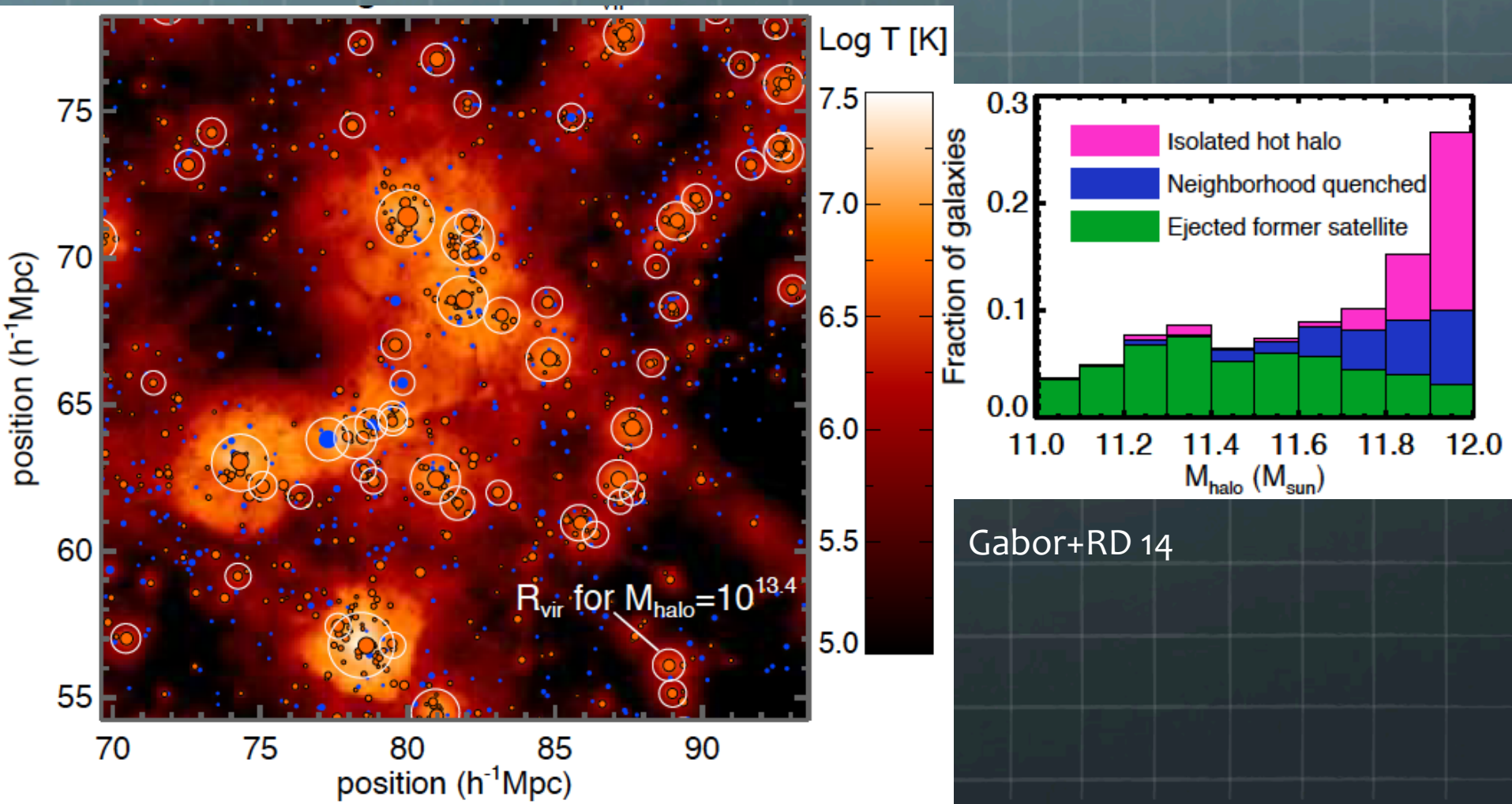
# Environment and mass quenching both come from hot gas quenching

- Galaxies are increasingly likely to be in a hot halo at both high masses and high densities



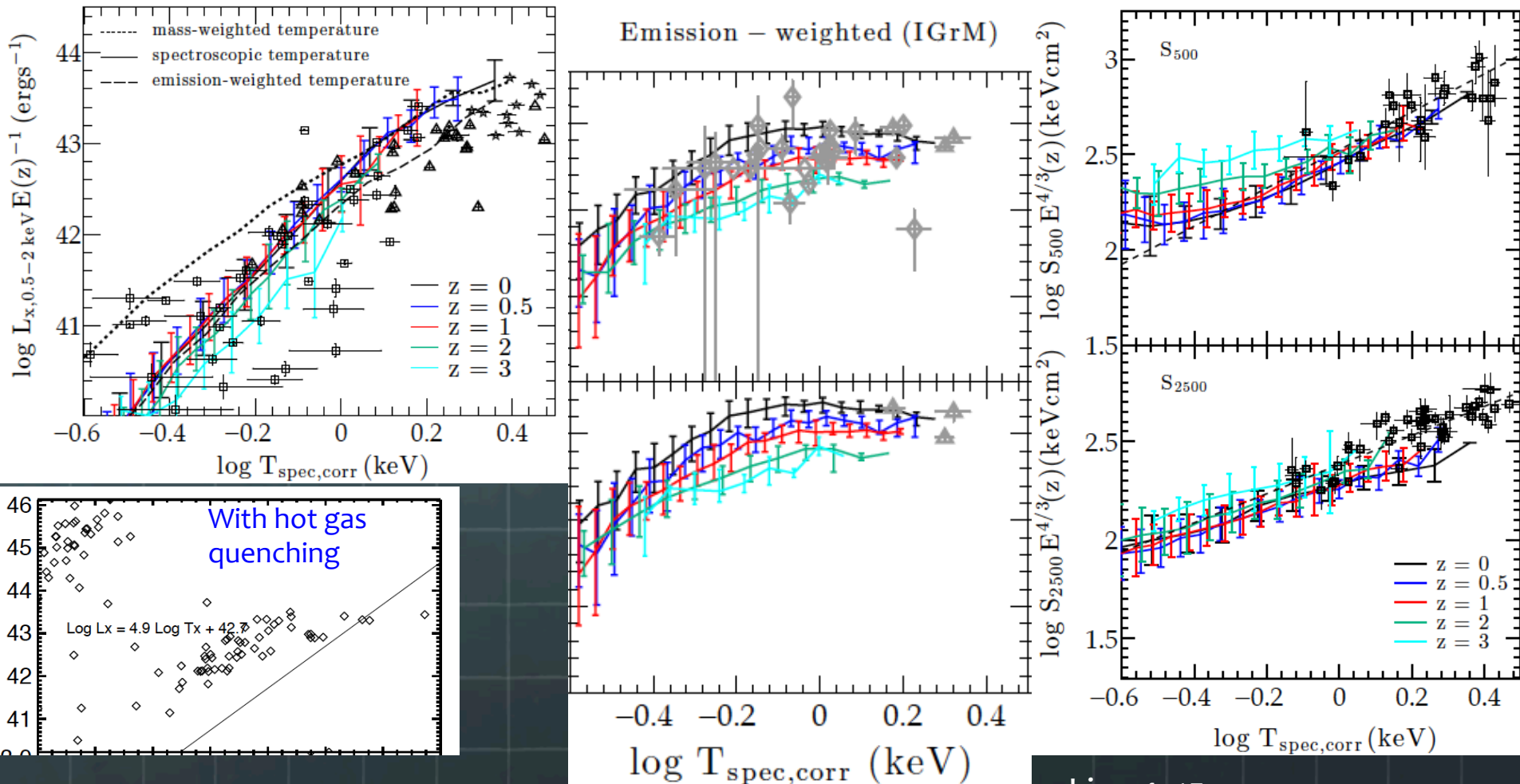
# Hot gas from gravity alone can extend well beyond $R_{\text{vir}}$

- Hot gas around big halos can quench “centrals”



Gabor+RD 14

# X-ray (ICM) scaling relations WITHOUT quenching – looks good!



# Discussion points

- Keeping hot halo gas hot (i.e. offsetting halo gas cooling) is a *necessary* and *sufficient* condition to quench a central galaxy. However, it may not be a *unique* condition for quenching a central.
- Quenching by offsetting cooling can simultaneously yield mass quenching (better: central quenching) and environment quenching (better: satellite quenching).
- X-ray scaling relations don't show strong evidence for widespread heating at late epochs as is required to offset cooling in centrals. Bubbles have enough energy but coupling this energy is unsolved.
- Satellite galaxy quenching is straightforward in hydro simulations, but may not be accurately captured in current semi-analytic models.
- Morphology is an *effect* of quenching, not a *cause*. Morphological quenching is a misnomer: morphology can reduce SF but not quench.