AGN FEEDBACK & STAR FORMATION QUENCHING

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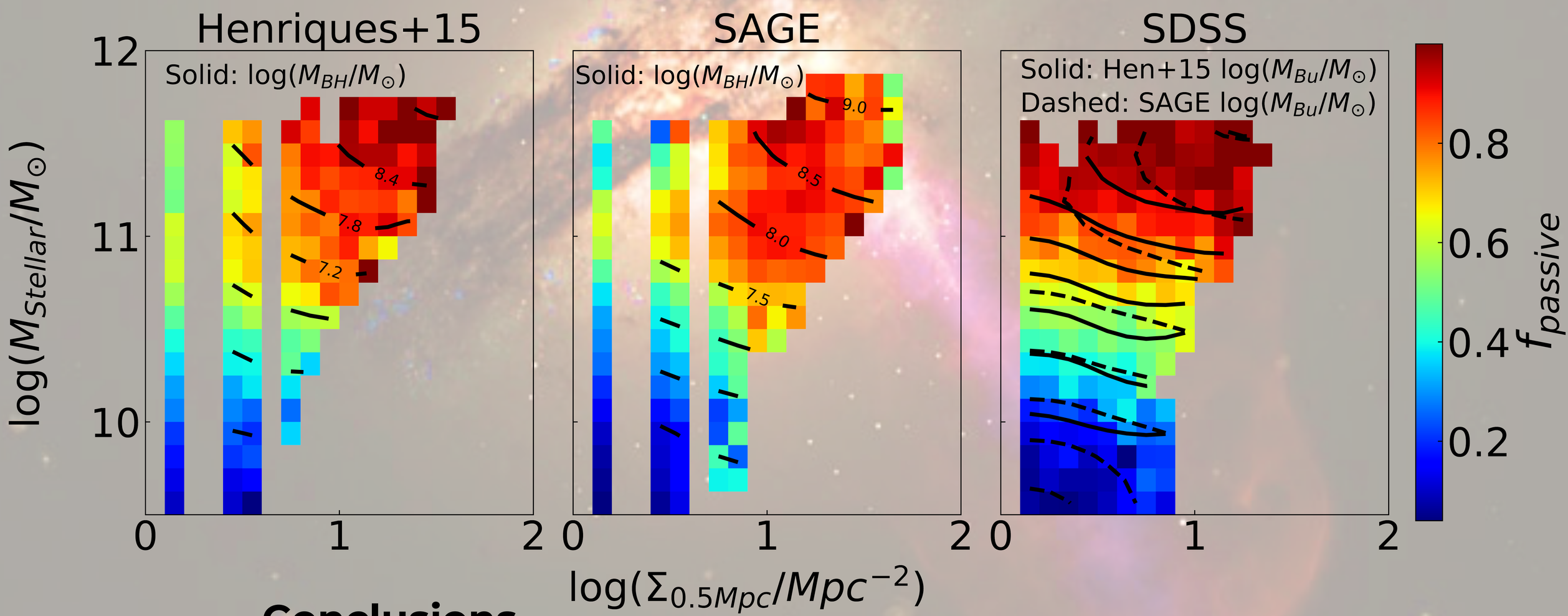
Introduction

Many observational studies have tested star formation quenching as a function of galaxy parameters. It is found that galaxy color bimodality, a qualitative proxy for star formation, strongly correlates with stellar mass, bulge mass and environment. Due to the strong correlation between bulge mass and black hole mass, it is expected that star formation quenching should correlate with the mass of the black hole and hence the AGN luminosity. The factors that dictate the AGN luminosity can be studied with Semi-Analytic Models (SAM) .

Data & Method

- Select central galaxies at z = 0 for SDSS DR7, and 2 SAMs. [1, 2]
- SAMs different majorly on the "radio mode" AGN feedback prescriptions. [3]
- Central galaxies selected through selecting a dark matter halo in position and velocity space. Central galaxy is most massive galaxy in the halo. [4]
- Analysis performed in a stellar mass – neighbor density space. Neighbor density correlates well with halo mass and breaks the degeneracy between stellar mass and halo mass .



Conclusions

- Passive fractions for model galaxies correlates SMBH mass. For observed galaxies, the mass of the bulge correlated well with passive fraction.
- Large scatter found in the model bulge mass – SMBH mass relation. Implicating an incomplete understanding of the coupled growth mechanism of the bulge and SMBH.
- Presence of hot gas halo around the bulge allows for the couple growth of the bulge and SMBH and lower scatter in bulge – SMBH relation. [2]

References:

1. Henriques B. et al. 2015, MNRAS, 451, 2663
2. Croton D. et al. 2016, ApJ, 222, 22
3. Croton D et al. 2006, MNRAS, 365, 11
4. Fossati M. et al. 2015, MNRAS, 446, 2582

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