UKIDSS UDS: The emergence of the red sequence

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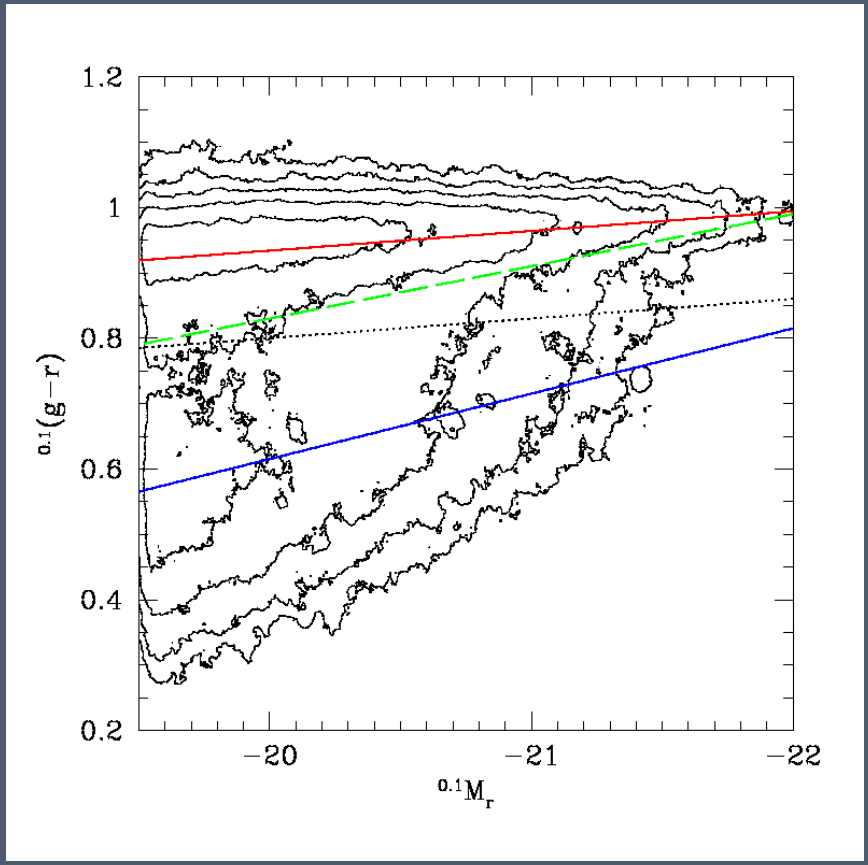
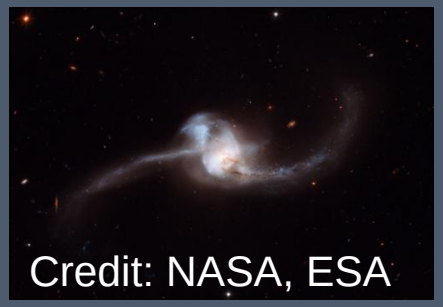
With special thanks to the JAC staff!

A fundamental issue:

Skibba & Sheth (2009)



Current model:


Credit: NASA, ESA


Credit: MPA-Garching

Gas-rich, major merger

↓

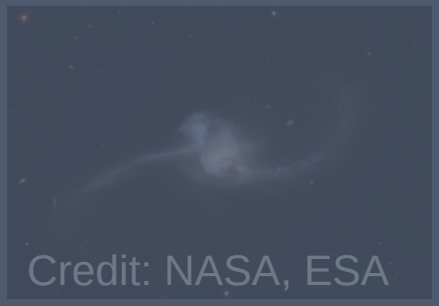
Quasar / intense star-burst phase

↓

Dead spheroid

Current model:

Hierarchical assembly


Credit: NASA, ESA


Credit: MPA-Garching

Free-fall time limit on SF
+ SF feedback

↓

Cooling time limits SFR
+ hot halo formed

↓

M_{halo} large (~$10^{12\text{-}13}$ M_{sun})
$t_{cool} \sim t_H$

redshift ↓

High mass halo

Low mass halo

UKIDSS UDS:

Depths are 5-σ rms between 2” apertures.

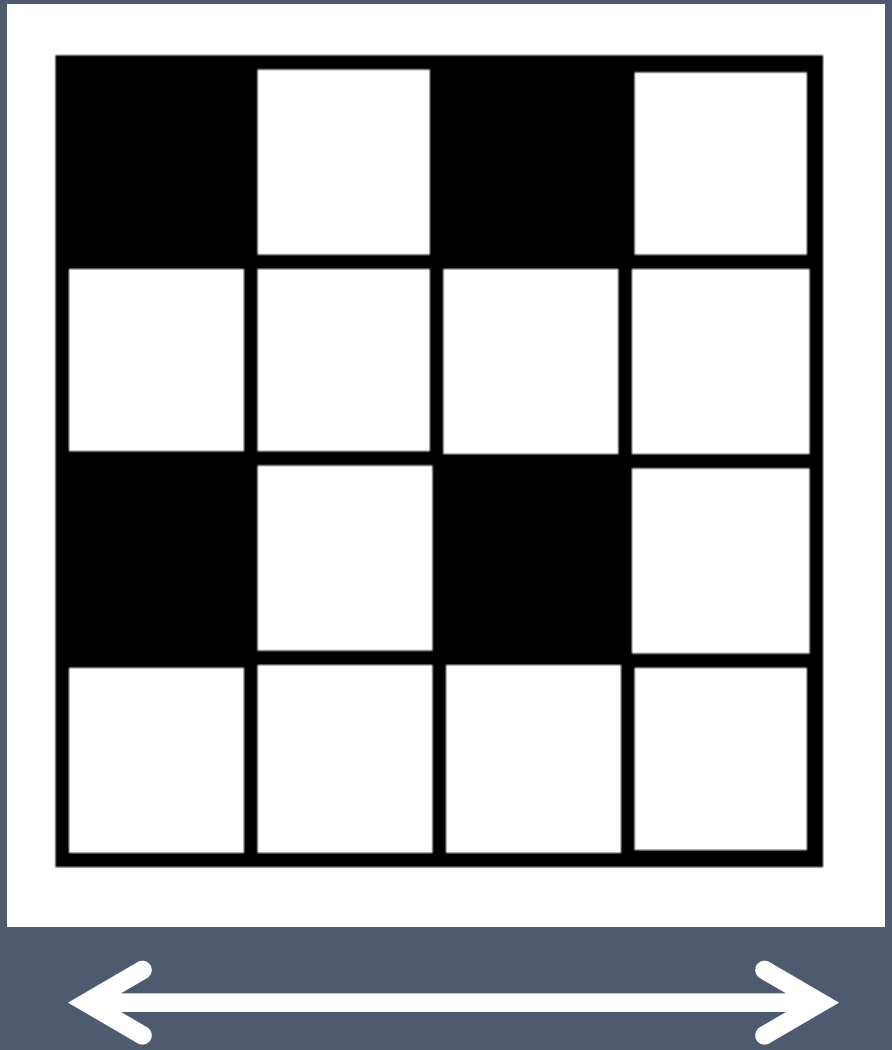
DR8

J = 24.9 (5-σ, AB)
H = 24.2
K = 24.6

Double the previous exposure time, and the data are public!

Currently the deepest degree-scale survey by at least half a magnitude.

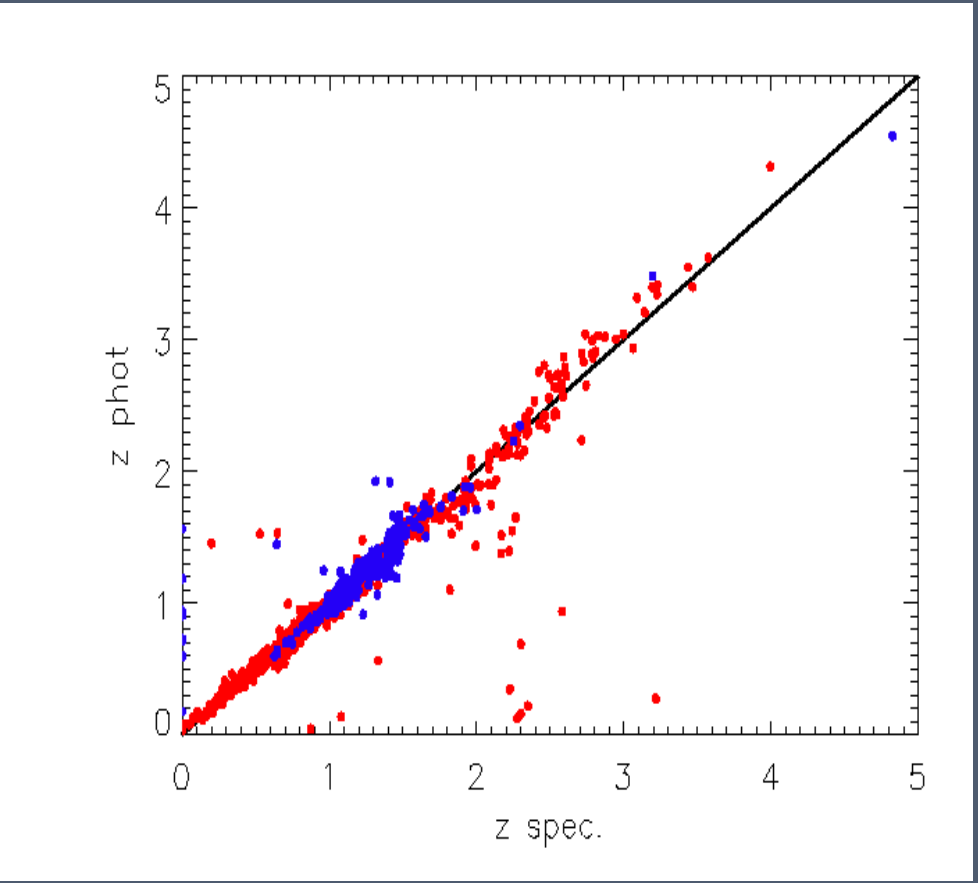
Next release:
Imminent



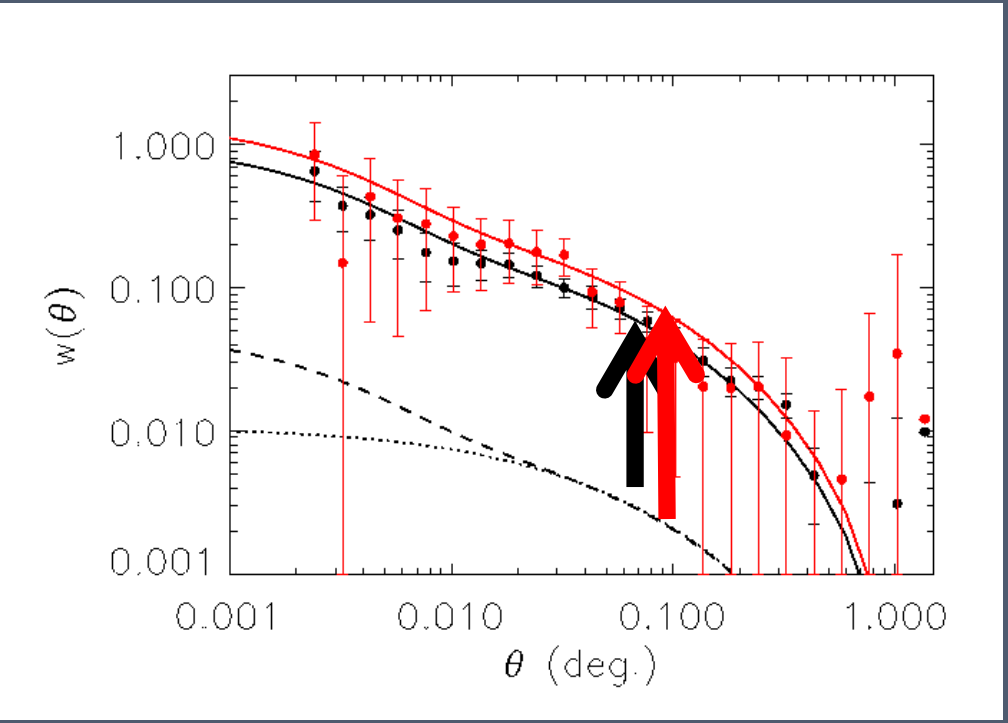
Photometric redshifts

Red: UDSz VIMOS
Blue: UDSz FORS2

$\Delta z / (1 + z) = 0.028$

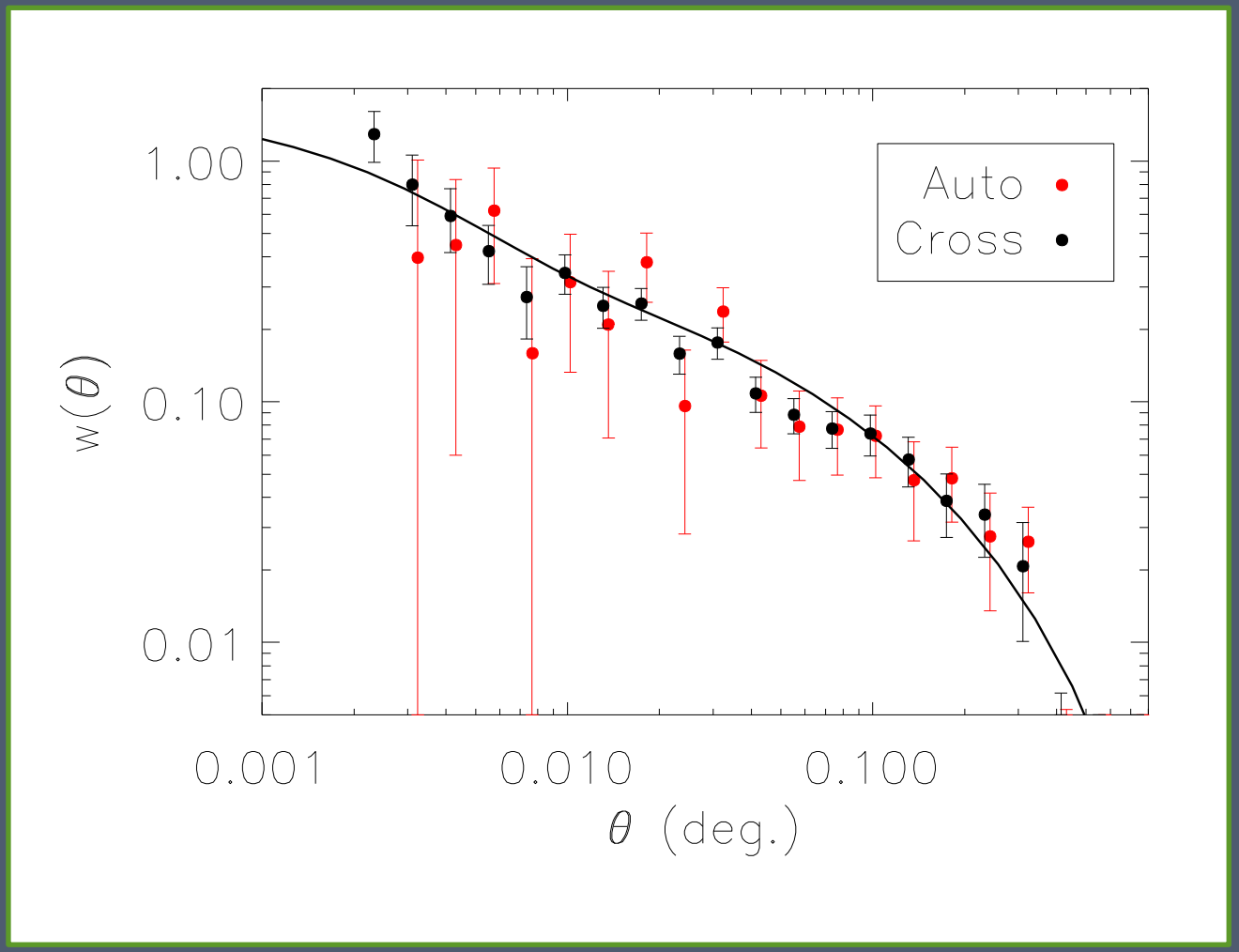


Cross-correlation:



$$\text{Bias}_{RR} = \frac{\text{Bias}^2_{RG}}{\text{Bias}_{GG}}$$

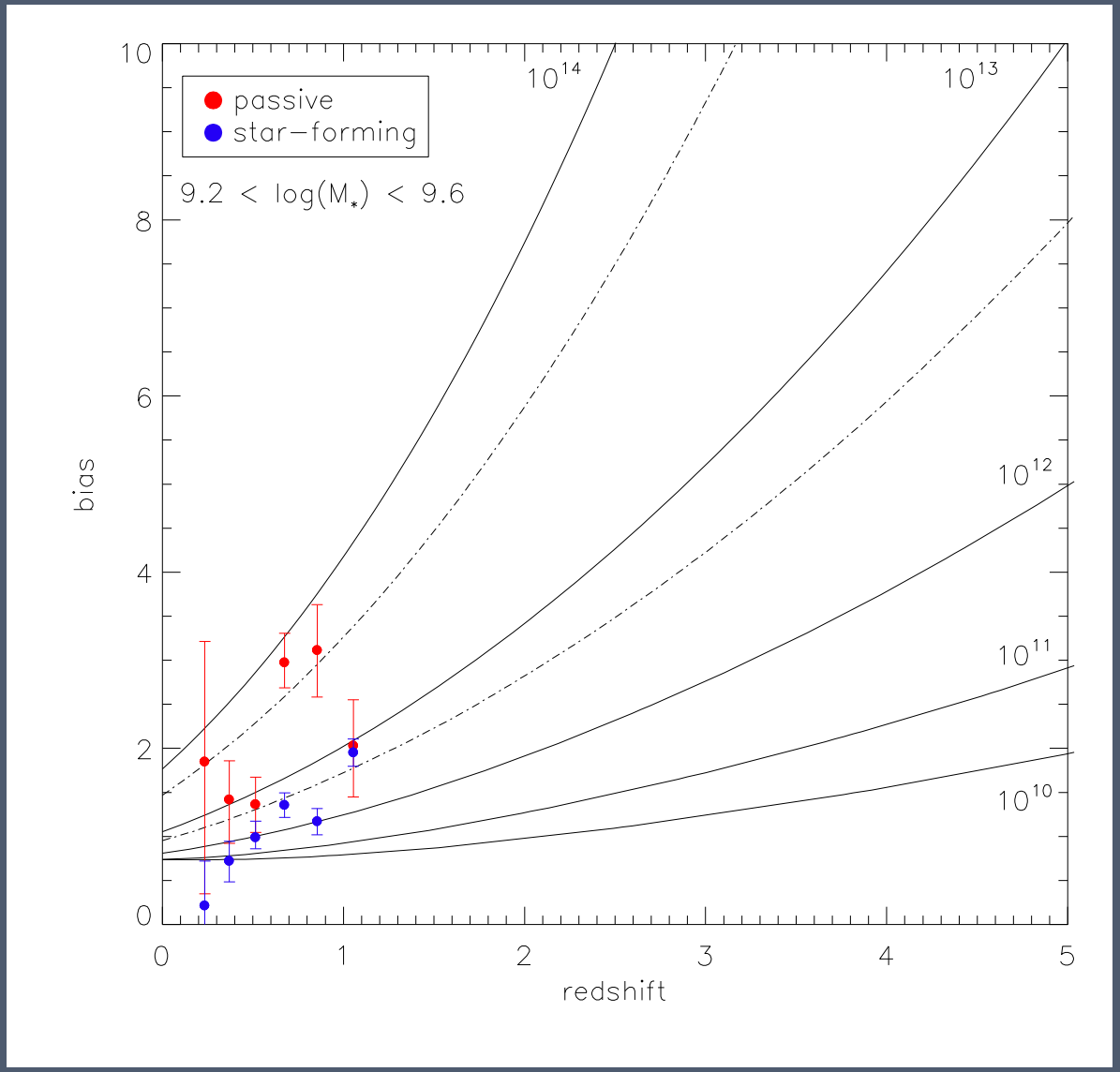
DR8



$9.2 < \log M_* < 9.6$

10^{14} M_{sun}

10^{13} M_{sun}



bias

10^{12} M_{sun}

10^{11} M_{sun}

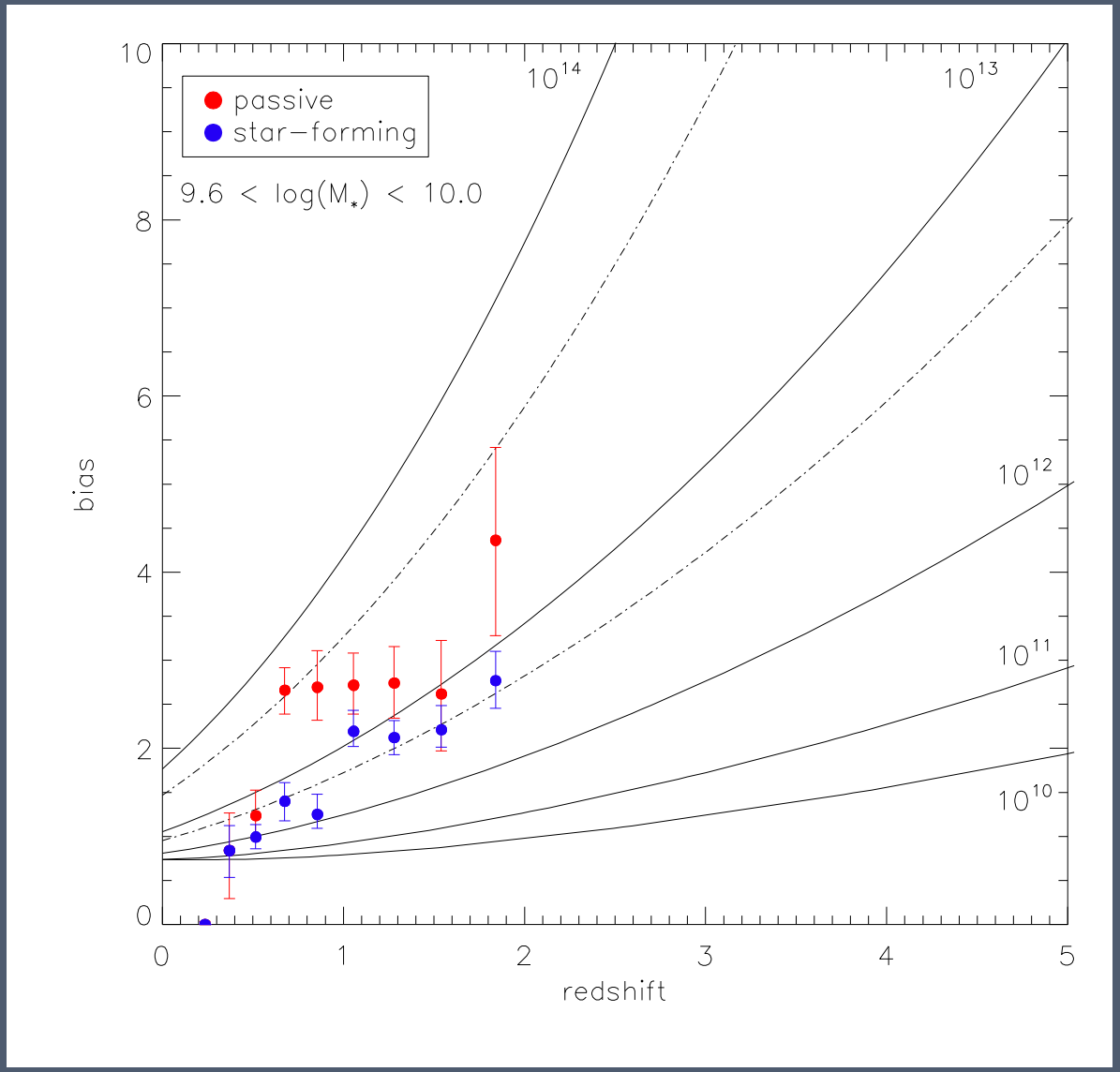
10^{10} M_{sun}

redshift

$9.6 < \log M_* < 10.0$

$10^{14}\ M_{sun}$

$10^{13}\ M_{sun}$



$10^{12}\ M_{sun}$

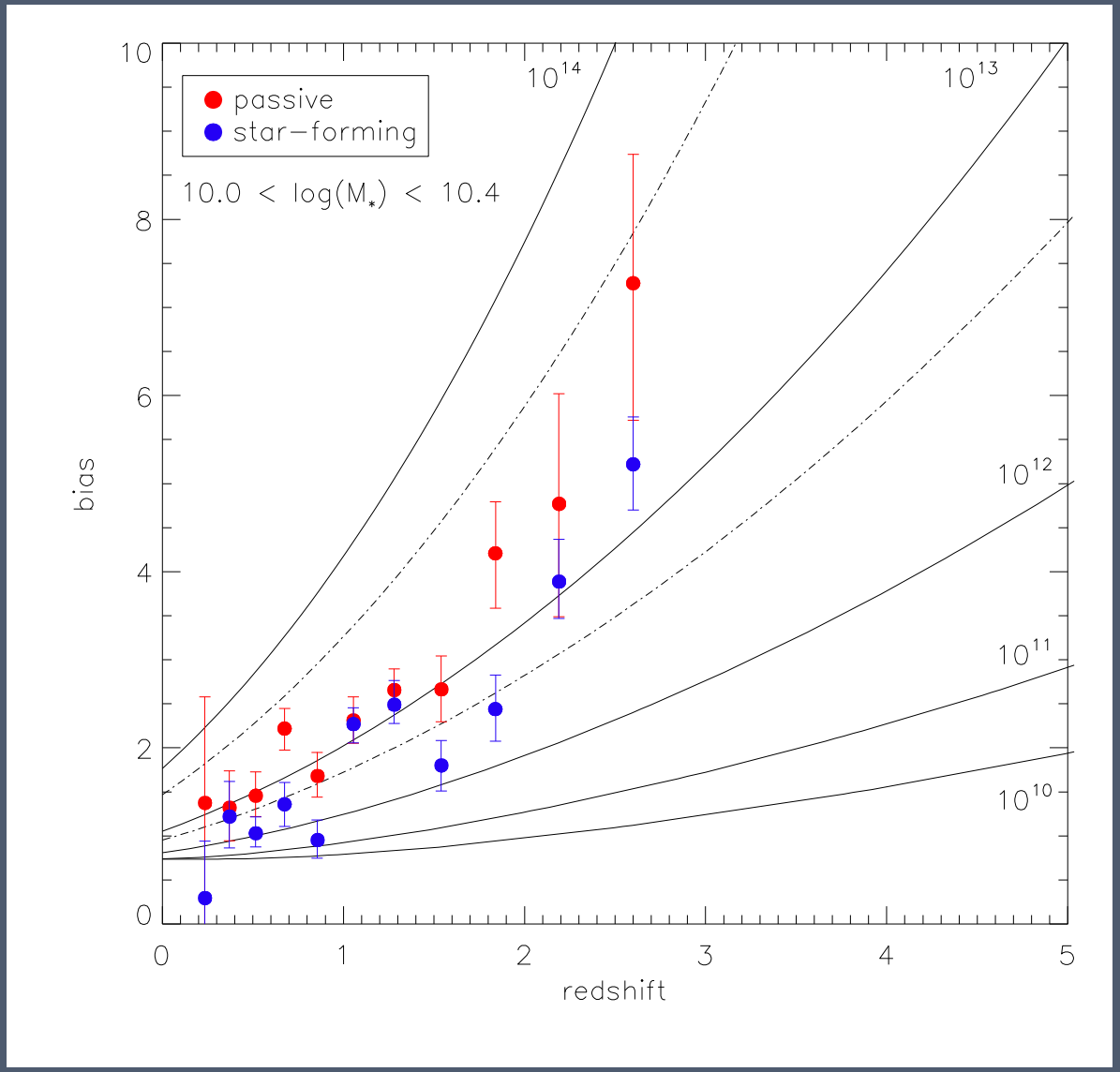
$10^{11}\ M_{sun}$

$10^{10}\ M_{sun}$

$10.0 < \log M_* < 10.4$

$10^{14}\ M_{sun}$

$10^{13}\ M_{sun}$



$10^{12}\ M_{sun}$

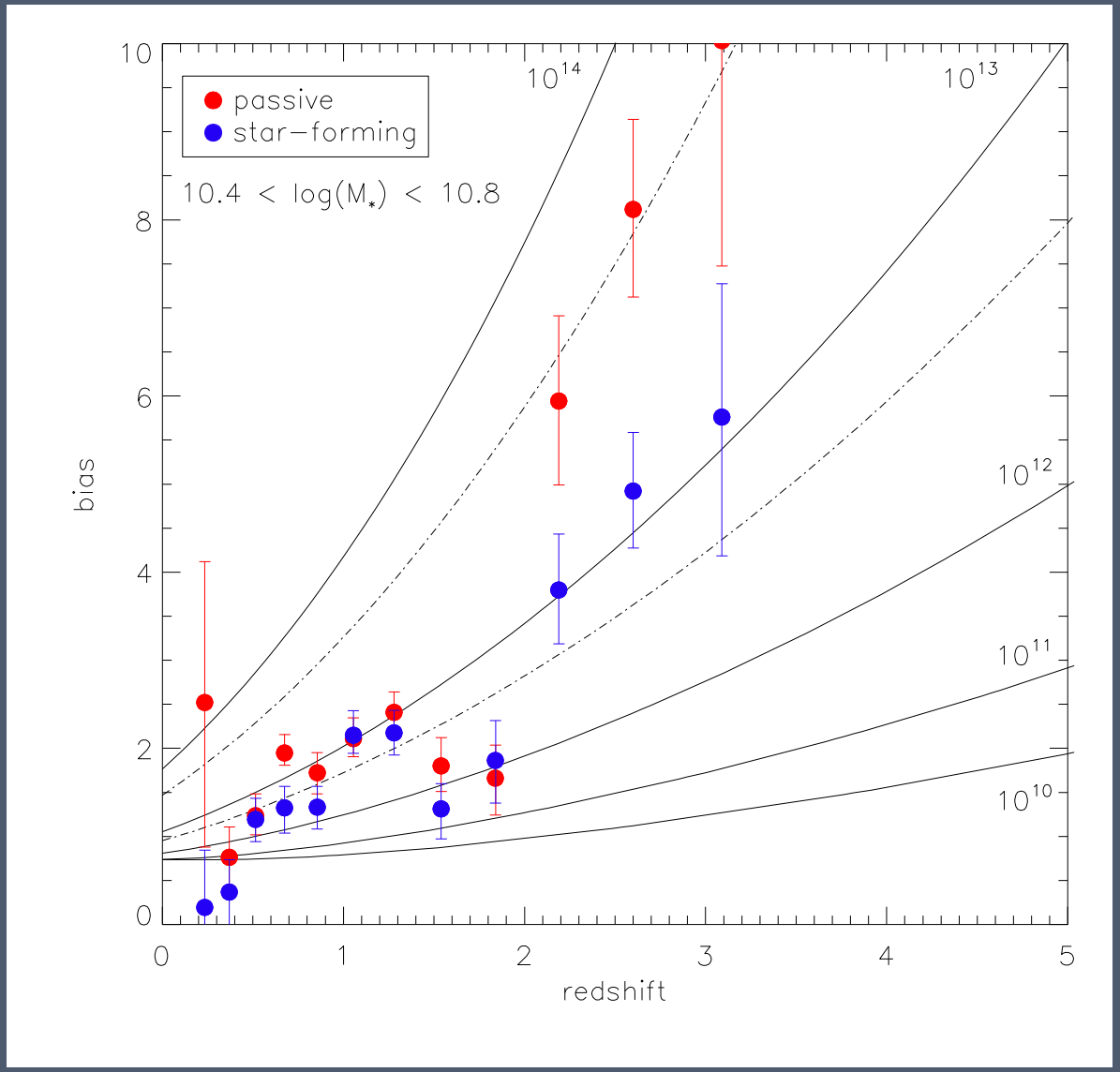
$10^{11}\ M_{sun}$

$10^{10}\ M_{sun}$

$10.4 < \log M_* < 10.8$

$10^{14}\ M_{sun}$

$10^{13}\ M_{sun}$



$10^{12}\ M_{sun}$

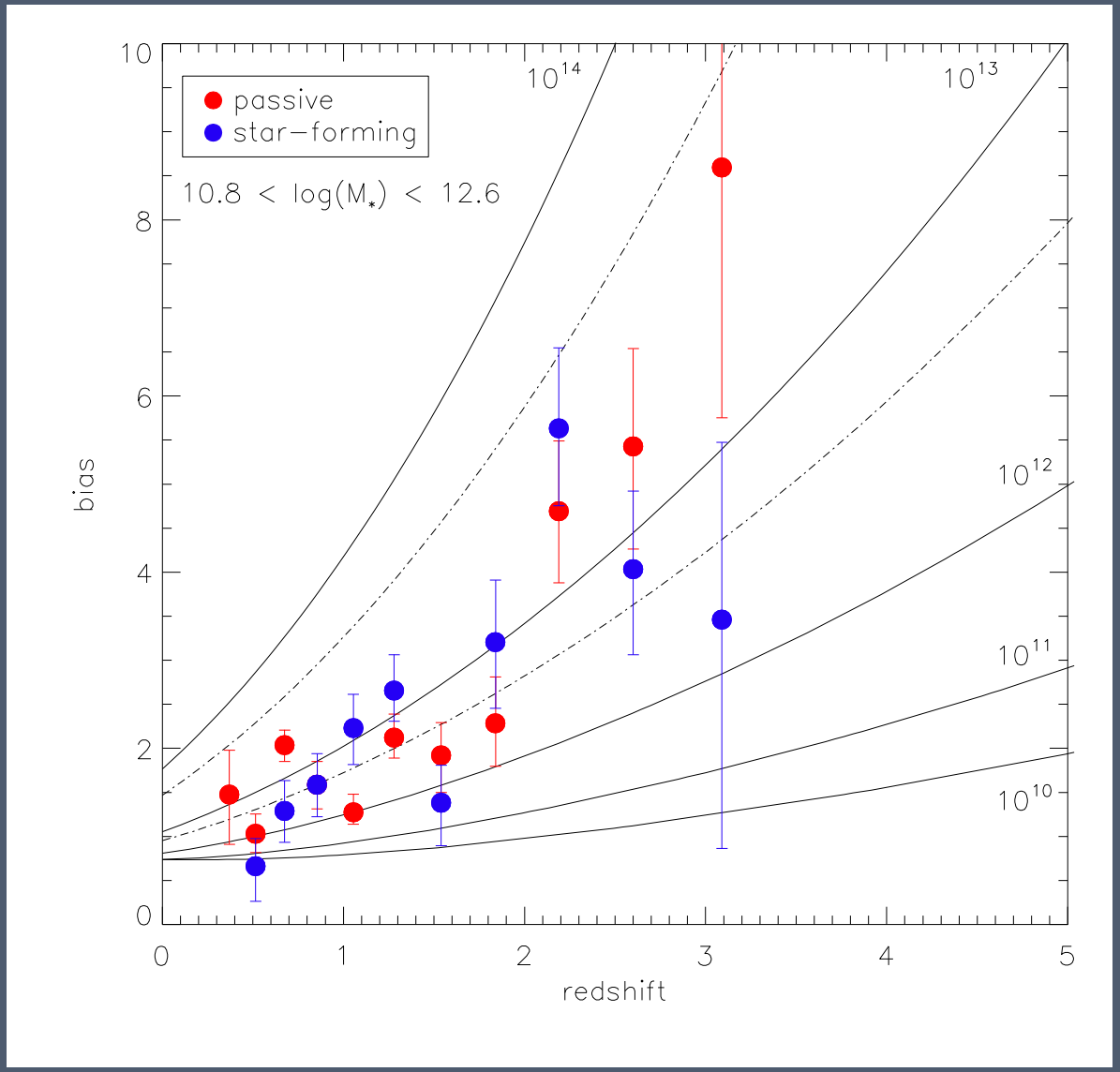
$10^{11}\ M_{sun}$

$10^{10}\ M_{sun}$

$10.8 < \log M_*$

$10^{14}\ M_{sun}$

$10^{13}\ M_{sun}$



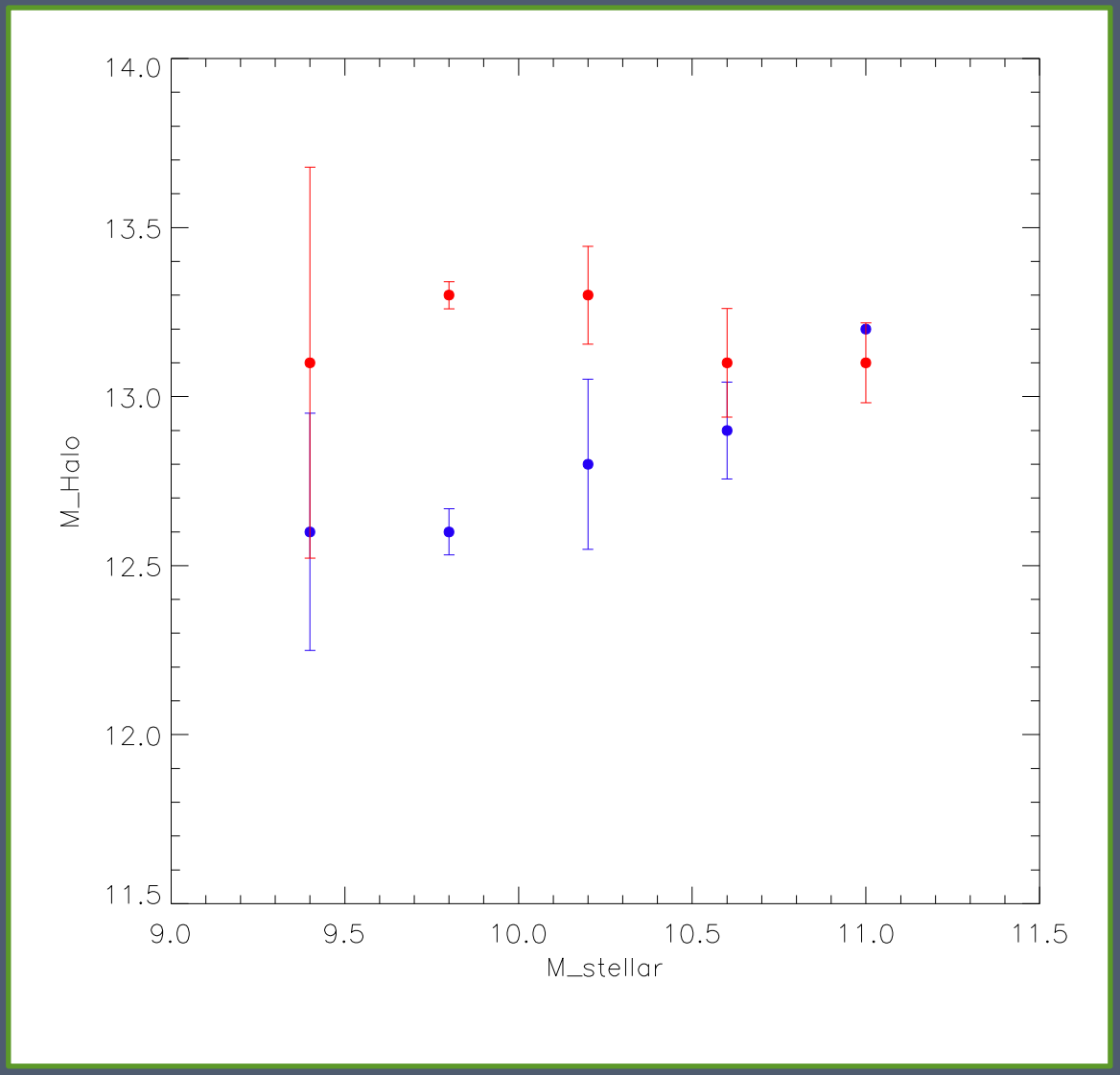
$10^{12}\ M_{sun}$

$10^{11}\ M_{sun}$

$10^{10}\ M_{sun}$

0.7 < z < 3.0

Halo mass

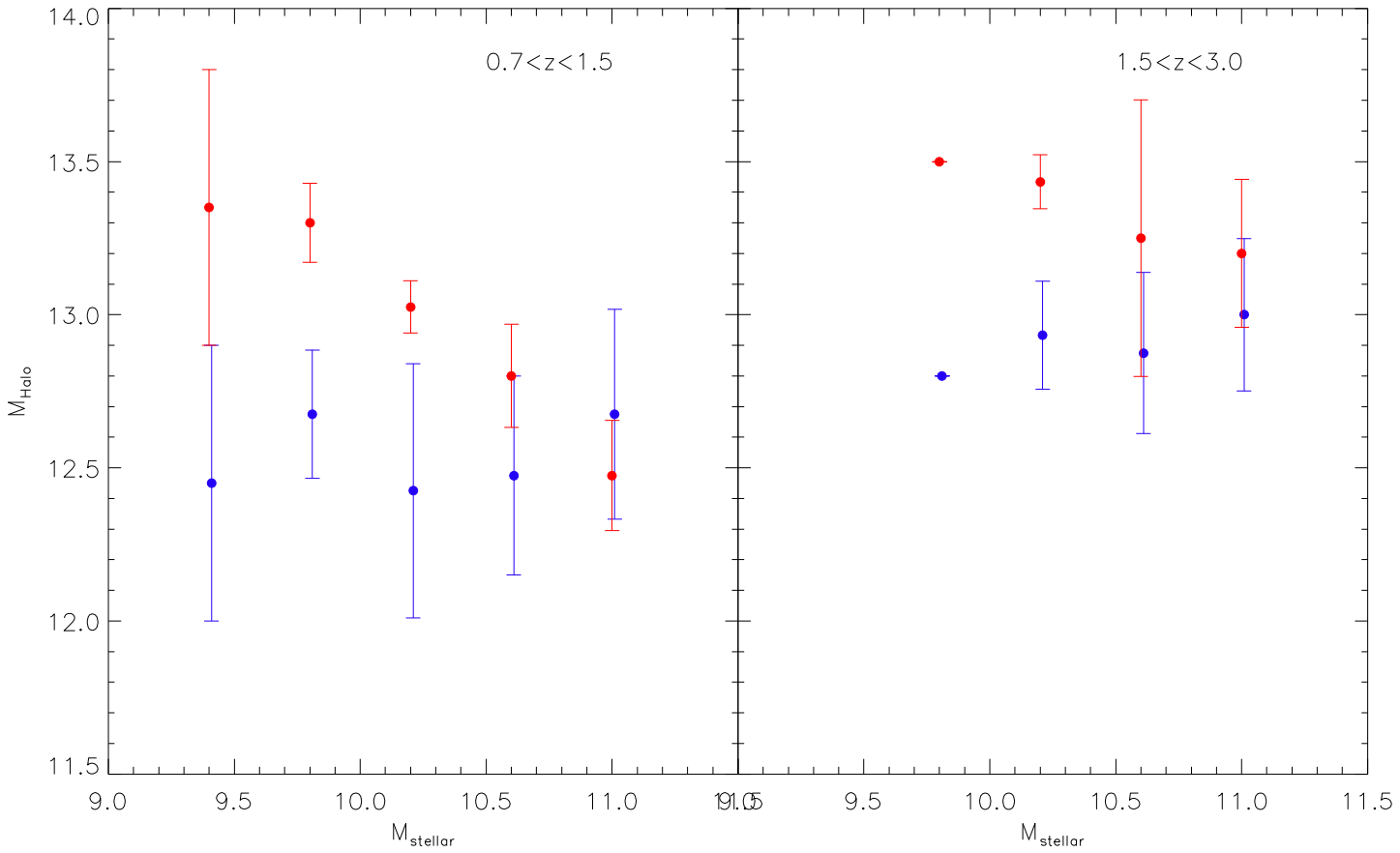


Stellar mass

0.7 < z < 1.5

1.5 < z < 3.0

Halo mass



Stellar mass

Summary

The UKIDSS UDS is currently the best near-IR survey for studies of large-scale structure at $z > 1$ (amongst other science goals).

We have used the cross-correlation technique to probe the masses of DM halos hosting passive galaxies to $z \sim 3$.

Results are **consistent** with a simple model in which halo mass has an important role is quenching star-formation.

Thanks for listening!