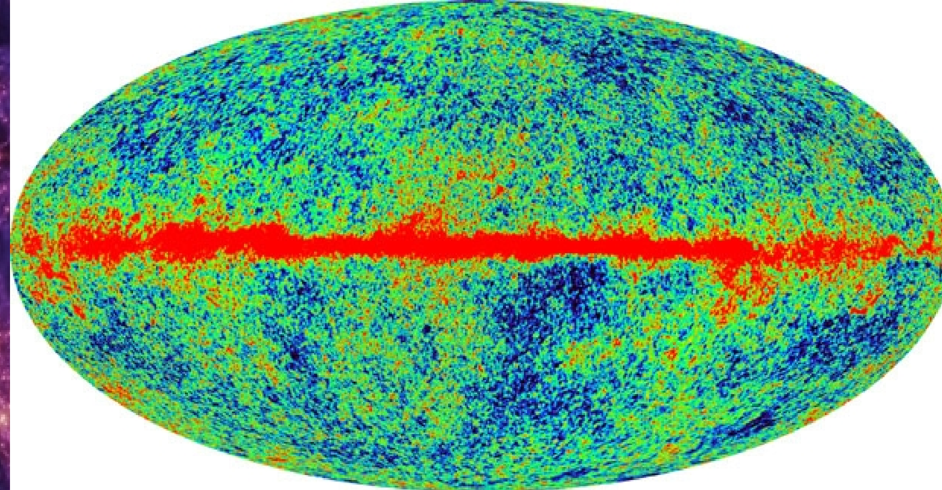
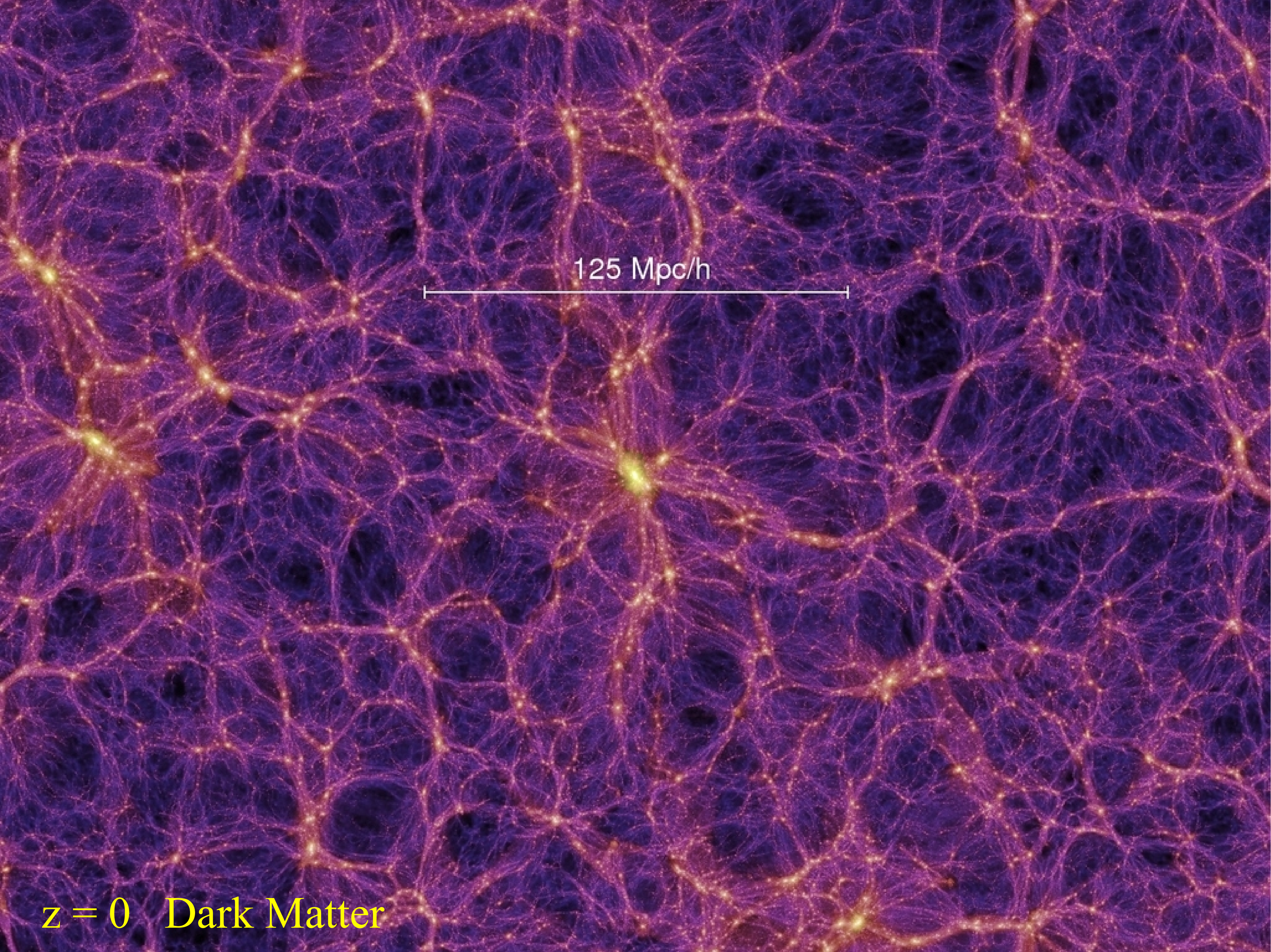
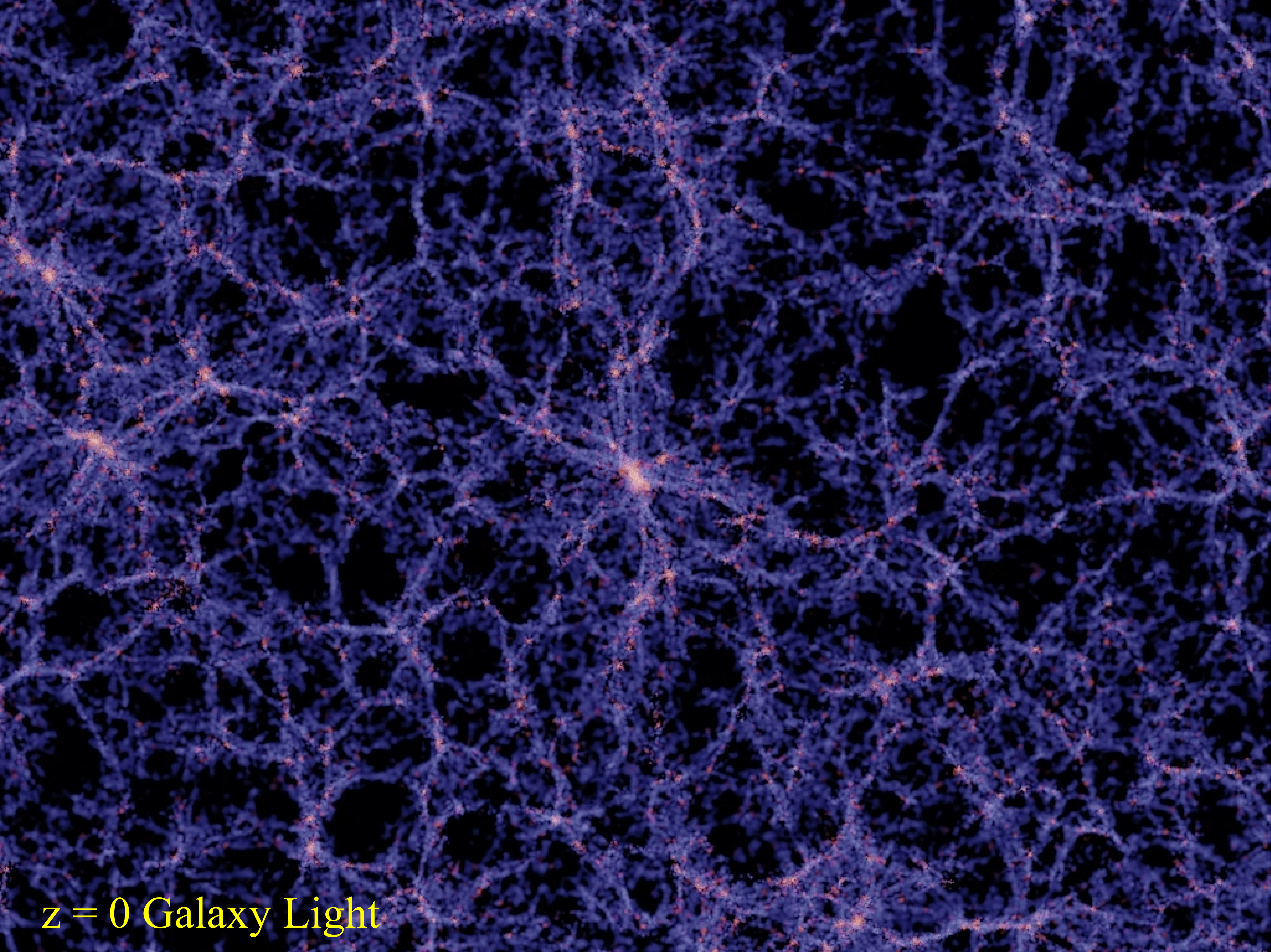


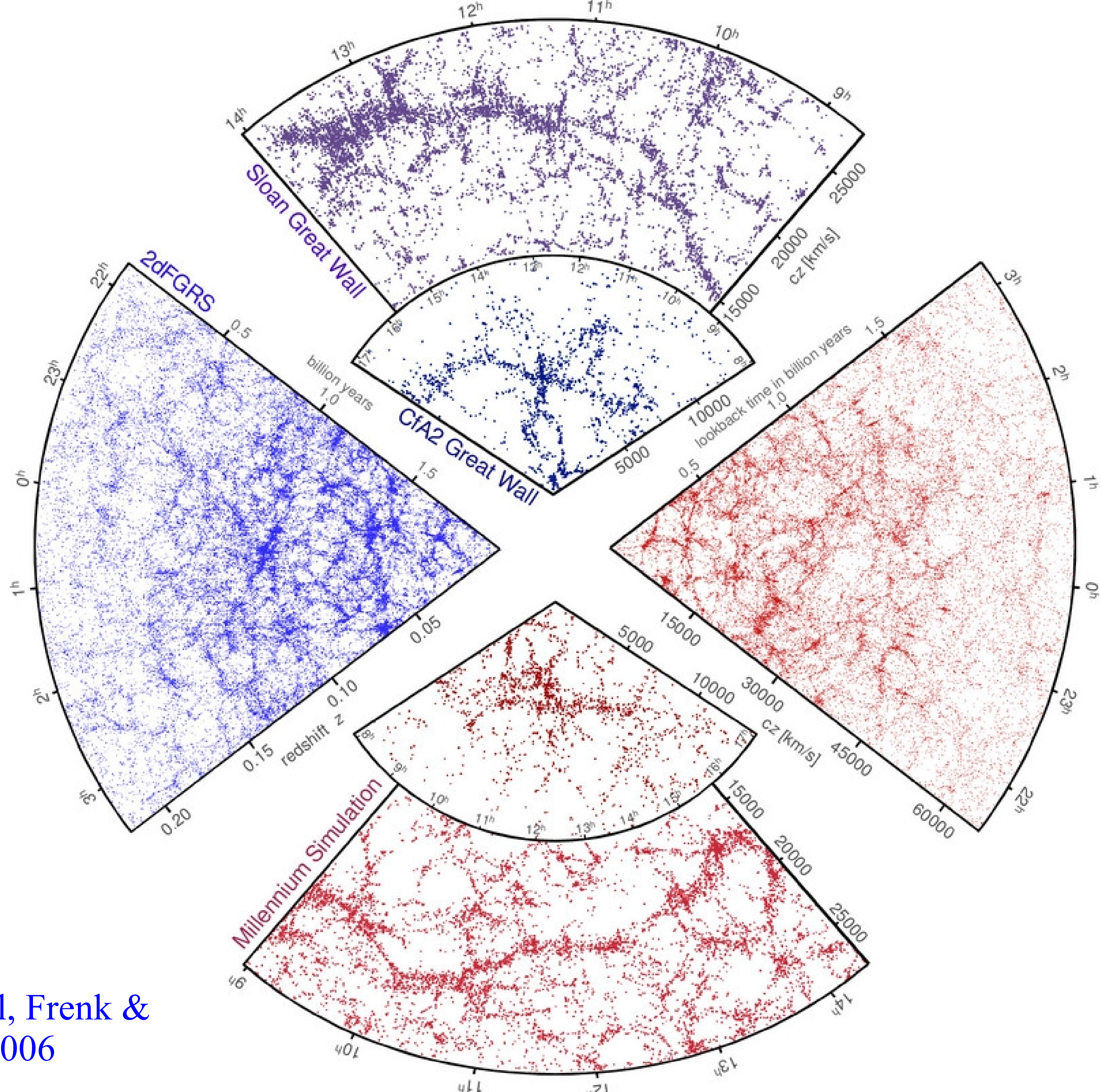
MR-R
London
July 2007

Large-scale structure from high to low redshift

Simon White
Max Planck Institute for Astrophysics


125 Mpc/h
z = 0 Dark Matter

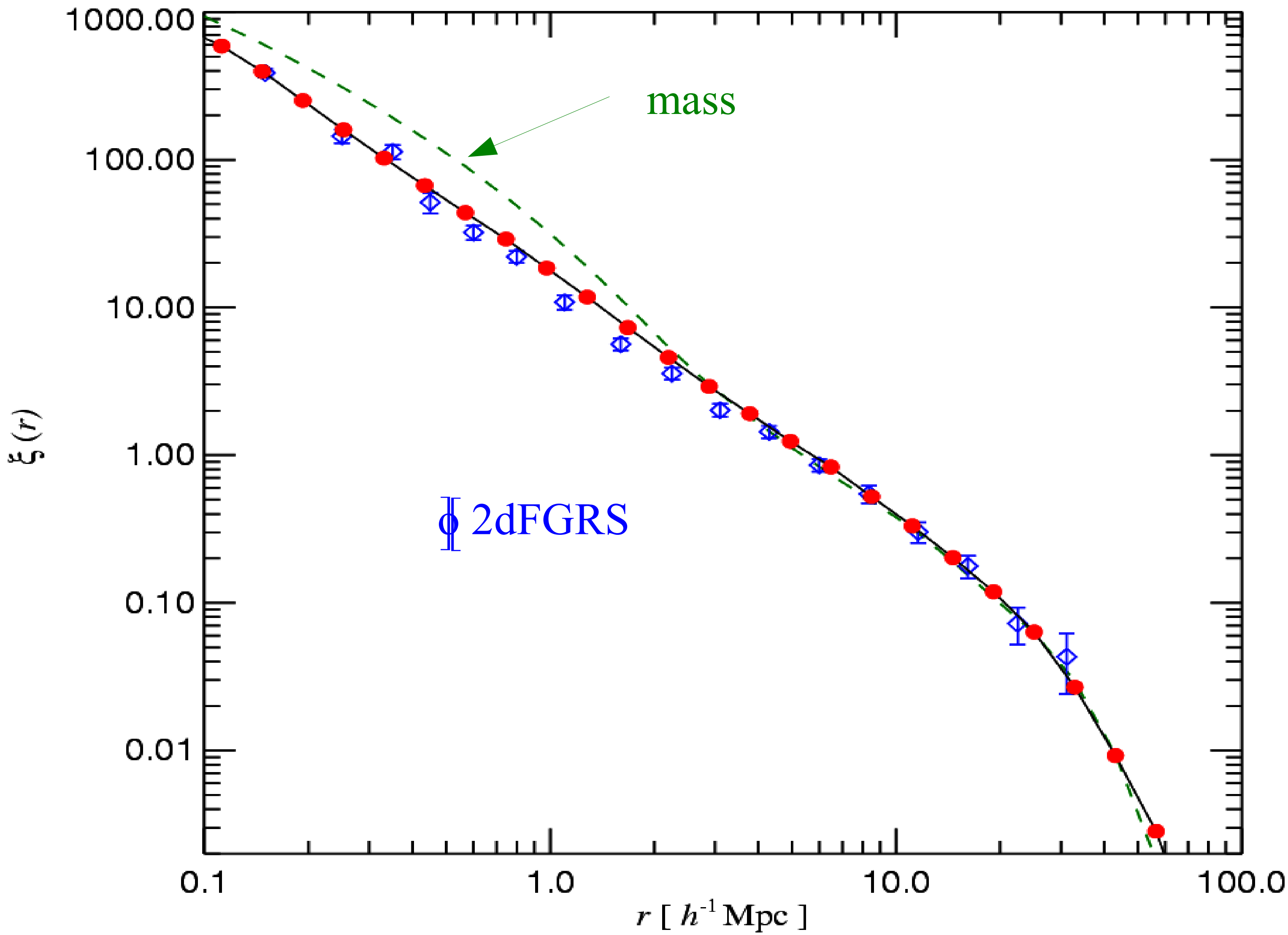

z = 0 Galaxy Light



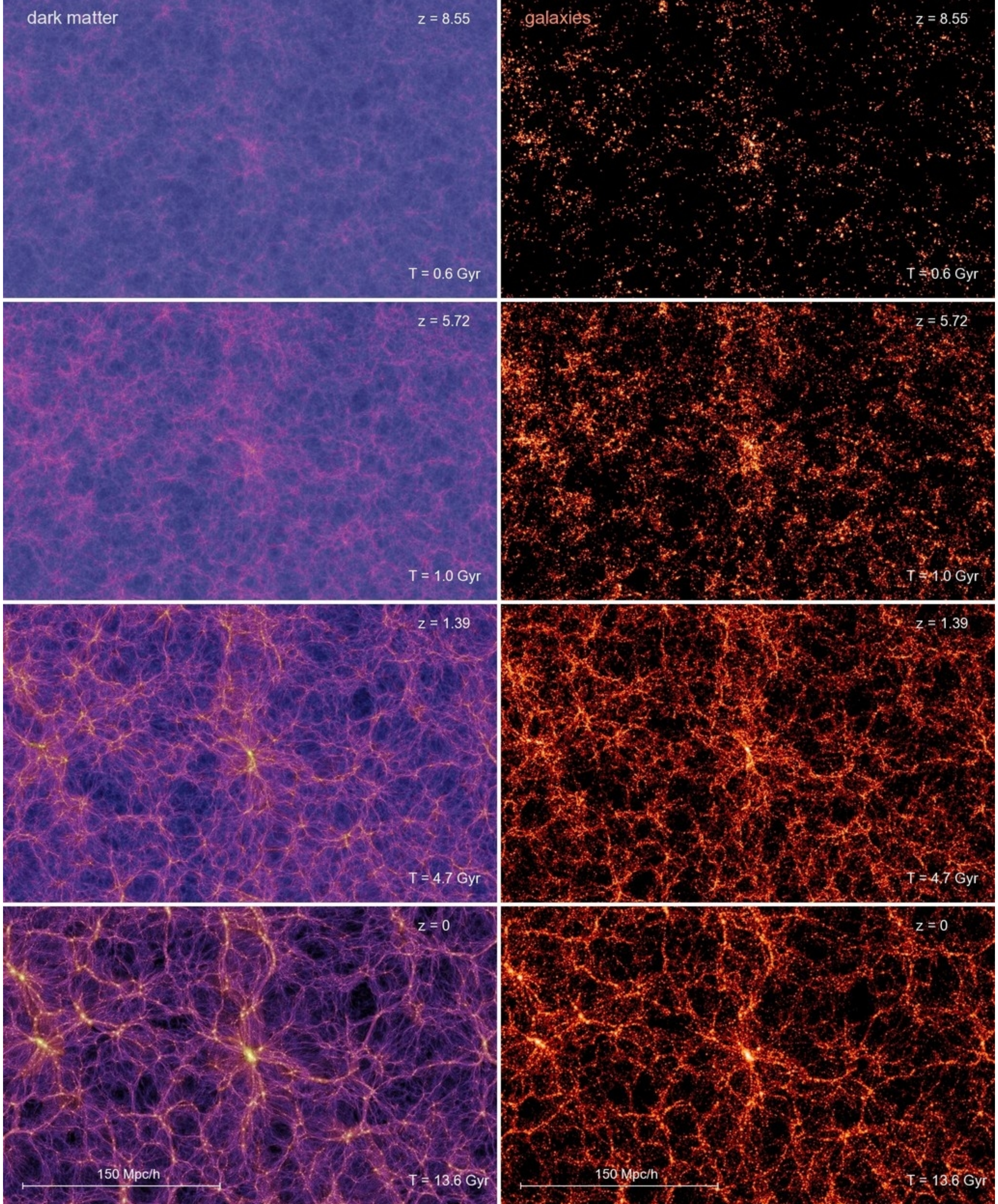
Springel, Frenk & White 2006

Galaxy autocorrelation function

Springel et al 2005



For such a large simulation the purely statistical error bars are negligible on ξ even for galaxies



Large-scale structure at high redshift

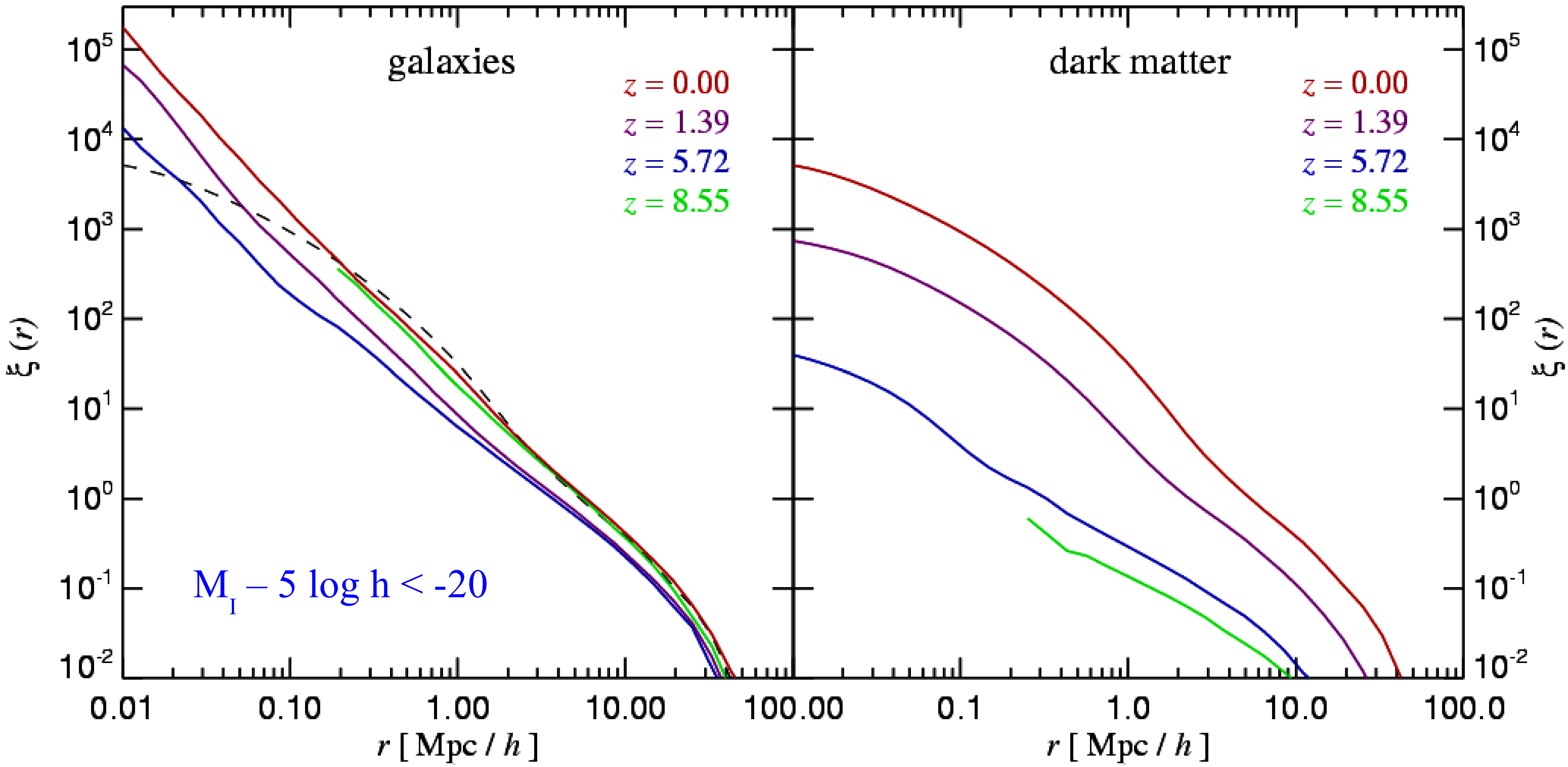
Springel, Frenk & White 2006

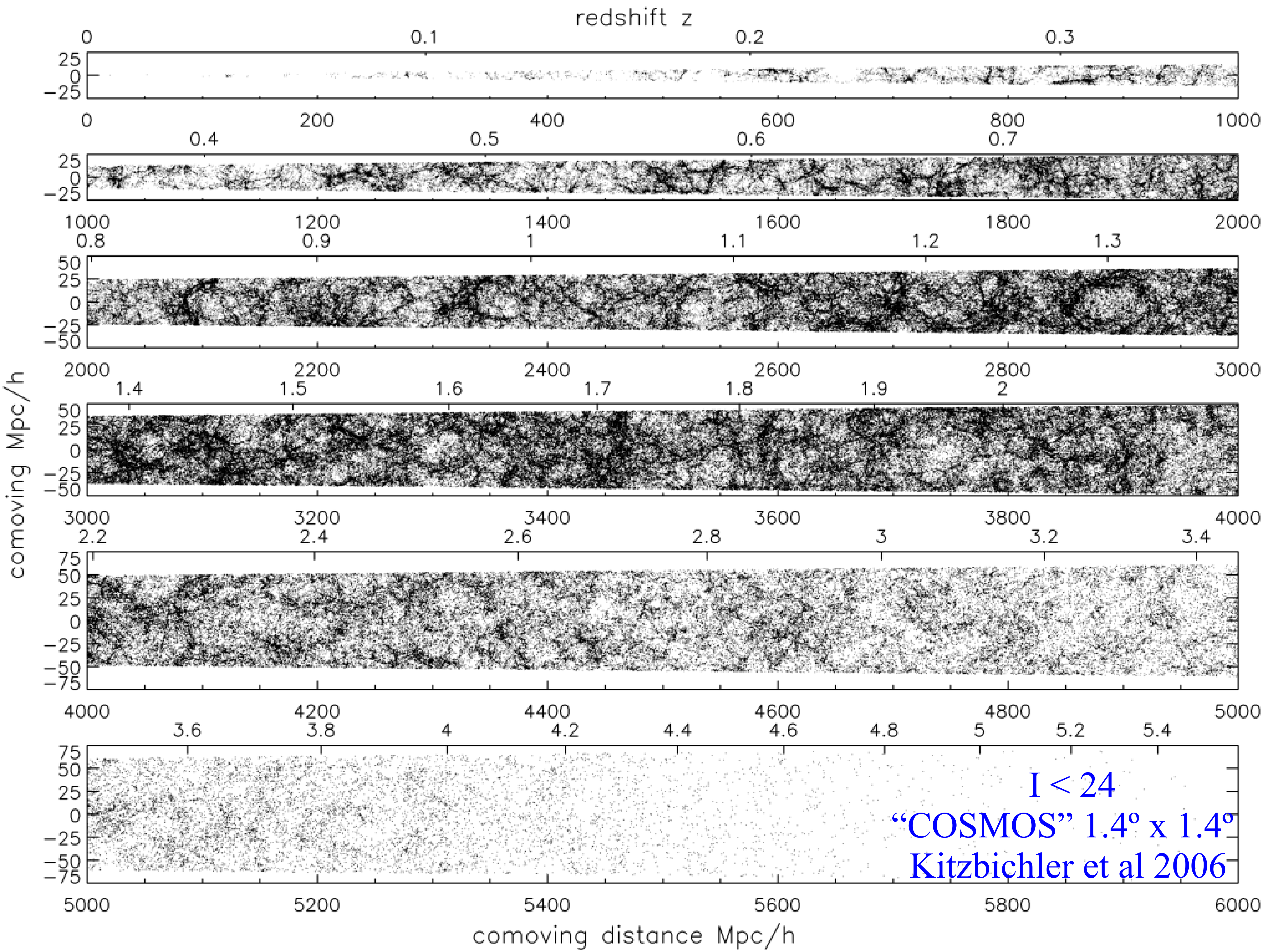
Large-scale structure in the galaxy distribution evolves very little with redshift

It is as strong at z=8.5 as at z=0

Evolution of mass and galaxy correlations

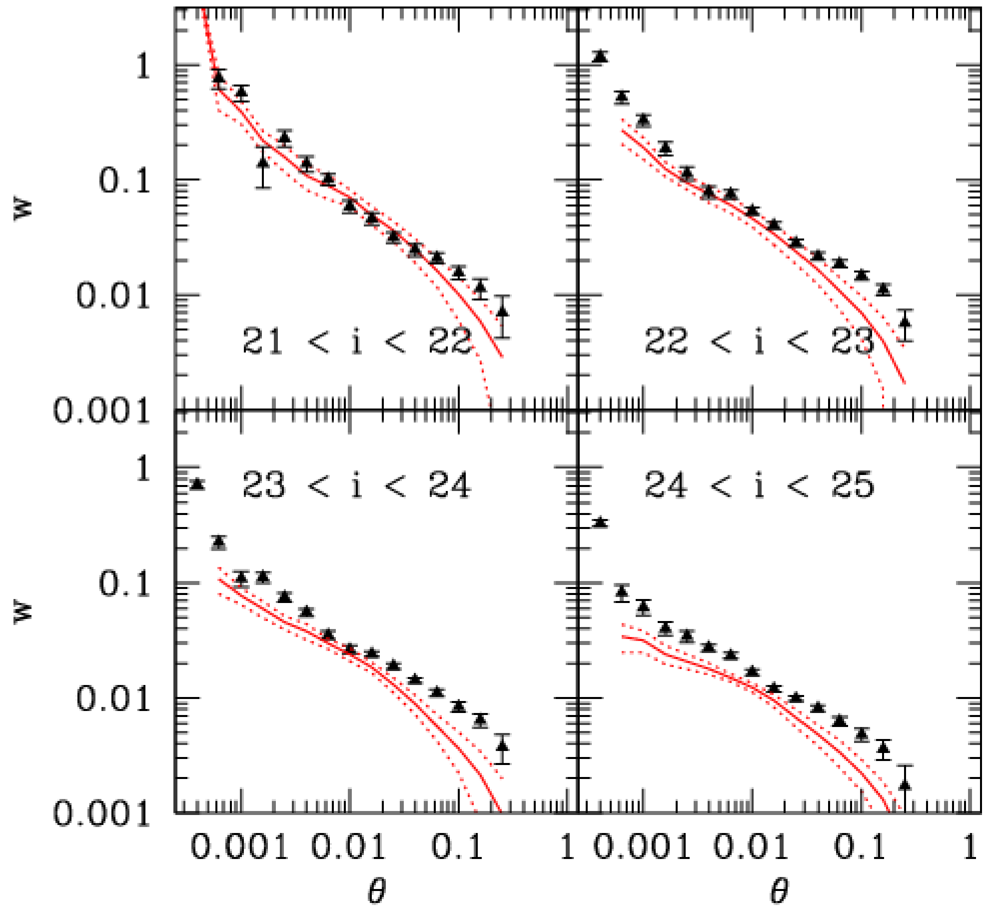
Springel, Frenk & White 2006




redshift z
comoving Mpc/h
comoving distance Mpc/h
I < 24
“COSMOS” 1.4º x 1.4º
Kitzbichler et al 2006

Comparison with COSMOS survey w(θ)

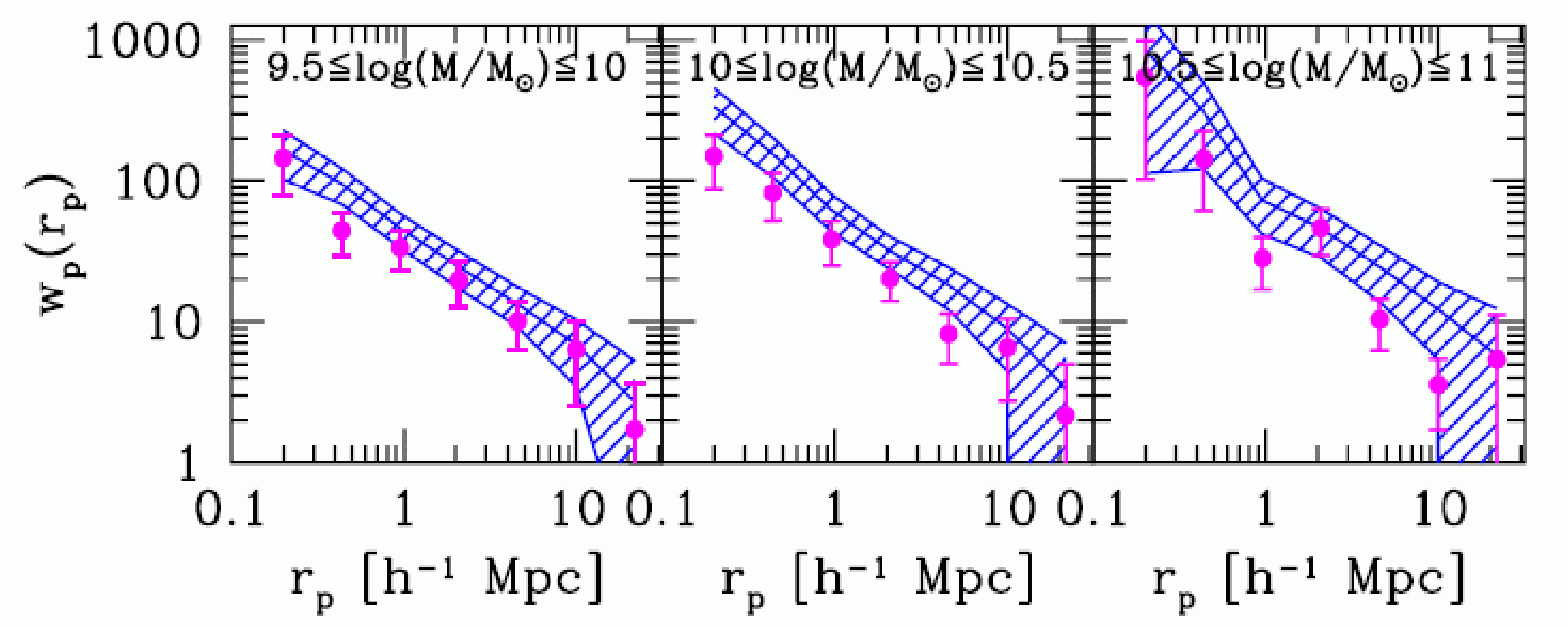
McCracken et al 2007



Comparison with VVDS survey $w_p(r_p)$

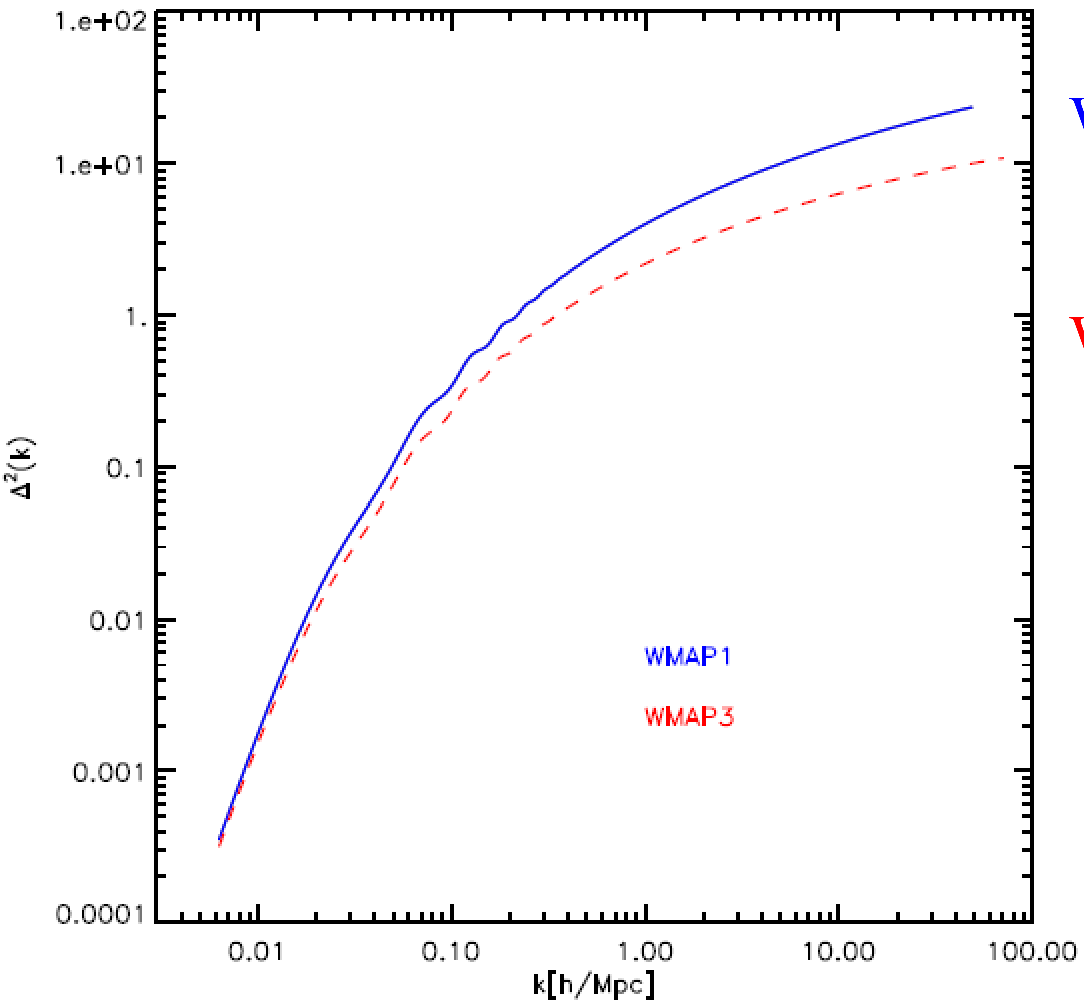
Meneux et al 2007

$\langle z \rangle \sim 0.6$



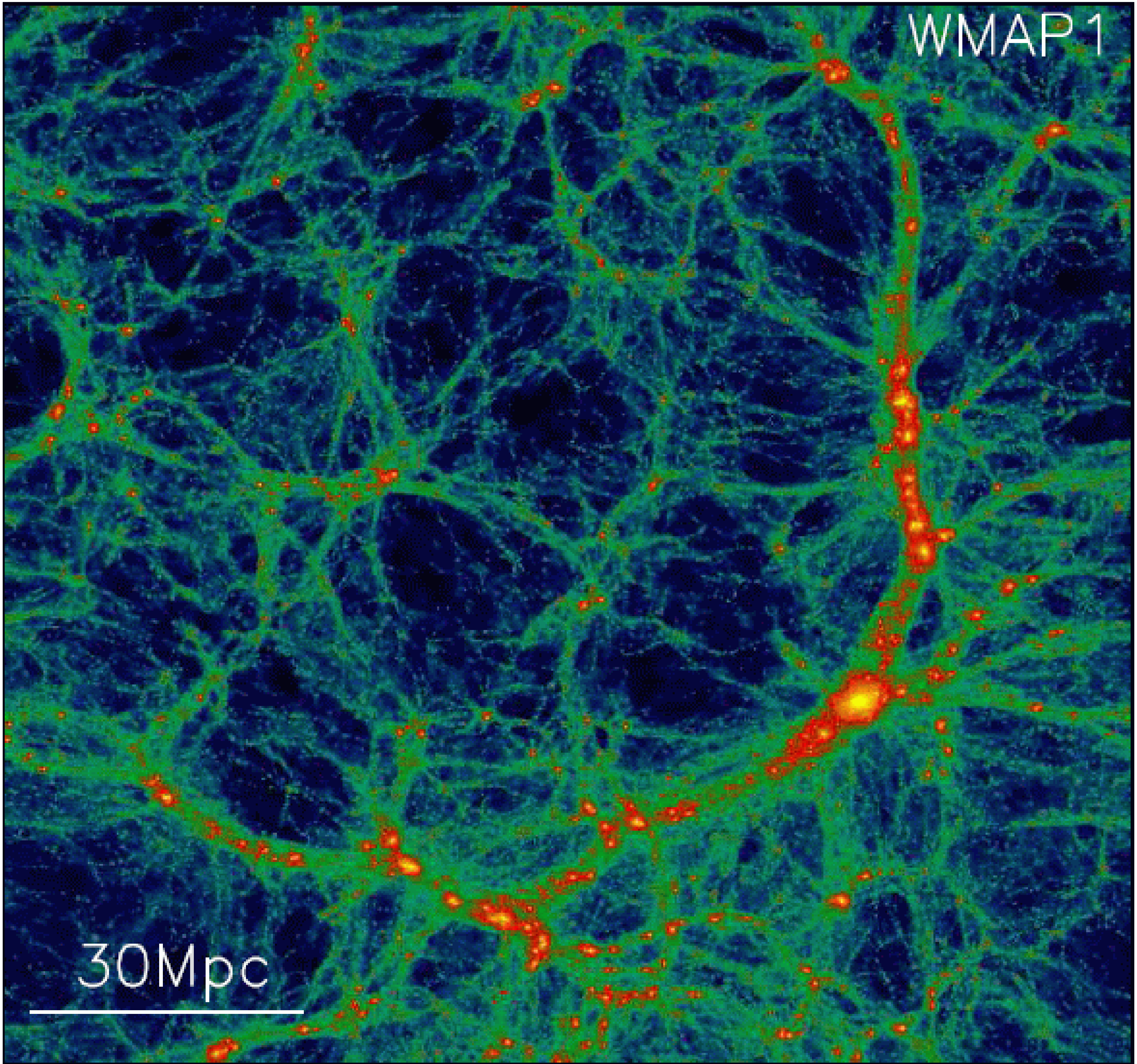
WMAP1 vs WMAP3 fluctuation amplitudes

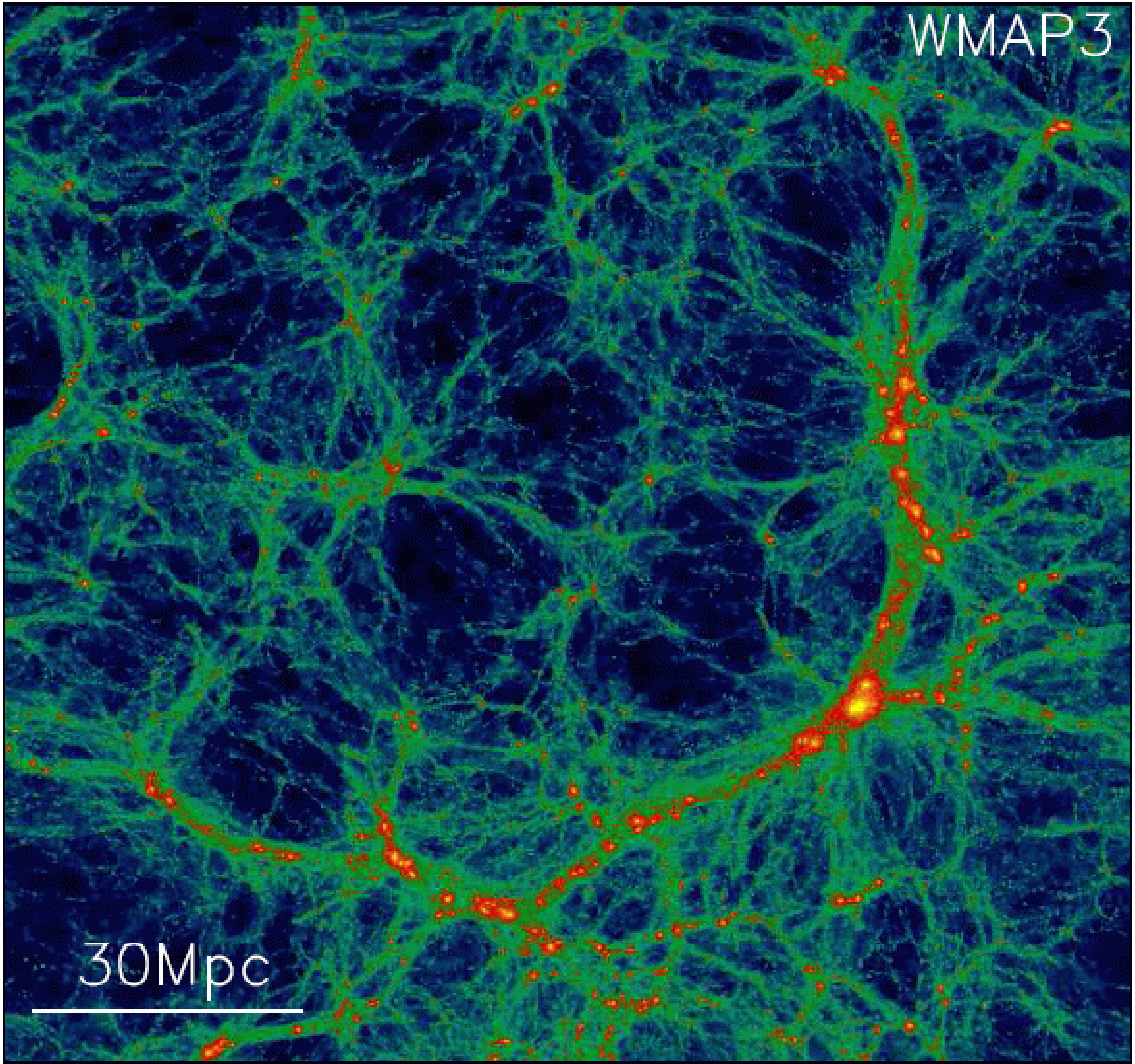
Wang et al 2007



WMAP1: $\Omega_m = 0.25$, $\sigma_8 = 0.9$,
$n = 1$, $\Omega_b = 0.045$

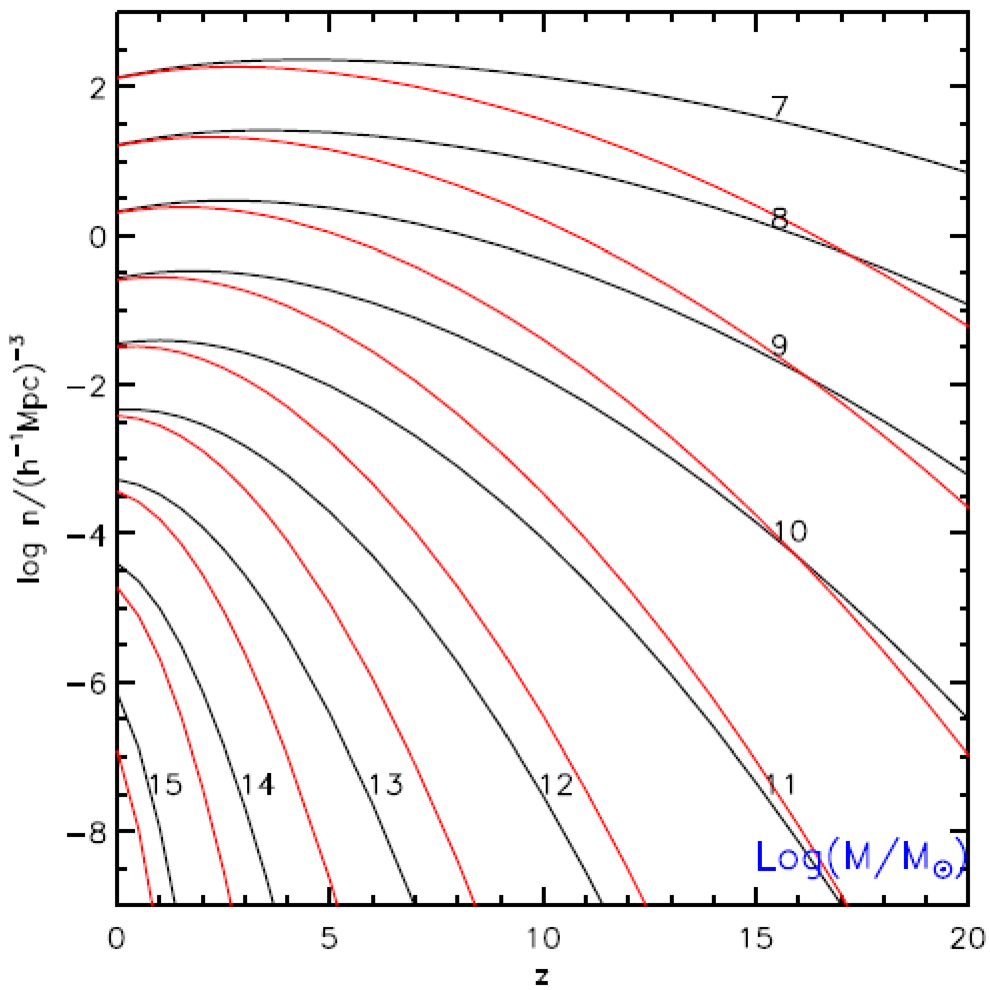
WMAP3: $\Omega_m = 0.226$, $\sigma_8 = 0.72$,
$n = 0.947$, $\Omega_b = 0.04$


WMAP1
30Mpc


WMAP3
30Mpc

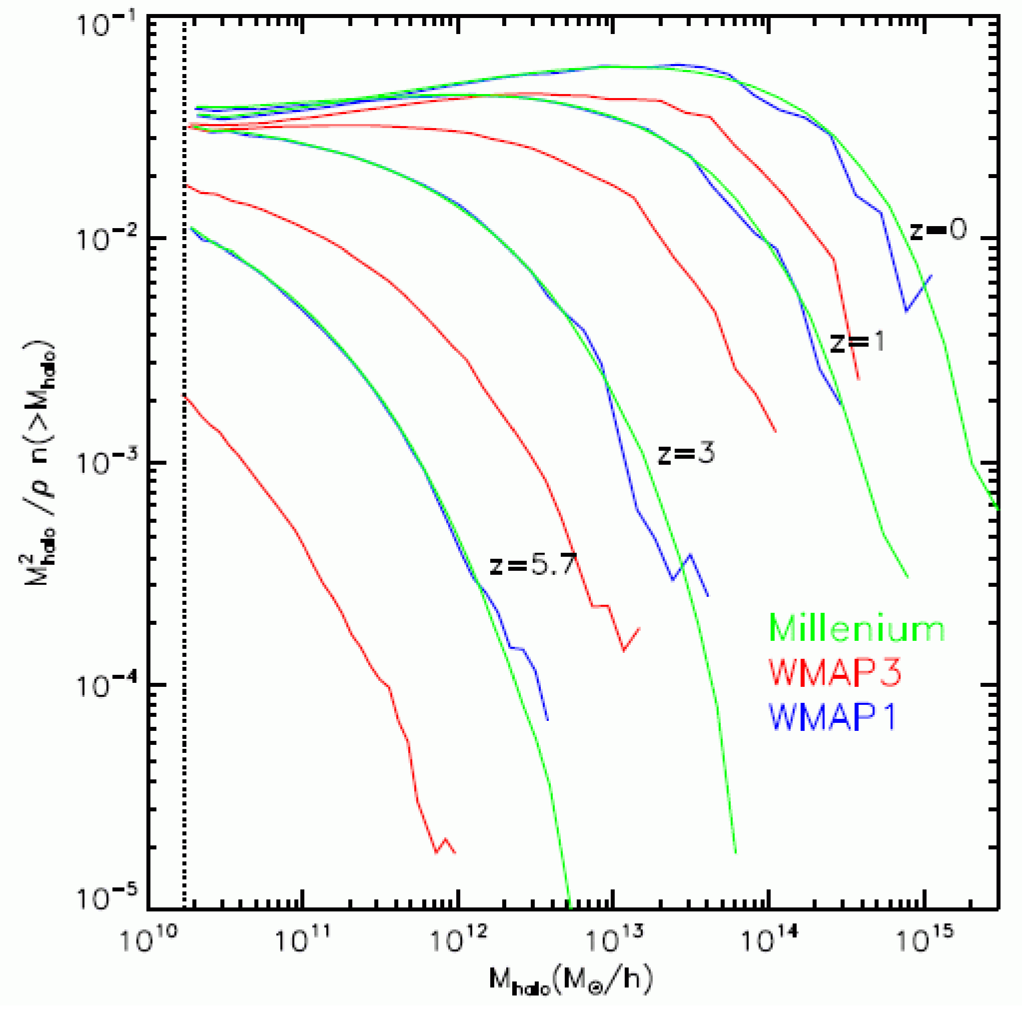
WMAP1 vs WMAP3 halo mass functions

Wang et al 2007



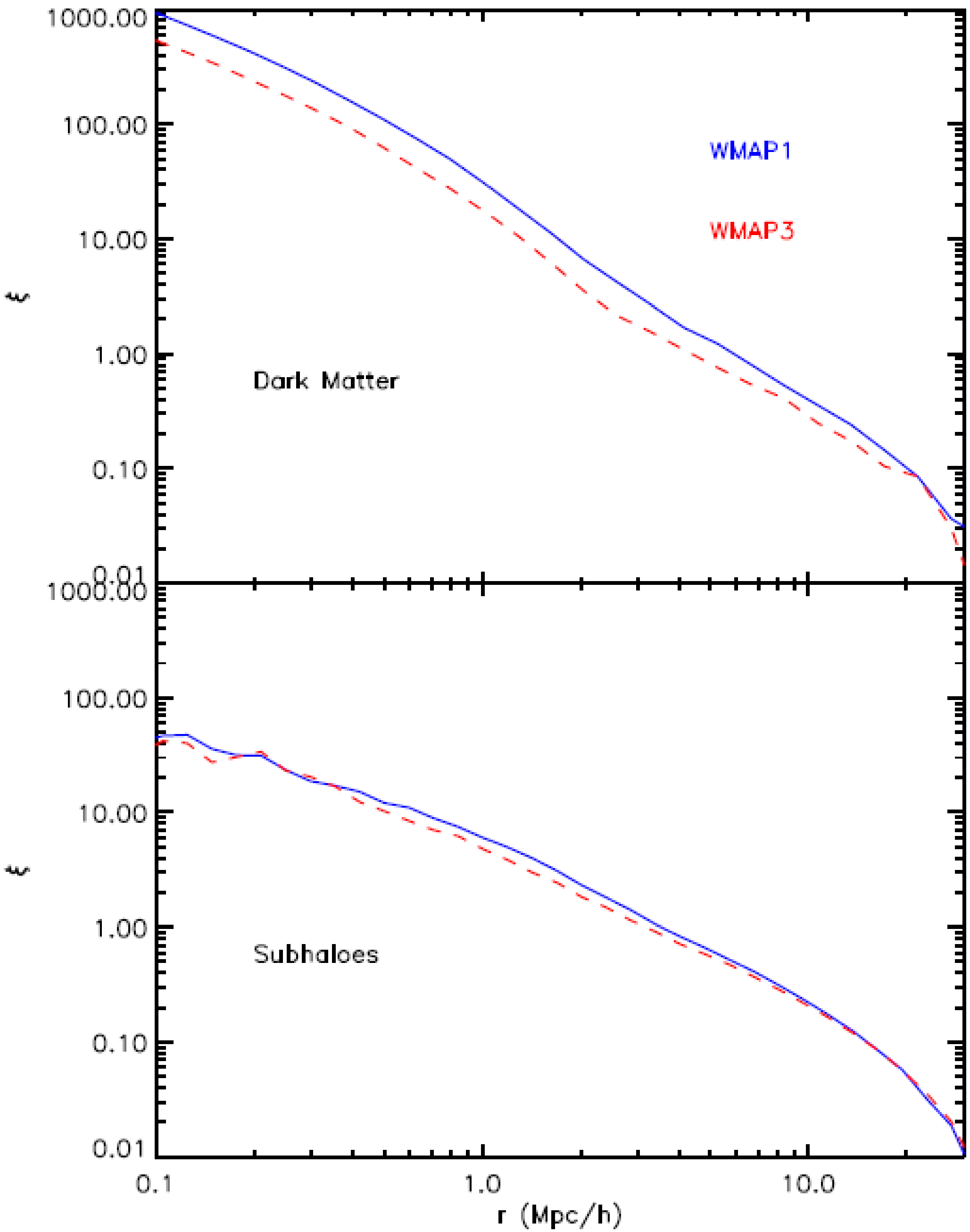
WMAP1 vs WMAP3 halo mass functions

Wang et al 2007



WMAP1 vs WMAP3 mass correlations

Wang et al 2007

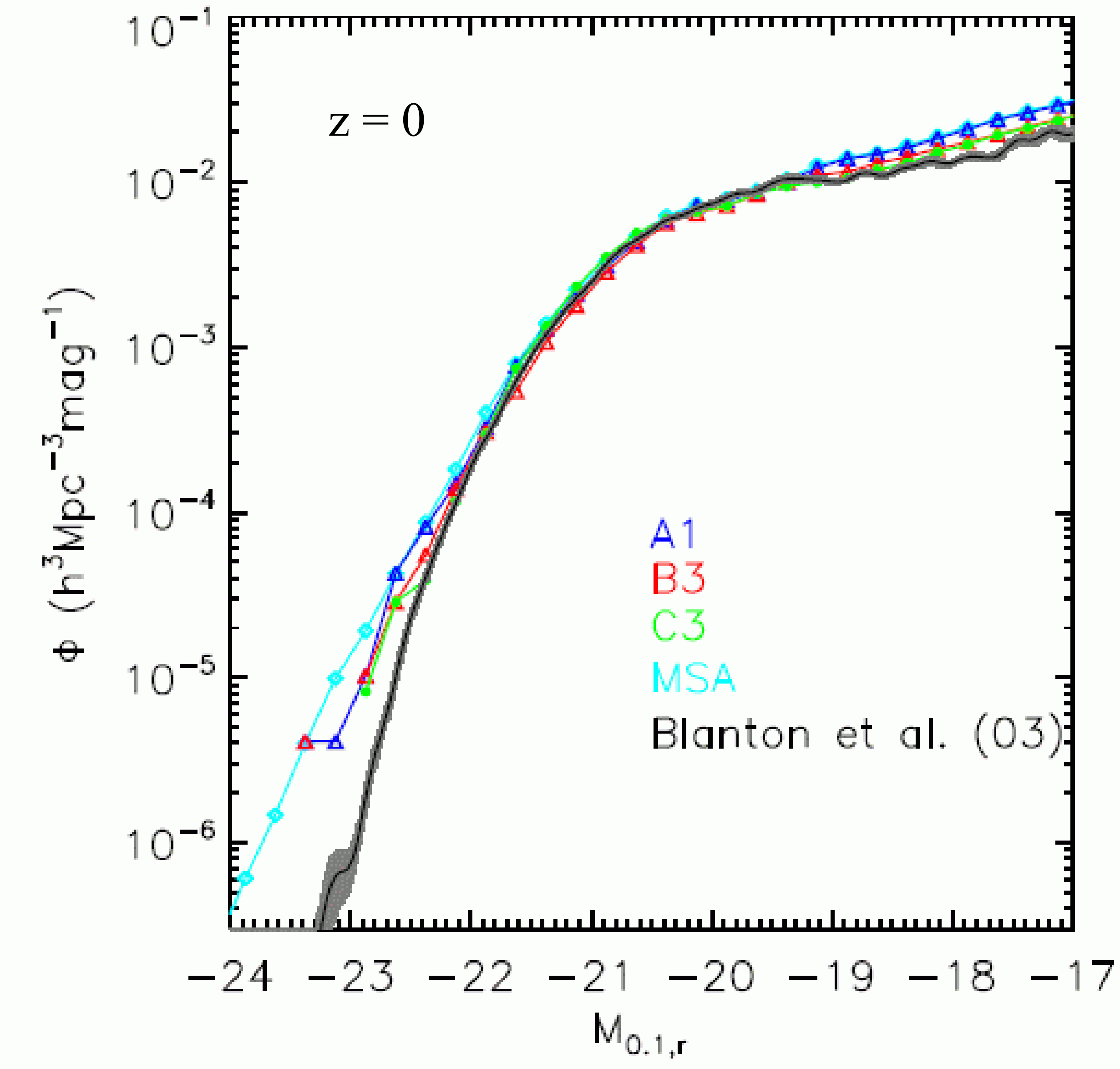


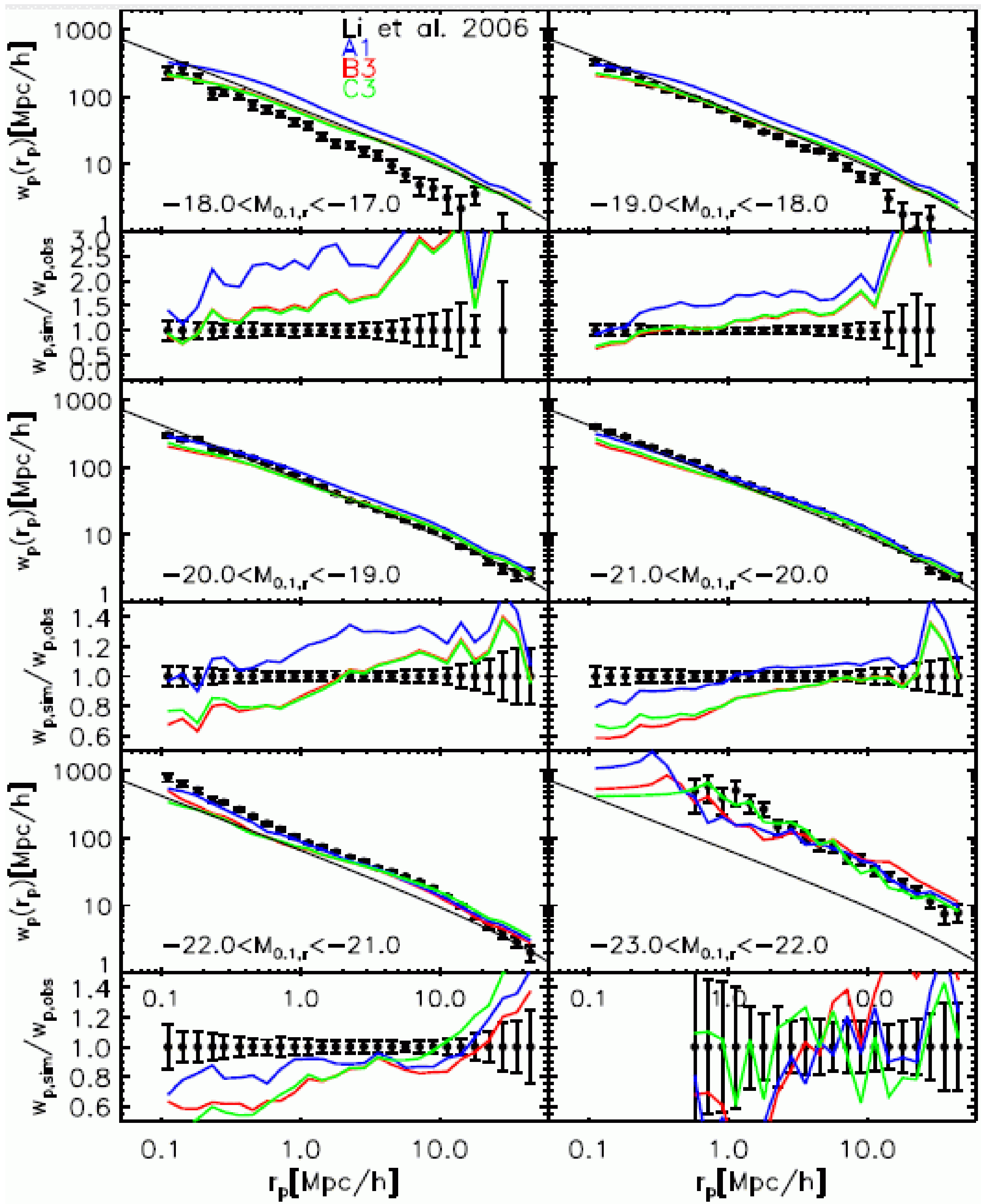
mass correlations

correlations of (sub)halos with $M > 2 \times 10^{10} M_\odot$

WMAP1 vs WMAP3 luminosity functions

Wang et al 2007





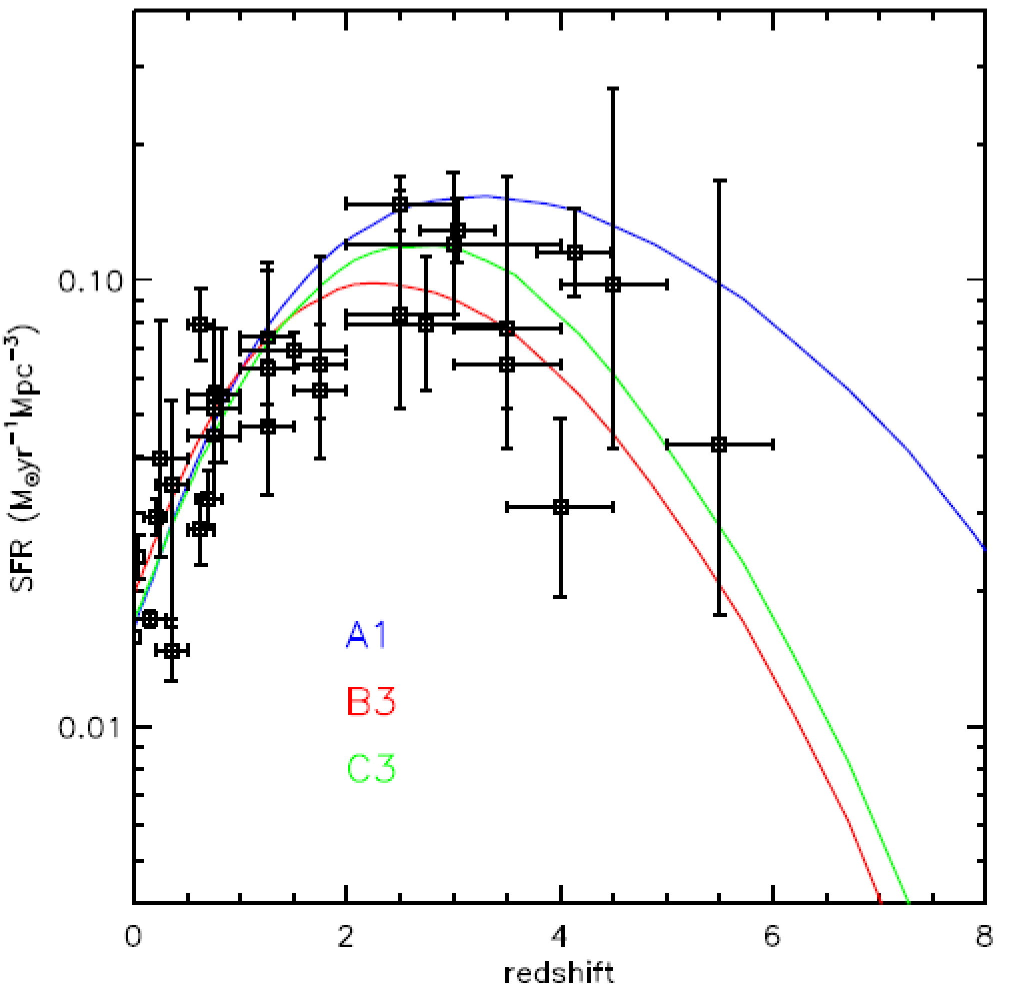
WMAP1 vs WMAP3 galaxy correlations

Wang et al 2007

$z = 0$

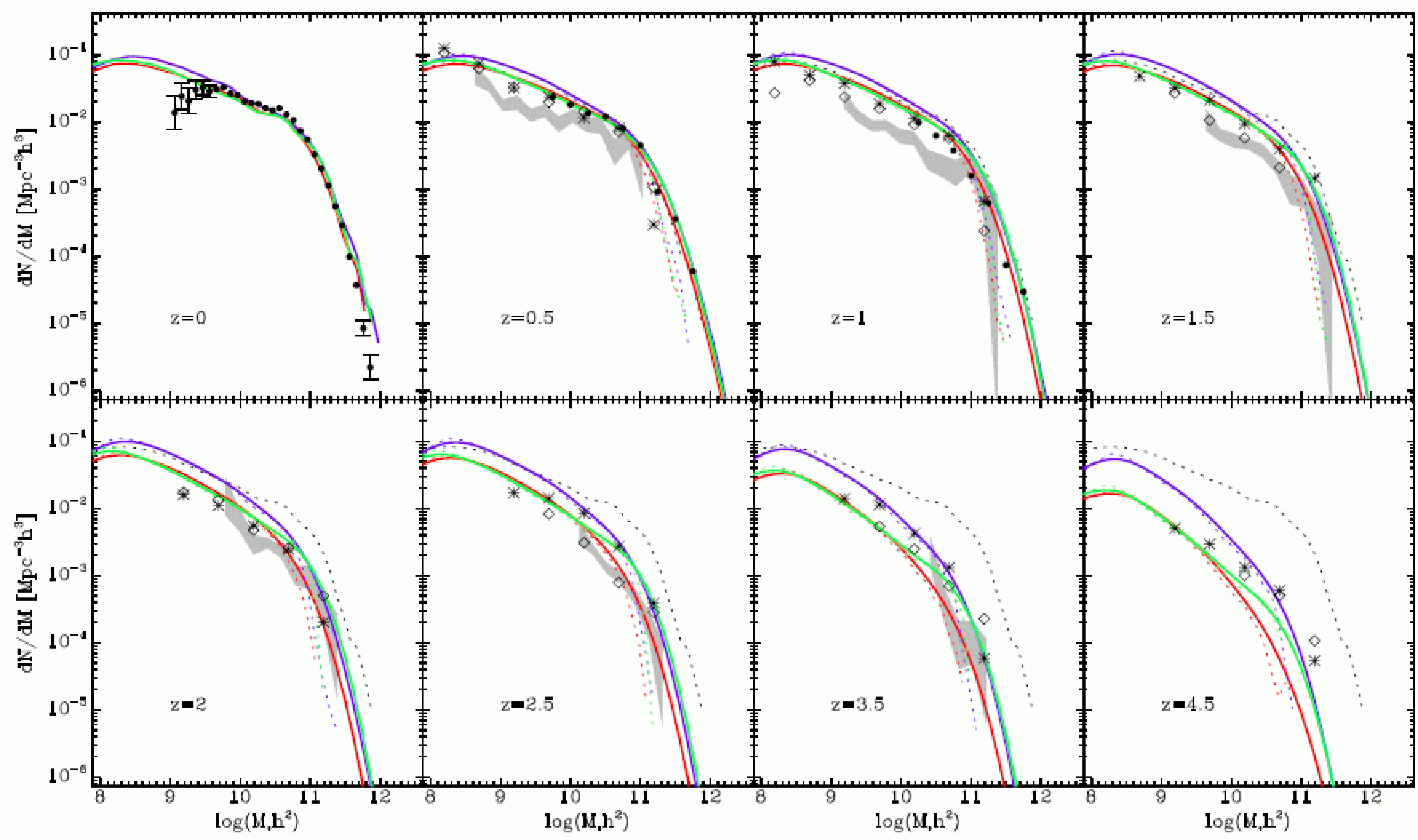
WMAP1 vs WMAP3 cosmic SFH

Wang et al 2007



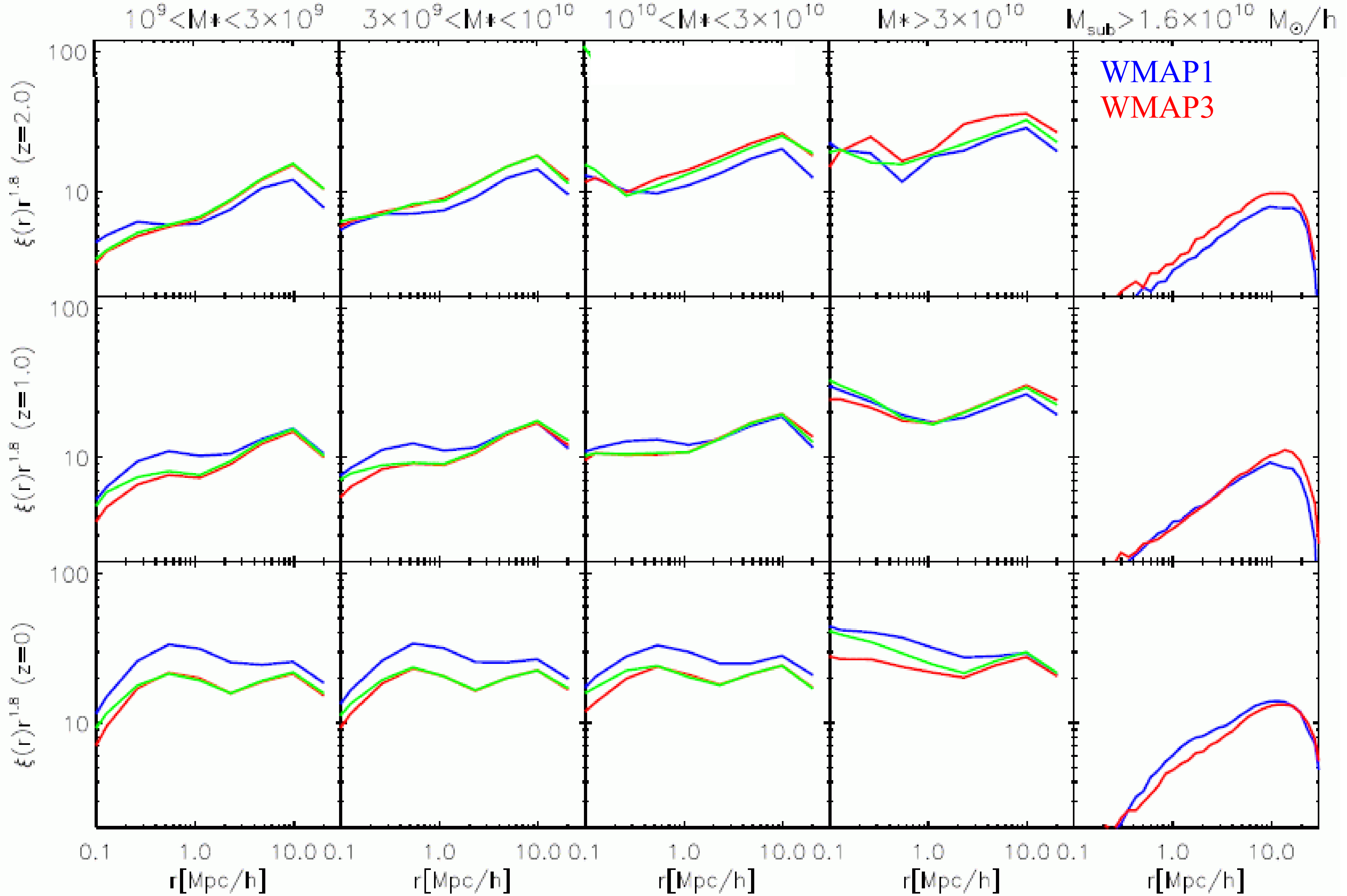
WMAP1 vs WMAP3 galaxy mass functions

Wang et al 2007



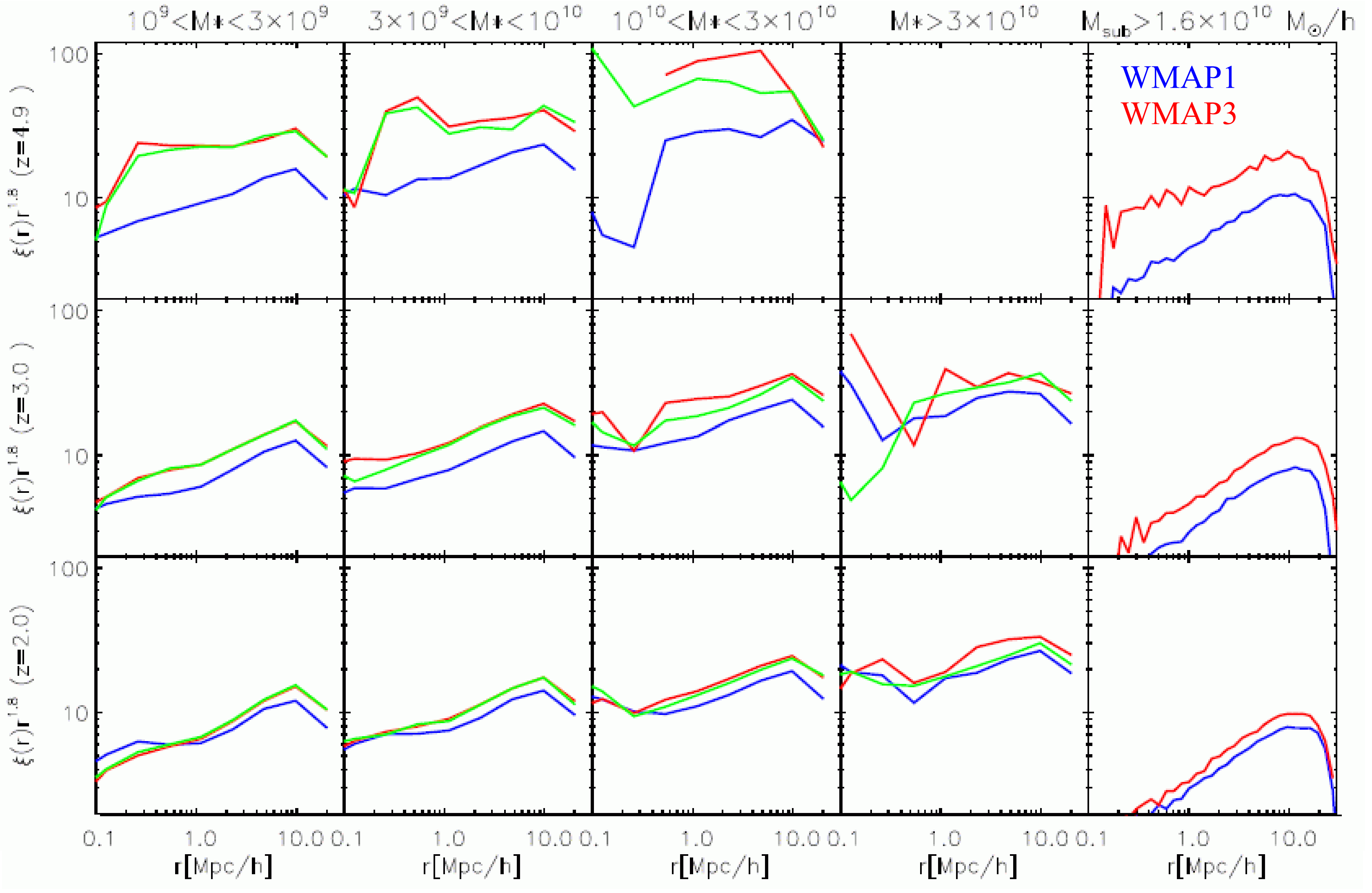
WMAP1 vs WMAP3 high-z galaxy correlations

Wang et al 2007



WMAP1 vs WMAP3 high-z galaxy correlations

Wang et al 2007



- Large-scale structure in observable galaxy populations should fall off much less rapidly to high redshift than that in the dark matter

- While the dark matter distribution is more weakly clustered for WMAP3 than for WMAP1 parameters, z=0 galaxy halos are *equally* clustered in the two cases

- At high redshift objects of given mass are less abundant in the WMAP3 case, but they are *more* strongly clustered

Galaxy and halo catalogues at all z, and also lightcones available at:
http://www.mpa-garching.mpg.de/millennium