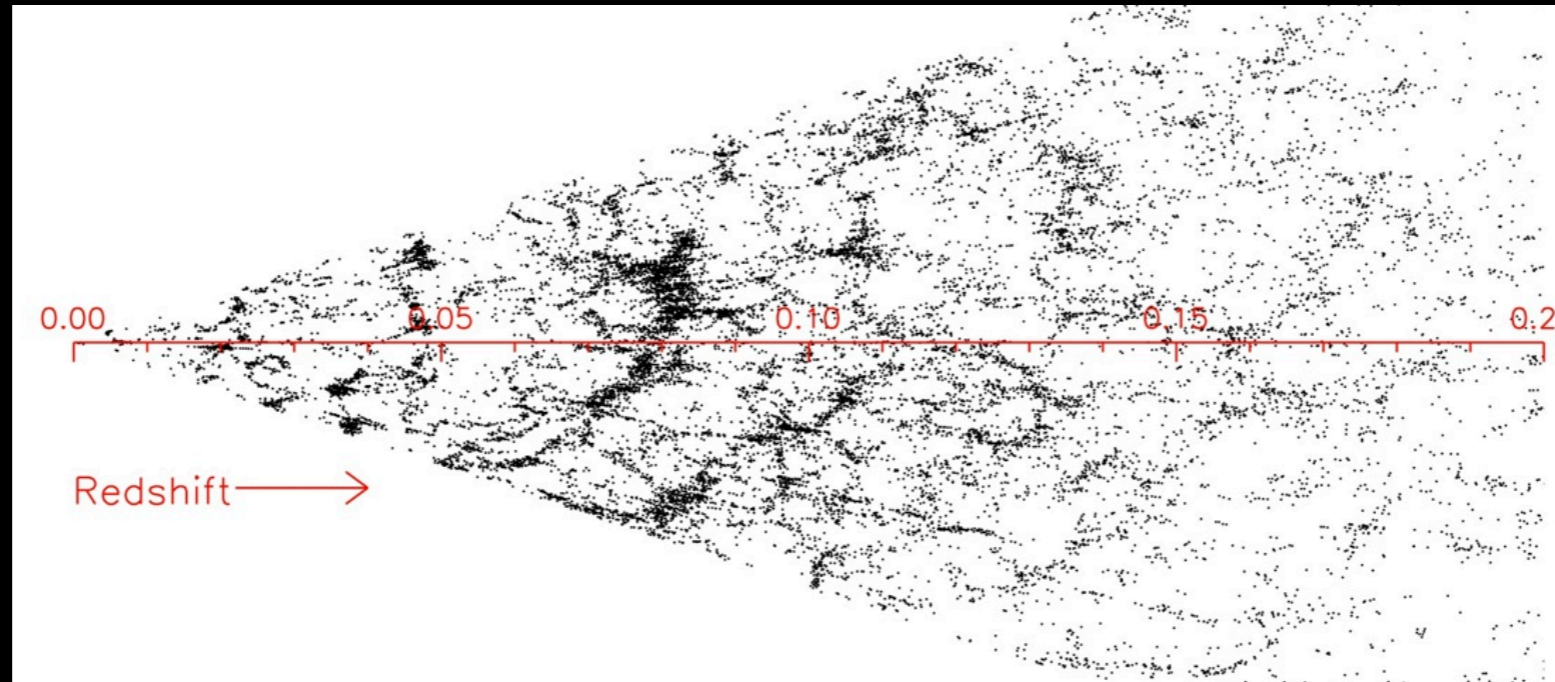


# Local Large-Scale Structure and the Assumption of Homogeneity

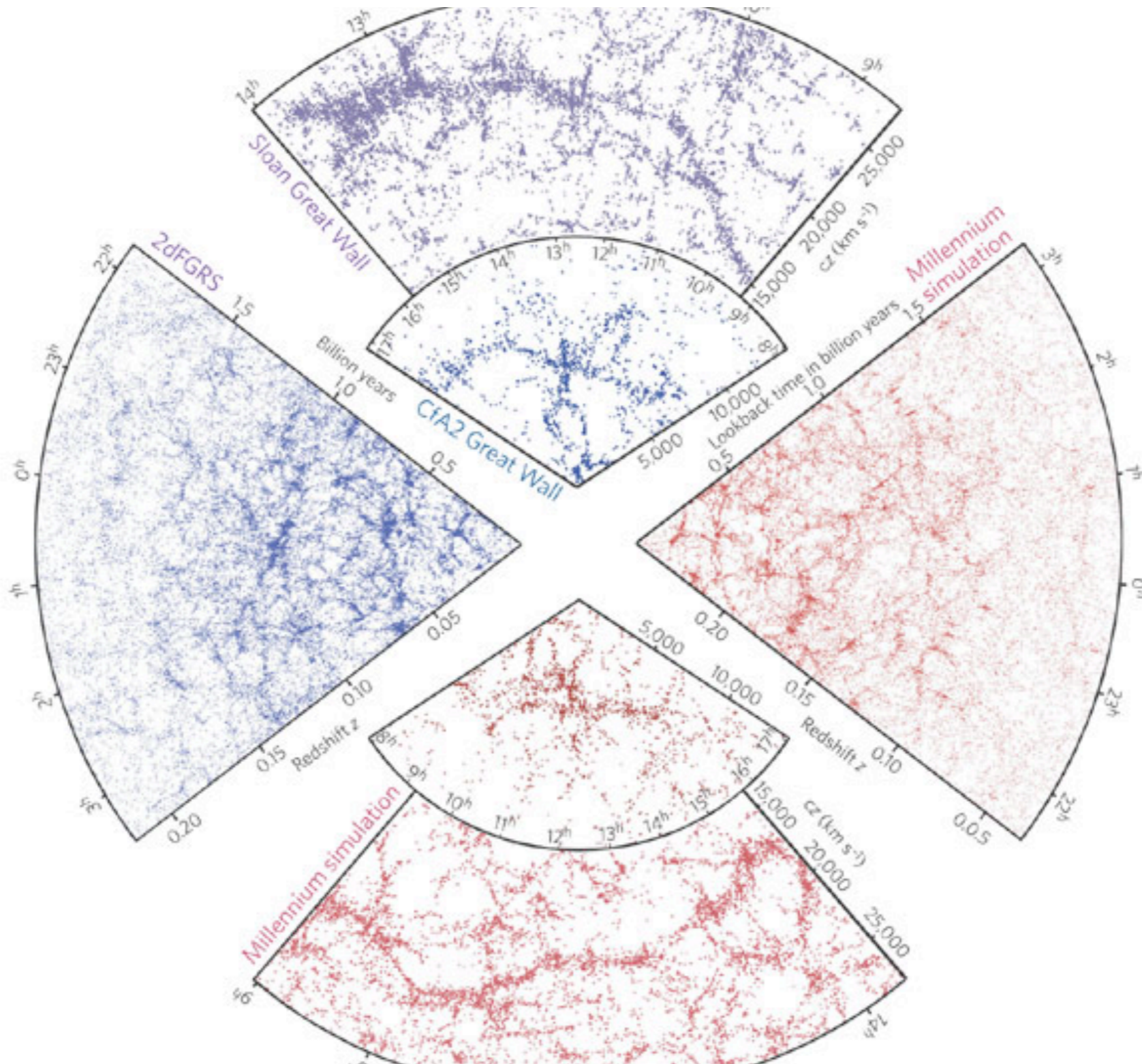


Ryan Keenan (ASIAA, Taiwan)

Collaborators: Amy Barger (U. Wisconsin), Lennox Cowie (IfA, Hawaii), Wei-Hao Wang (ASIAA, Taiwan), Isak Wold (U. Wisconsin), Laura Trouille (Northwestern, IL)

The Horizon Simulation: [www.horizon-project.fr](http://www.horizon-project.fr)

Observations: CFA2, 2DFGRS, SDSS (blue and purple)

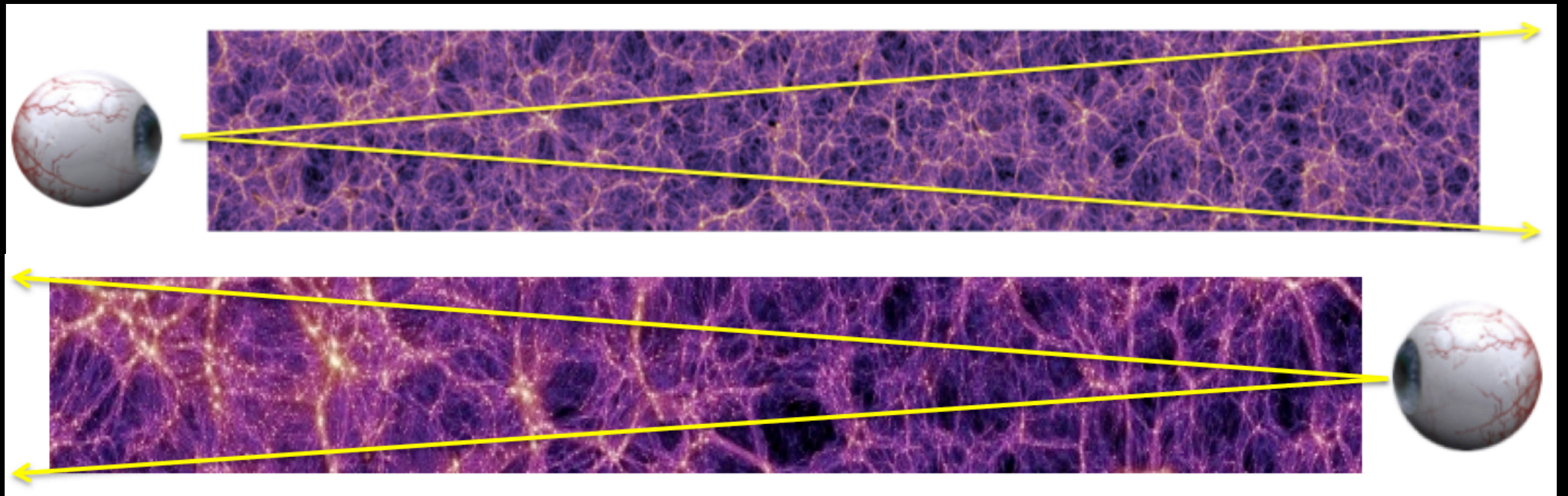


Millennium Simulation (red)

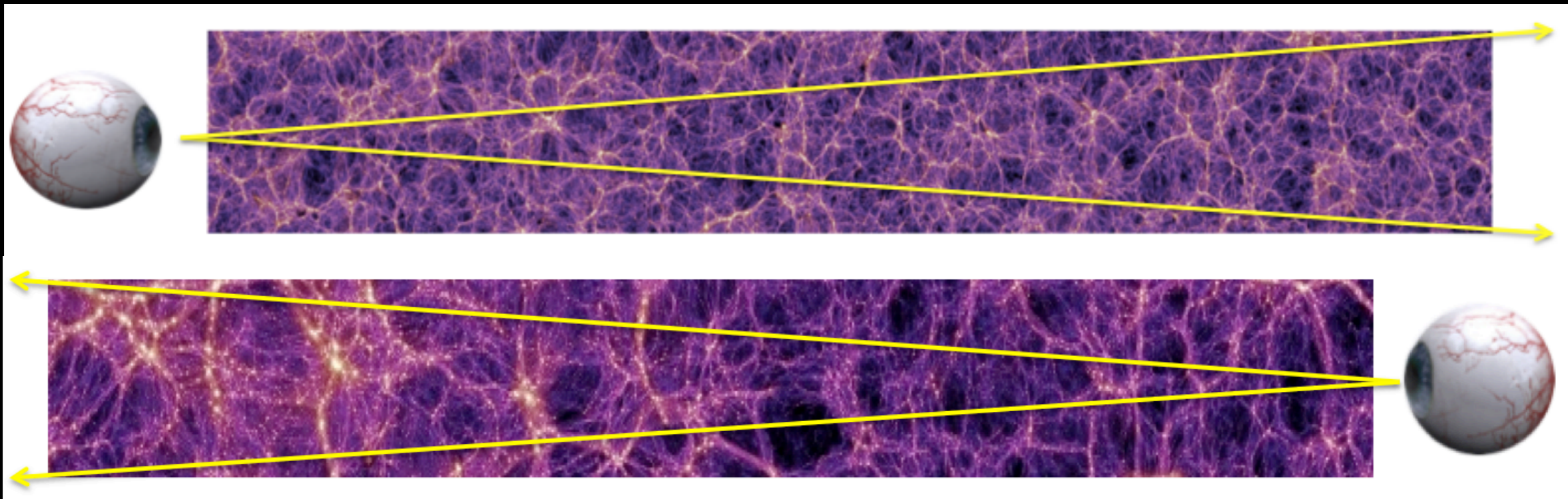
Springel et al. (2006)

The Horizon Simulation: [www.horizon-project.fr](http://www.horizon-project.fr)

# (NIR) Galaxy Counts to Probe Structure



# (NIR) Galaxy Counts to Probe Structure



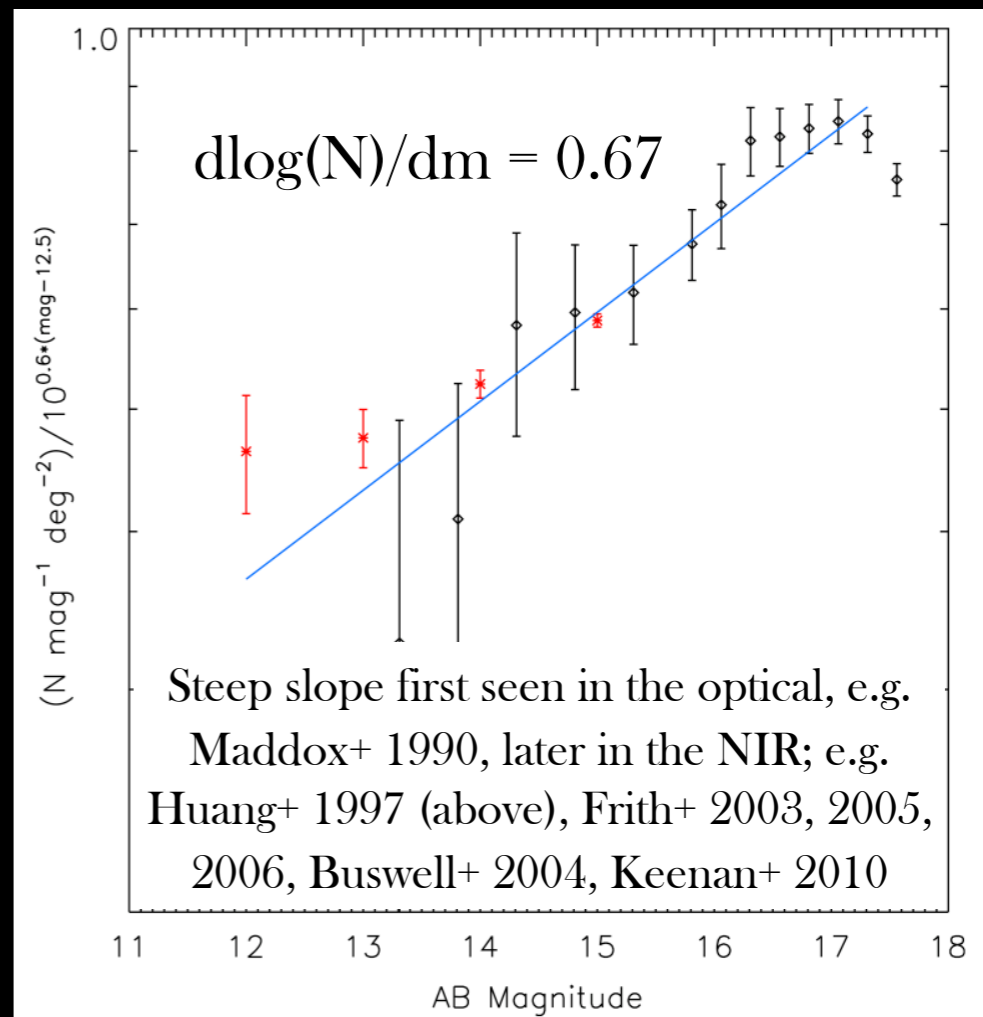
$$F \sim \frac{1}{R^2} \longrightarrow R \sim F^{-\frac{1}{2}}$$

$$N(F > F_0) = n_* V \sim R^3 \sim F^{-\frac{3}{2}}$$

$$m = -2.5 \log(F) \longrightarrow F = 10^{-0.4m}$$

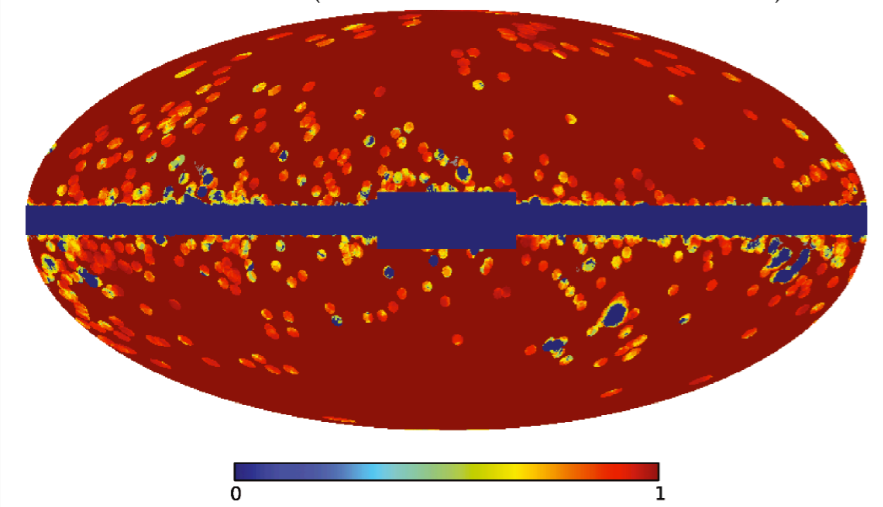
$$F^{-\frac{3}{2}} = 10^{0.6m} \sim N(m < m_0)$$

So,  $\frac{d \log(N)}{dm} = 0.6$  expected from homogeneity

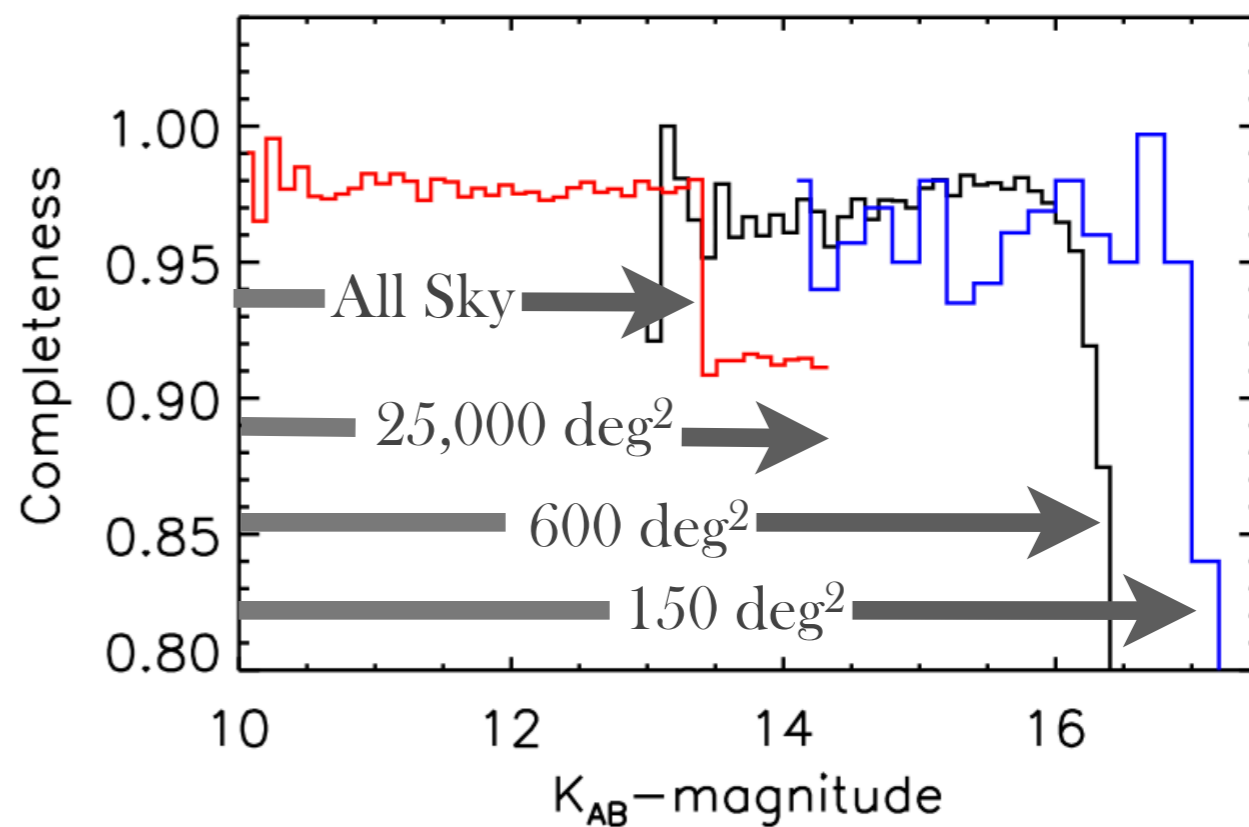
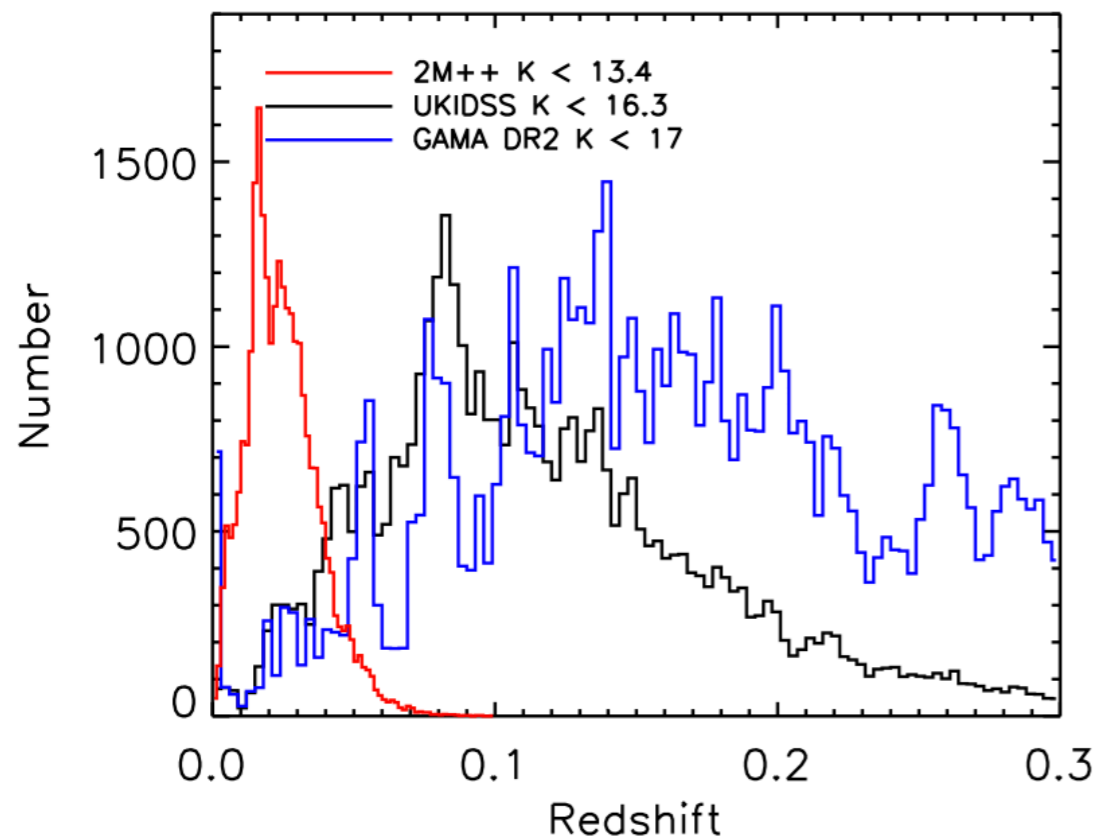
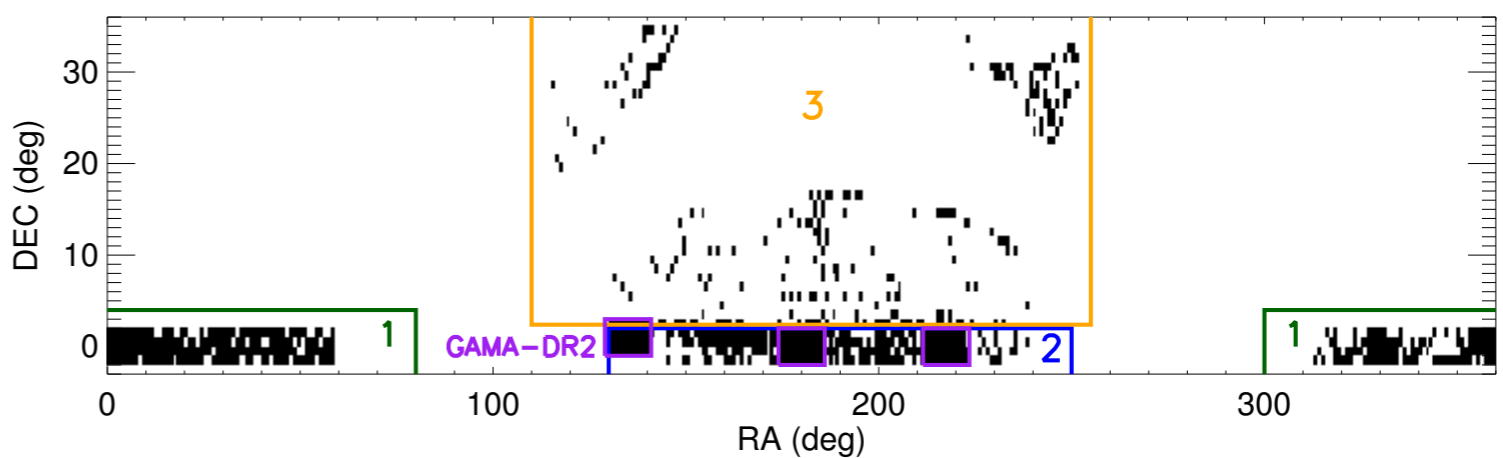


# K-band (UKIDSS/2MASS) + Redshifts (SDSS, 2DF, 6DF, 2MR, GAMA)

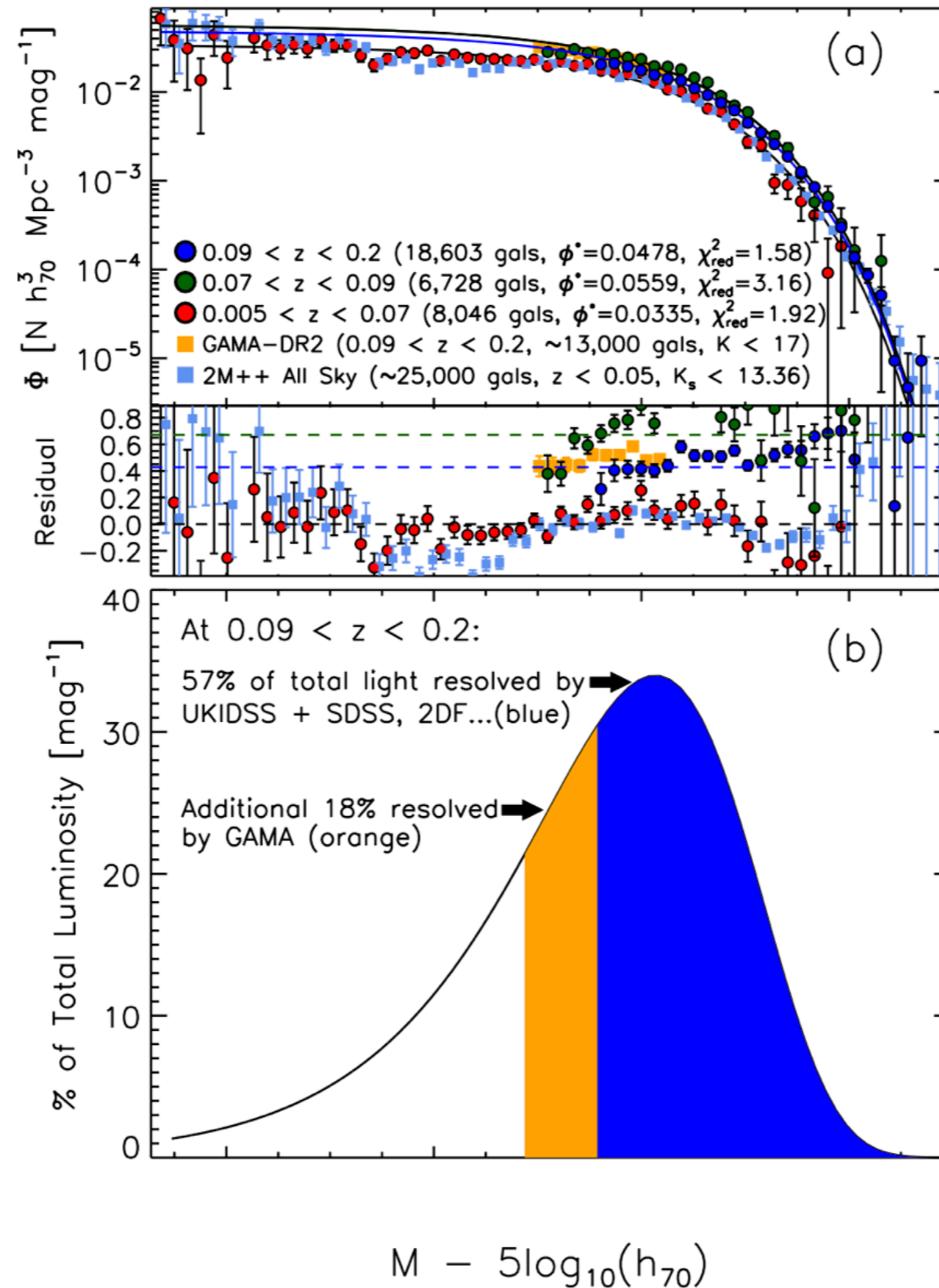
2M++ K < 13.4 (Lavaux & Hudson 2011)



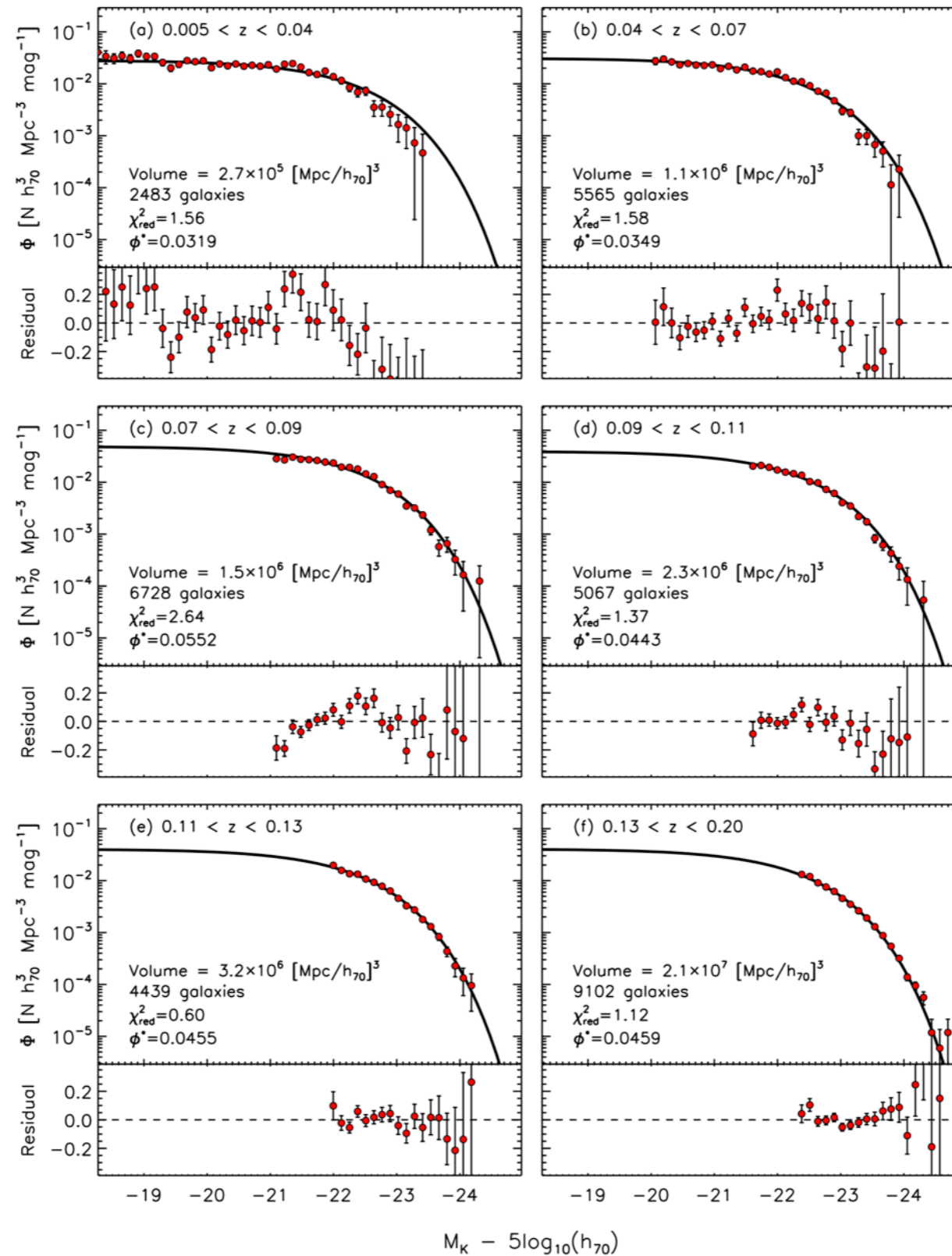
UKIDSS LAS K < 16.3 & GAMA-DR2 K < 17



# LF As a Function of Redshift

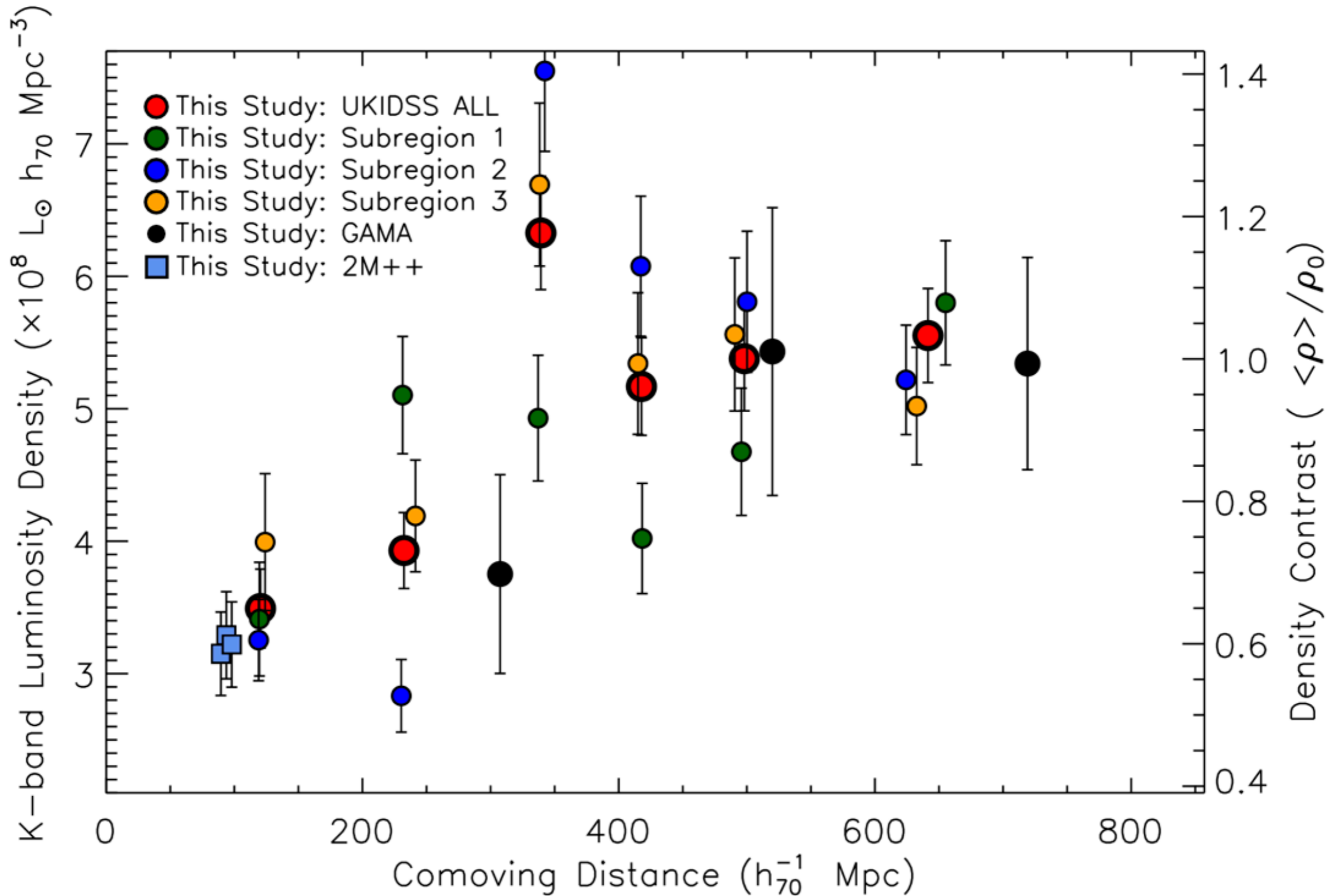


# LF As a Function of Redshift





# Luminosity Density vs. Distance



# Luminosity Density vs. Distance

