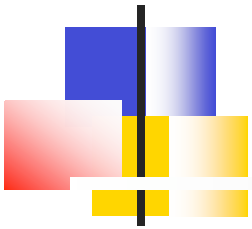
Clusters in deep XMM surveys



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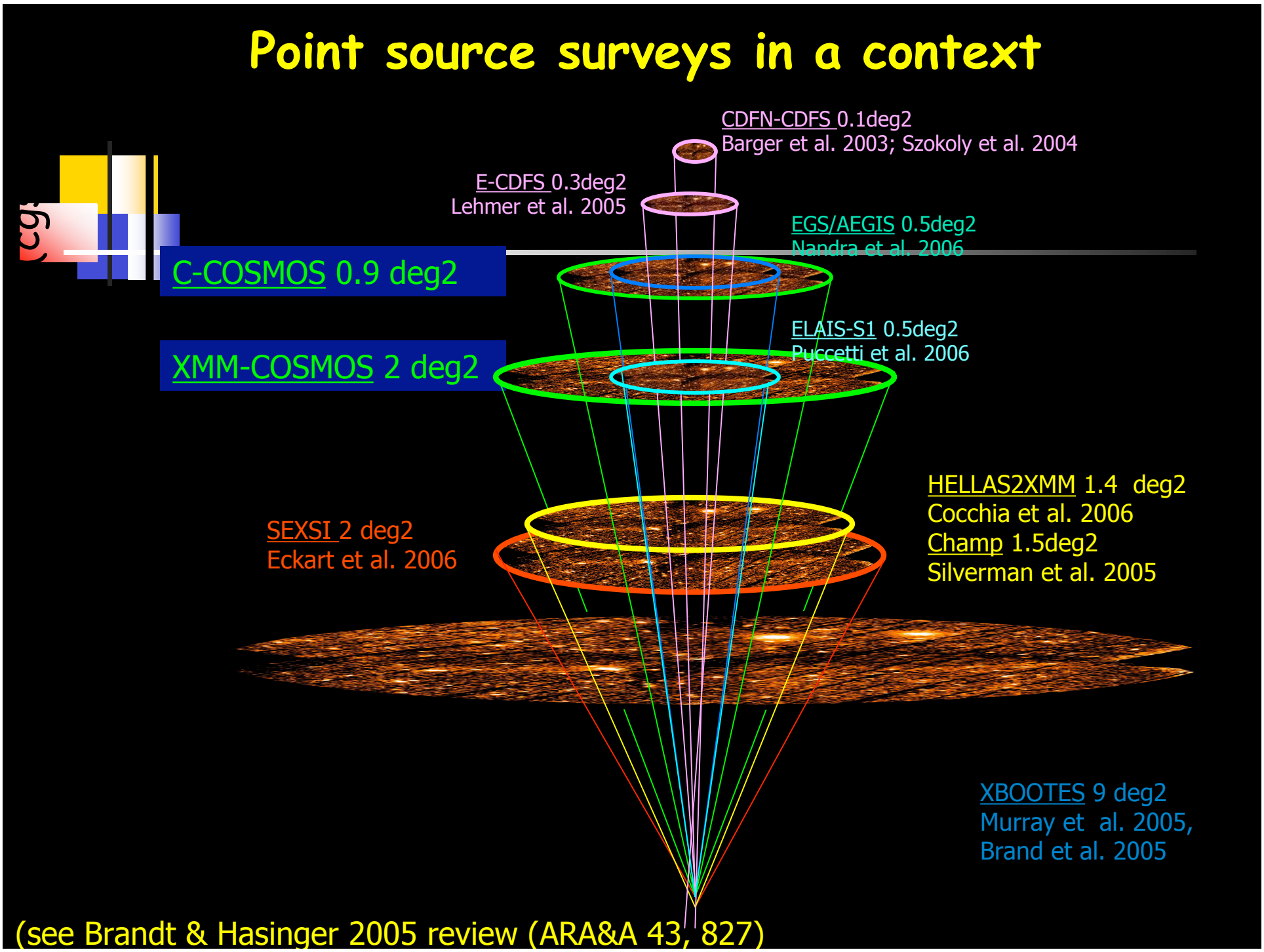
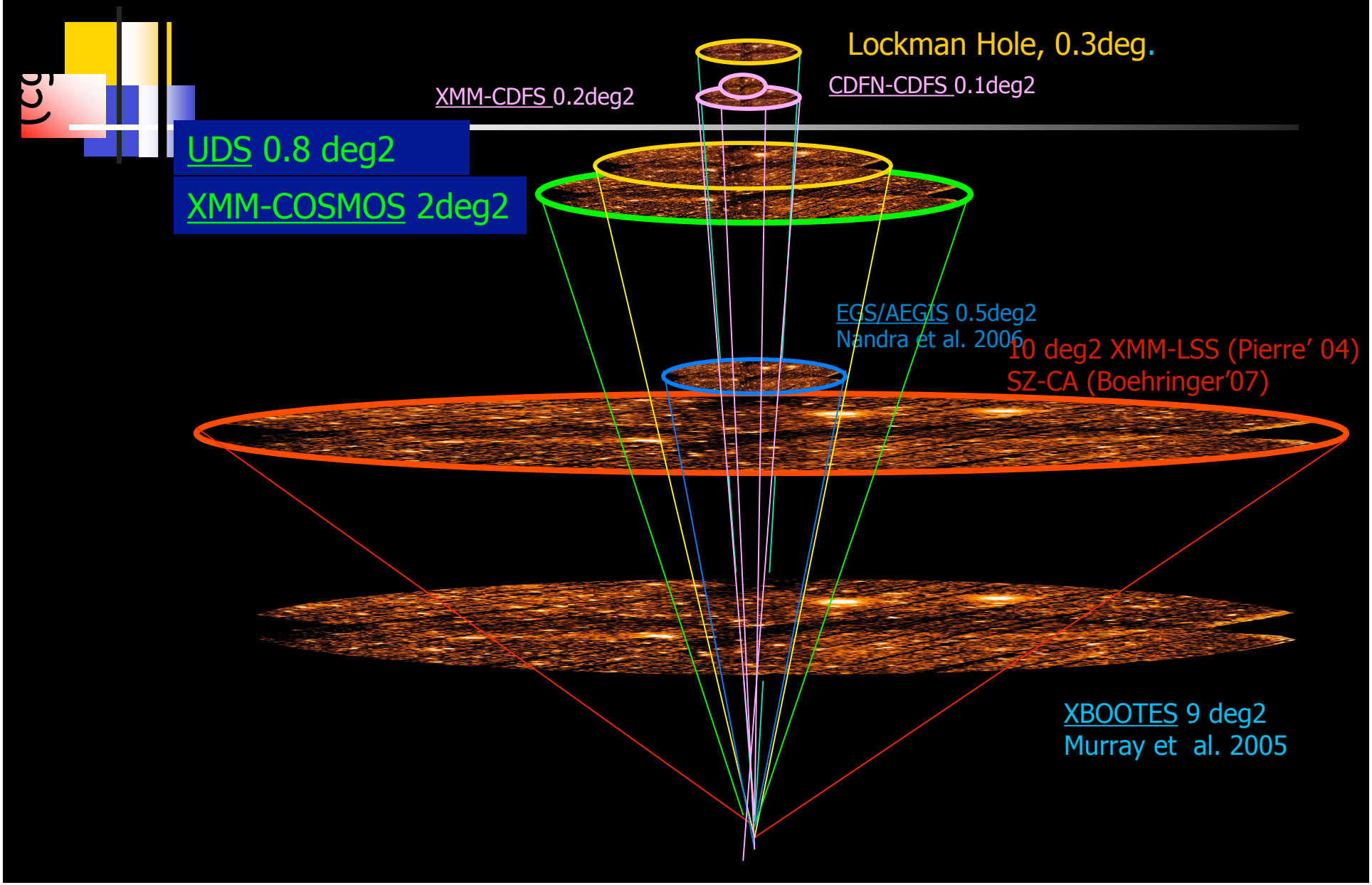
With thanks to CDFS, COSMOS, SDXF/UDS teams

Point source surveys in a context

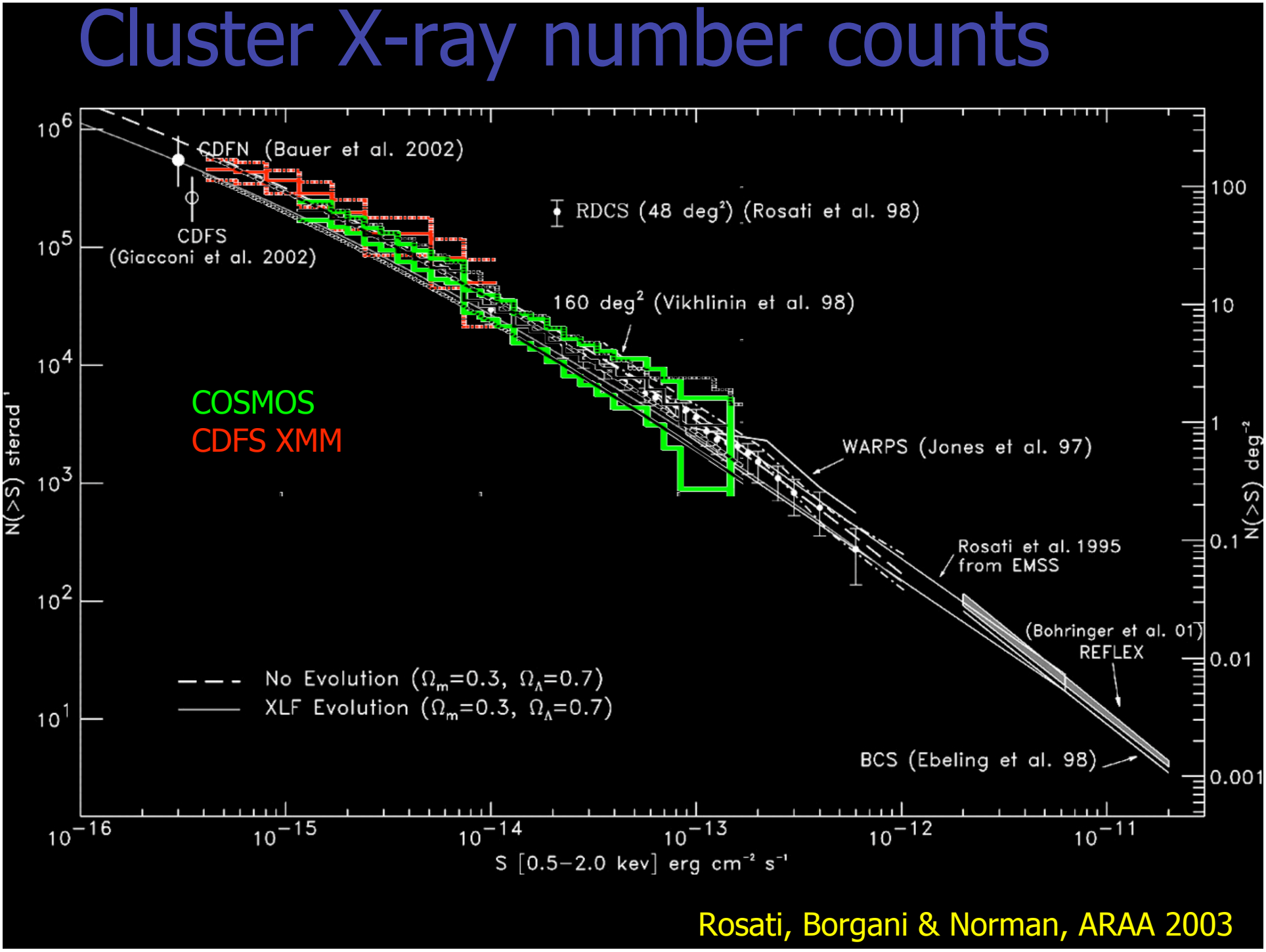


(see Brandt & Hasinger 2005 review (ARA&A 43, 827)

Continguous cluster surveys in context

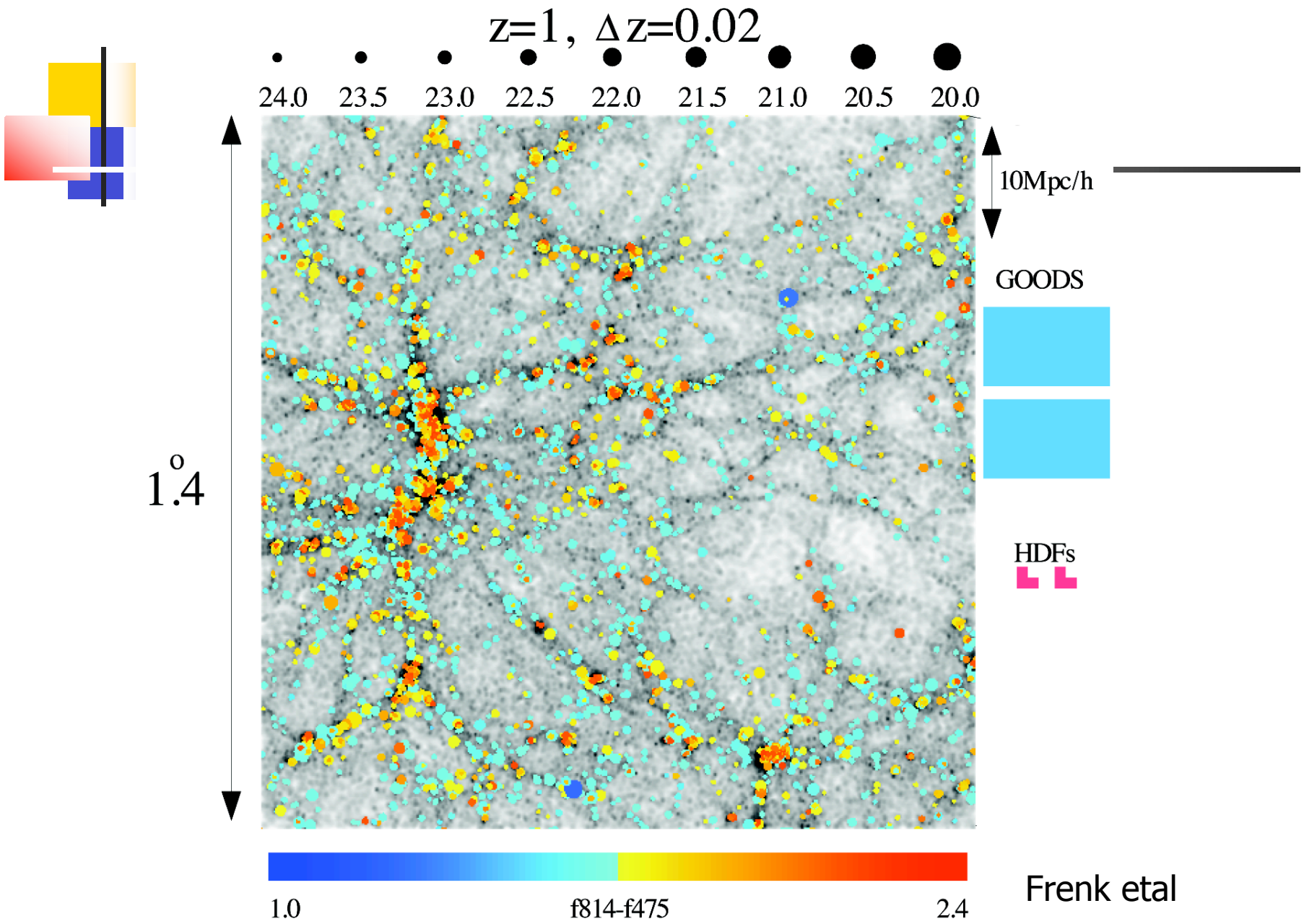


Cluster X-ray number counts

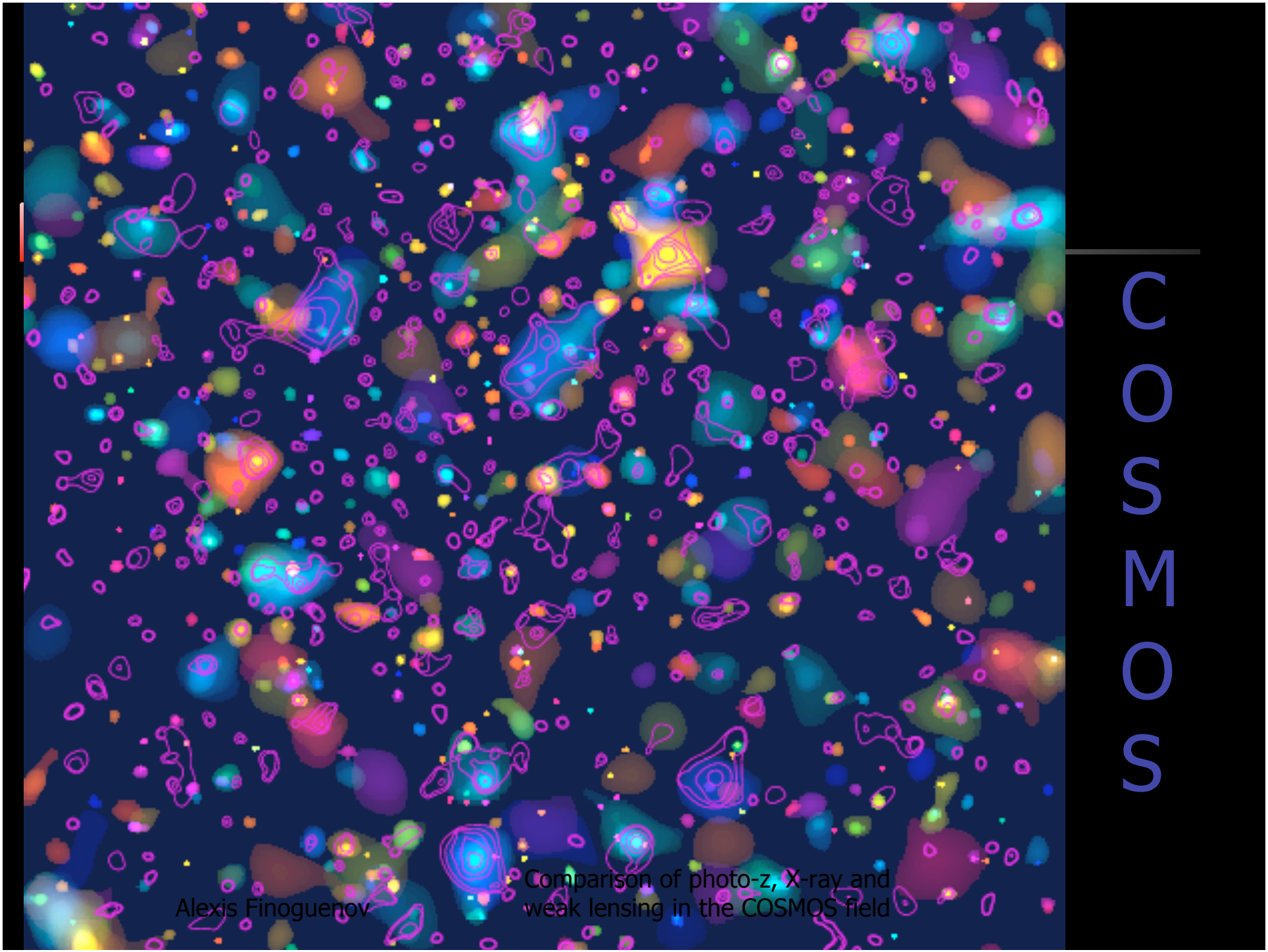


Rosati, Borgani & Norman, ARAA 2003

redshift slice from Λ CDM sim.



Frenk etal



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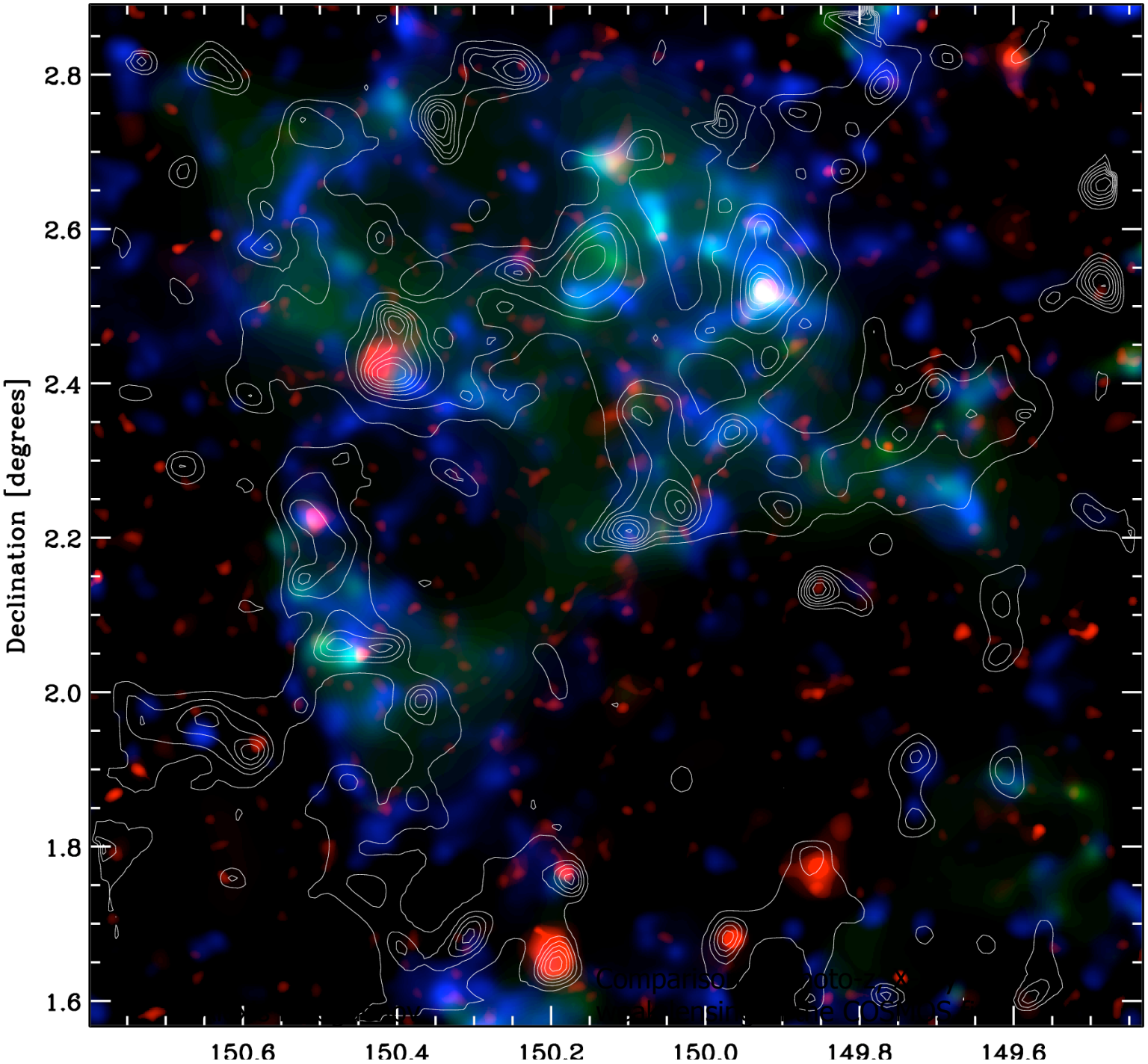
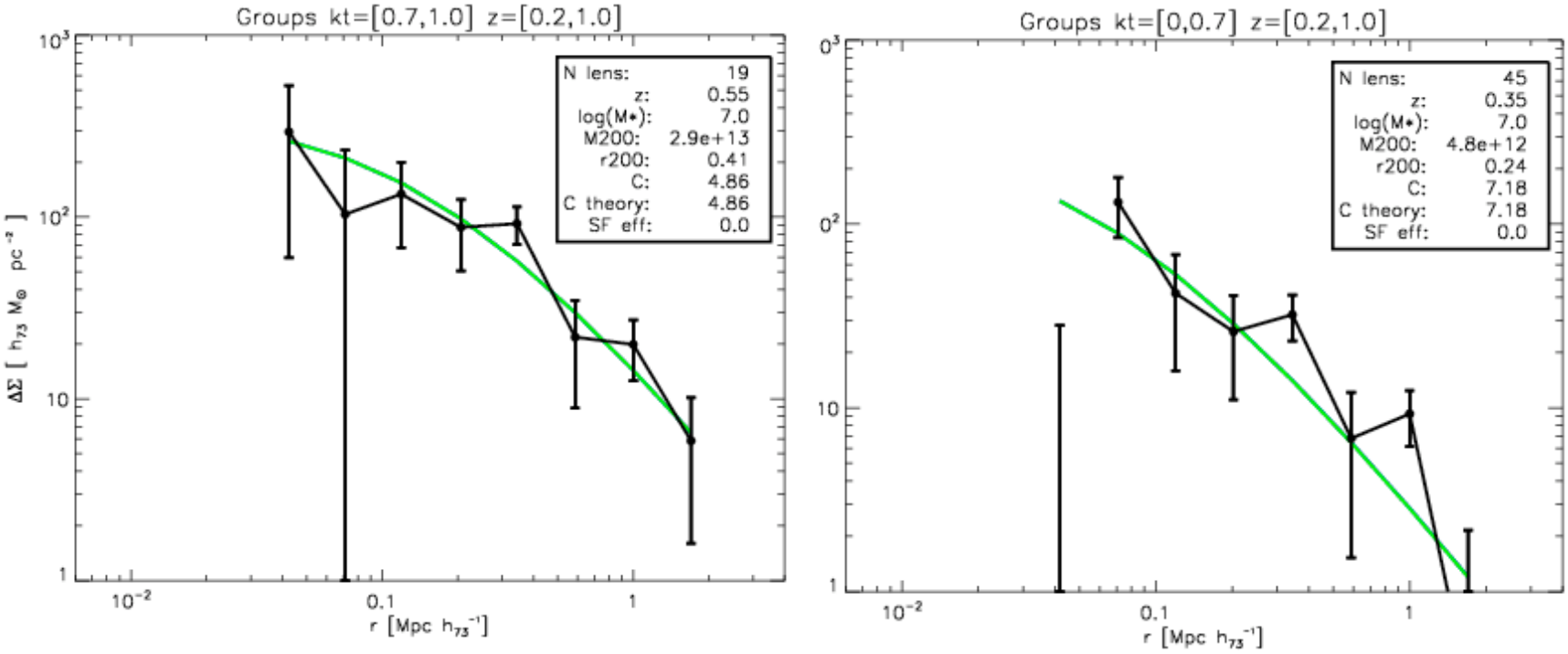
Comparison of photo-z, X-ray and weak lensing in the COSMOS field

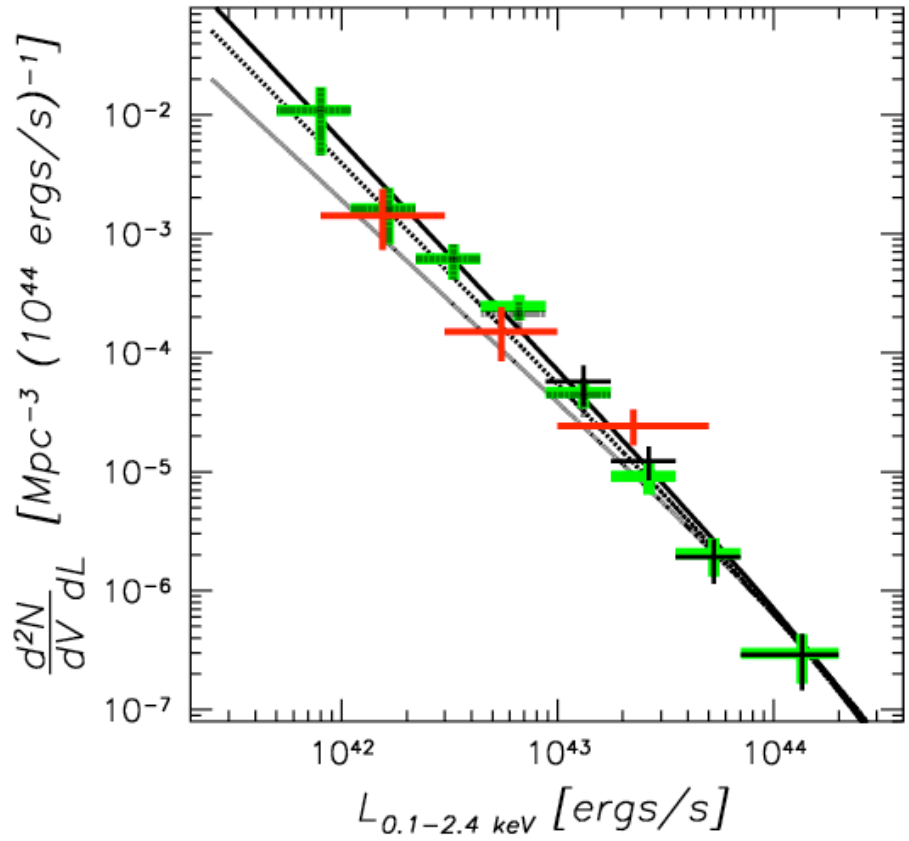

Declination [degrees]
2.8
2.6
2.4
2.2
2.0
1.8
1.6
150.6
150.4
150.2
150.0
149.8
149.6

COSMOS

Stacked lensing signal

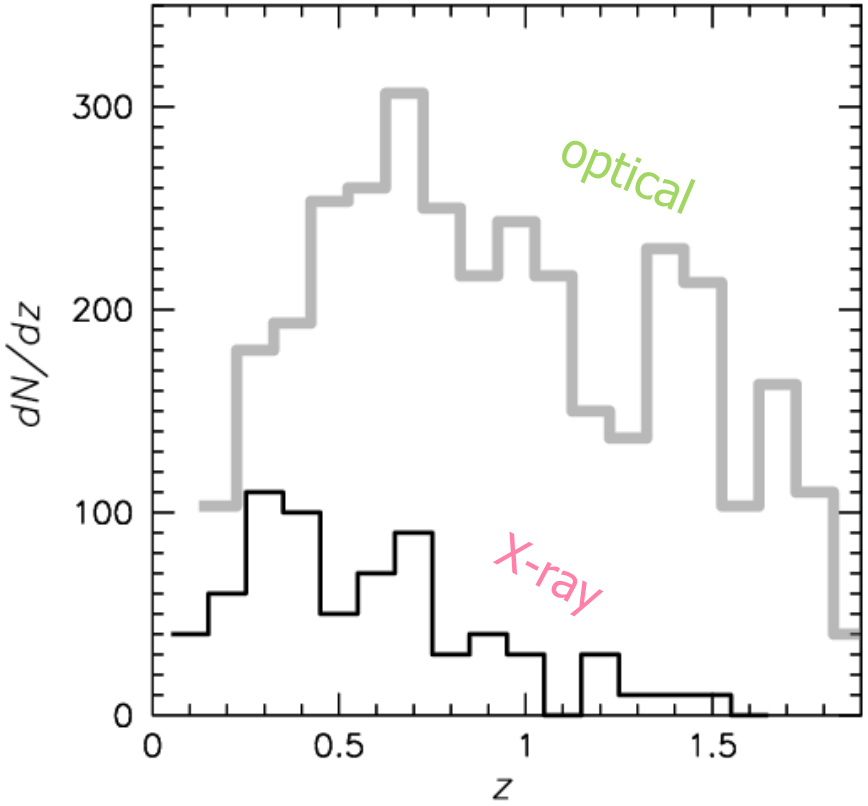


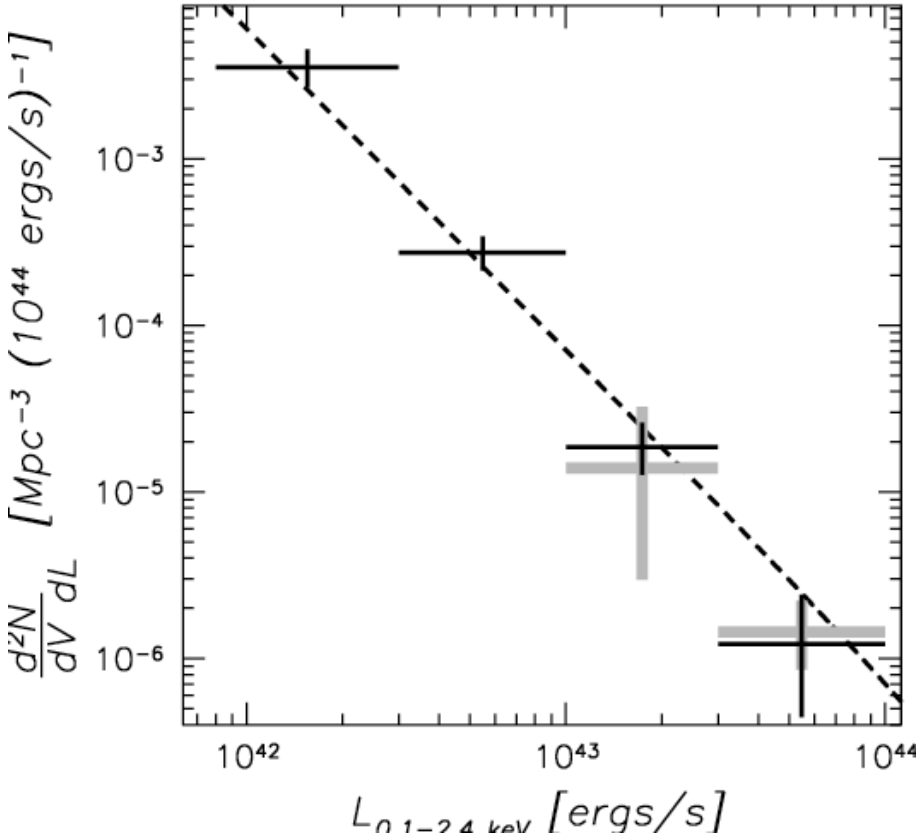
Cluster statistics: COSMOS & CDFS



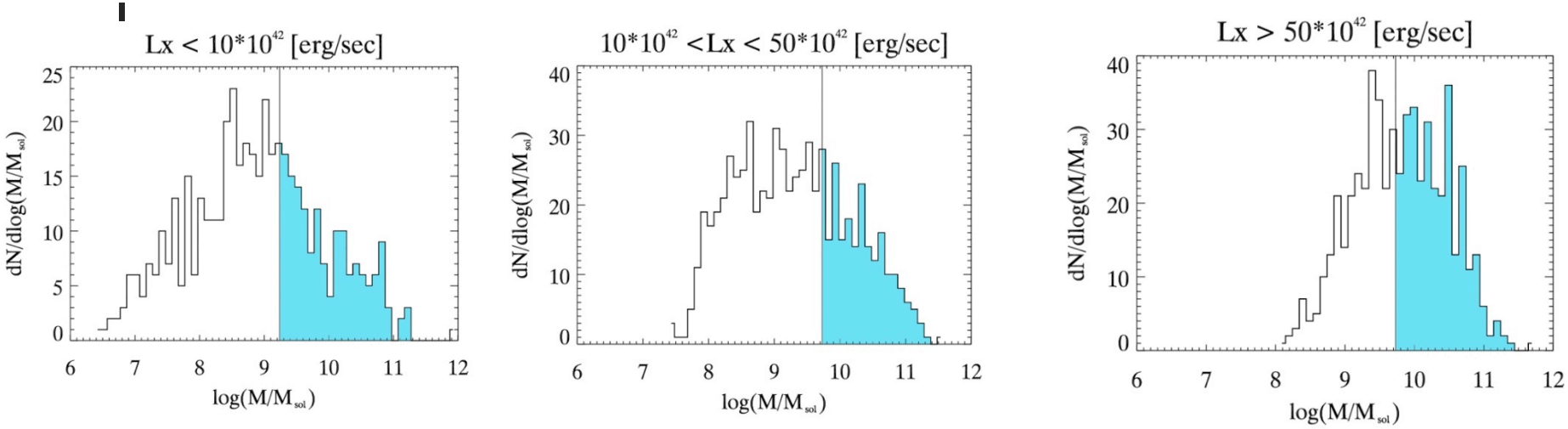
No evolution is seen

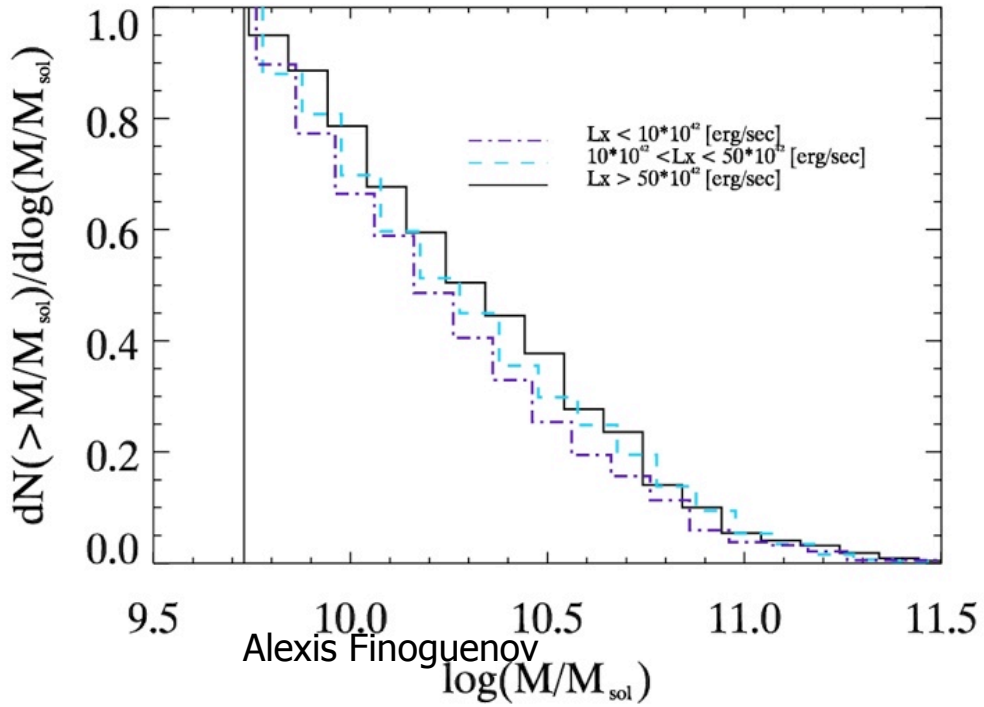
SXDF/UDS groups at z>1





Galaxy mass function vs environment (Giodini in prep.)

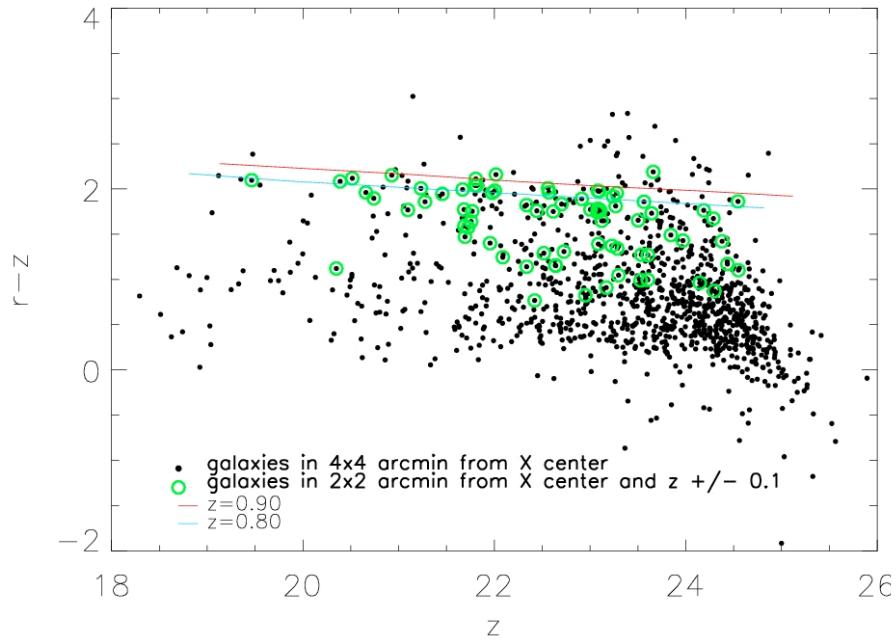


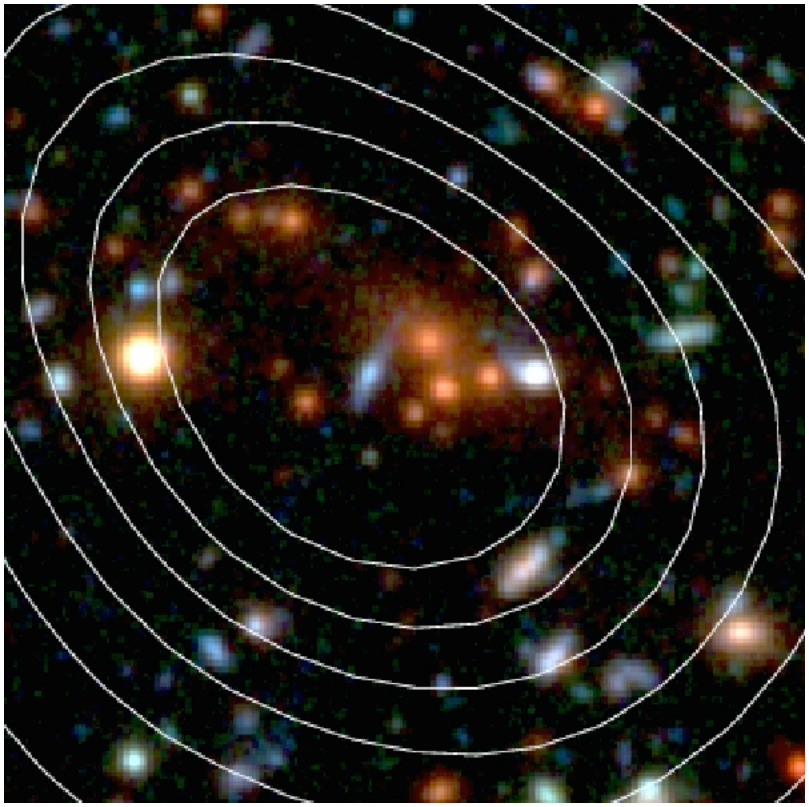


$$L_x \propto \rho_{gas}^2 \sqrt{T_x}$$

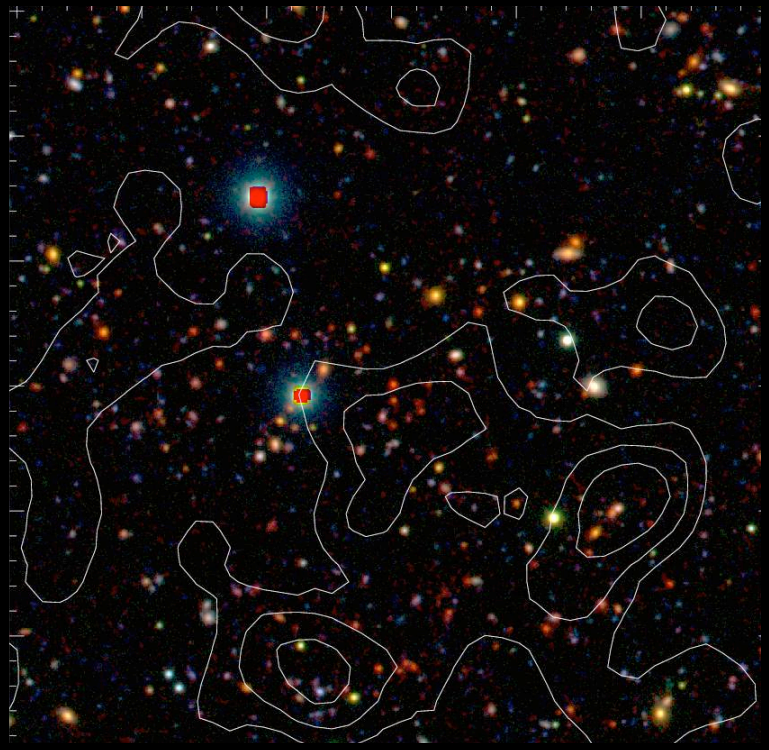
- Galaxy stellar mass distribution seems to be independent from L_x.
- Mass distribution seems independent from the initial conditions (a global fluctuation on 10 Mpc comoving scale happened in a early epoch)

Cluster at z=0.84

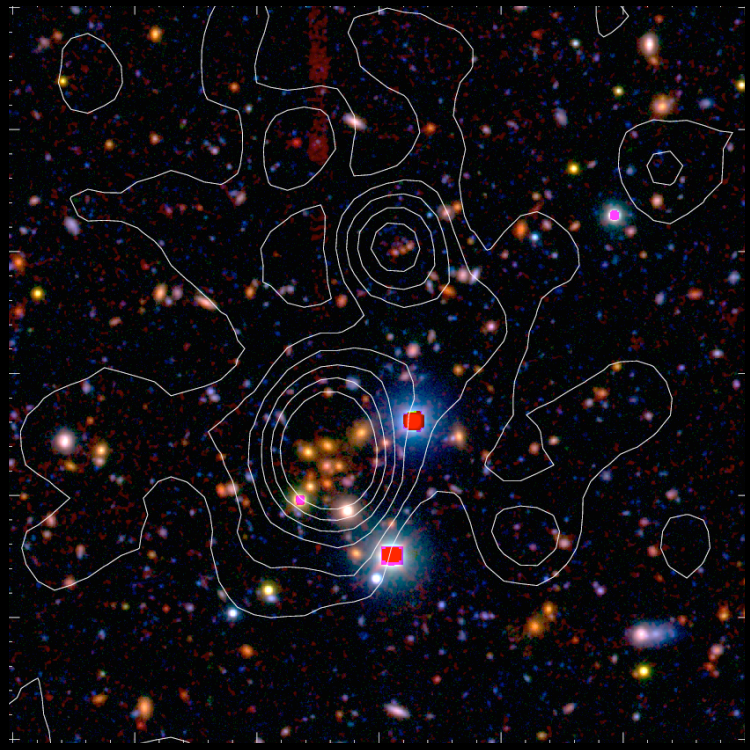




High redshift clusters

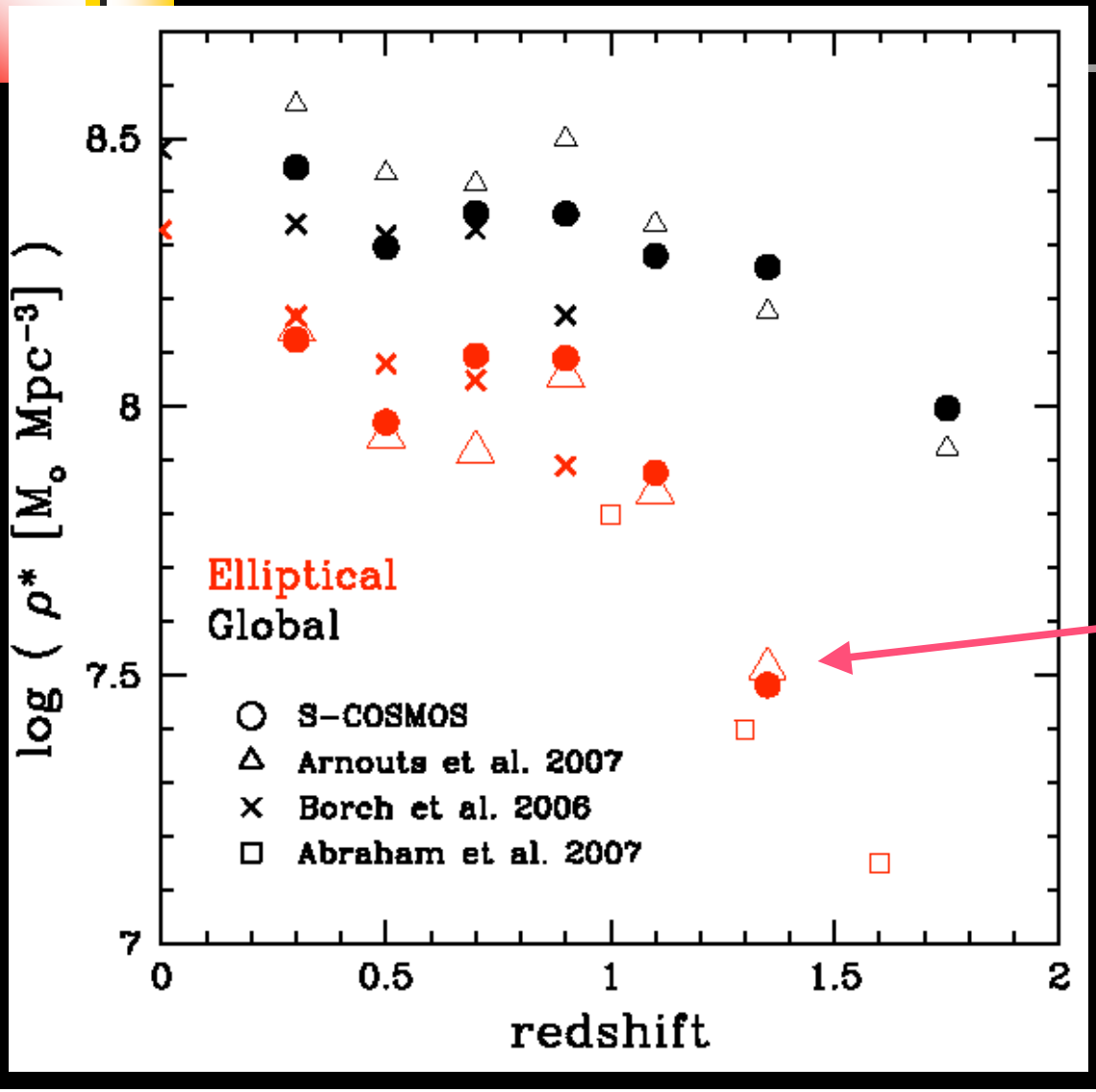


z~1.7



z=1.2

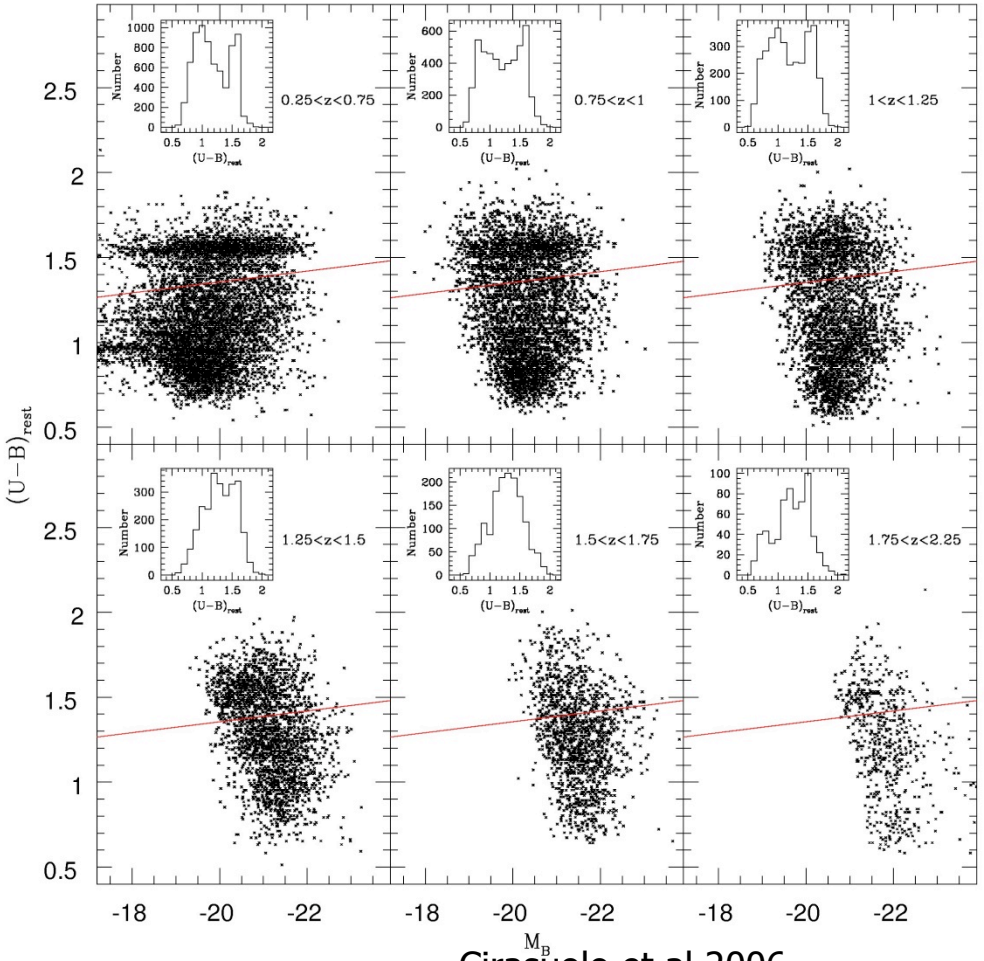
Stellar mass density



Ilbert et al. 2007

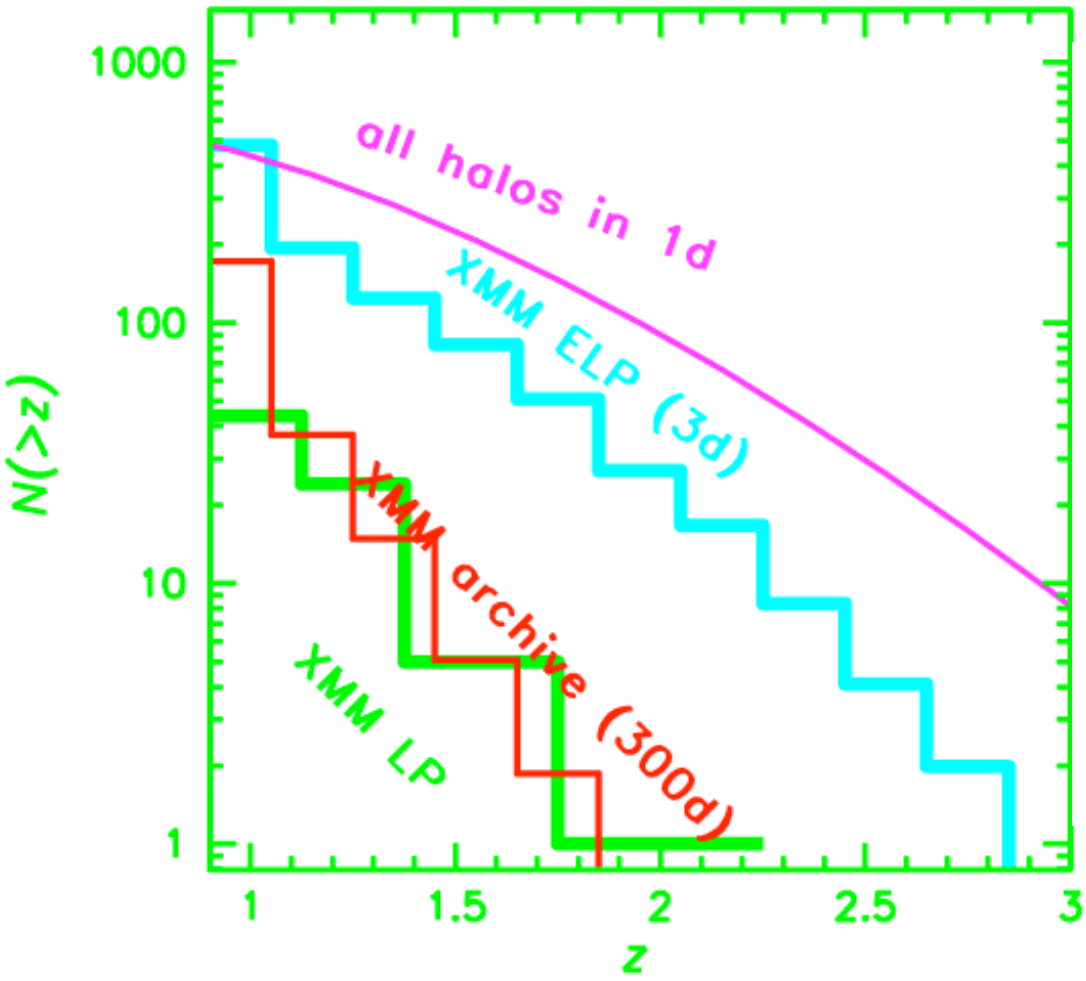
Rapid assembly of the elliptical population at z>1

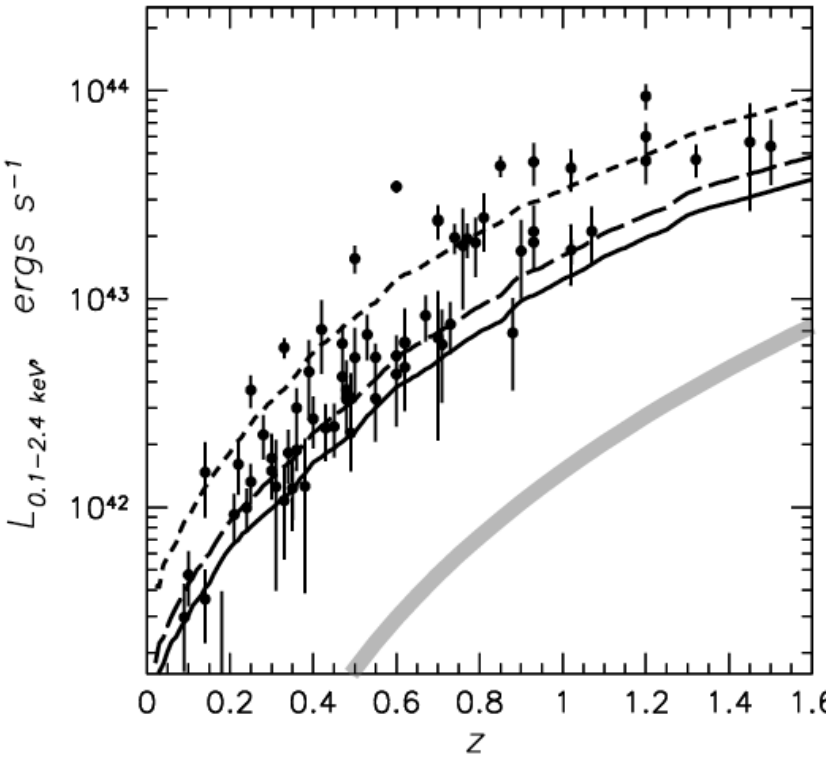
Apparent change in bimodality of color distribution at high-z



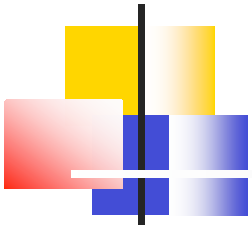
Cirasuolo et al 2006

Strategy of high-z cluster detection





laxy groups



Conclusions

- Current X-ray surveys approach the sensitivity of optical group finding methods. X-rays are unique and most robust way to localize the low-mass galaxy groups and distant clusters.
- Current XMM exposures do not match the rich optical data available as well as the science driver for these surveys, z>0.6 groups.
- A unique chance to view the AGN and galaxy evolution as a function of environment at z>1