

The Golden Age of X-ray Astronomy: From ROSAT to eROSITA



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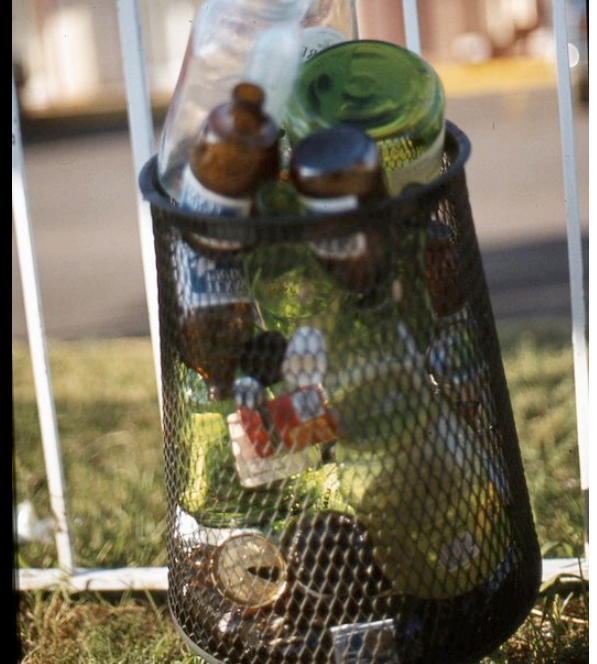
*Experimental High Energy Astrophysics
Challenges for the new Decade*

Tübingen, 15.-16. July 2010

IAAT

Eckhards 65 Workshop

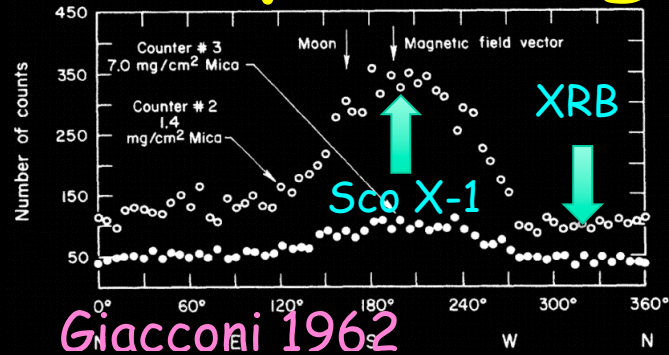
Thanks Eckhard



The X-ray background



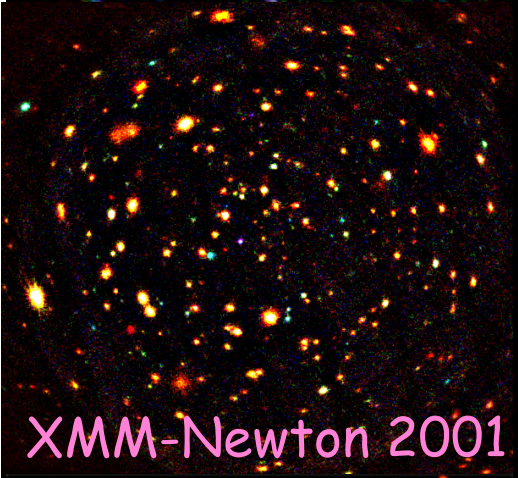
ROSAT 1998



Giacconi 1962



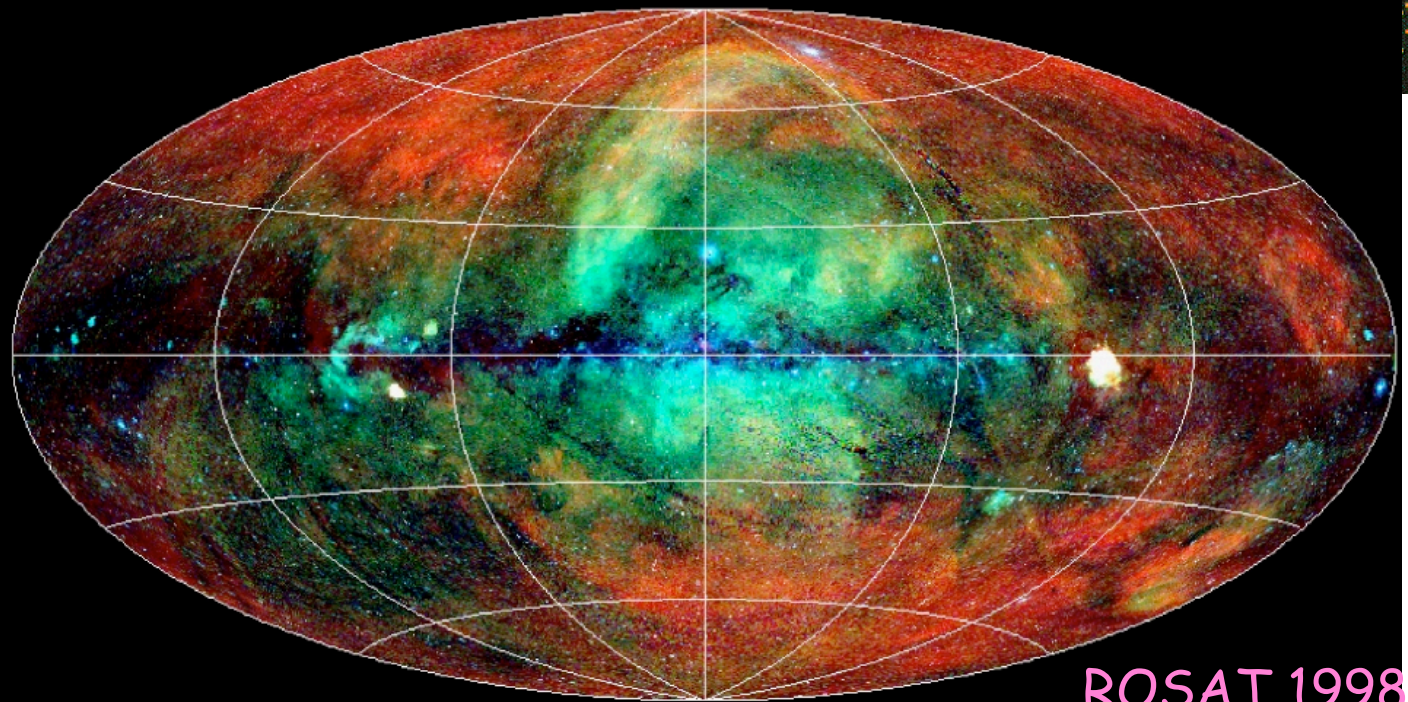
ROSAT 1991



XMM-Newton 2001



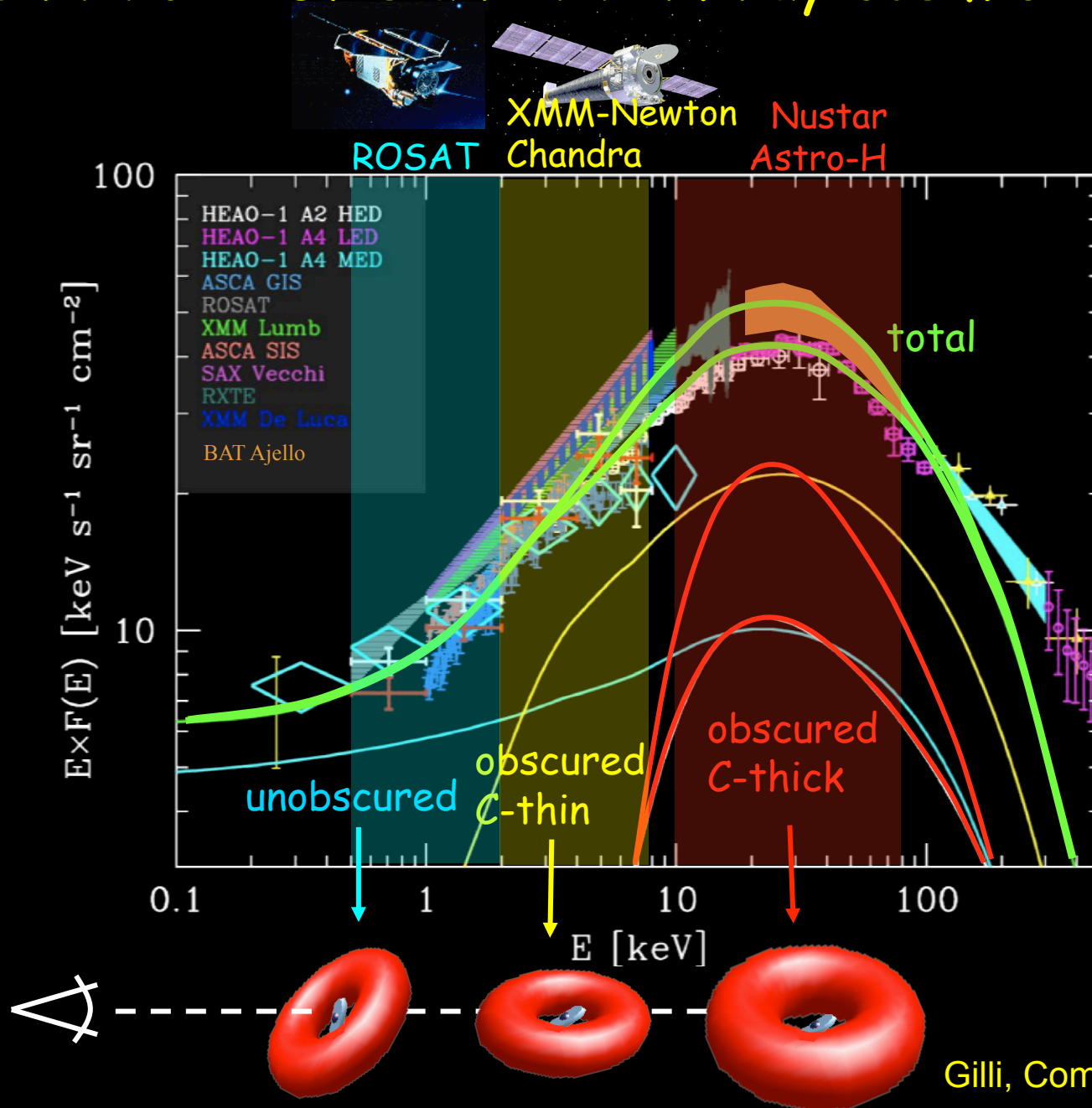
Chandra 2003



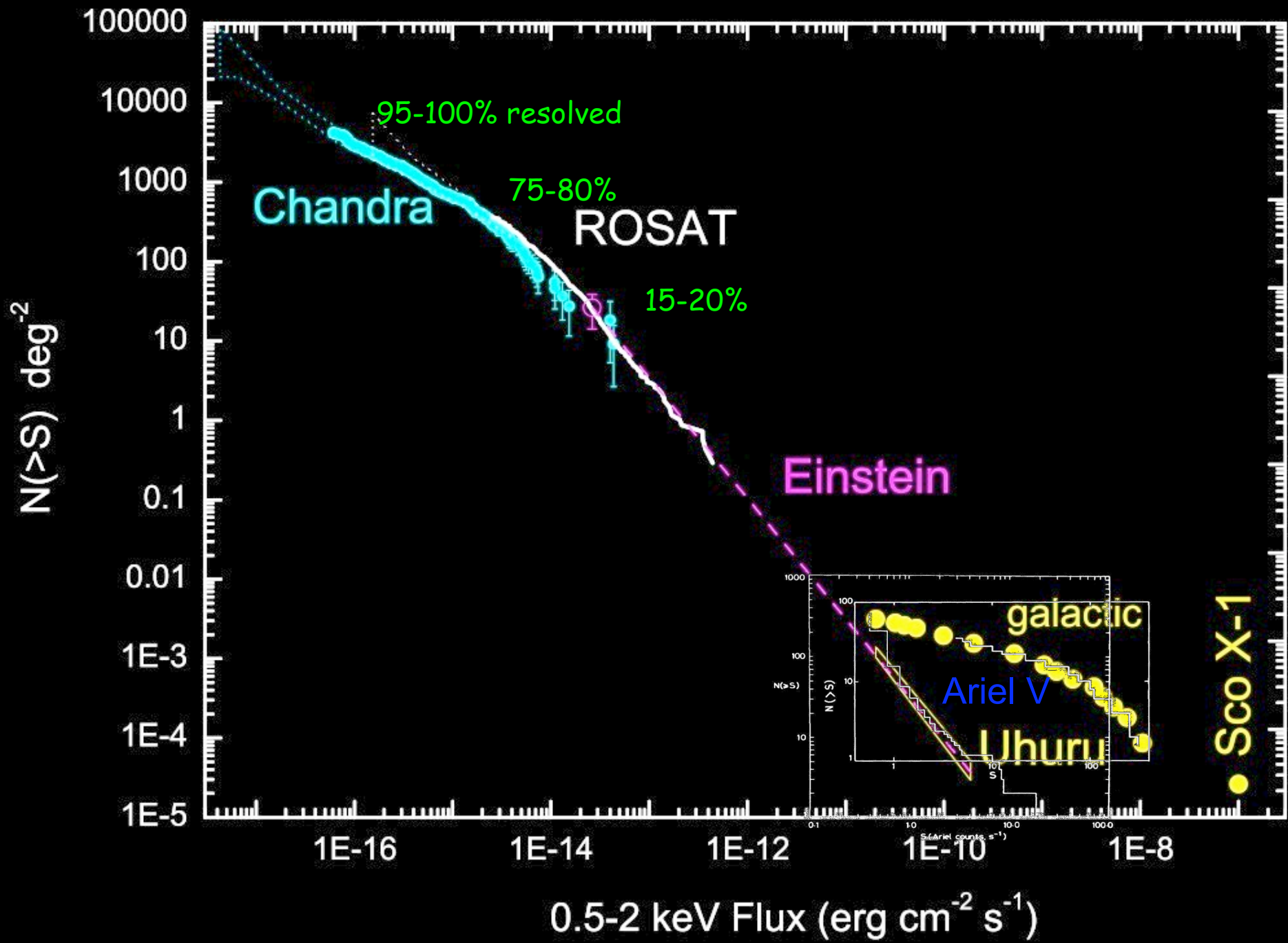
ROSAT 1998

Resolution of the X-ray background was „The Holy Grail“ for several decades. Now the focus has changed to understanding AGN evolution.

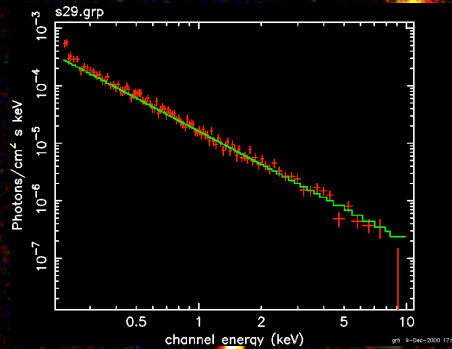
Compton thick AGNs and the X-ray cosmic background



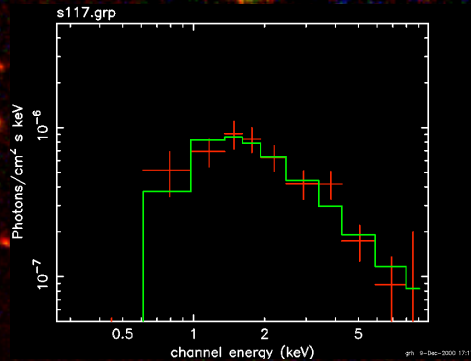
Gilli, Comastri & G.H., 2007



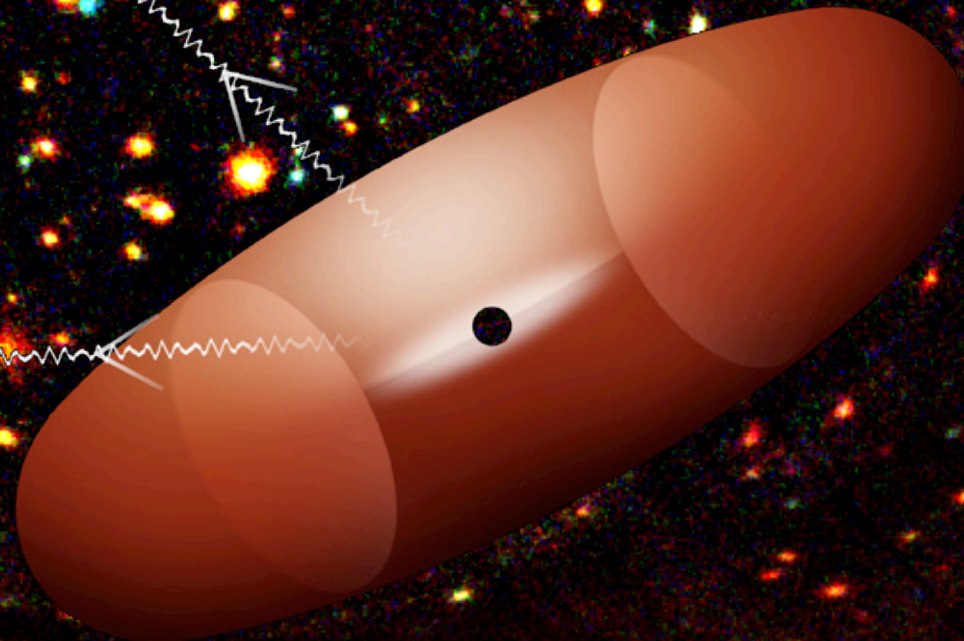
Lockman Hole



Red (more soft
X-rays)



Blue (only hard
X-rays)

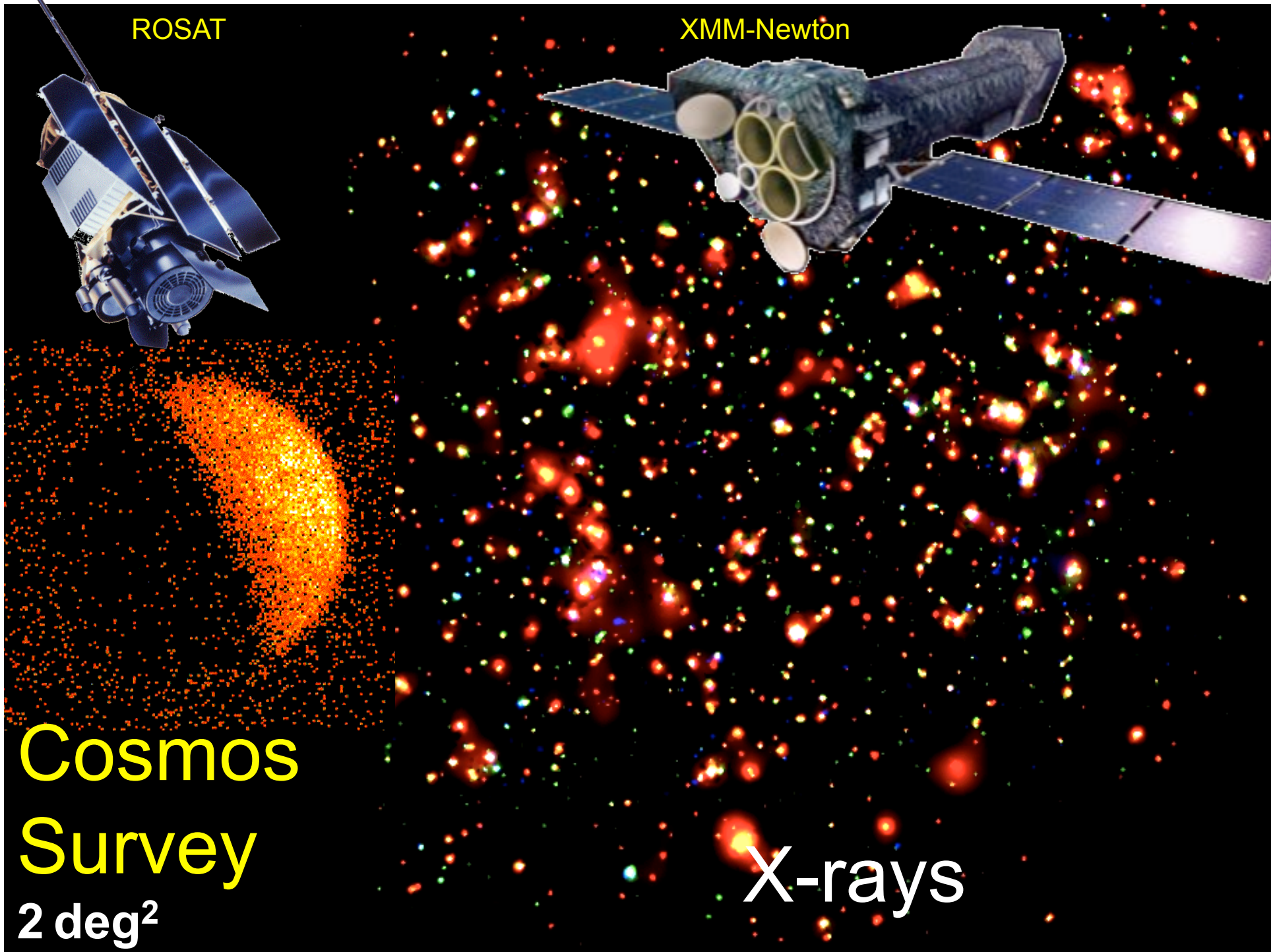


ROSAT

XMM-Newton

Cosmos
Survey
2 deg²

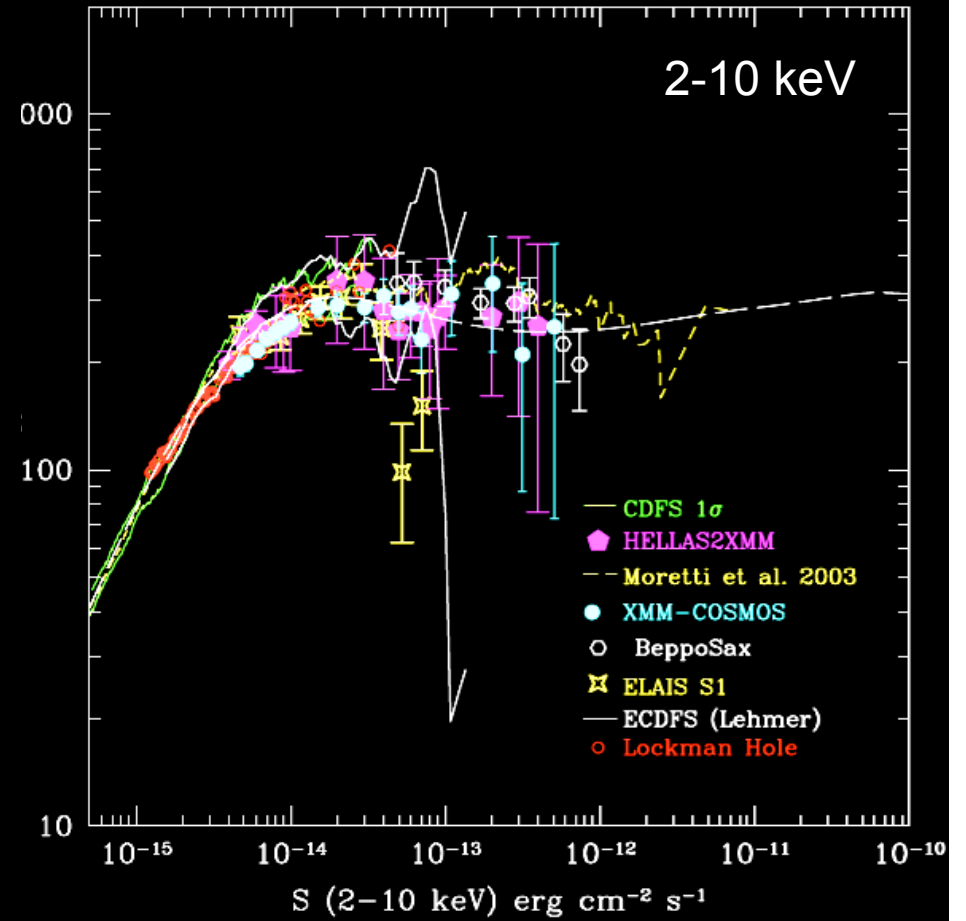
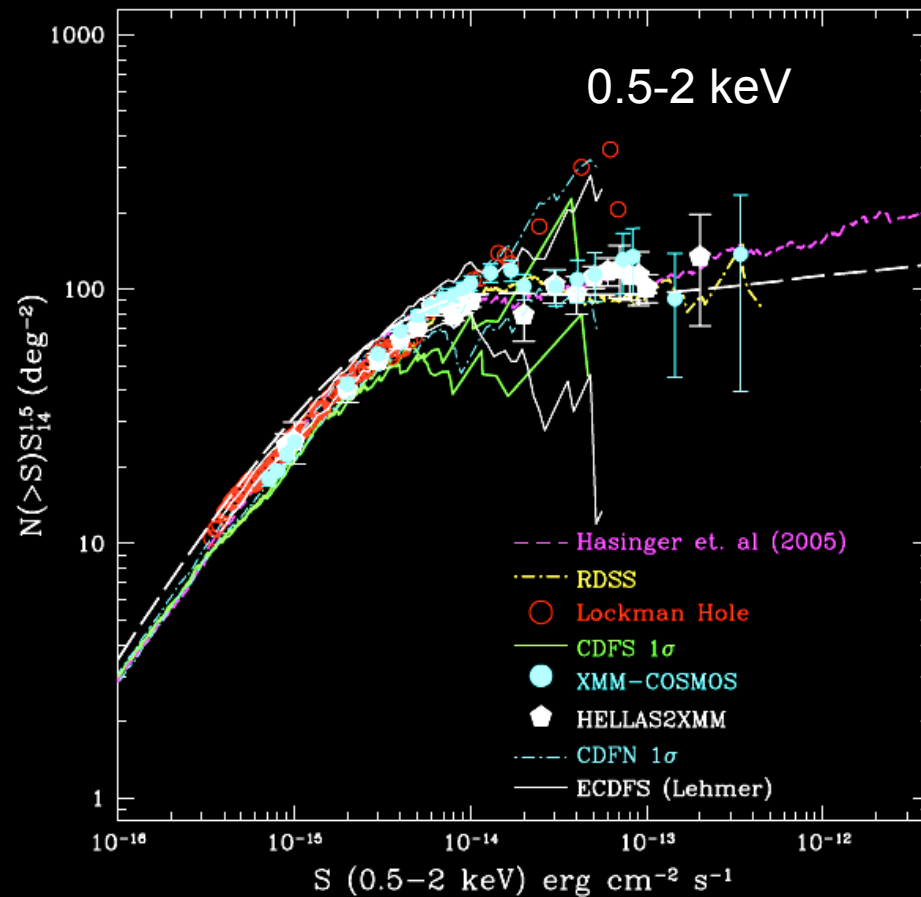
X-rays



Visual impression of COSMOS Team



logN-logS



Cappelluti et al., 2007, COSMOS special issue ApJS

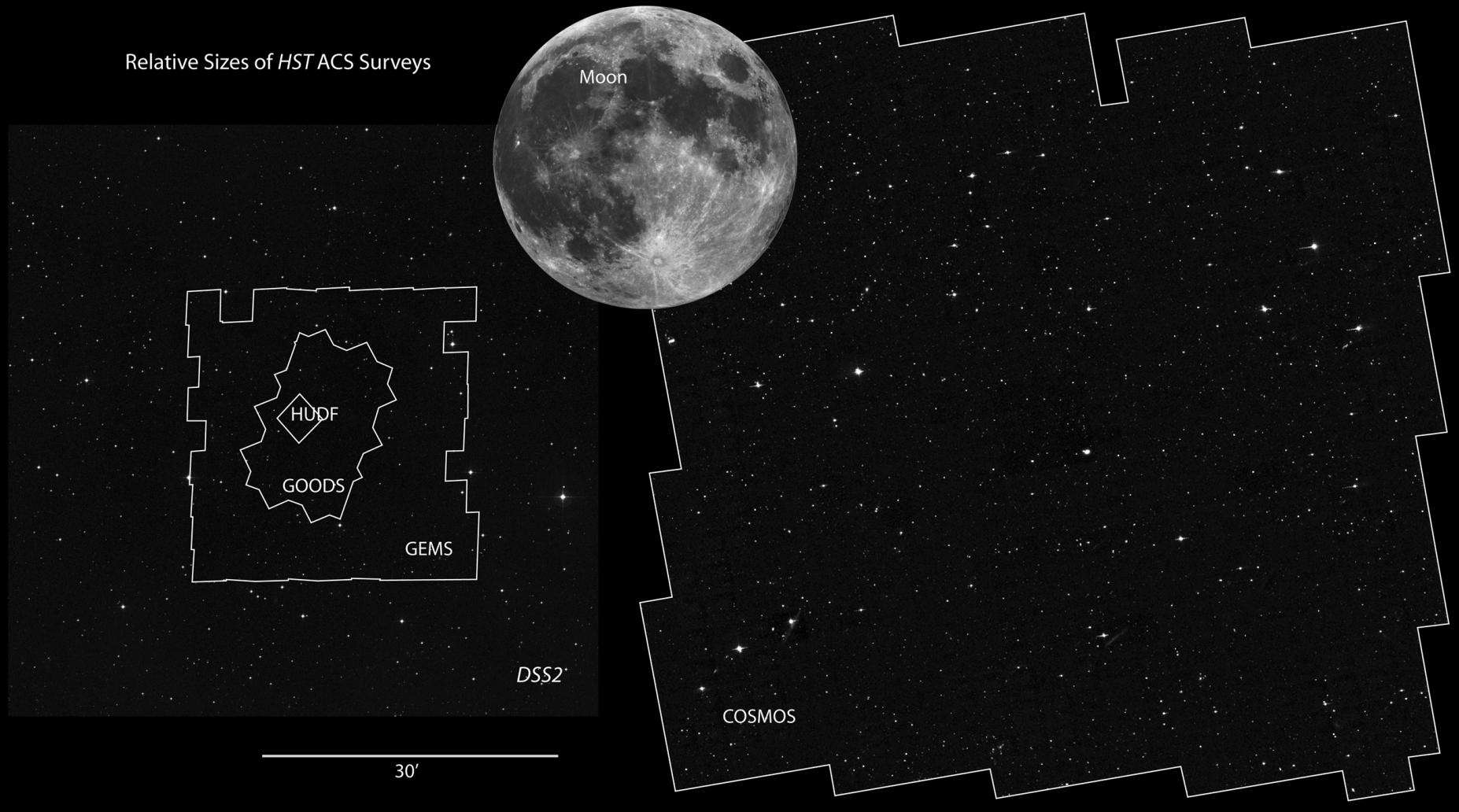
Models by Gilli, Comastri, Hasinger 2007

Relative Sizes of HST Surveys

CDFS

COSMOS

Relative Sizes of HST ACS Surveys



Chandra Deep Field South

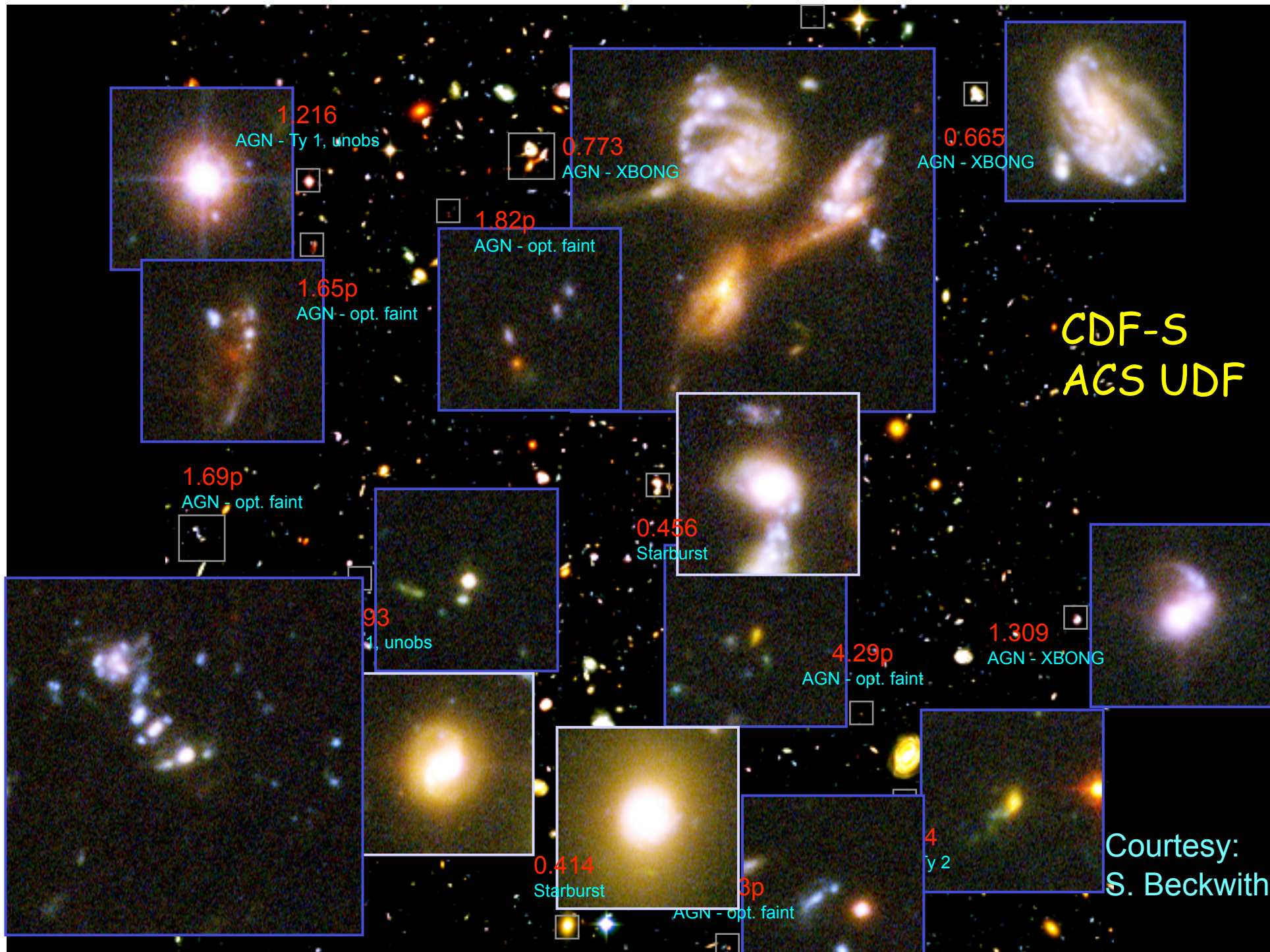


CDFS: Chandra 2 Msec
Luo et al., 2008

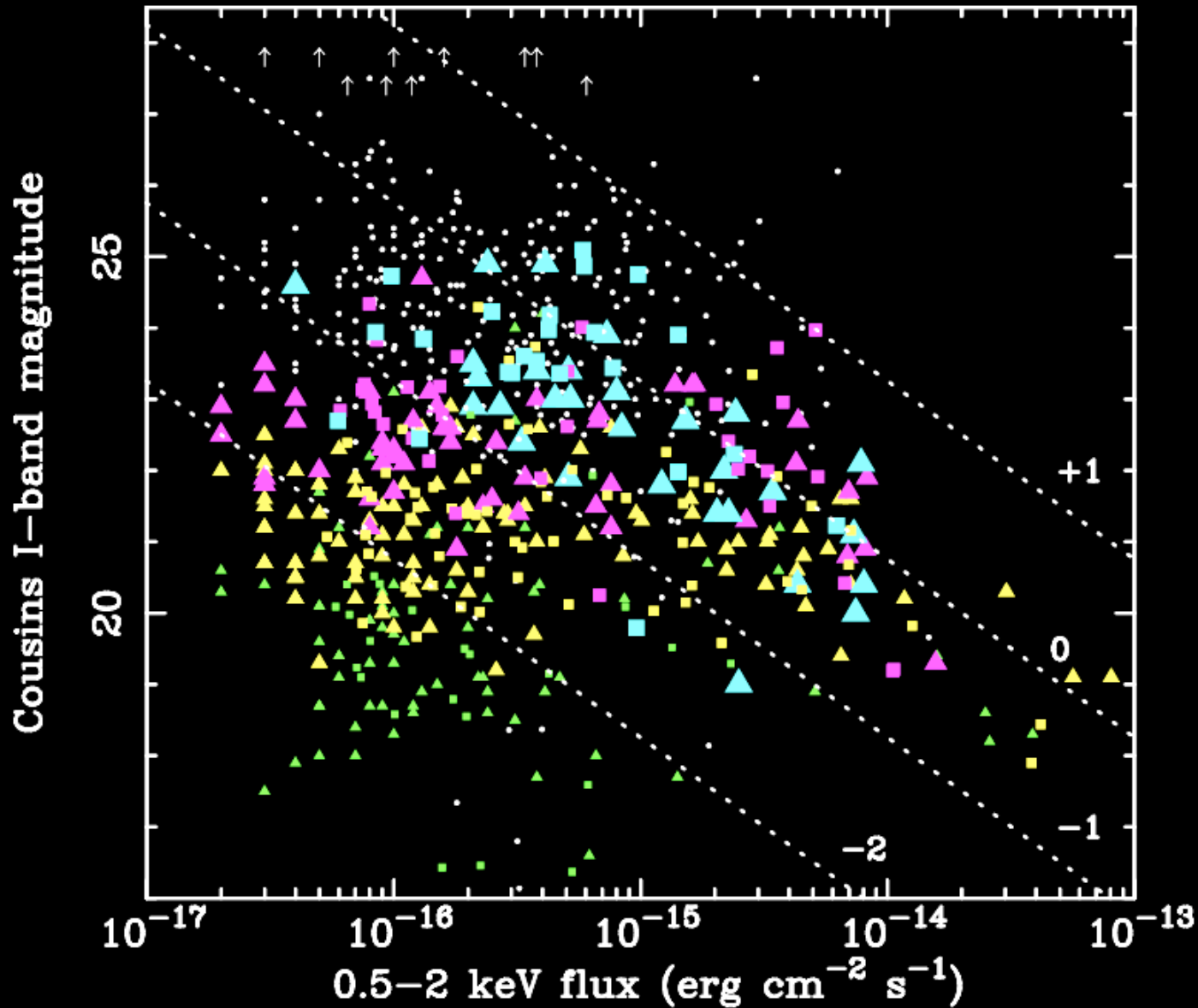
GOODS South

UDF

Chandra 4x250 ksec
(PI: N. Brandt)



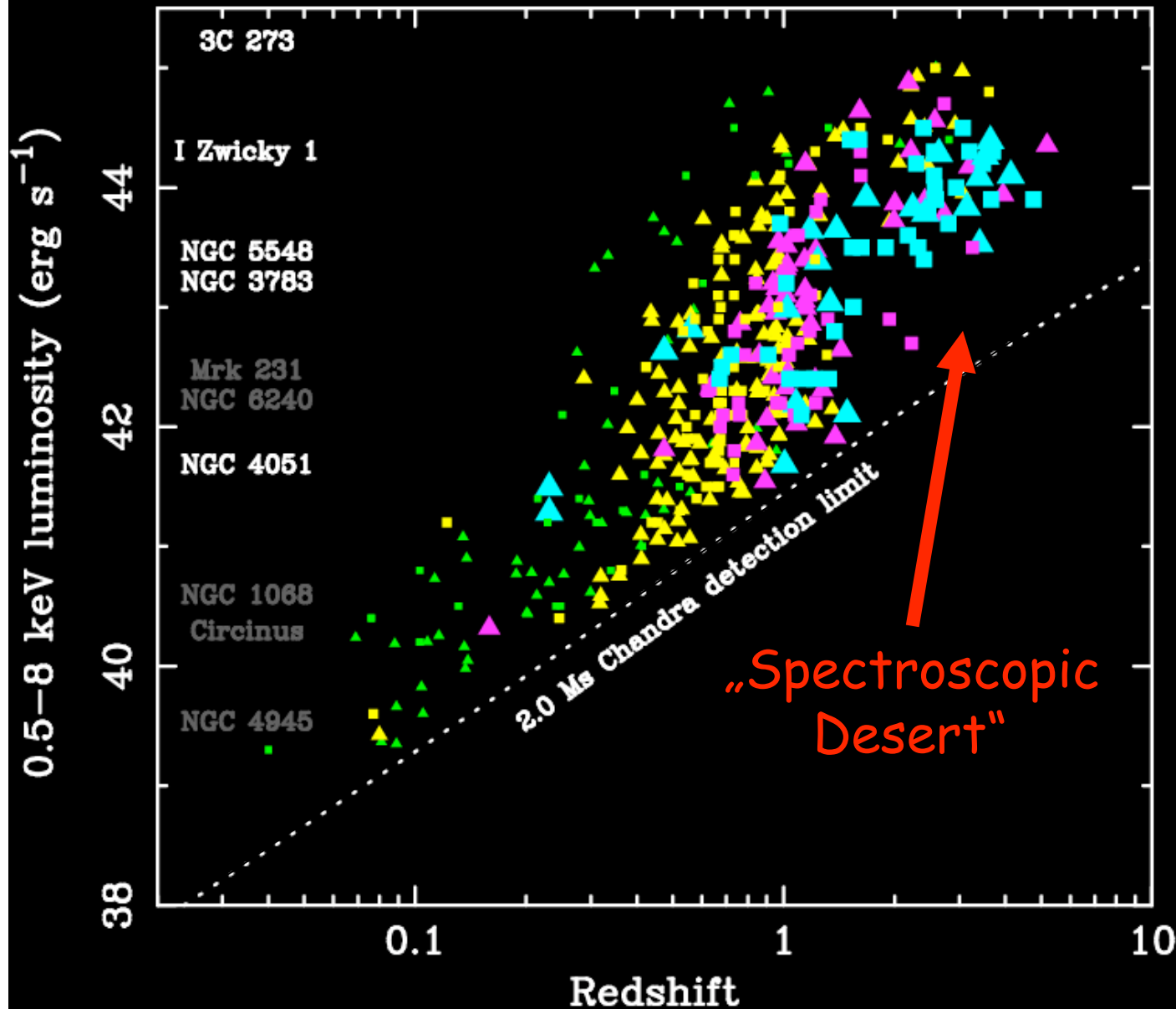
Chandra Deep Field IDs



CDFN: Triangles
CDFS: Squares
dot: unidentified

$0 < z < 0.5$
 $0.5 < z < 1$
 $1 < z < 2$
 $2 < z < 6$

L_x vs. redshift

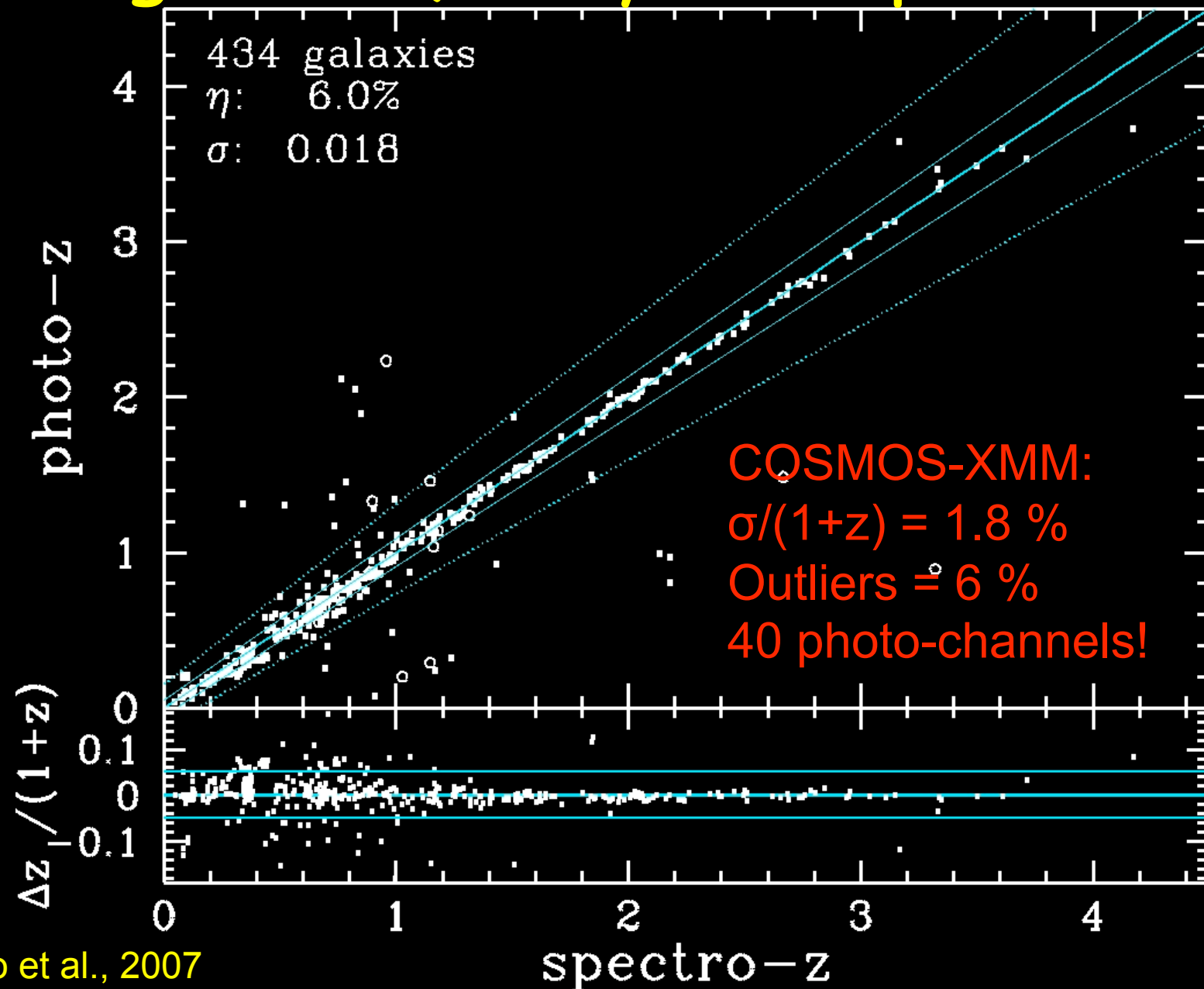


CDFN: Triangles
CDFS: Squares

I=15-20
I=20-22
I=22-23
I>23

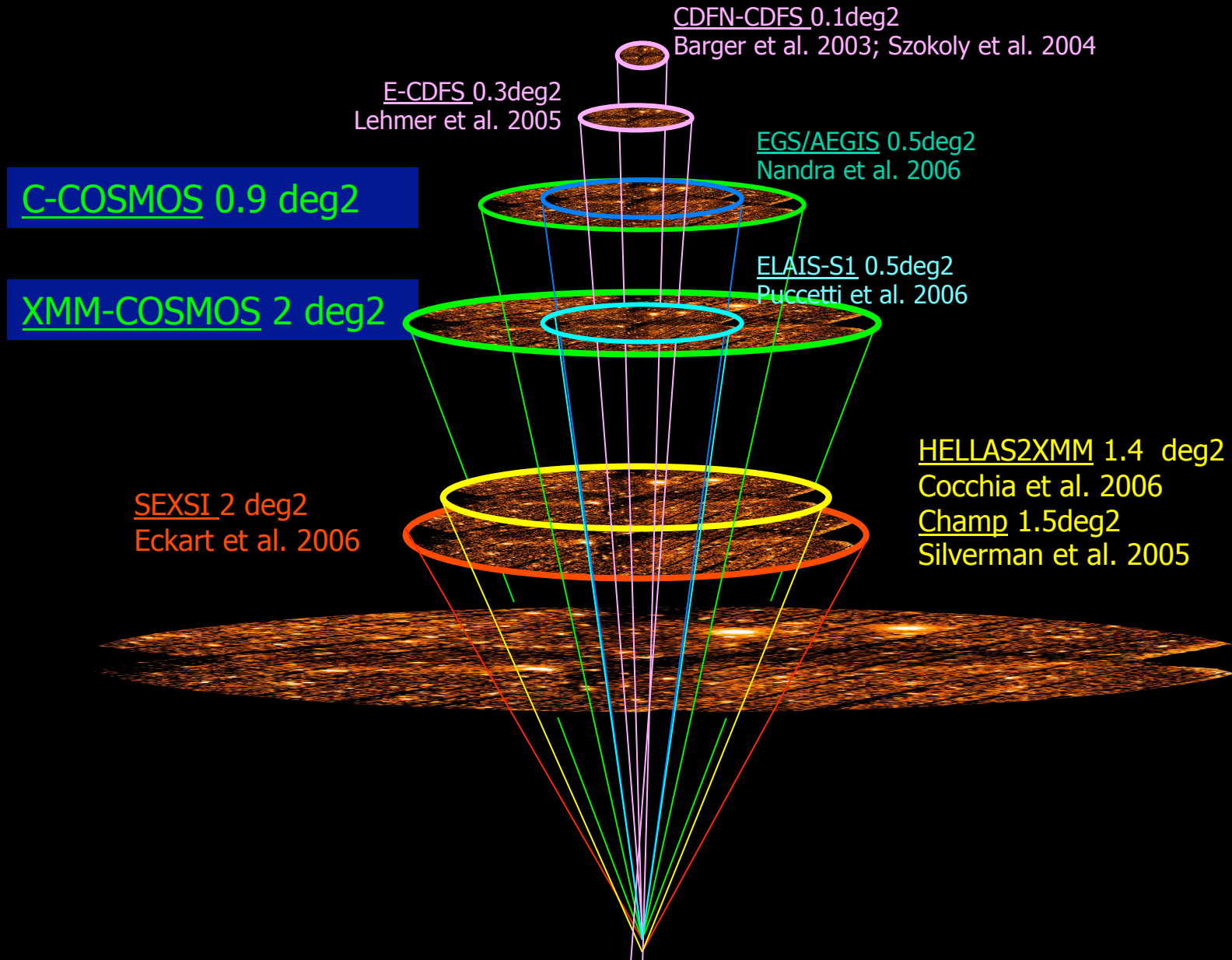
„Spectroscopic Desert“

Highest Quality AGN photo-z



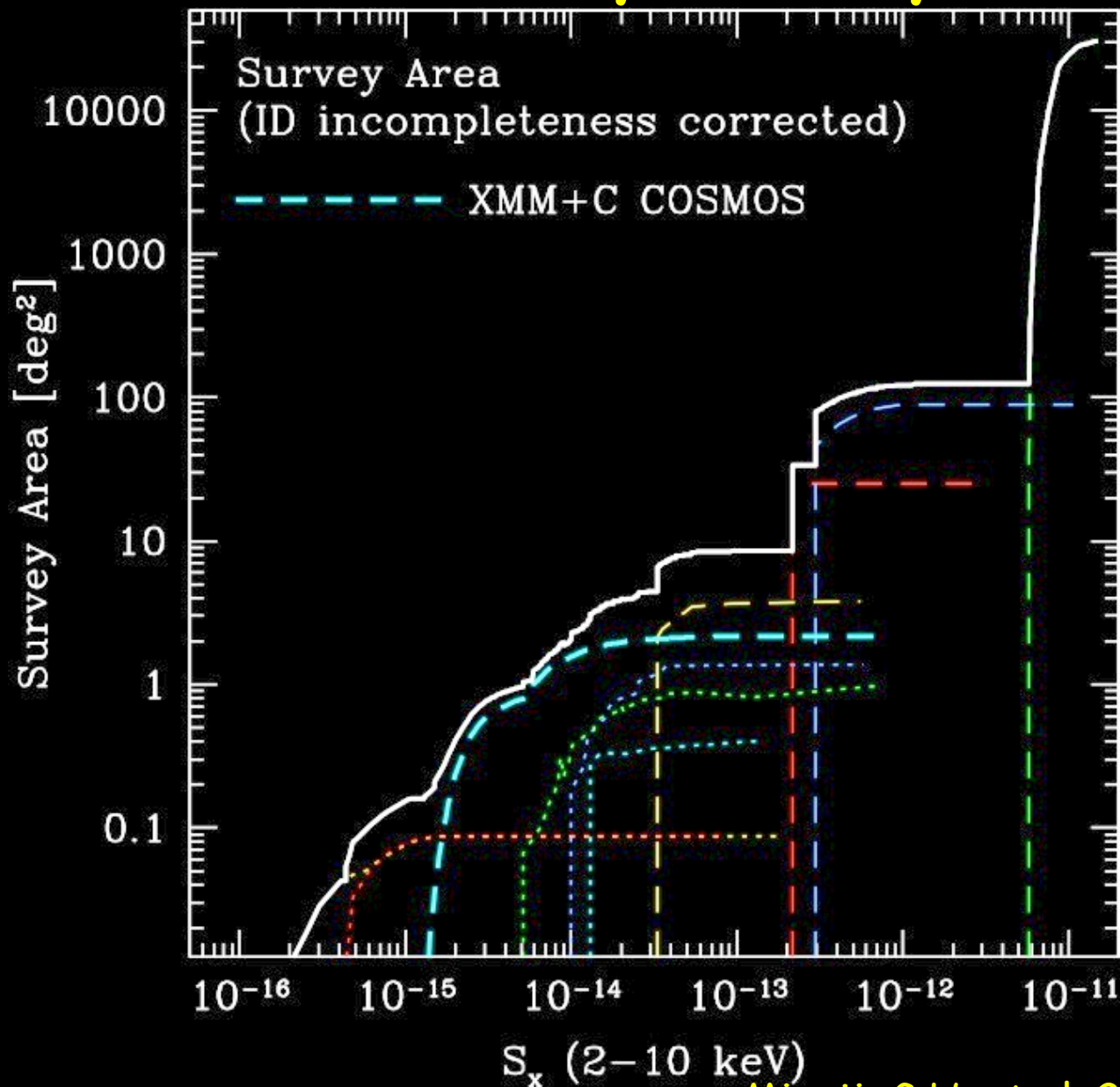
X-ray AGN Survey Wedding Cake

Flux 2-10 keV (cgs)



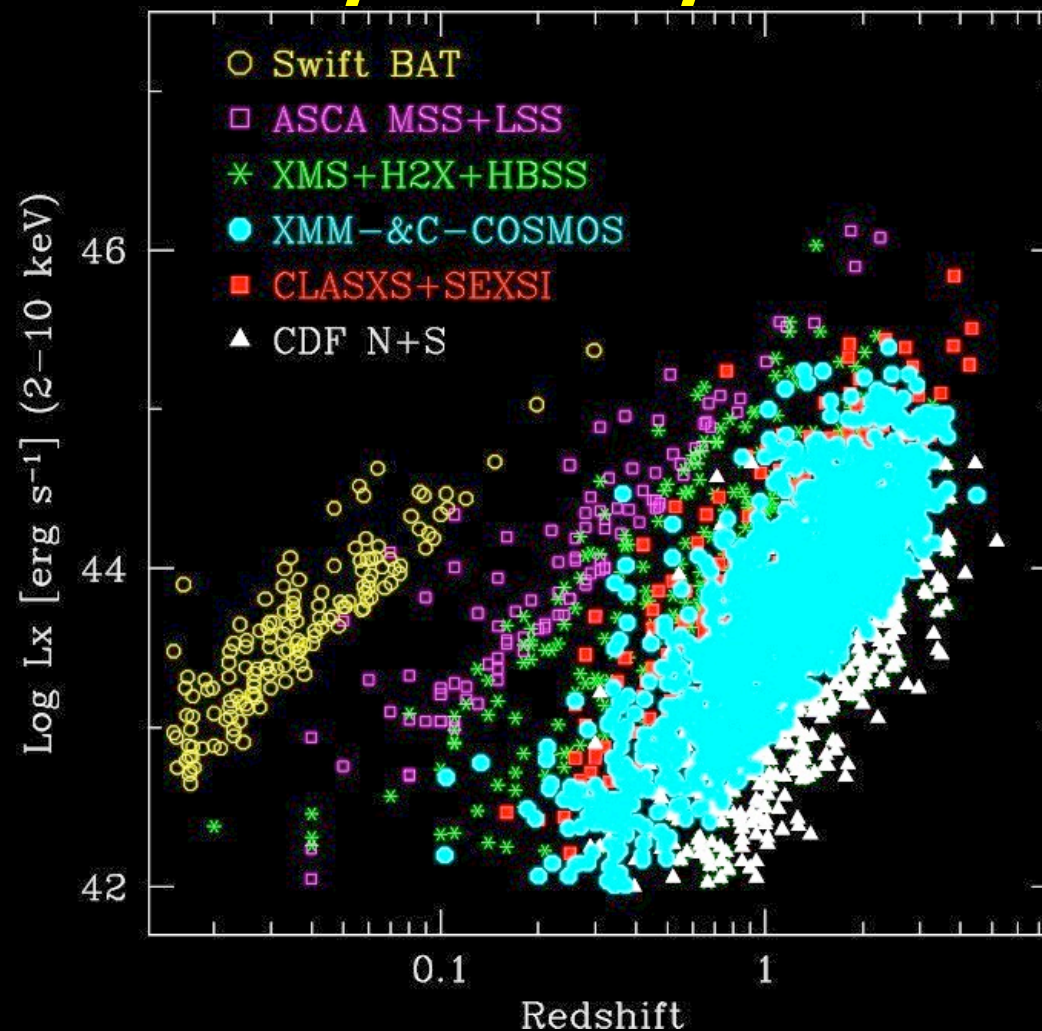
(see Brandt & Hasinger 2005 review (ARA&A 43, 827))

Meta-Survey Analysis



Miyaji, G.H. et al. 2010 (in prep.)

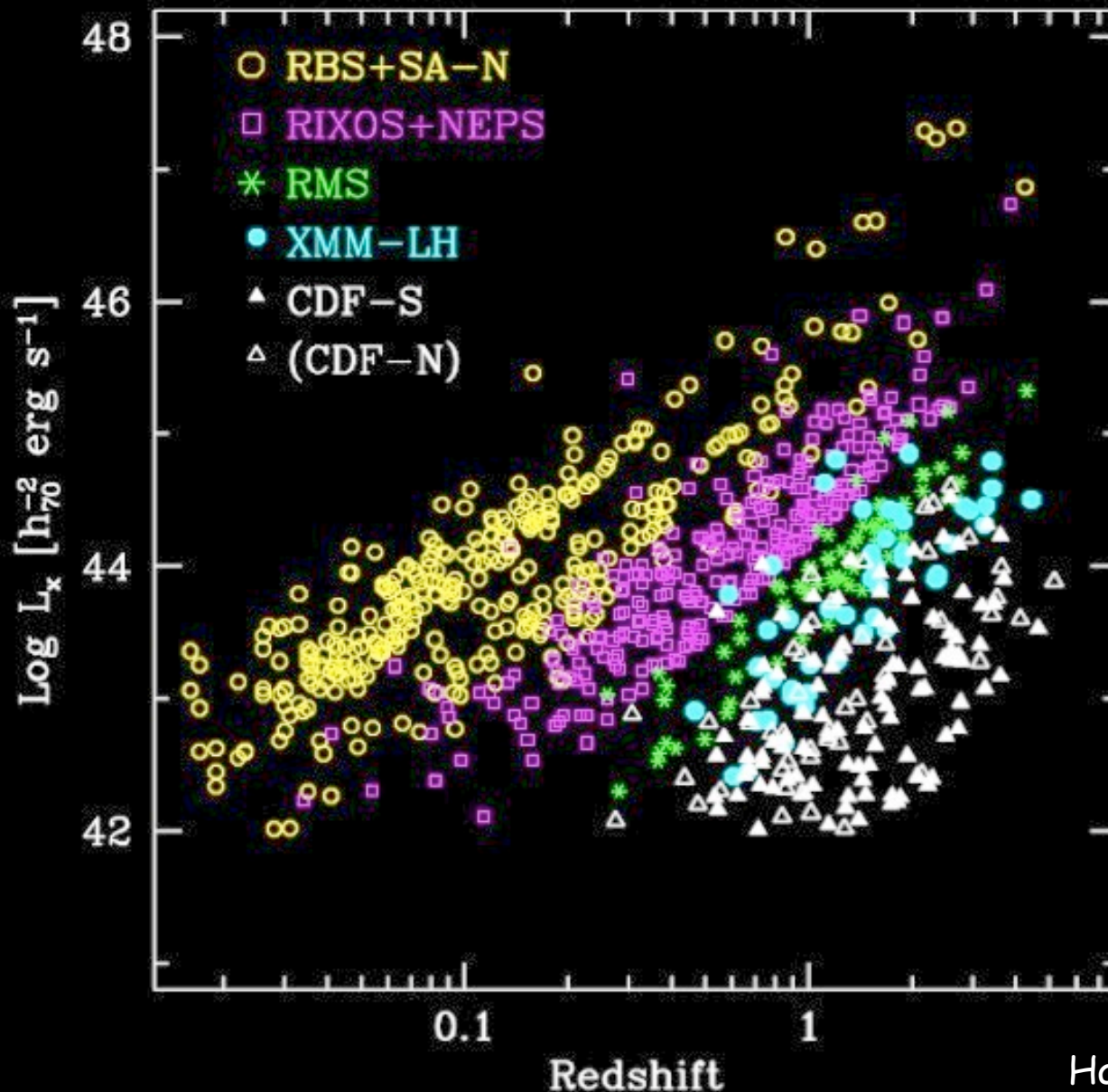
Meta Survey Analysis 2-10 keV



eROSITA will fill the gap at high fluxes wide surveys

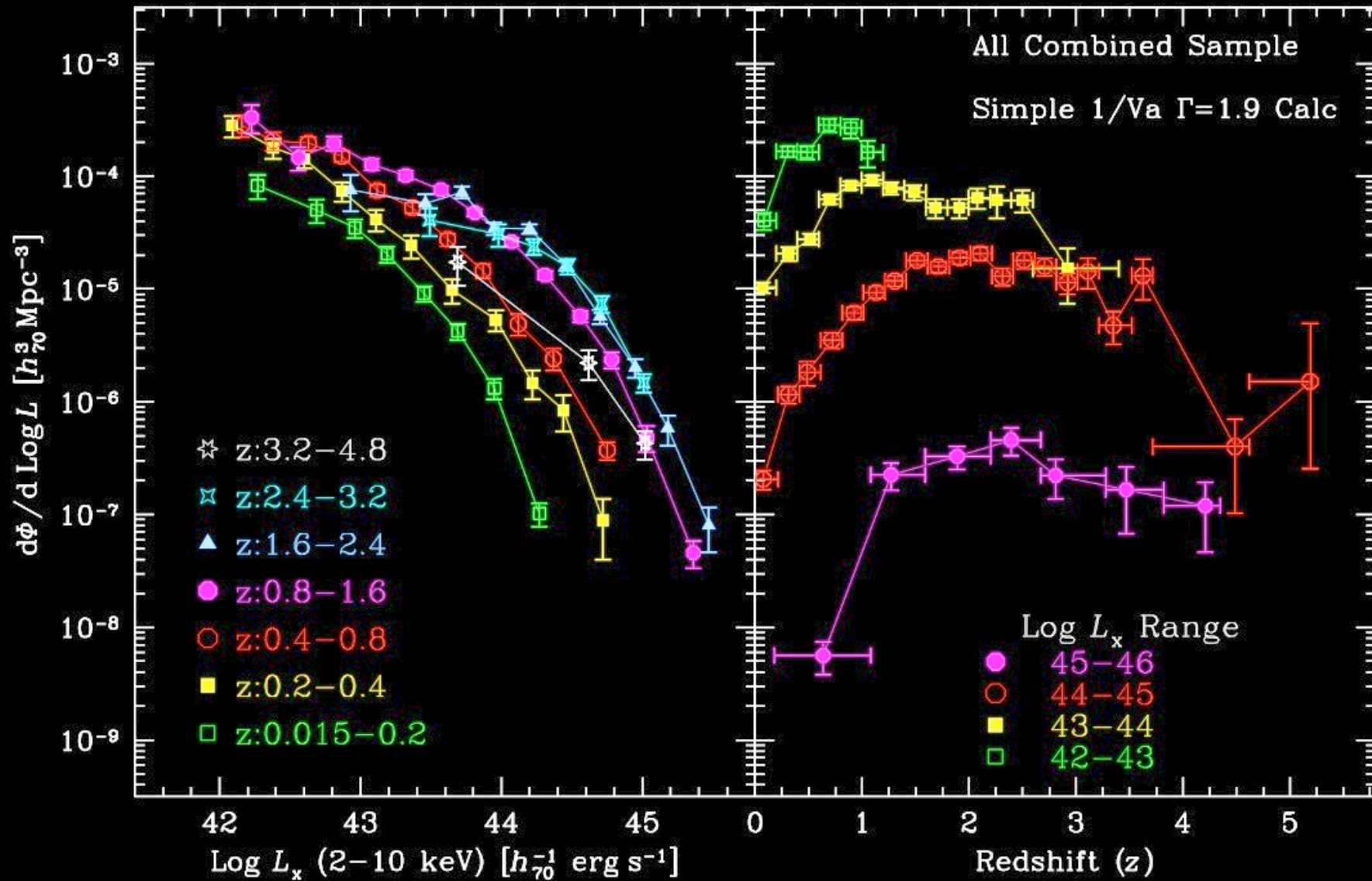
Miyaji, G.H. et al. 2010 (in prep.)

Meta Survey Analysis 0.5-2 keV



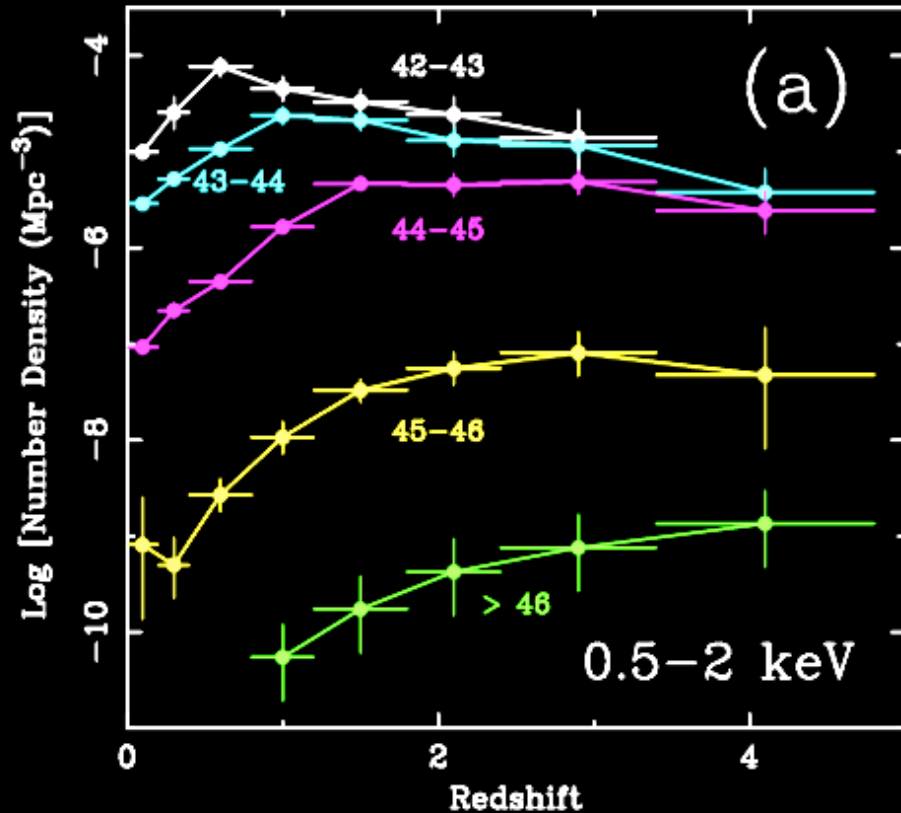
Note the very good coverage at intermediate to bright fluxes due to the **ROSAT All-Sky-Survey!**

2-10 keV AGN Luminosity Function

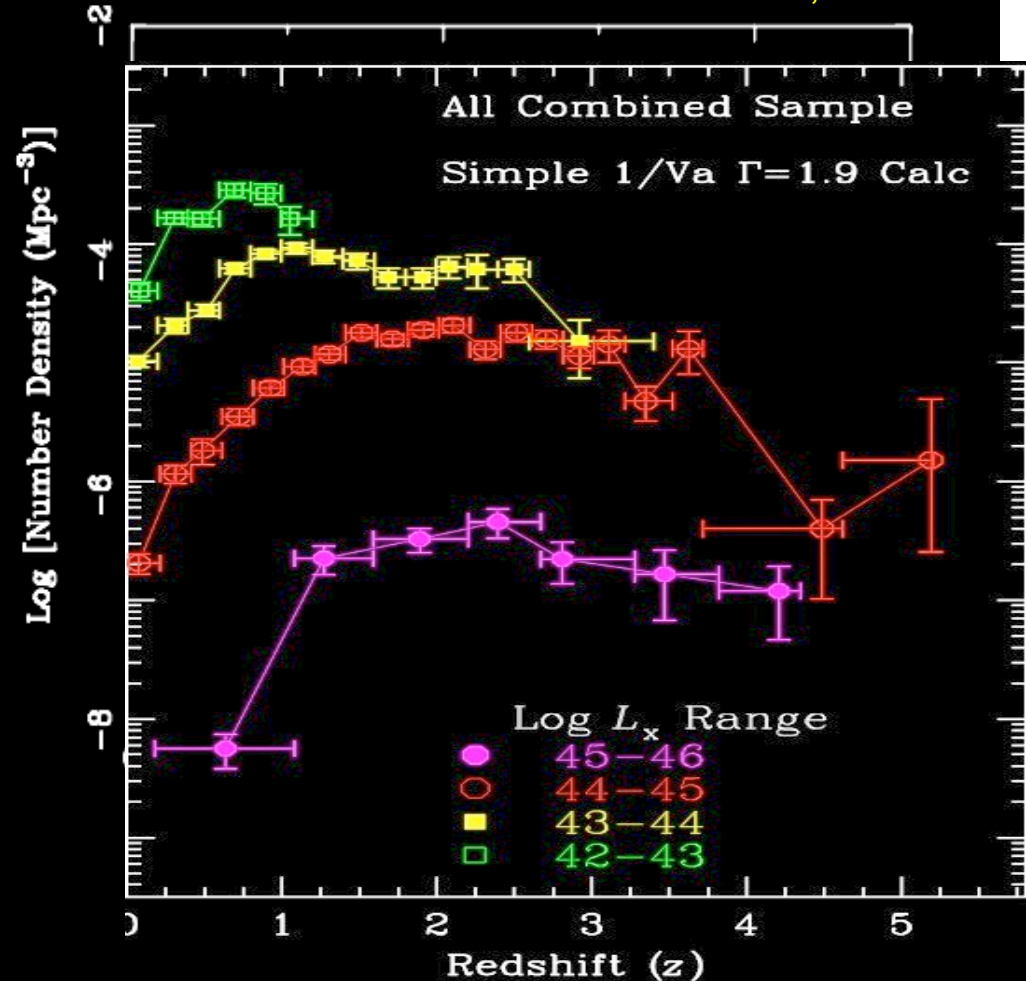


Densities in soft and hard band

Brandt & G.H., 2005

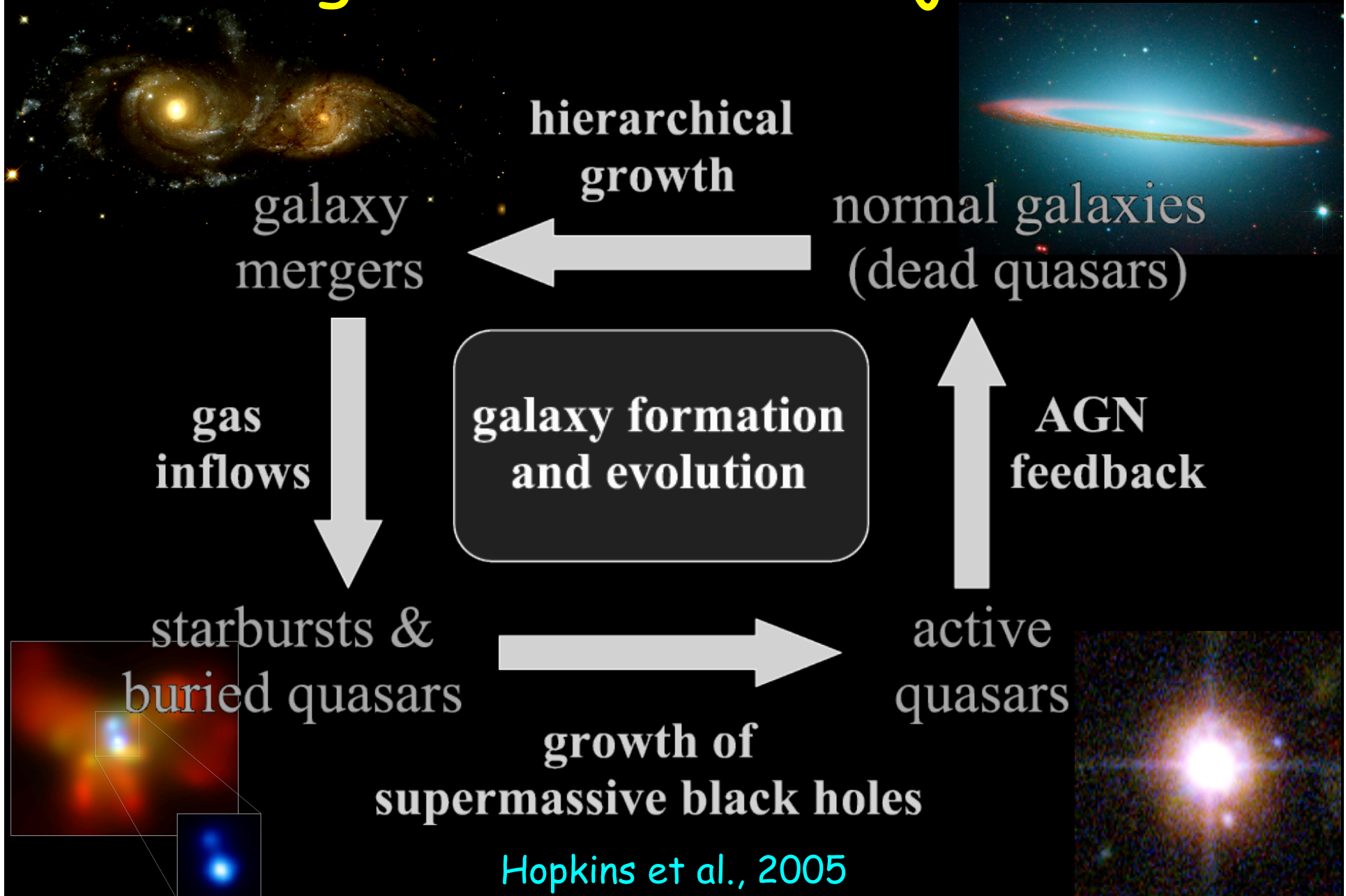


G.H., Miyaji & Schmidt, 2005
based on ~1000 AGN-1



Very similar anti-hierarchical behaviour in hard and soft band. Hard samples are now competitive.

Merger Evolution Conjecture



IXO in context @ z=10

