

# XMM-Newton survey of the COSMOS field

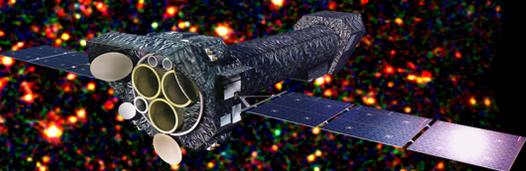
Nico Cappelluti, MPE-Garching

Brusa, Hasinger, Aldcroft, Boehringer, Brunner, Civano, Comastri, Elvis, Finoguenov, Fiore, Fruscione, Gilli, Griffiths, Impey, Mainieri, Miyaji, Puccetti, Salvato, Scoville, Silverman, Urry, Vignali, Zamorani

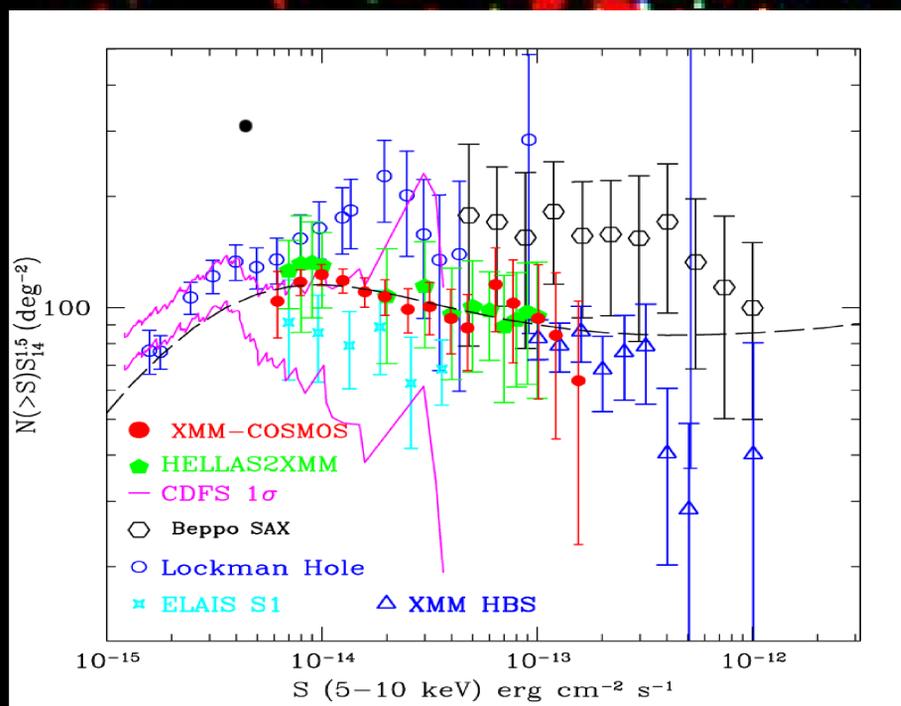
**Abstract:** The COSMOS survey is a multiwavelength 2 square degree survey built around a HST-ACS treasury program (P.I. N. Scoville). The XMM-COSMOS (P.I. G. Hasinger) is the deepest XMM-Newton wide field survey. It is aimed to study Super Massive Black Holes, Large Scale Structures and their co-evolution. In the X-ray band the field has been also observed by Chandra (P.I. M. Elvis). XMM-Newton performed 55 pointings toward the COSMOS field for a total exposure of 1.5 Ms.

## Key points:

- Deepest XMM-Newton extragalactic wide field survey.
- 1887 point-like X-ray sources.
- ~250 X-ray selected clusters/groups.
- High Statistics at high energy → **OBSCURED AGN.**
- Homogeneous sensitivity → **Clustering**
- ~40% spectroscopic completeness
- 100% photo-z.
- Low Cosmic/Sample variance.
- Chandra Coverage

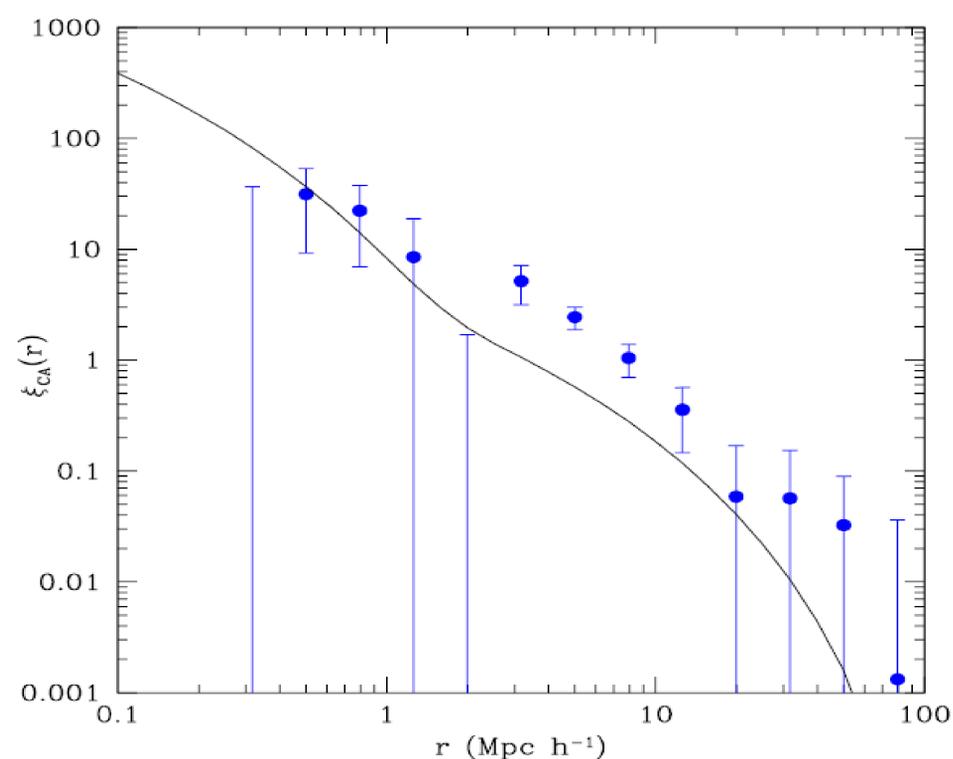


**Fig.1** False color XMM-Newton X-ray image of the cosmos field. Red, green and blue, correspond to the 0.5-2 keV, 2-4.5 keV and 4.5-10 keV energy band, respectively



**Fig. 3** The 5-10 keV logN-logS of the XMM-COSMOS survey compared with previous results and the Gilli et al. 2007 XRB population synthesis model.

Thanks to the large effective area of XMM-Newton, we were able to tightly constrain the hard energy (5-10 keV) logN-logS. In this band most of the Compton-Thick/Highly absorbed sources show up. Such a relation is in good agreement with XRB synthesis model predictions. Moreover thanks to the large sky coverage and depth of the survey our result are weakly affected by the so called Cosmic/Sample Variance.



**Fig. 4** The real space Cluster/AGN Cross Correlation function in XMM-COSMOS compared with the DM autocorrelation function (Hamana+04)

Thanks to its homogeneous sensitivity and to the large sample of spectroscopically identified AGN and Clusters, we obtained the X-ray Cluster/AGN cross-correlation function. As a result we obtained a correlation length of ~7.7 Mpc. This implies that AGN generally live in DM halo with  $\log(M)=13 M/M_*$ . This results in close agreement with predictions with independent results obtained with AGN auto correlation (e.g. Miyaji et al. 2007). There is a slight indication of a lower AGN activity in the inner 2 Mpc of clusters.