An XMM-Newton catalogue of radio-quiet AGN

Stefano Bianchi[1,2], Matteo Guainazzi[2], Giorgio Matt[1], Nuria Fonseca Bonilla[2]

[1]Dipartimento di Fisica "E. Amaldi", Università degli Studi di Roma TRE, Rome, Italy
[2]European Space Astronomy Centre of ESA, Villafranca del Castillo, Spain

A large and systematic use of the XMM-Newton archive represents one of the major legacies of this highly successful mission. In particular, multi-wavelength analysis on large samples of Active Galactic Nuclei (AGN) provides an excellent tool to understand the physics of these objects. We present the largest catalogue of XMM-Newton targeted AGN with high SNR X-ray spectra published so far. It includes all the radio-quiet objects observed by XMM-Newton, in targeted observations of the AGN panel, whose data are public as of March 2007, for a total of 157 unobscured sources. The principal X-ray properties of the catalogue are complemented by multi-wavelength data found in the literature (optical magnitudes, radio fluxes, Hβ FWHM, BH masses).
This work highlights the importance of large and homogeneous samples to characterize the properties of classes of celestial objects. Our sample is still plagued by the lack of completeness in any relevant parameter spaces. Achieving in the next decade an homogeneous coverage of complete samples would represent a long-lasting legacy for XMM-Newton.

IWASAWA-TANIGUCHI EFFECT

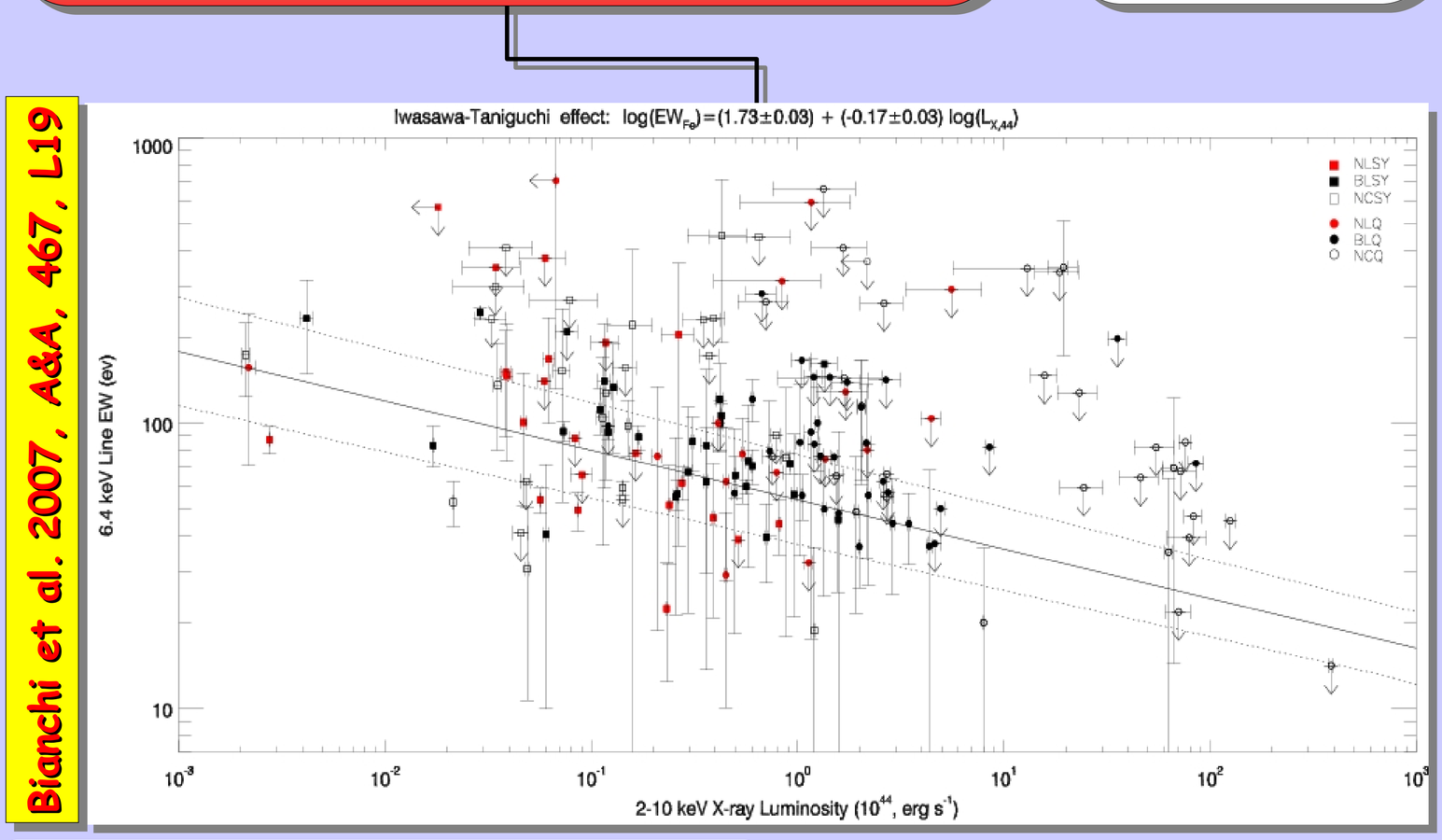
The anti-correlation between the neutral iron Kα line and the 2-10 keV luminosity is highly significant:

$\log(EW_{Fe})=(1.73\pm0.03) + (-0.17\pm0.03) \log(L_{X,44})$

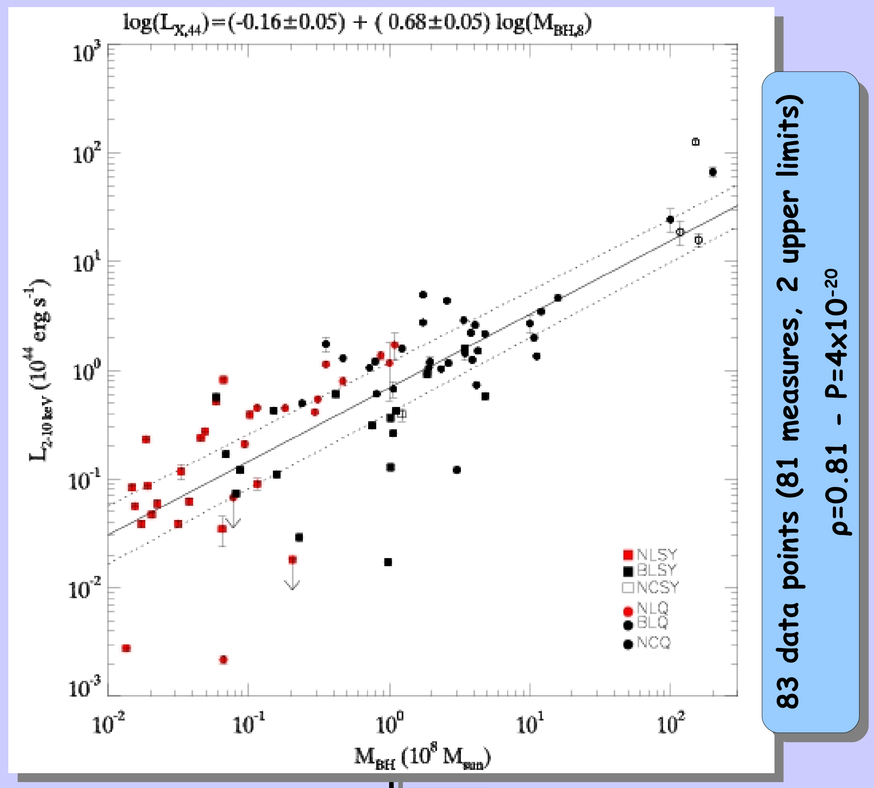
157 data points (81 measures, 76 upper limits)

$\rho=-0.33$ - $P=4\times10^{-5}$

Luminosity-dependent covering factor of the torus?



Bianchi et al. 2007, A&A, 467, L19



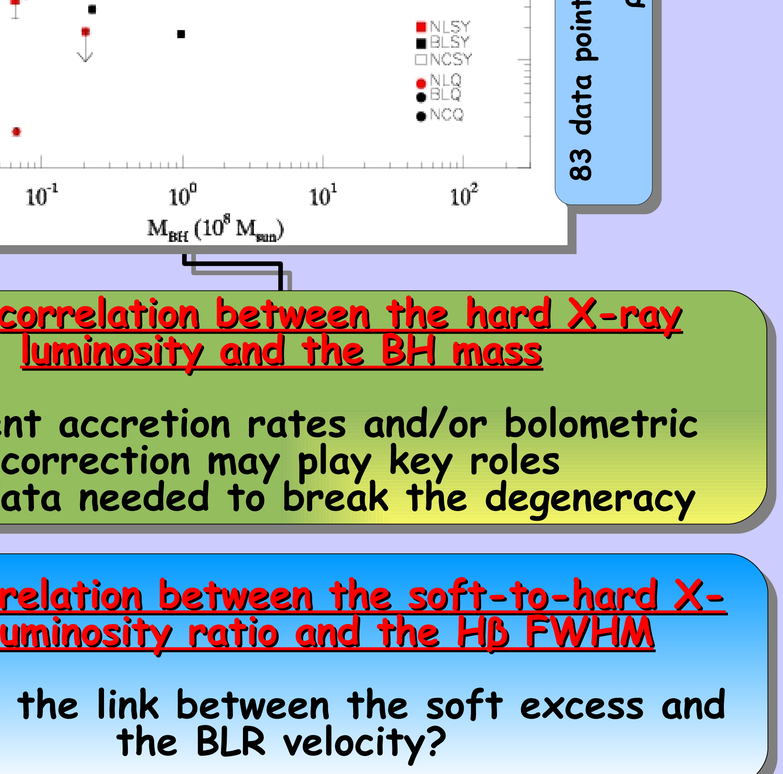
83 data points (81 measures, 2 upper limits)
$\rho=0.81$ - $P=4\times10^{-20}$

Tight correlation between the hard X-ray luminosity and the BH mass

Different accretion rates and/or bolometric correction may play key roles
More data needed to break the degeneracy

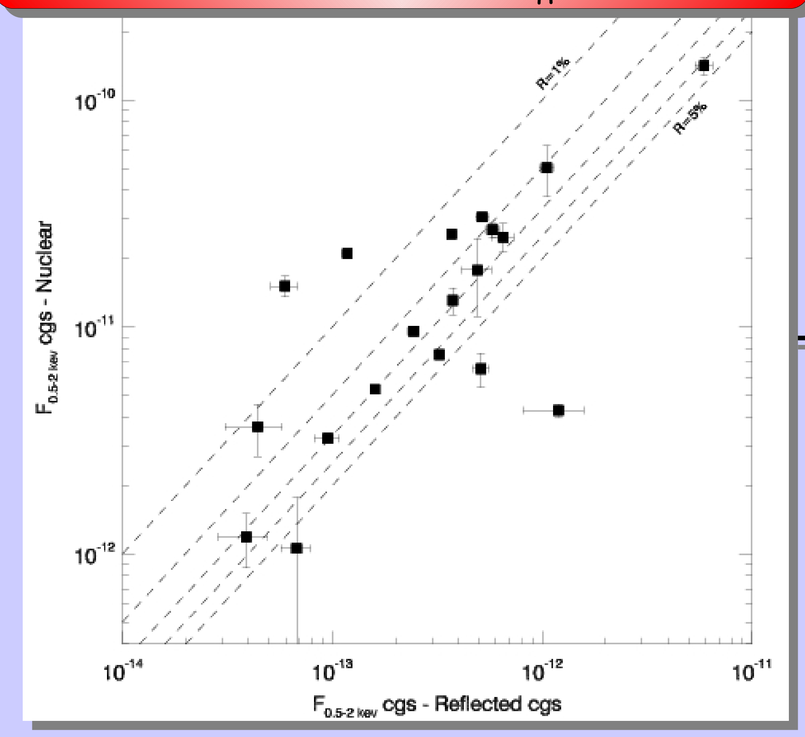
Anti-correlation between the soft-to-hard X-ray luminosity ratio and the Hβ FWHM

Which is the link between the soft excess and the BLR velocity?



93 data points (89 measures, 4 upper limits)
$\rho=-0.60$ - $P=1\times10^{-12}$

Preliminary results on Obscured sources ($10^{22}<N_H<10^{24}$ cm^{-2})



The observed soft X-ray flux is well correlated with the extrapolated nuclear soft X-ray flux in obscured AGN, their ratio being around 3%.

This confirms the origin of the 'soft excess' in these sources as reprocessing of the primary continuum.

Moreover, the exact value of this ratio is crucial to properly model the cosmic X-ray background

Bianchi et al. 2007, in prep.

ROMA TRE UNIVERSITÀ DEGLI STUDI

bianchi@fis.uniroma3.it