Witnessing Matter Accreting onto the Central Supermassive Black Hole of NGC 2617

Margherita Giustini

SRON
Netherlands Institute for Space Research

"Torus 2015 : The Unification Scheme After 30 Years" — Winchester/Southampton, UK — 14-17/09/2015

Where do I come from..?

2008-11	Giorgio G. C. Palumbo Massimo Cappi Cristian Vignali
2009	George Chartas Mike Eracleous
2010	Daniel Proga
2012	Jane Turner
2012-14	Norbert Schartel
2014-?	Margherita Giustini Elisa Costantini

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

IASF

UNIVERSITY OF NEVADA LAS VEGAS

European Space Agency

SRON
Netherlands Institute for Space Research

Back in 2006…

Relativistic blue- and red-shifted absorption lines in AGNs

M. Cappi*

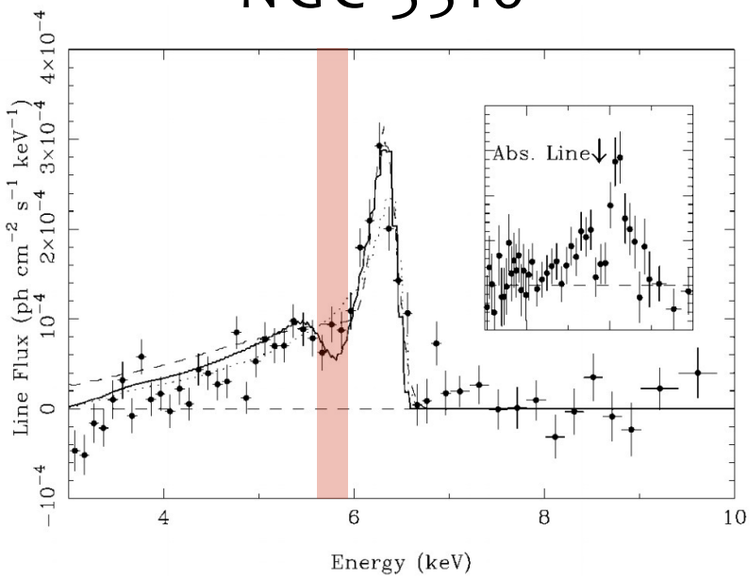
INAF-IASF Bologna, Via Gobetti 101, I-40129, Bologna, Italy

Surprisingly enough, there is little *direct* evidence yet for inward radial motions (e.g. infalling/inflowing material)

CAPPI 2006, AN 327, 1012

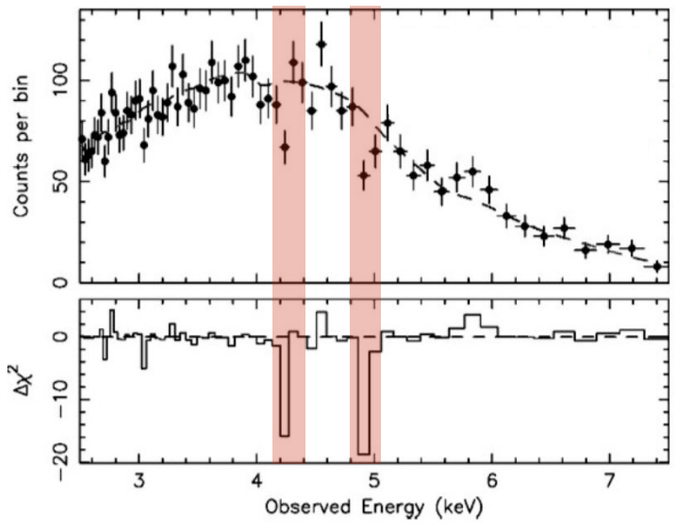
WHENEVER CLAIMED, REDSHIFTED X-RAY ABSORPTION HAS BEEN NEVER DETECTED TWICE

NGC 3516



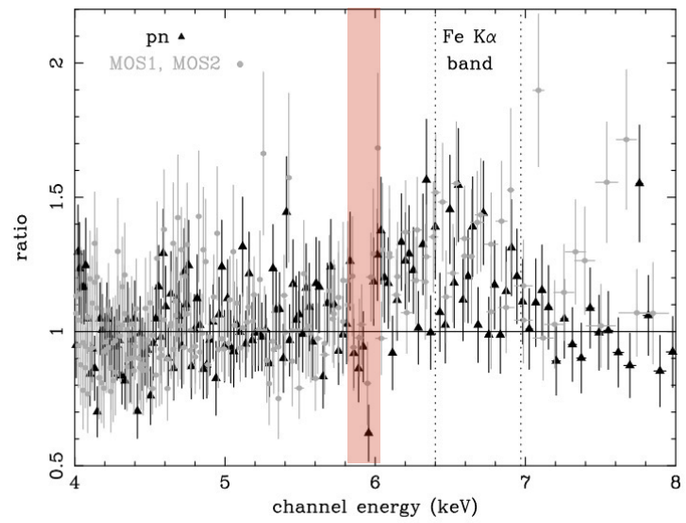
Nandra et al. 1999

PG 1211+143



Reeves et al. 2005

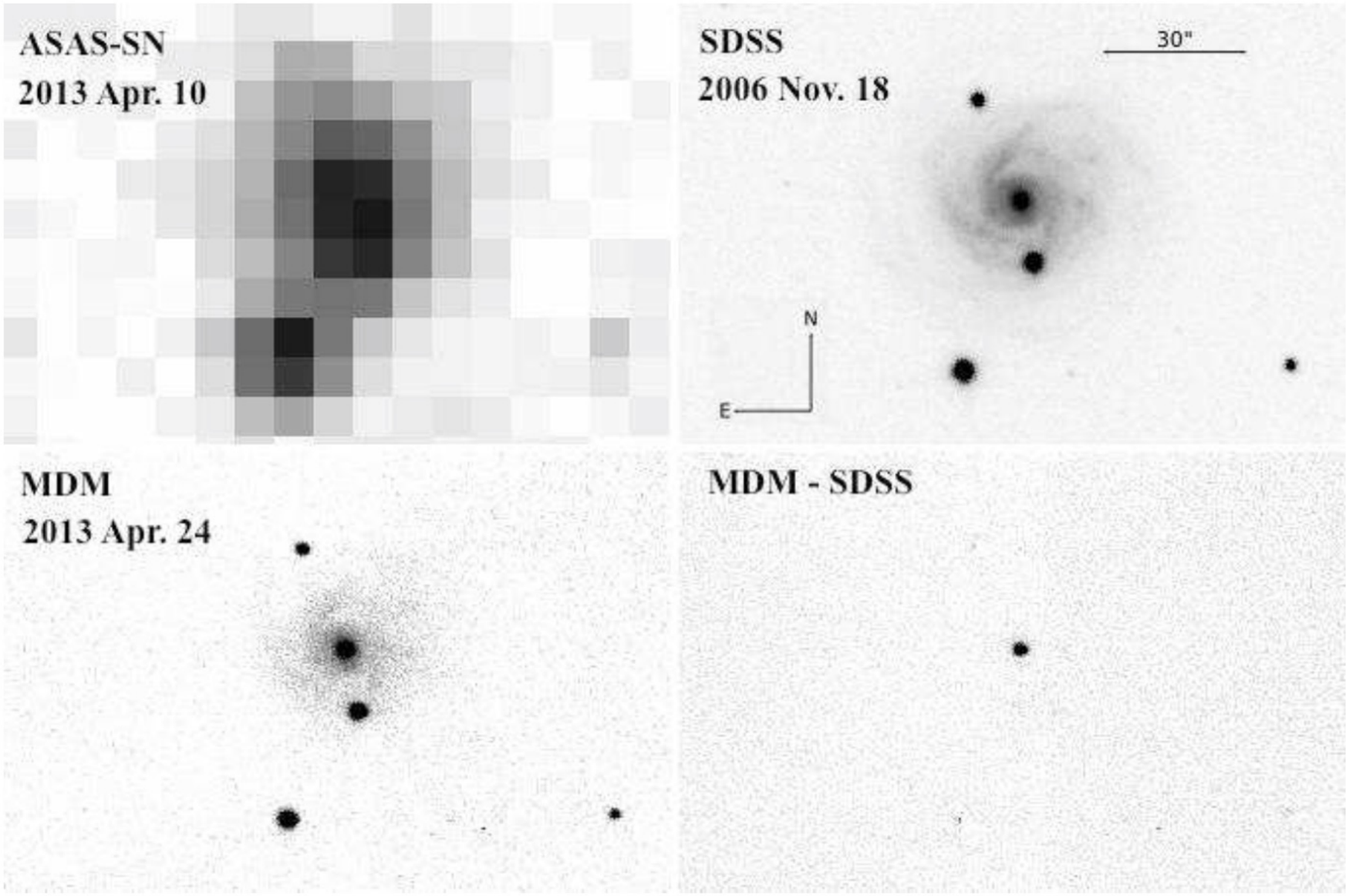
MRK 335



Longinotti et al. 2007

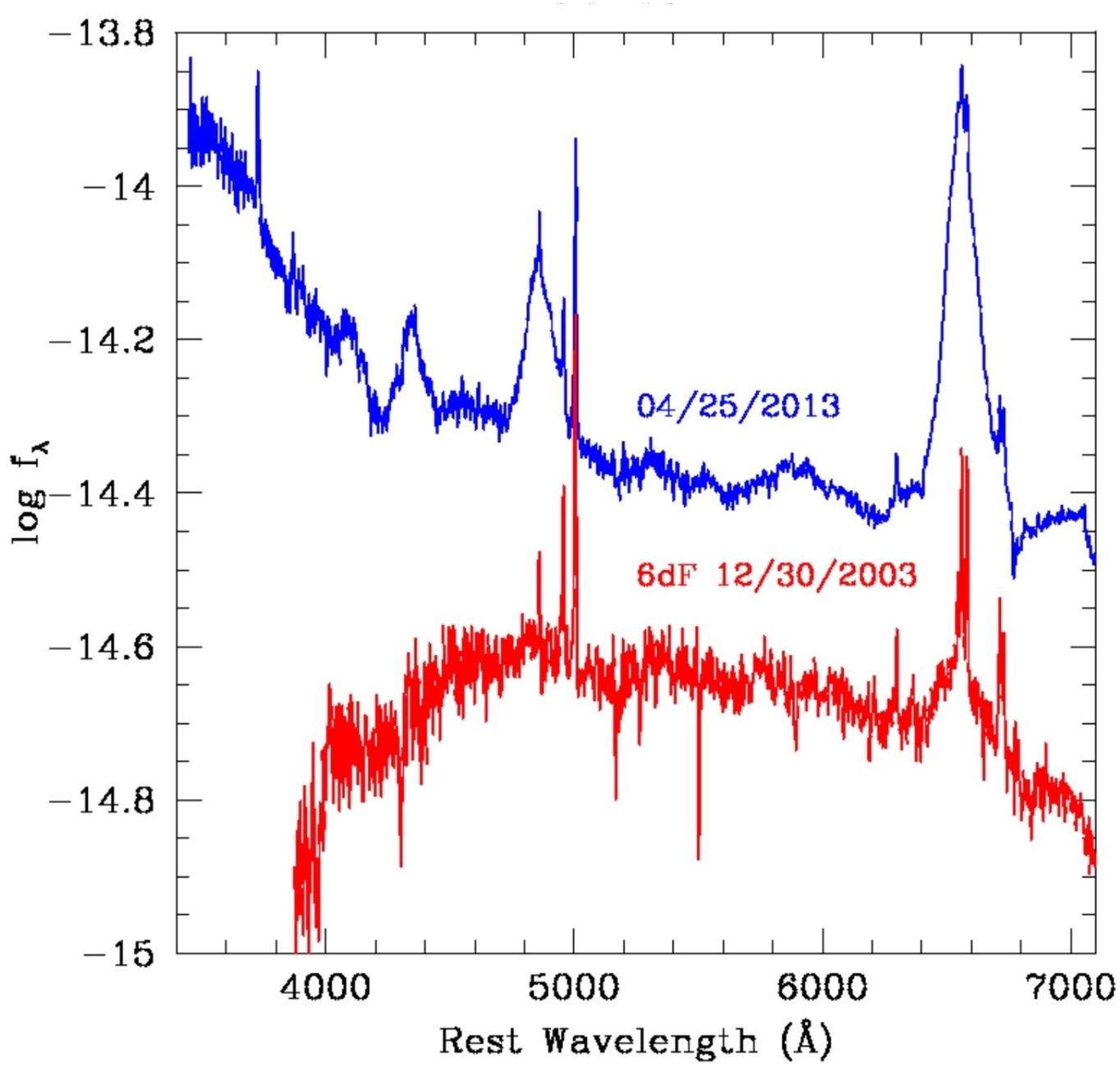
NGC 2617: a boring galaxy?

z=0.0142, face-on Sc galaxy



Shappee et al. 2014, ApJ 788, 48

NGC 2617: not so boring after all!



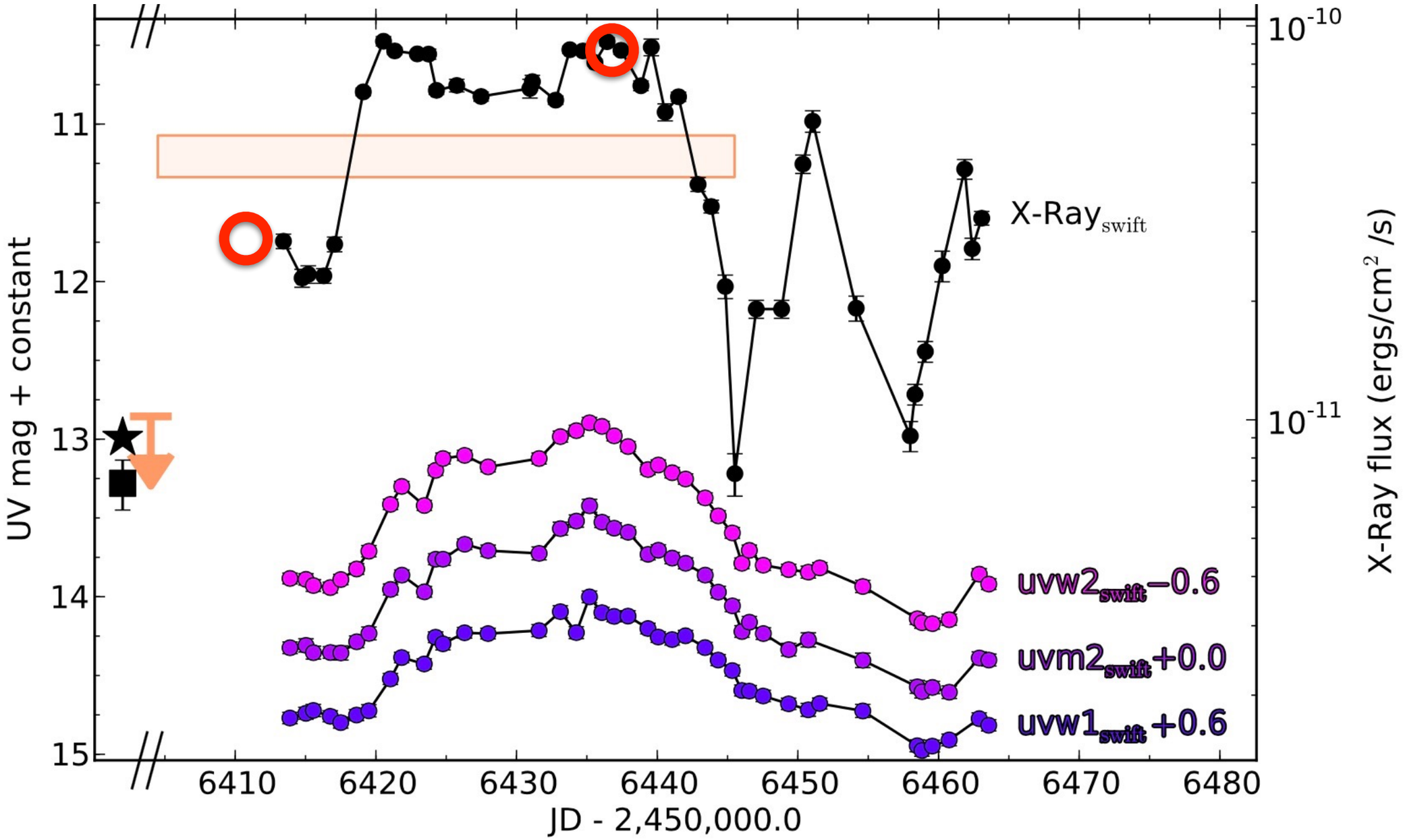
Sy 1.0

Sy 1.8

A DRAMATIC OPTICAL BRIGHTENING OCCURRED SOMETIMES DURING THE PAST TEN YEARS

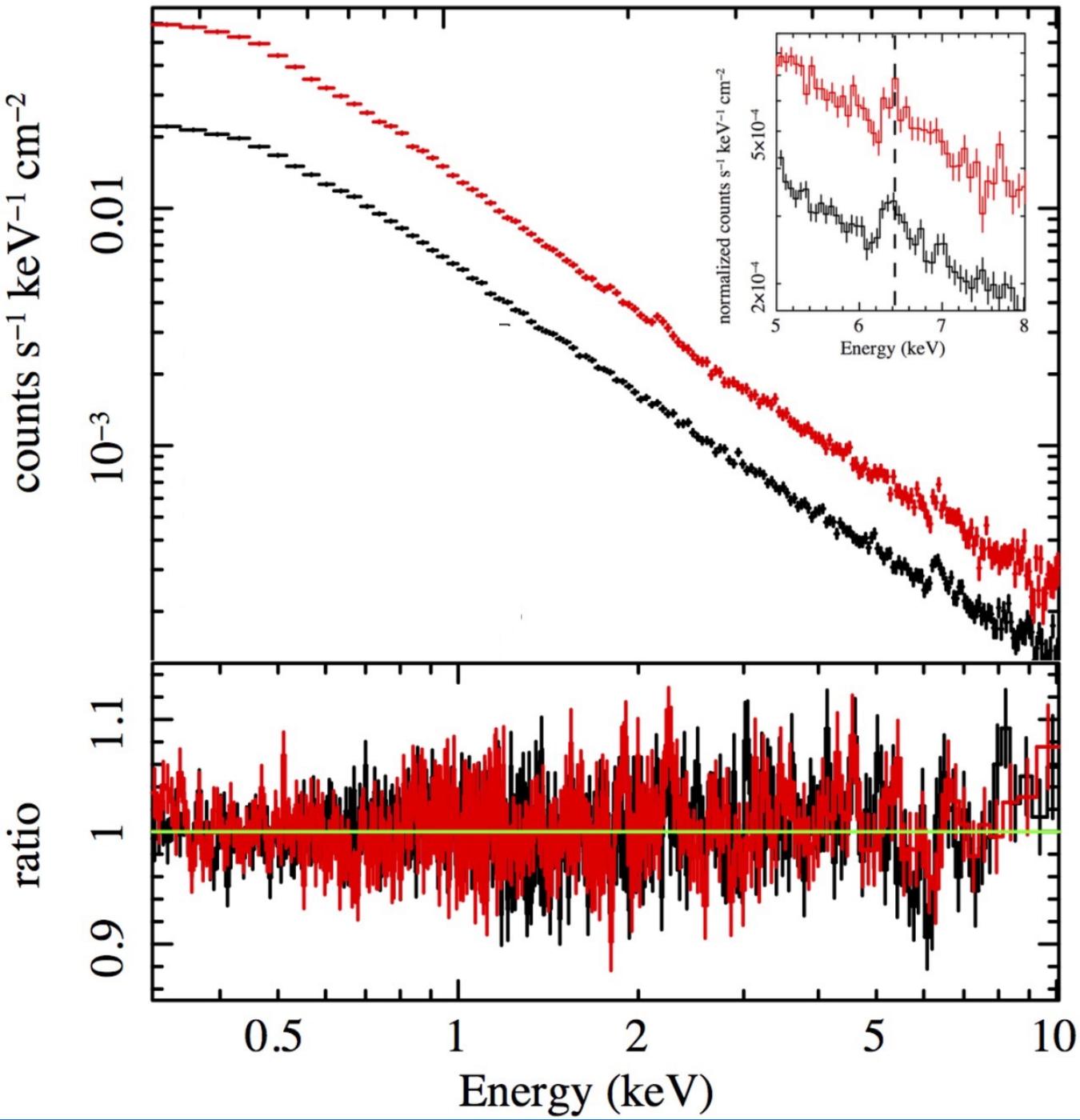
NGC 2617 exposed

Two XMM-Newton pointings were triggered in 2013



SHAPPEE ET AL. 2014, APJ 788, 48

THE XMM-NEWTON SPECTRA REVEALED PERSISTENT REDSHIFTED X-RAY ABSORPTION IN NGC 2617



MAY 24

APRIL 27

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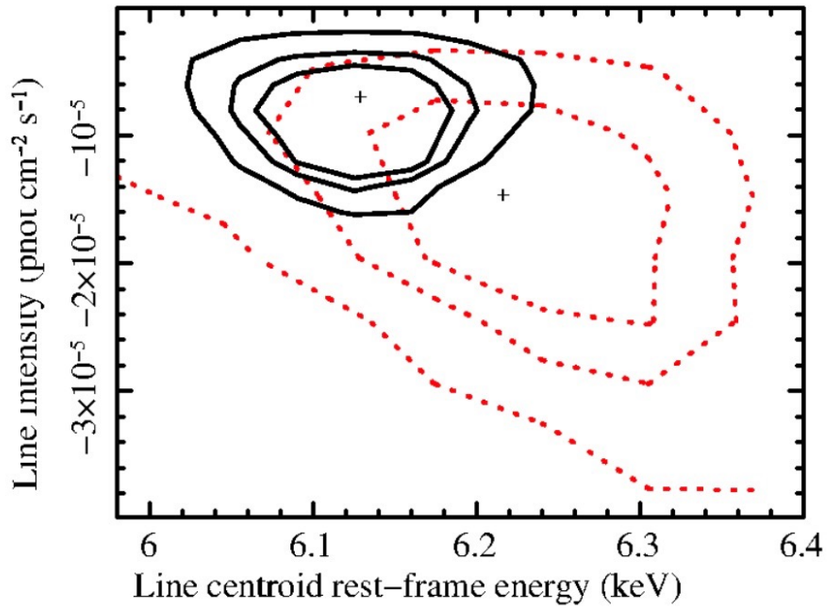
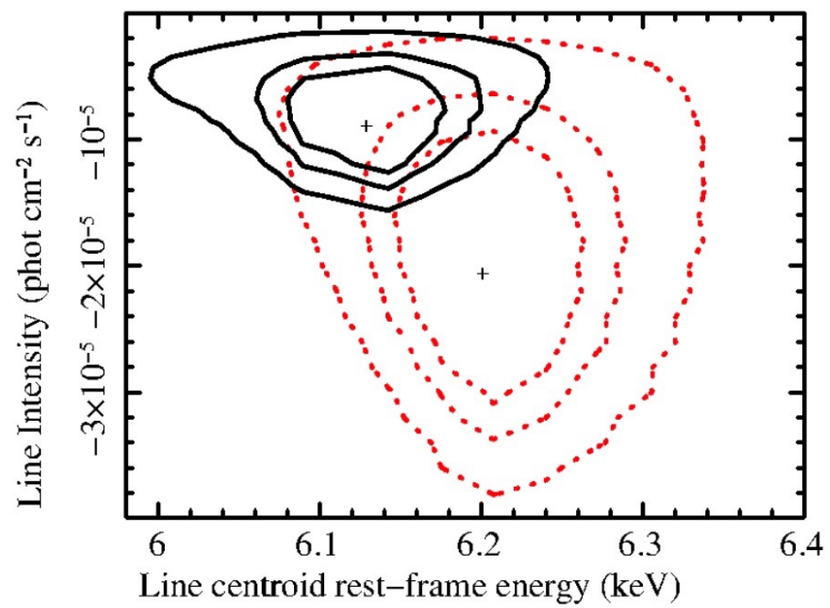
THE ABSORPTION FEATURE IS SIGNIFICANT AND PERSISTENT

SINGLES + DOUBLES



SINGLES ONLY



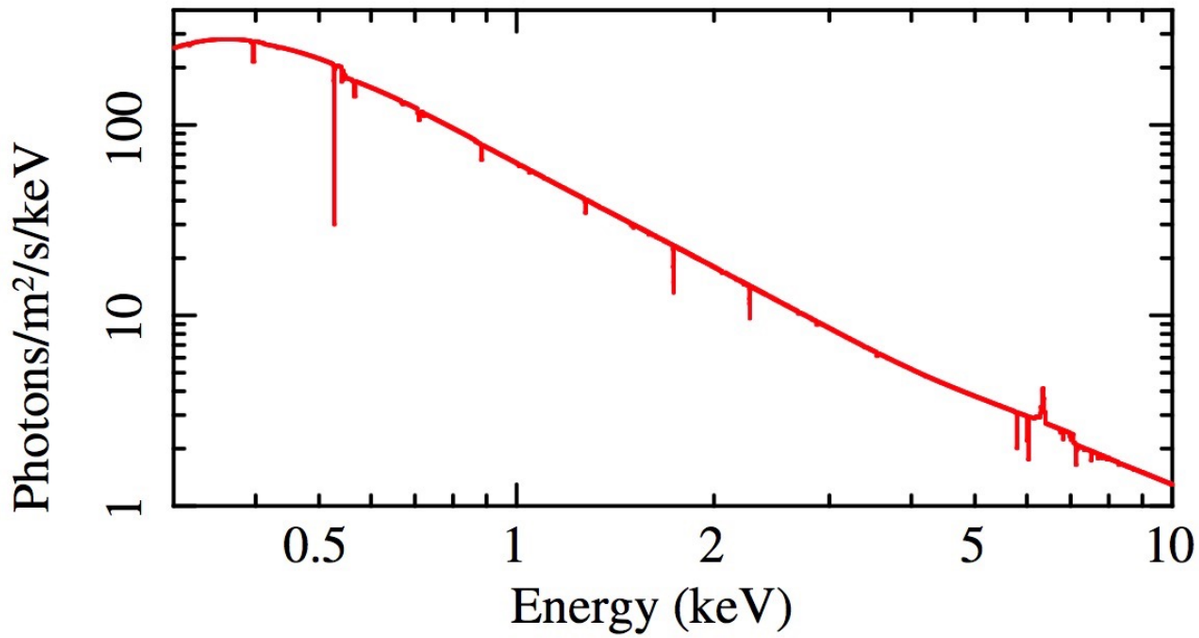


Table 3. Fit statistics for the ionised absorber.

$^{(a)}\,N_H$	$6.8^{+5.8}_{-2.2} \times 10^{22}$	cm^{-2}
$^{(b)}\,\log\xi$	$4.02^{+0.12}_{-0.09}$	erg cm s^{-1}
$^{(c)}\,\upsilon_{shift}$	$3.52^{+0.15}_{-0.08} \times 10^4$	km s^{-1}

Notes. Notes: (a) Absorber column density; (b) Logarithm of the absorber ionisation parameter; (c) Absorber velocity shift.

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So What : Accretion Caught in Action?

MASS ACCRETION?

Free-fall time $t_{ff} = \frac{2GM_{BH}}{v^3}$ **~ 370 ks ~ 4 days**

Radial scale **~ 500 Gravitational Radii**

Time elapsed **up to 10 years… "TORUS"?**

NOT A "CLOUD" — RATHER A "FILAMENT"

CHAOTIC ACCRETION? (*King et al., Pringle et al., Nayakshin et al. …*)

FAILED DISK WIND?

(*Proga et al.*)

GRAVITATIONAL REDSHIFT?

(*Dorodnitsyn*)

250 ks of Chandra HETG are coming… STAY TUNED

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.THANK YOU FOR YOUR ATTENTION.

MARGHERITA GIUSTINI

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