



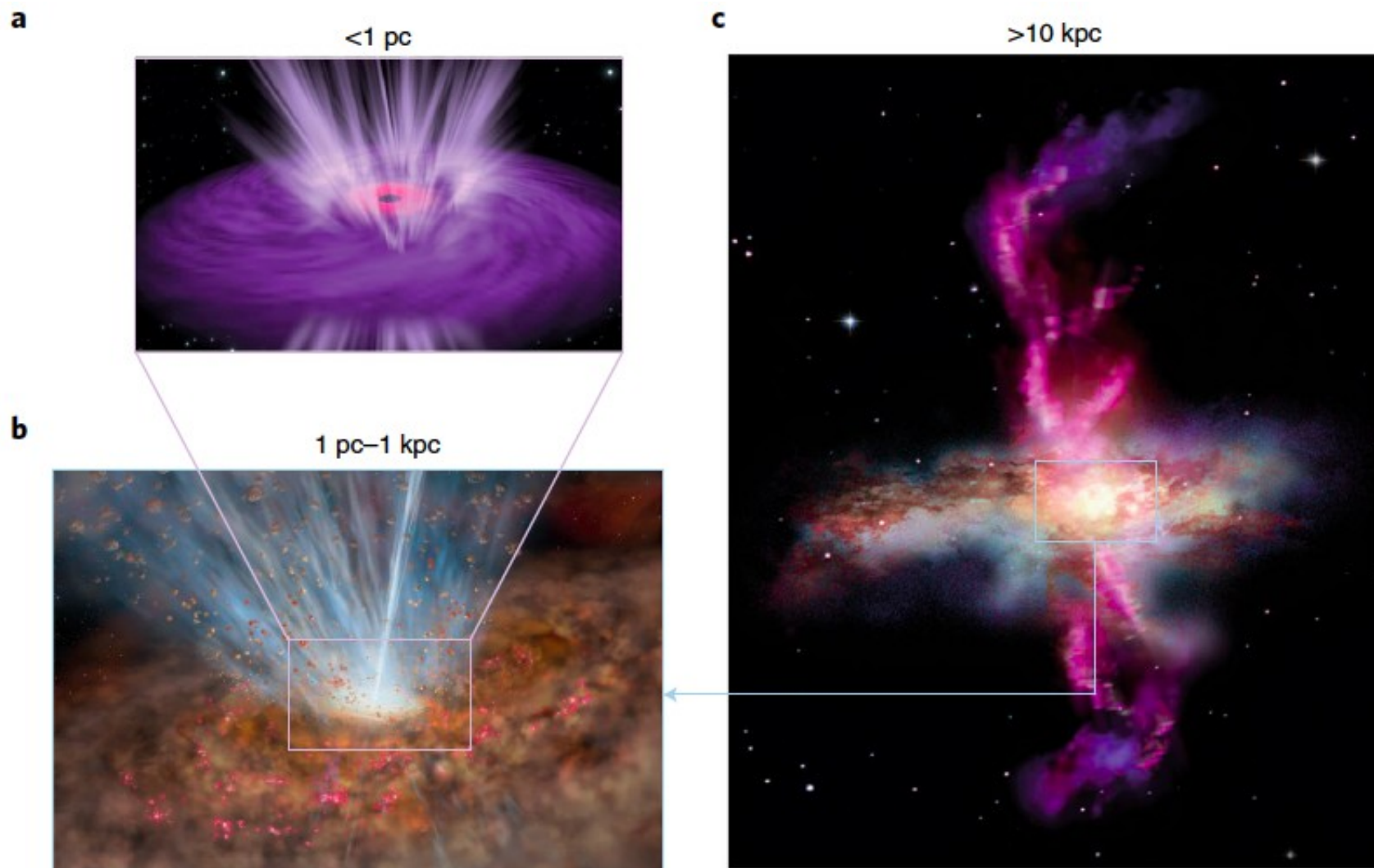
AGN accretion & ejection physics

OAS-Bo: G. Lanzuisi, M. Cappi, M. Dadina,
D. Costanzo (PhD), E. Bertola (PhD)

DIFA: M. Brusa, C. Vignali

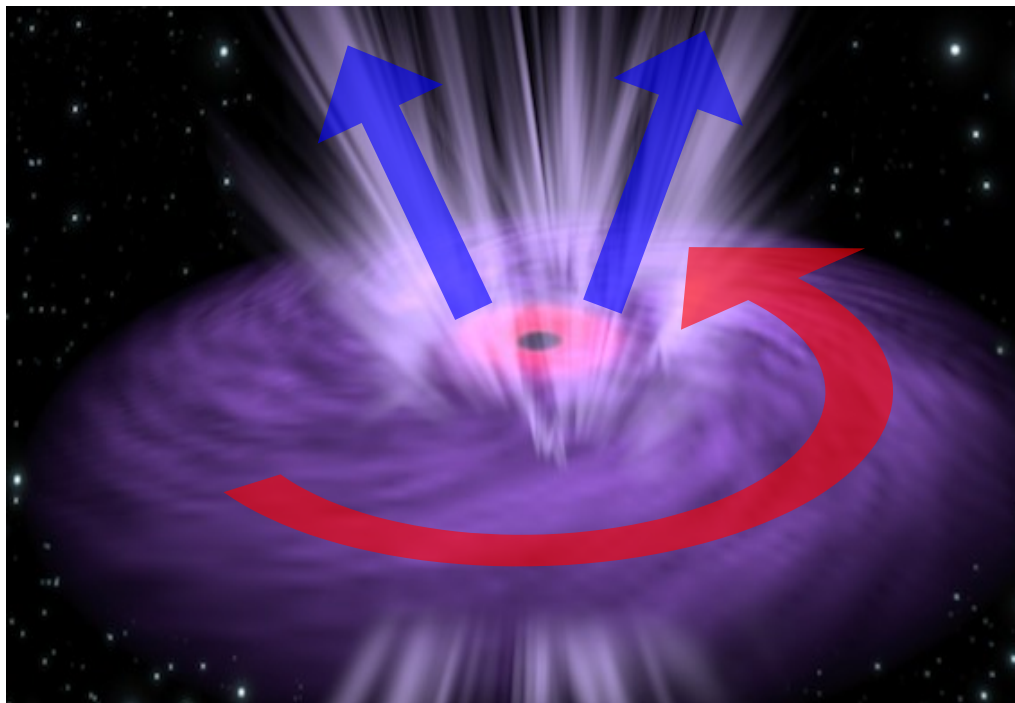
Thesis day 17 Dec. 2019

Accretion and ejection flows in nearby and distant AGNs



Adapted from Cicone, Brusa+18, Nat. As., 2, 176

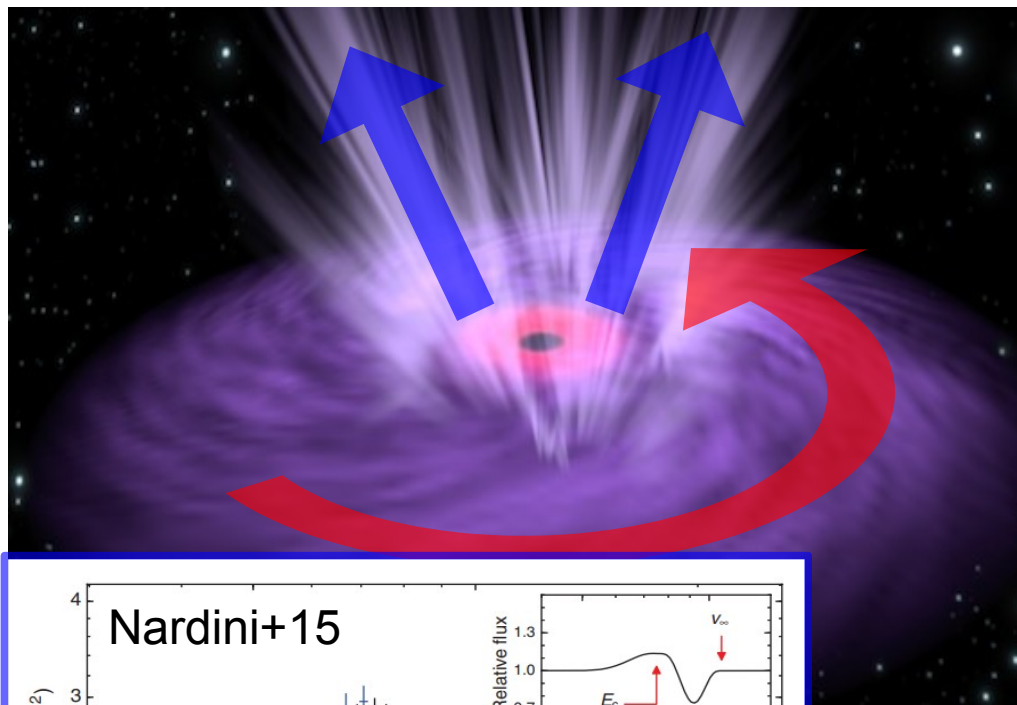
Accretion and ejection flows in nearby and distant AGNs



Characterize the geometry and velocity of the outflow/wind, and its impact on the host galaxy

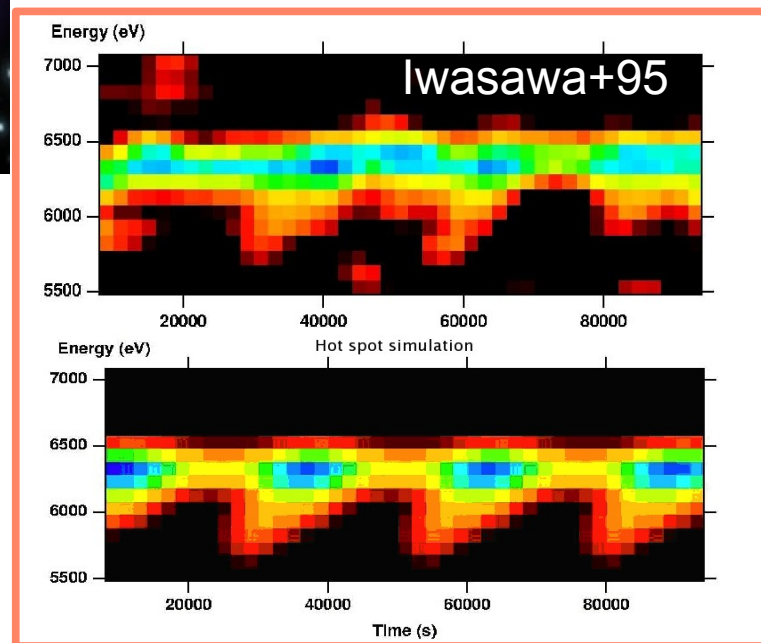
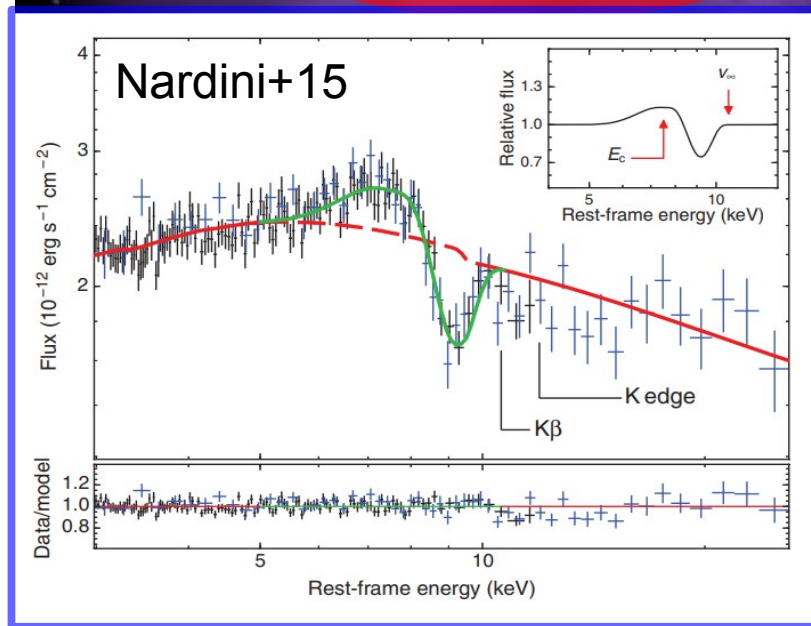
Characterize the geometry and mode of the accretion flow

Accretion and ejection flows in nearby and distant AGNs ...through **X-ray** spectroscopy/timing/imaging



Characterize the geometry and velocity of the outflow/wind, and its impact on the host galaxy

Characterize the geometry and mode of the accretion flow



Tesi 1: Accretion properties in Seyfert locali brillanti

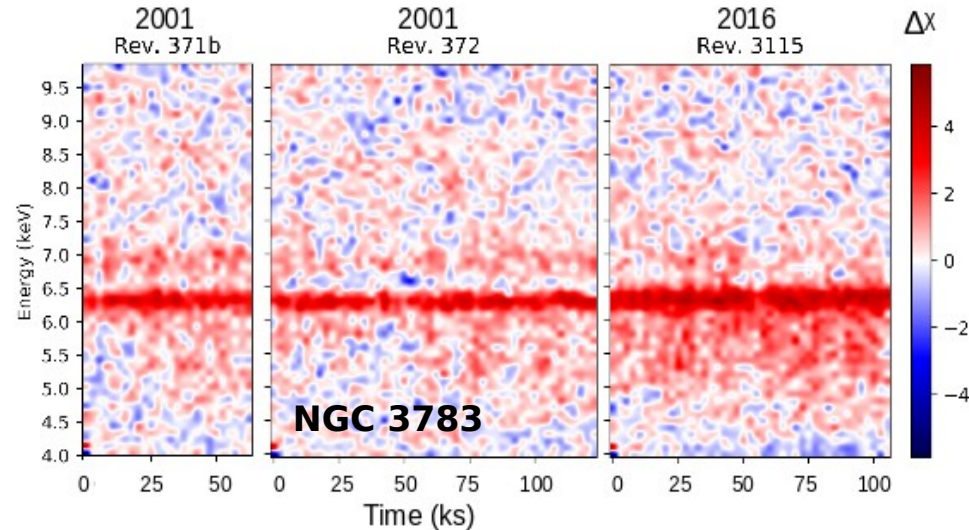
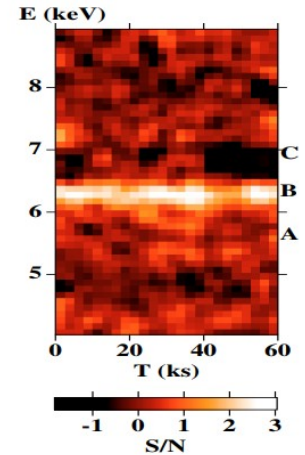
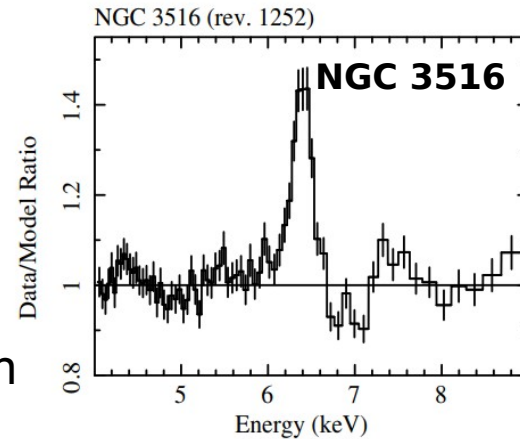
Supervisor: **M. Cappi**

Spectral-timing di Seyfert a basso z

- Dati: **XMM-Newton** (archivio)

- Goal: ricerca e modellizzazione di righe in emissione e assorbimento per mappare inflows e outflows su scale $r < 100 R_g$

De Marco +09



Contact person @DIFA: **C. Vignali**

D. Costanzo PhD, +19 in prep.

Tesi 2: Accretion and ejection in Quasar brillanti e lensati

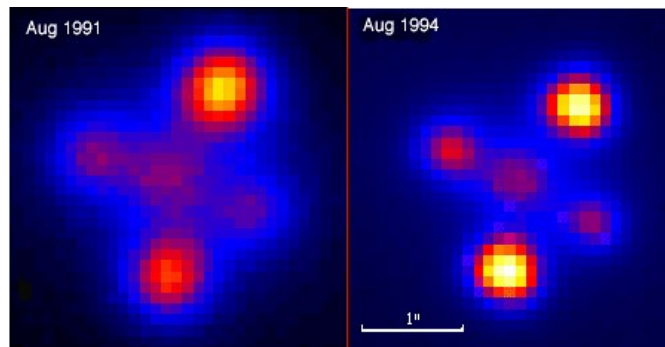
Supervisor: **M. Dadina**

Analisi spettrale di high-z ($z > 2$) QSO
(in genere **lensati**)

- Dati: **XMM-Newton** (archivio e Large Program 450ks PI Cappi, 4 QSO, **Nustar** PI Lanzuisi APM08279, $z=3.91$)

- Goal: Caratterizzazione di Ultra Fast Outflow nei quasar più luminosi ad alto z per stima dell'impatto del feedback al **picco di BH growth e SF history**

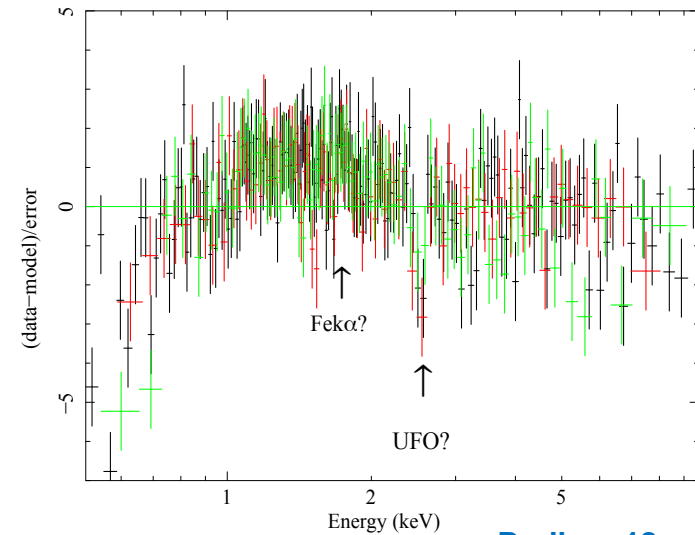
Einstein Cross ($z=1.695$)



Chartas+09, E. Bertola Thesis 2019

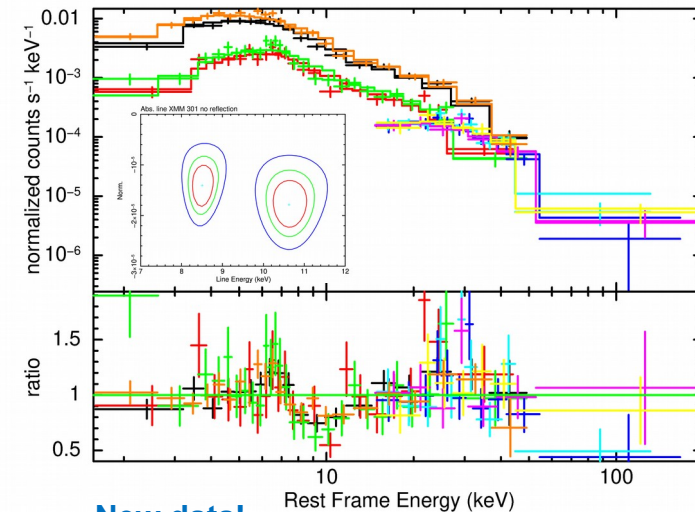
Contact person @DIFA: **C. Vignali**

MG J0414+0534 ($z=2.64$)



Dadina+18

APM 08279 ($z=3.91$)



New data!

Tesi 3: UFOs e venti galattici in un Quasar a basso z

Supervisor: **G. Lanzuisi**

2MASS 0918+2117 (z=0.149)

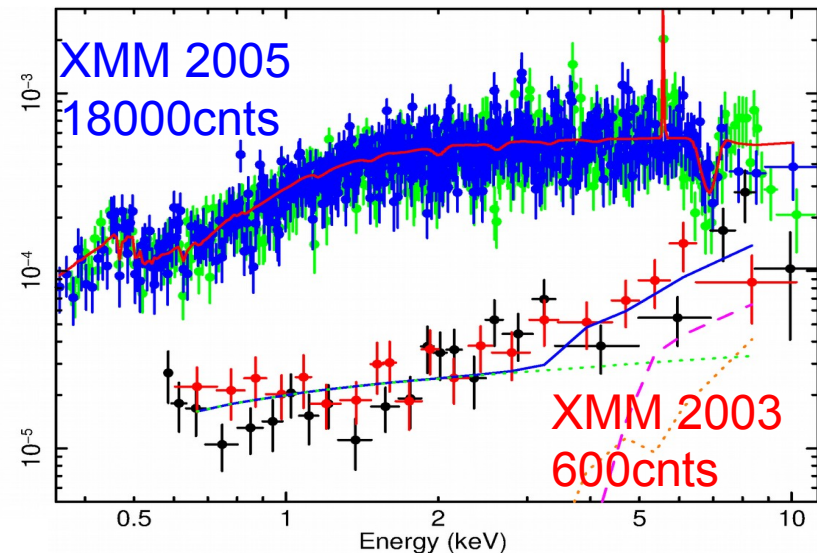
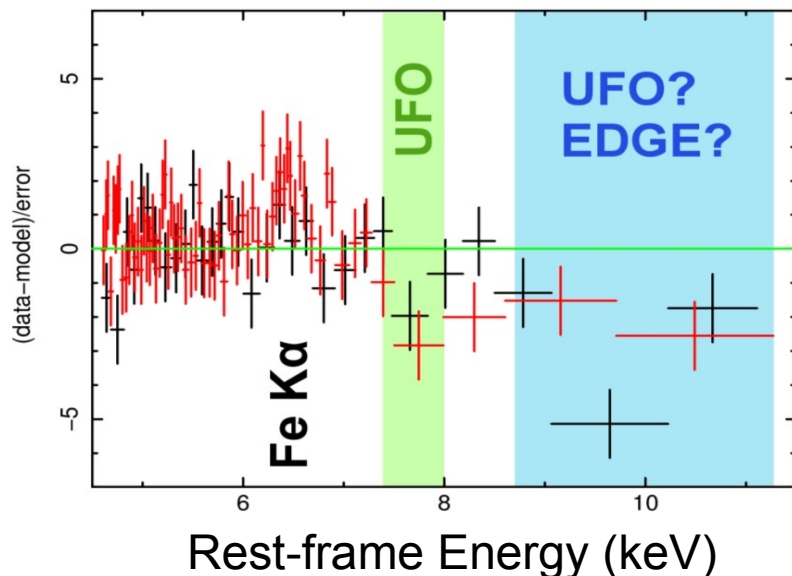
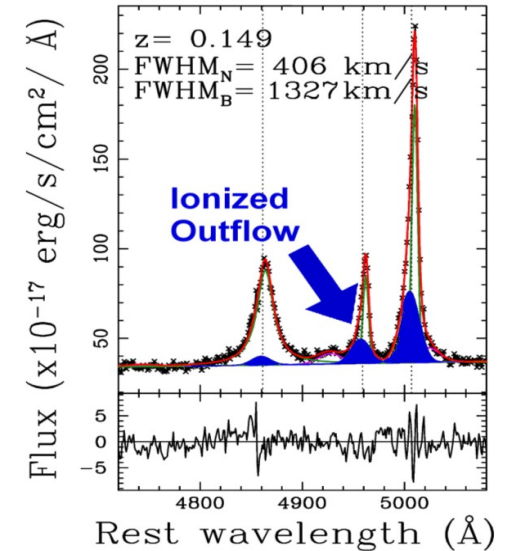
Pounds&Wilkes07, Perna+17 PhD

Analisi spettrale di un Quasar a basso z

- Dati: **SDSS, XMM-Newton, Chandra**
(prossimo proposal **Nustar**)

- Goal: Caratterizzazione di UFOs. Energetica dell'outflow in rapporto al vento su larga scala osservato in OIII (e molecolare? Proposal **ALMA**)

Contact person @DIFA: **M. Brusa**



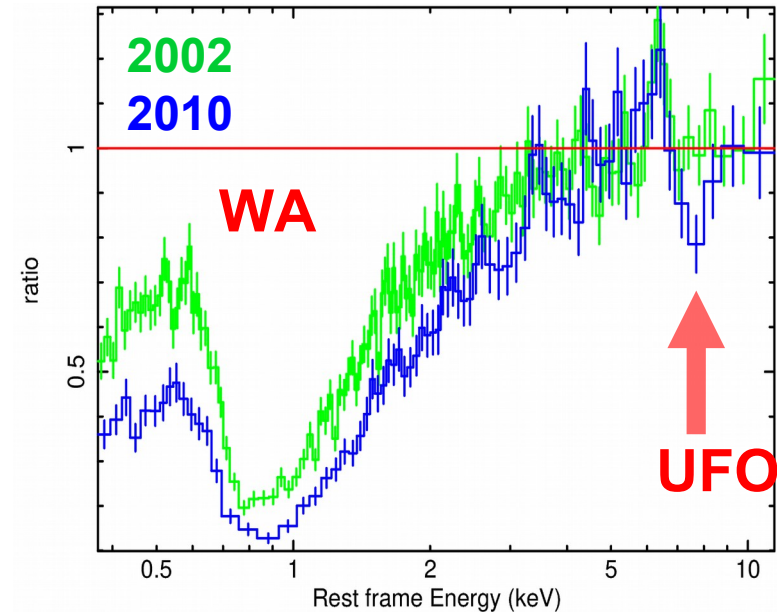
Tesi 4: Duty cycle e variability di UFO in Quasar a basso z

Supervisor: **G. Lanzuisi**

PG 1114+445 (z=0.144)

Variabilità di UFO e Warm Absorber su tempi scala h → yr

- Dati: **XMM-Newton** (12 oss. in archivio!)
- Goal: Studio della variabilità del WA, UFO, detection rate/duty cycle.



Contact person @DIFA: **M. Brusa**

Vedi anche Large Program XMM SUBWAYS (PI Brusa):

<https://marcellabrusa.wixsite.com/subways2019>

1.6Ms per mappare UFO in 20 Quasar locali, 6 già osservati.

SUBWAYS
Supermassive Black Hole Winds in X-rays

Home Aims Targets Data Publications Team

Table 1: Targets properties, observed count rates and requested exposures

Name	z	outflow	logL _X erg/s	logL _{out} erg/s	logM _{out} M _⊙	logL _{out} /L _{Edd}	F _{2-10keV} erg/cm ² /s	cr cta/s	Expo ks
PG0092+231*	0.154	-	44.61	45.72	8.41	-0.83	6.3×10 ⁻¹²	0.367	43
PG0931+414*	0.234	-	44.73	46.33	8.24	-0.65	2.9×10 ⁻¹²	0.240	45
PG1626+554*	0.133	-	44.16	46.02	8.54	-0.66	2.8×10 ⁻¹²	0.297	52
PG1202+281*	0.164	Y	44.43	46.30	8.61	-0.45	3.5×10 ⁻¹²	0.280	56
PG1435+067*	0.126	-	44.05	45.51	7.77	-0.40	2.6×10 ⁻¹²	0.255	69
SDSSJ144414+0638*	0.207	Y	44.65	45.34	8.10	-1.07	2.1×10 ⁻¹²	0.200	78
2MASXJ165315+2349	0.103	Y	44.00	45.47	6.98	0.35	2.1×10 ⁻¹²	0.188	78
PG1216+069*	0.231	-	44.72	45.84	9.2	-1.50	2.0×10 ⁻¹²	0.165	78
PG1947+306*	0.205	-	44.37	45.99	8.68	-0.53	1.9×10 ⁻¹²	0.157	83
WISEJ053756-0245	0.110	-	43.82	45.27	7.73	-0.60	1.8×10 ⁻¹²	0.153	85
HB891029+030*	0.218	Y	44.34	45.17	8.75	-1.72	1.8×10 ⁻¹²	0.152	85
PG1307+086*	0.154	Y	44.08	44.86	7.90	-1.18	1.7×10 ⁻¹²	0.147	88
PG1428+267*	0.364	Y	44.78	46.06	9.22	-1.30	1.6×10 ⁻¹²	0.145	90
PG1352+183*	0.151	Y	44.13	46.26	8.42	-0.30	1.6×10 ⁻¹²	0.145	90
2MASXJ051144-3339*	0.159	Y	44.09	44.57	8.40	-1.32	1.5×10 ⁻¹²	0.139	94
2MASXJ140251+2631*	0.188	Y	44.23	45.44	8.55	-1.21	1.3×10 ⁻¹²	0.134	97
2MASXJ0220-0728	0.213	Y	44.60	46.33	8.42	-0.23	1.1×10 ⁻¹²	0.124	105
PG1427+480*	0.221	-	44.20	45.82	8.09	-0.41	1.0×10 ⁻¹²	0.118	110
LBQS158-0038 *	0.237	Y	44.49	45.27	7.77	-0.60	1.0×10 ⁻¹²	0.118	110

Total requested time, including flares overheads: ~1.58 Ms

Columns: (1) Target name; (2) Redshift; (3) Ionised outflow presence; (4, 5, 6, 7) 2-10 keV luminosity, Bolometric luminosity, BH mass and Eddington ratio extracted from the data presented in Bianchi et al. (2009, *), Xie, Li & Hao (2017, *), Peres et al. (2017, *) and from our analysis; (8) 2-10 keV fluxes from the available spectra; (9) count rates in the 4-10 keV rest frame band.