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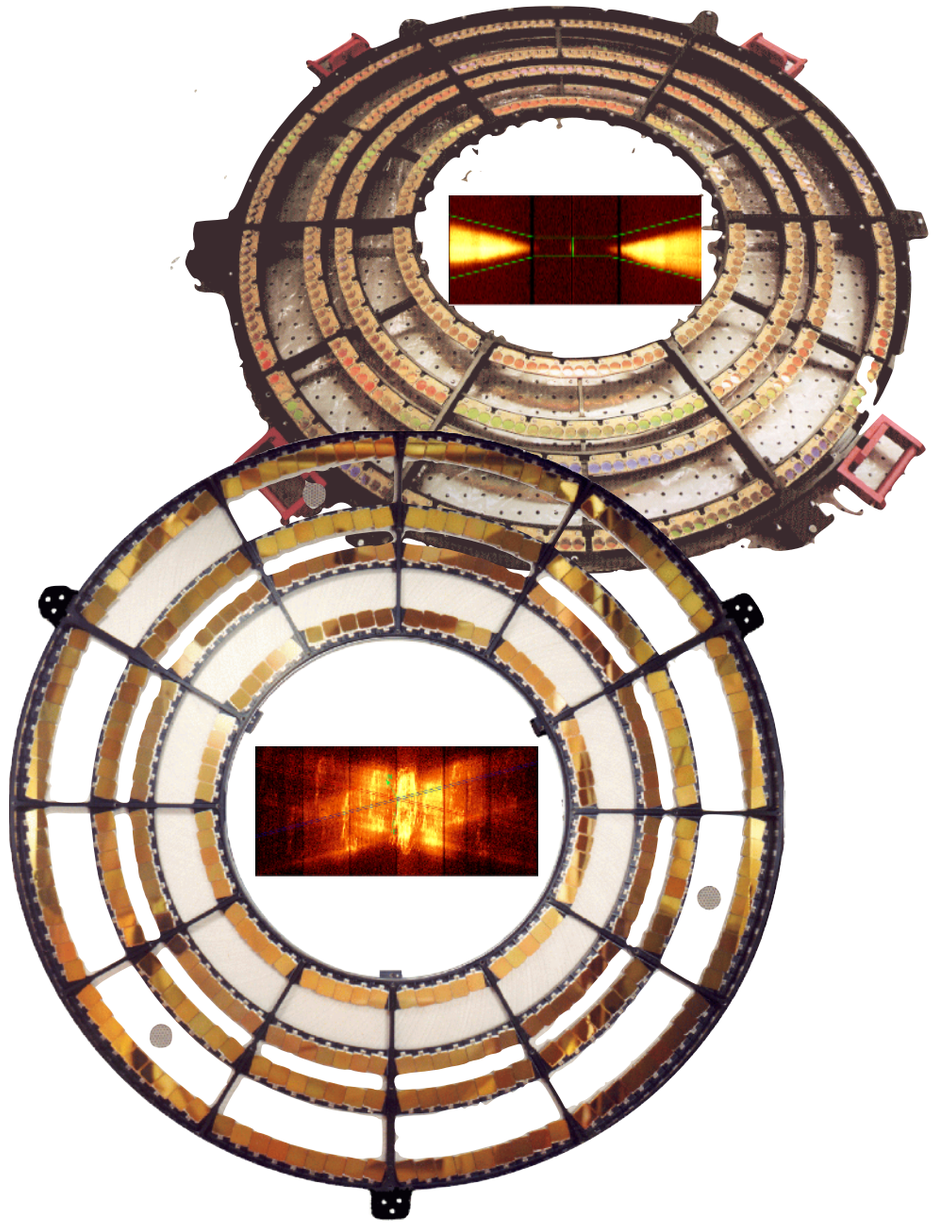
H/LETG — Status

Chandra Quarterly Review No. 44
4 October 2017



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HETG IPI: Prof. C.R. Canizares
MIT Kavli Institute

Ongoing HETG Team Activities Summary

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HETG/ACIS-S Performance (April 2017 — September 2017); 1324 ks

- 38 HETG observations on 16 targets (17/21 GO/GTO observations)
- 3 HETG Cal observations

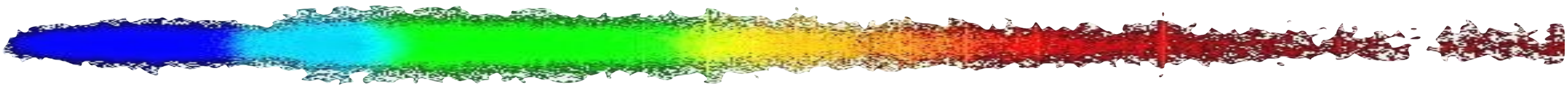
LETG Performance (April 2017 — September 2017); 488 ks

- 5 LETG/HRC-S observations, 2 targets (1/4 GO/GTO, 200 ks)
- 5 LETG/HRC-S Cal
- 7 LETG/ACIS-S Cal
- 1 LETG/HRC-I Cal

Grating performance is nominal.

TGCat has 1784 extractions for 469 objects (+55/+8 since last report)
Total volume: 405 GB

http://tgcat.mit.edu



HETG Team Activities

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GTO Science Program, HETG/ACIS-S

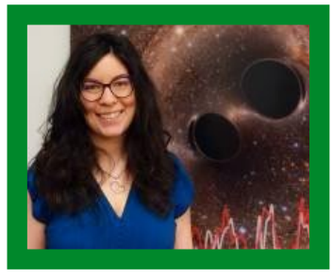
Cycle 18:

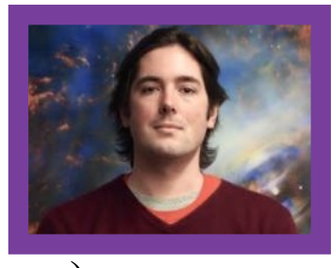
★ULX/BH:	NGC 1313 X-1	**253**/500 ks	Ultra-luminous source outflow: absorption, emission lines
★NS/BH:	GRS 1915+105	**97** ks	Black hole accretion, line variability
★XRB:	4U 1626-67	0/50 ks	Neutron star accretion; Fe K absorption variability
★NS:	Terzan 5 X-2	0/200 ks	(untriggered) TOO (10%); Neutron Star Equation of State
★LIGO/GW:	GW2017nnnn	0/300 ks	(untriggered) TOO (10%); Gravitational wave transient

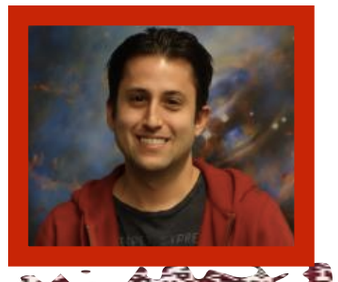
Cycle 19:

★ **AGN:**	**Fairall 51**	240 ks	Seyfert 1, warm absorber variability (w/ NuSTAR 120 ks)
★ **HMXB:**	**4U 1907+09**	145 ks	Accreting neutron star; wind emission, absorption lines
★ **Stars:**	**V773 Tau**	140 ks	Evolution of pre-MS stars; flares (w/ NuSTAR 150 ks)
★ISM:	4U 1636-53	140 ks	Si, Fe absorption edges; part of survey vs N_H
★NS:	Terzan 5 X-2	200 ks	TOO (10%); Neutron Star Equation of State
★LIGO/GW:	GW2018nnnn	300 ks	TOO (10%); Gravitational wave transient

Postdoc status/activities:







Dr. Rozenn Boissay, since Feb 2017 (Ph.D. U. Geneva, May 2016)
Dr. Paul Hemphill, since Oct 2016 (Ph.D. UCSD, August 2016) [partial GTO support]
Dr. David Principe, since Nov 2016 (mainly GO support; involved in HETG/GTO program)

LETG Team Activities

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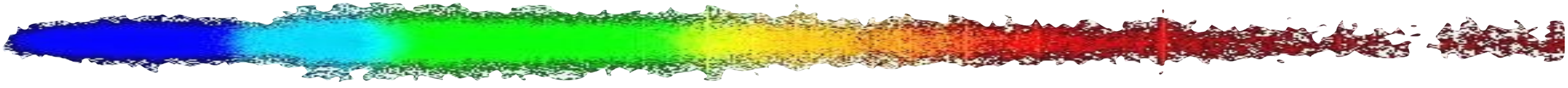
LETG/GTO Science Program

Cycle 18:

★AGN: (Kaastra/SRON) IC 4329a **174** ks Neutral, warm absorbers (HETG/ACIS)
★Stars: (Predehl/MPE) Proxima Cen **166** ks Reference spectrum of an old M-dwarf (LETG/HRC)

Cycle 19:

★ NS: (Predehl/MPE) RX J2143.0+0654 175 ks Cyclotron Absorption Line in an Isolated Neutron Star (LETG/HRC)
★ Gal: (Kaastra/SRON) 1E 2216/1E 2215 145 ks Shocks in Galaxy Cluster Collisions (ACIS-I)
★ ISM: (Kaastra/SRON) 4U 1608-522 30 ks Astro-silicates through Mg and Si K-edges (HETG/ACIS)



HETG Trends: Streak Width

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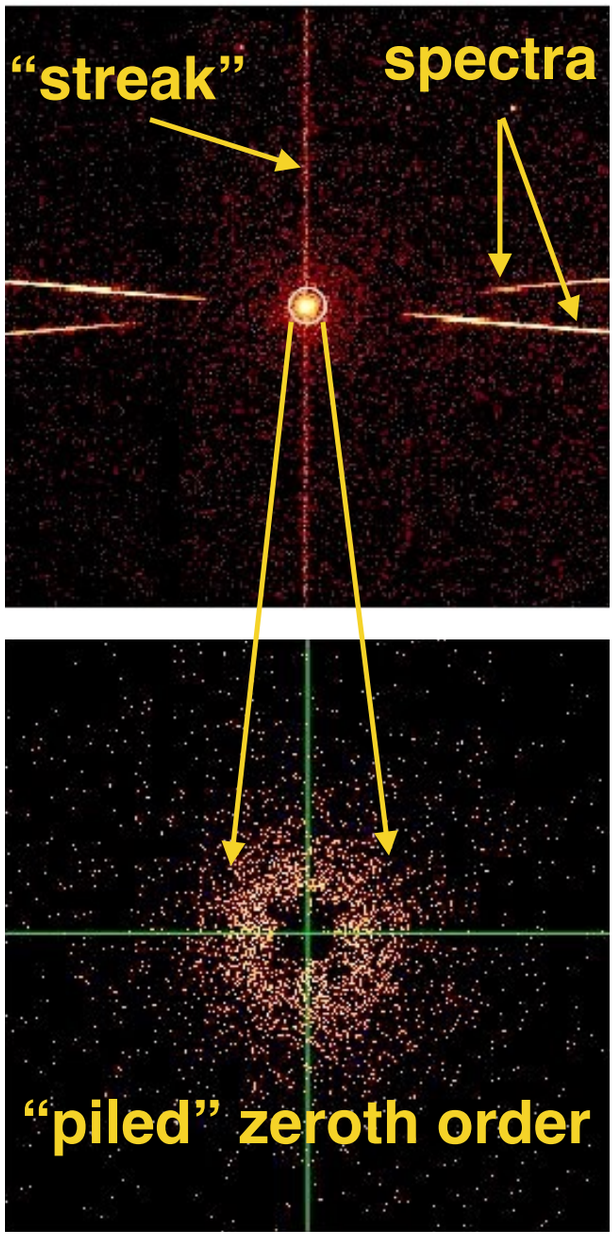
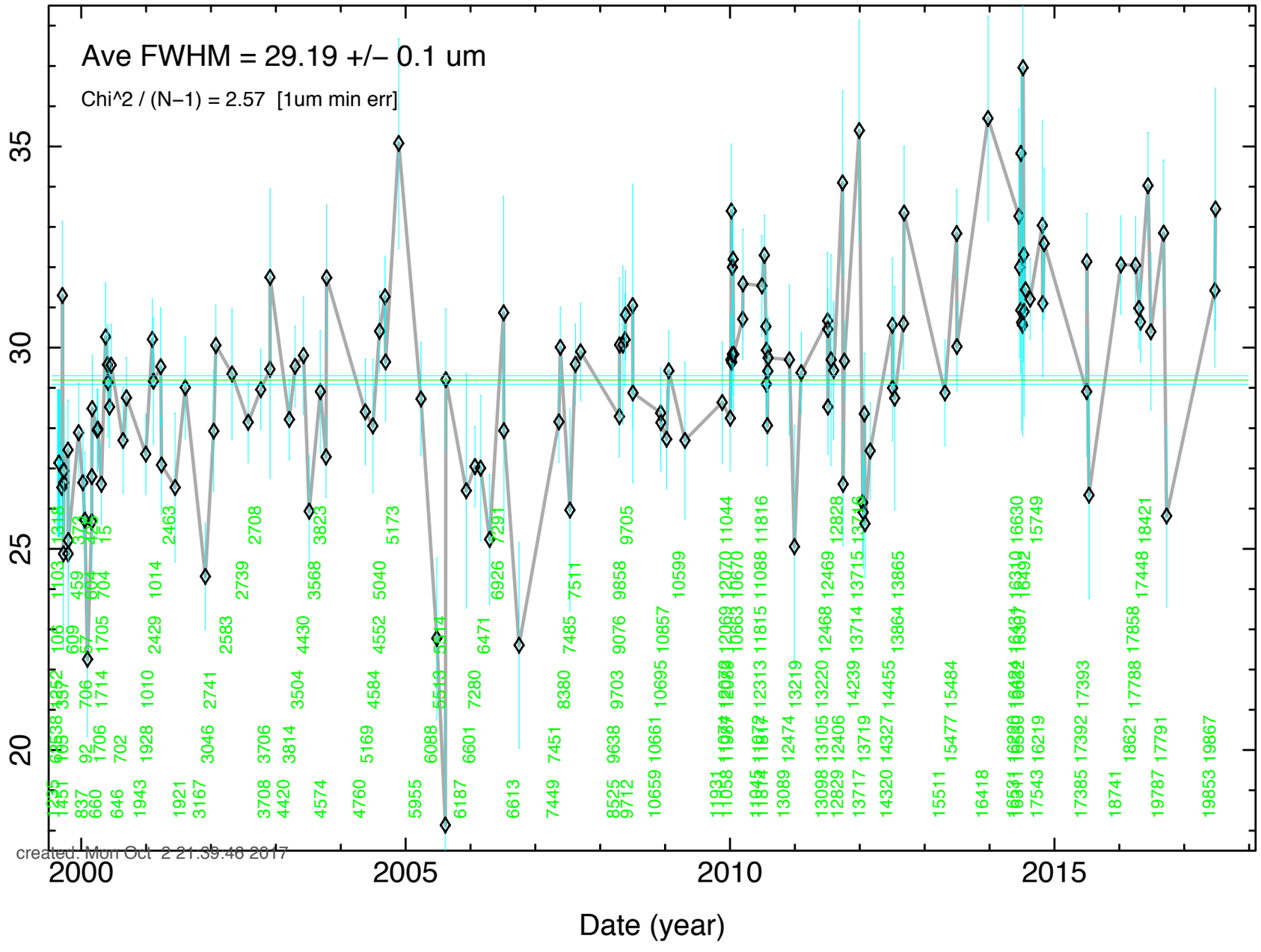
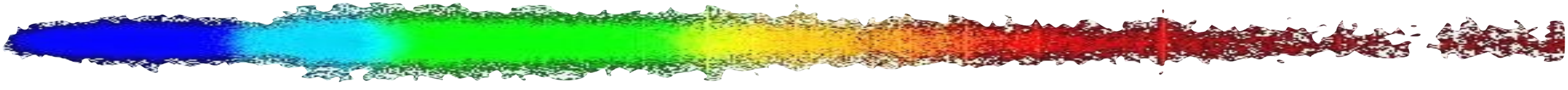


FWHM of HETG Streak Core vs Time (TGCat processed)



(Analysis by Herman Marshall)



Science Highlights

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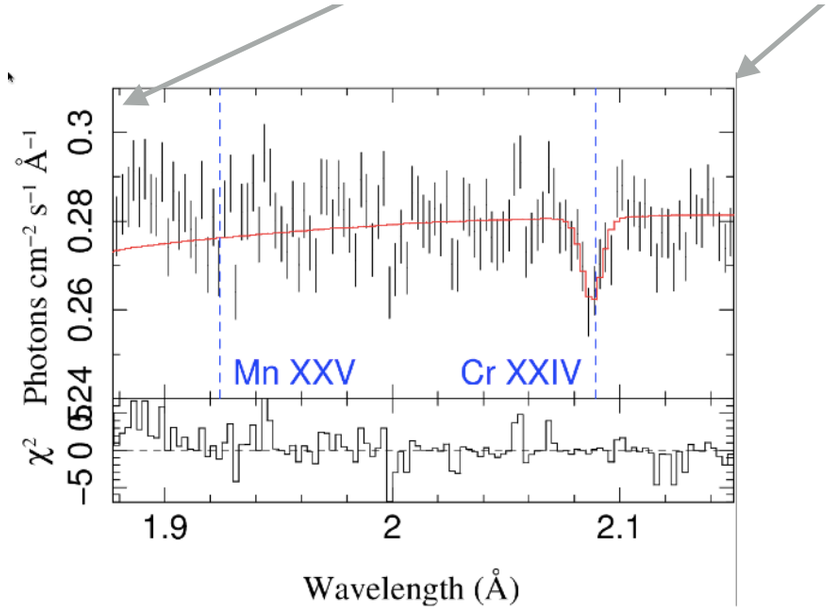
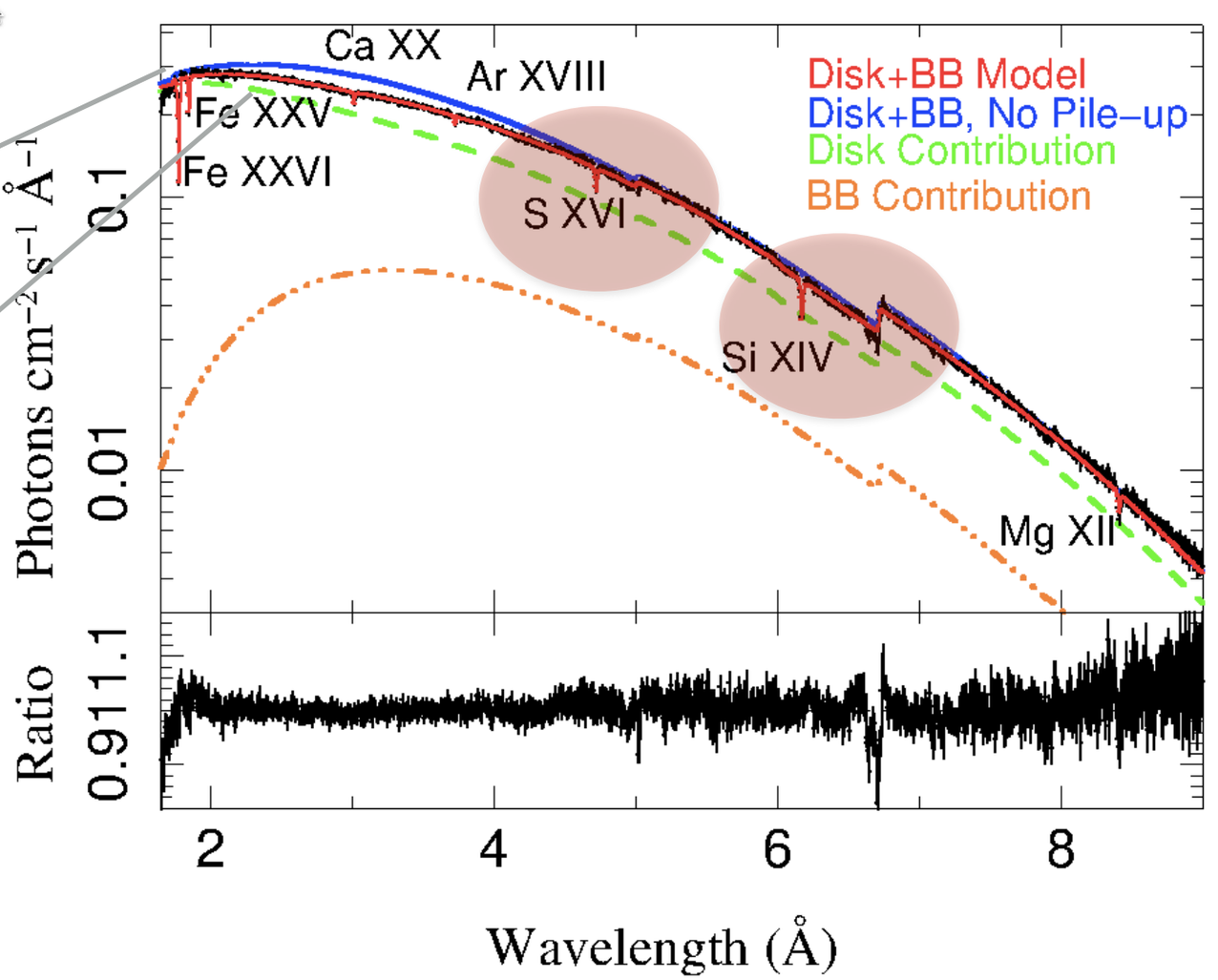
Dr. Jessamyn Allen Ph.D. thesis: "*Accretion Flows and Neutron Star Heating in X-ray Binaries*"

Multiple ***absorption features*** (other than from Fe) have been resolved by HETG in the neutron star binary, GX 13+1. They reveal multiple ionization zones in the outflow, with velocities of about 700 km/s.

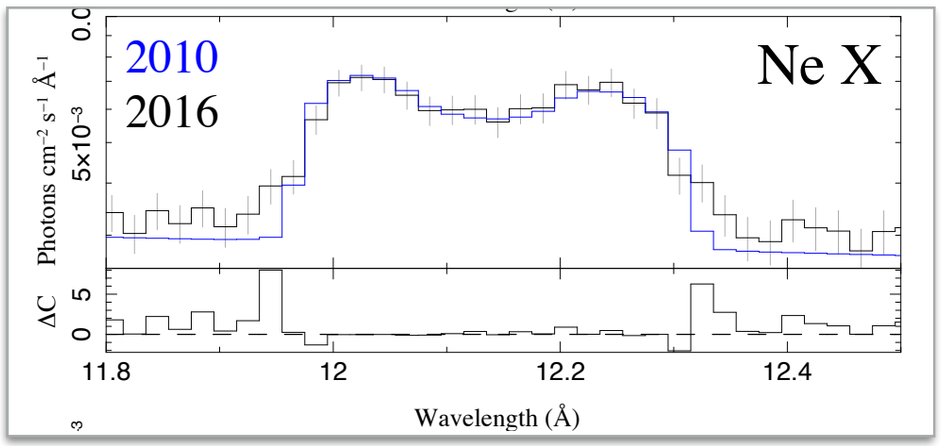




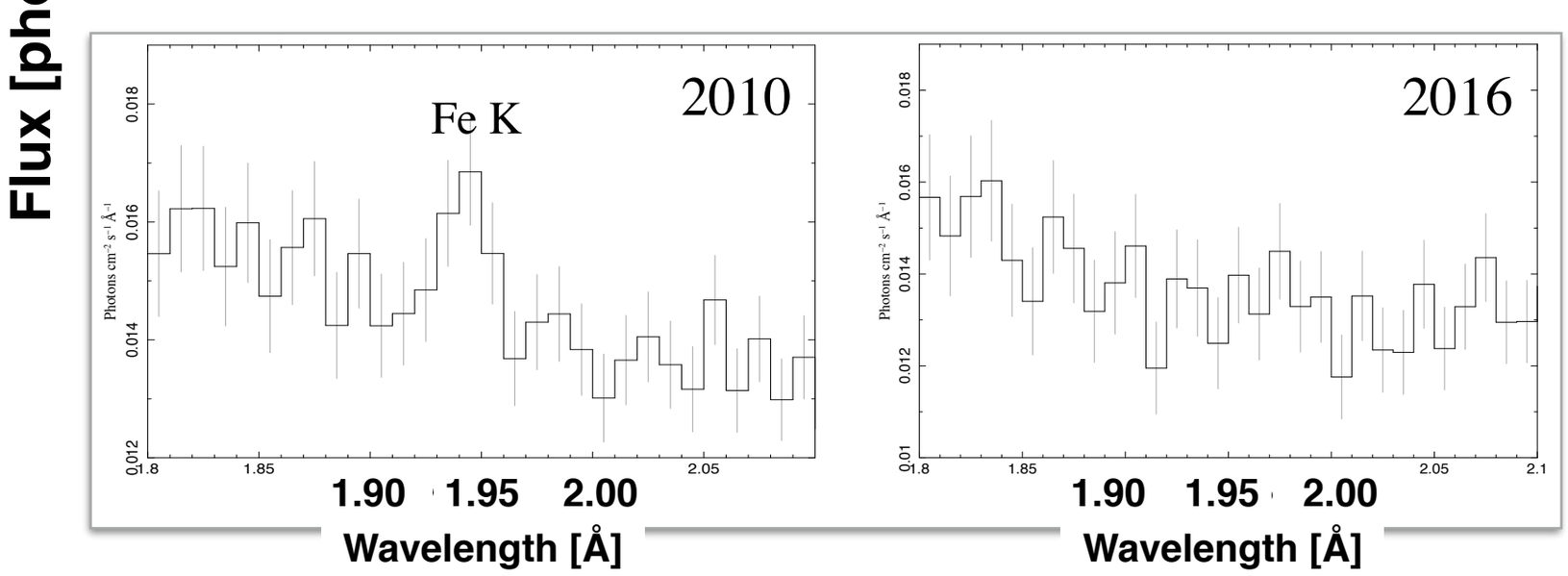
HETG Guaranteed Time Program AO19:

Disk and Fe K lines in 4U 1626-67

Ultra-compact system: Neutron star plus white dwarf in binary with orbital period of 41 minutes. The neutron star is a pulsar with a period of 7.7 s.



Ne X disk line, 2010 vs. 2016 — little change.



Fe K fluorescence emission line appeared in 2010 after a torque reversal episode, and is gone in 2016.

(Analysis by Norbert Schulz, Paul Hemphill, Herman Marshall, Deepto Chakrabarti)