

Spectr-RG X-ray Calorimeter

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Netherlands Institute for Space Research

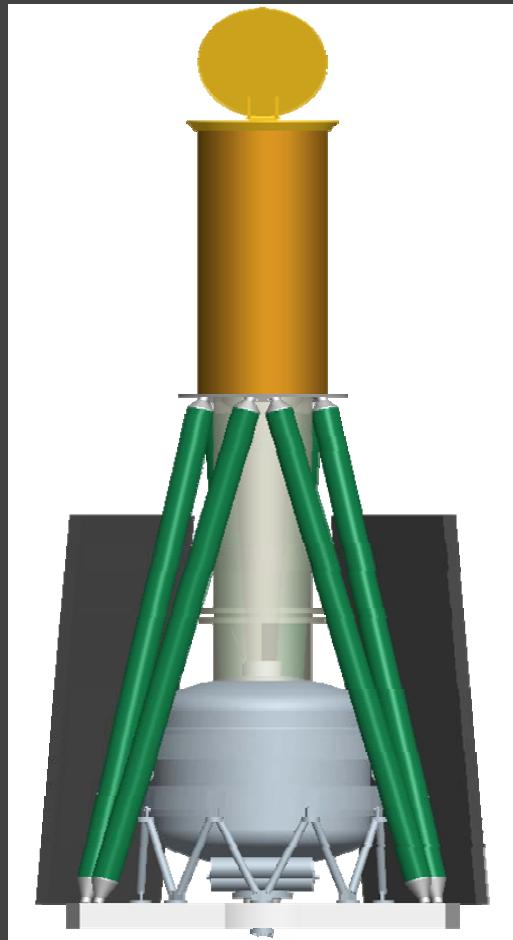
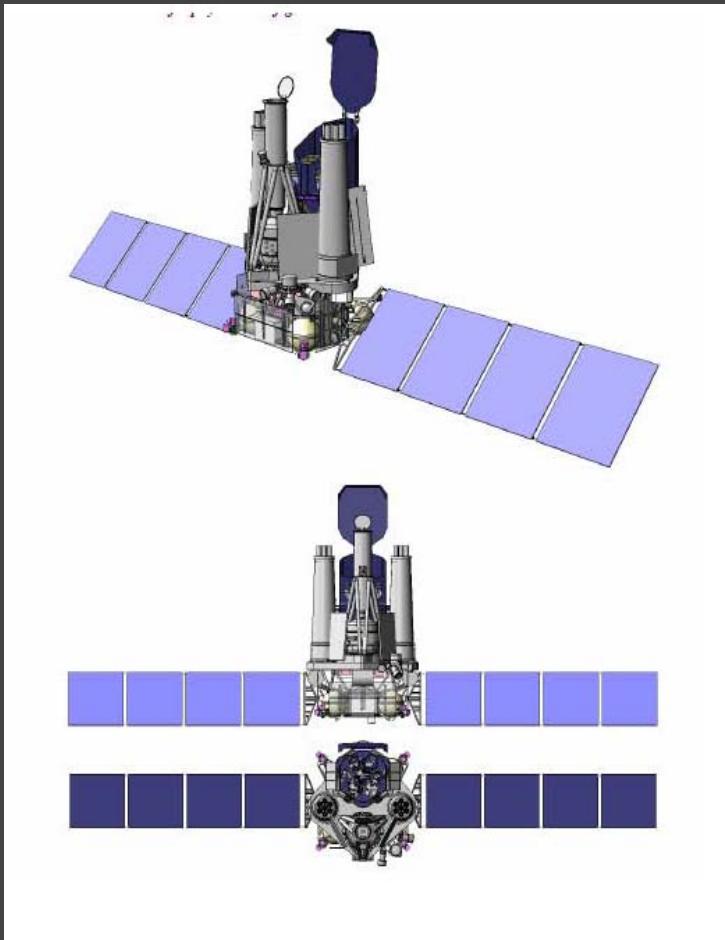


Netherlands Organisation for Scientific Research

Overview

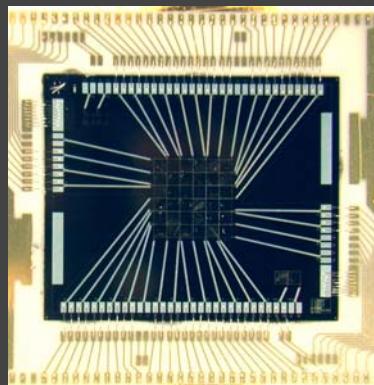
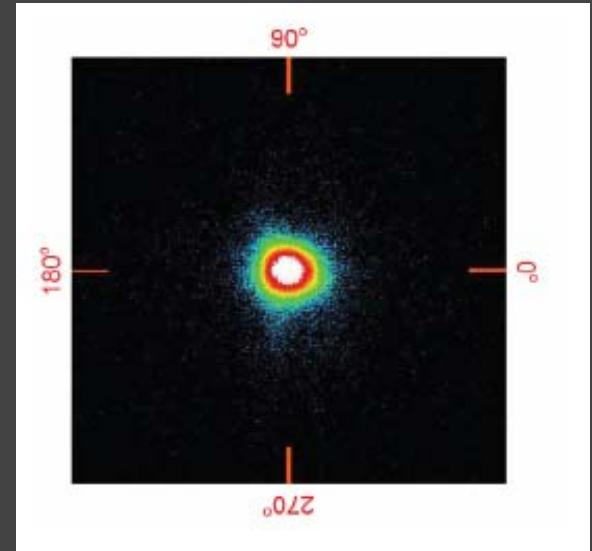
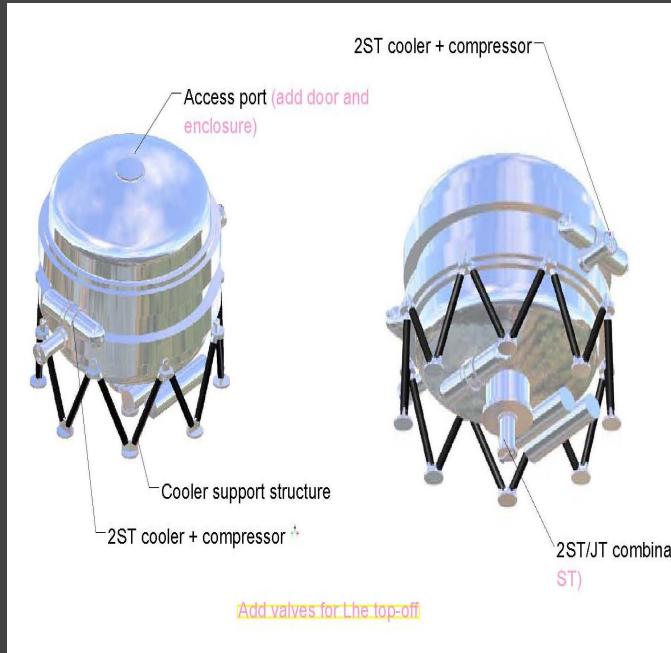
- Mission
- Clusters of galaxies
- Supernova Remnants
- The hot Interstellar Medium

Spektr Röntgen Gamma X-ray Calorimeter (SXC)



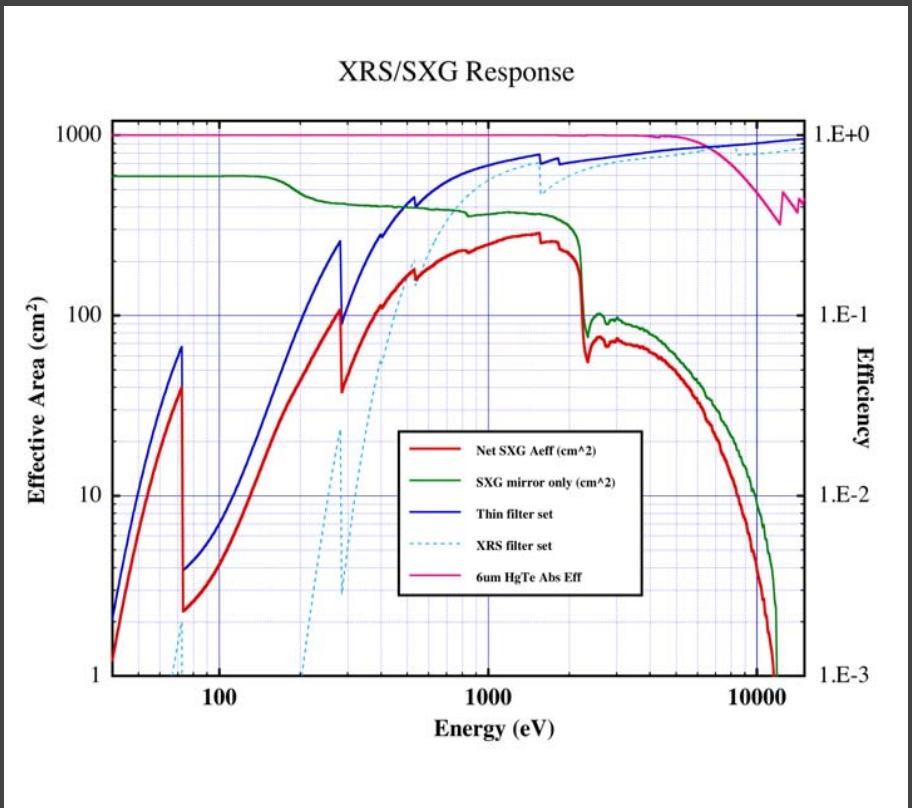
Spektr-RG X-ray Calorimeter

- Suzaku spare detector
- NeXT QM dewar
- eROSITA spare mirror
- And a lot of other stuff



Key characteristics

- Detector: 6 x 6 array with $0.815 \times 0.815 \text{ mm}^2$ pixels, 6 eV @ 6 keV(requiremet), $T_{\text{operational}} 50 \text{ mK}$
- Mirror: eRosita (15'' on axis, 400 cm^2 @ 1 keV, 40 @ 6 keV)
- Cooler: NeXT design (mechanical pre-coolers + ADR, LHe for reliability)
- Lifetime requirement $> \frac{1}{2}$ year, potential 5 years



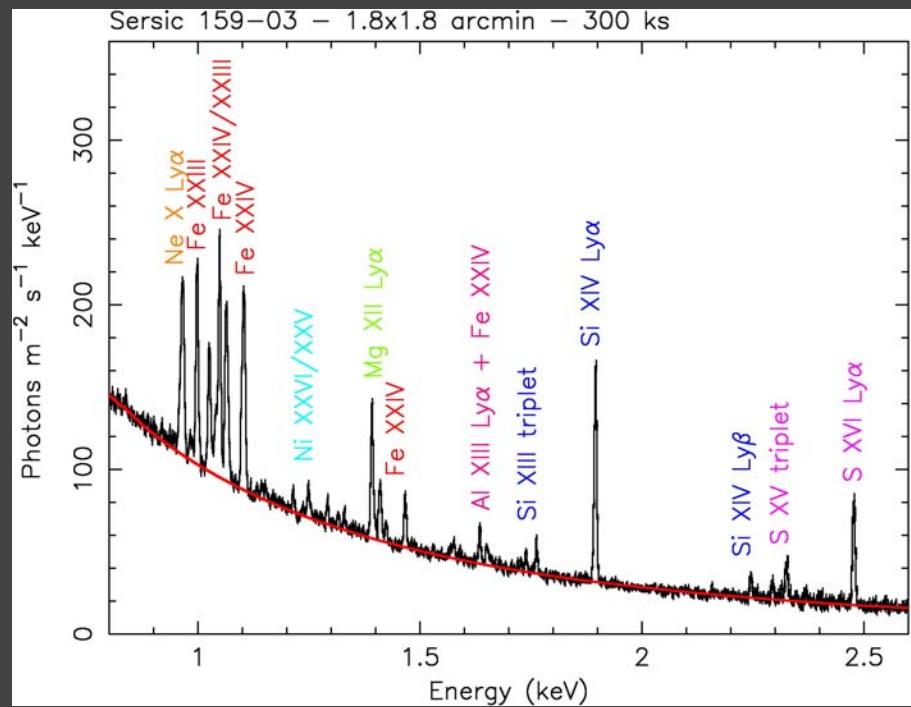
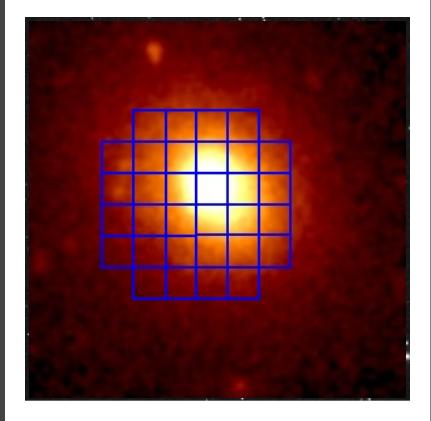
Observation plan

- Launch 2011
- ½ year pointed observations
- 4 year all sky survey
- Followed by pointed observations

- data will become public after completion of calibration and proprietary data period

Pointed observations: clusters

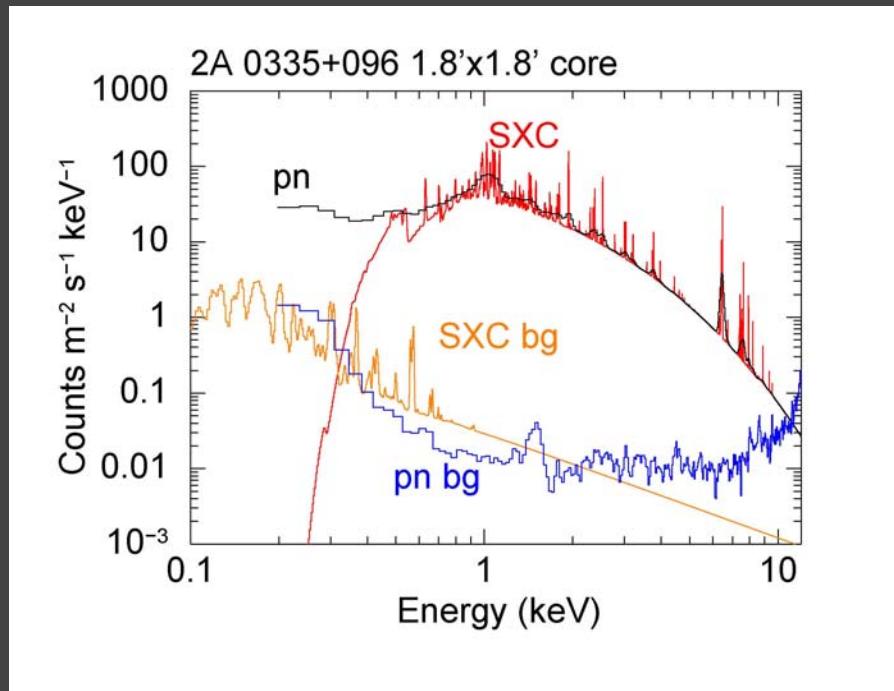
A 2199



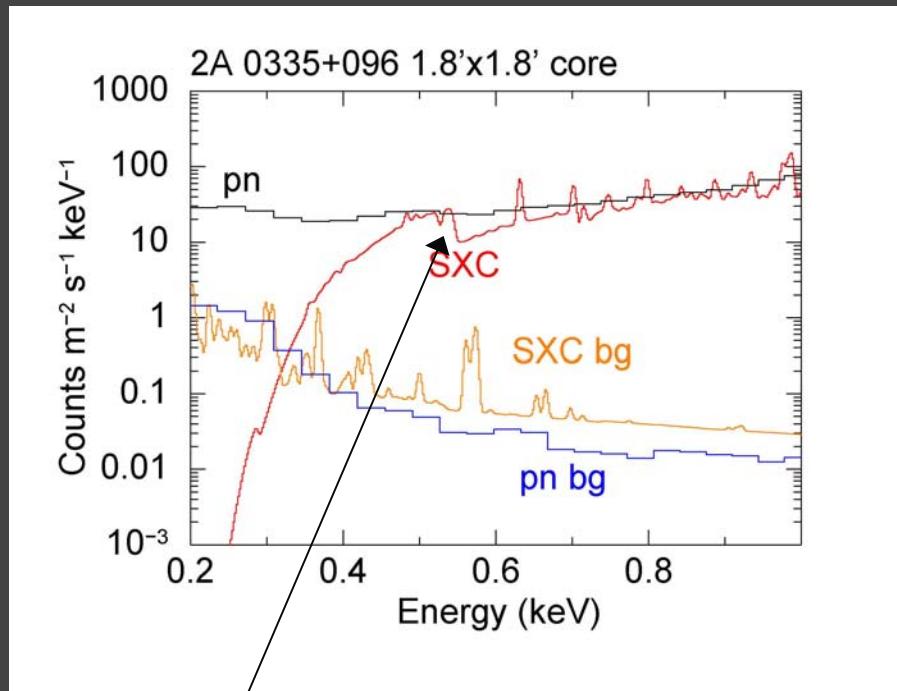
Abundances, densities,
temperatures, ionization state
(300 ks 1.8'x1.8' Sersic 159-03)

2A 0335-096

$z = 0.035, \text{NH} = 3 \cdot 10^{21}, \text{kT} = 3 \text{ keV}$



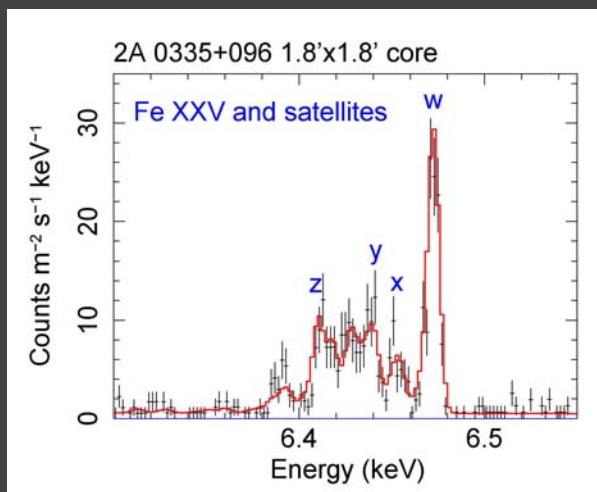
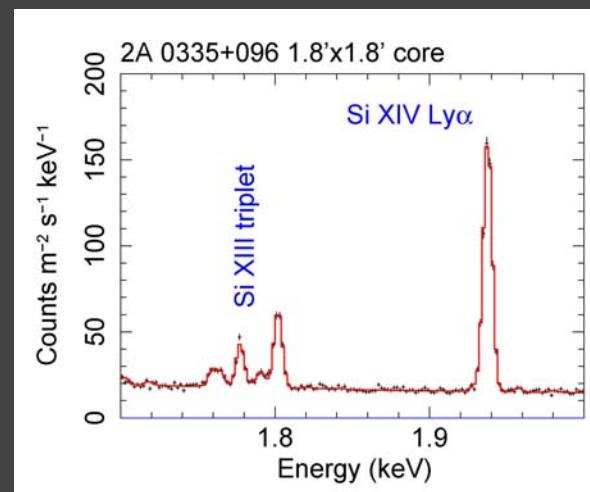
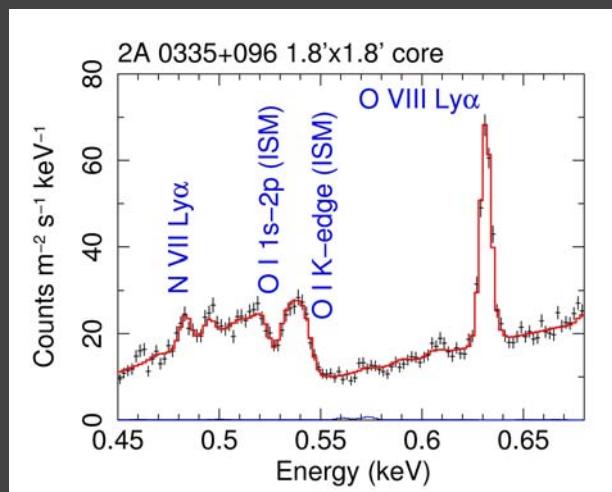
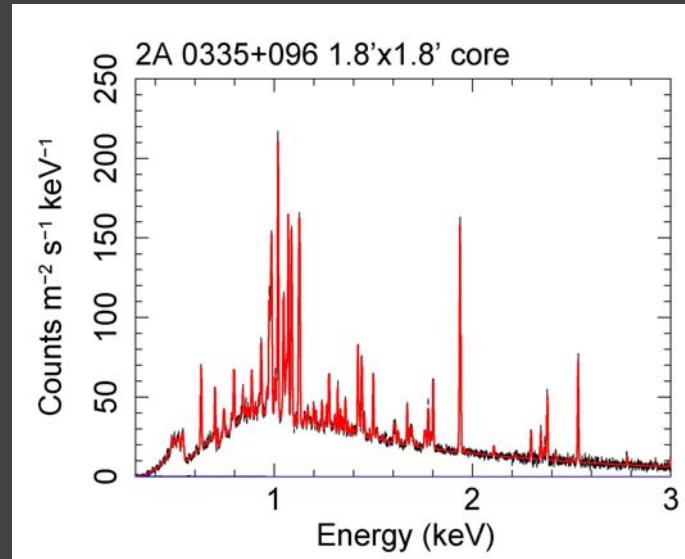
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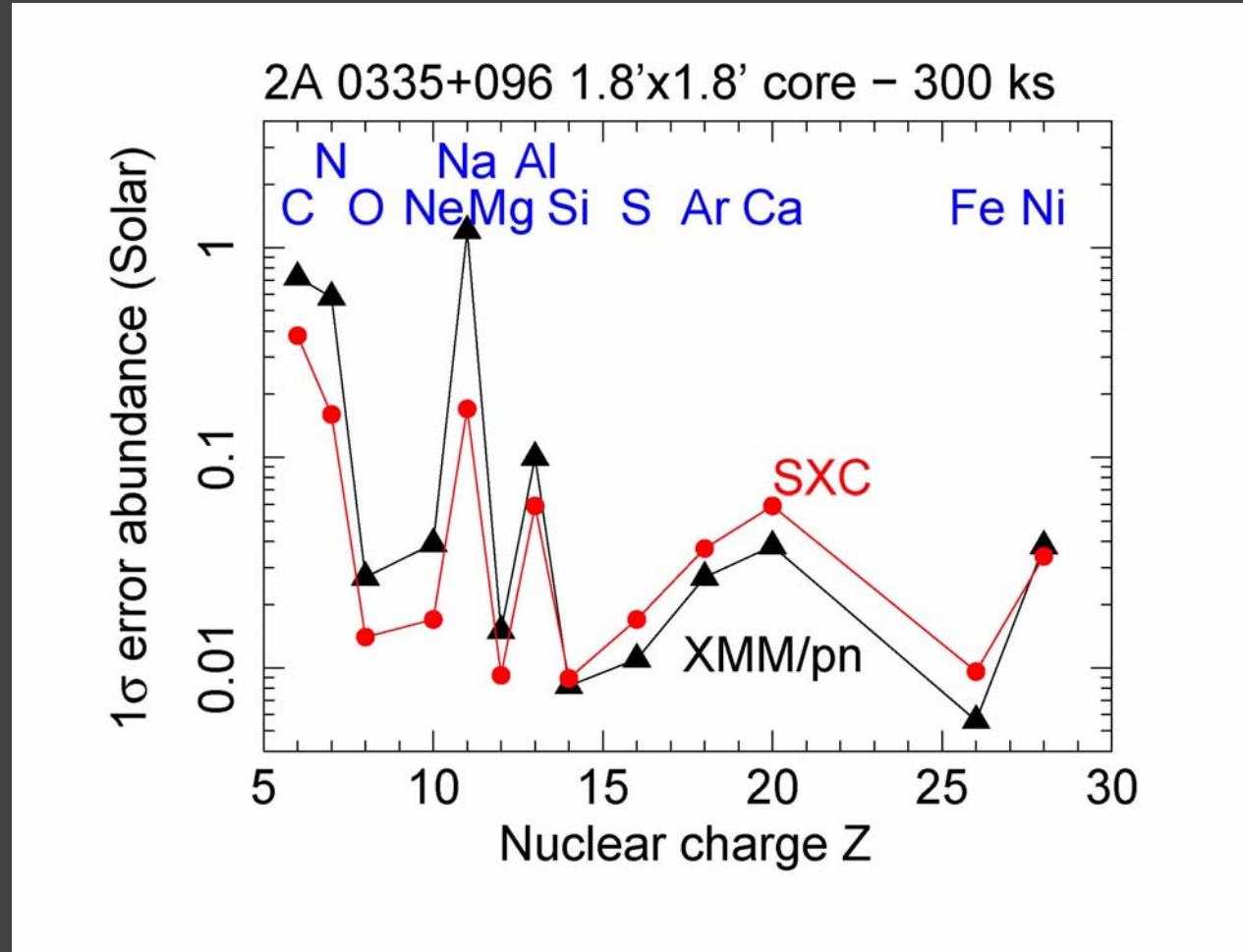


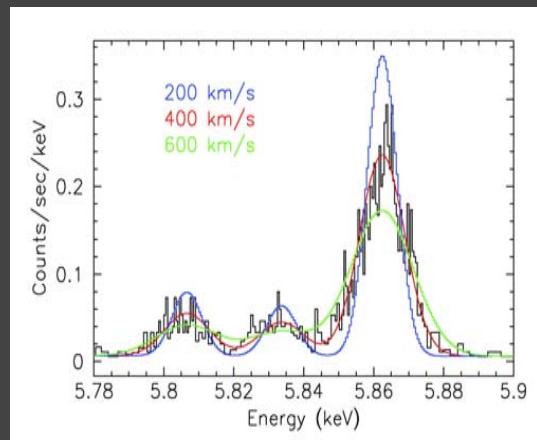
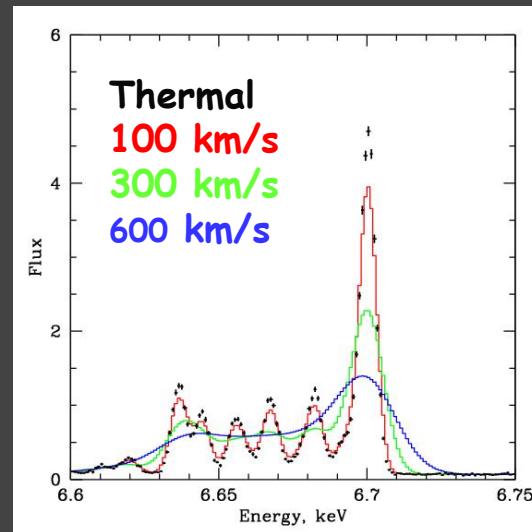
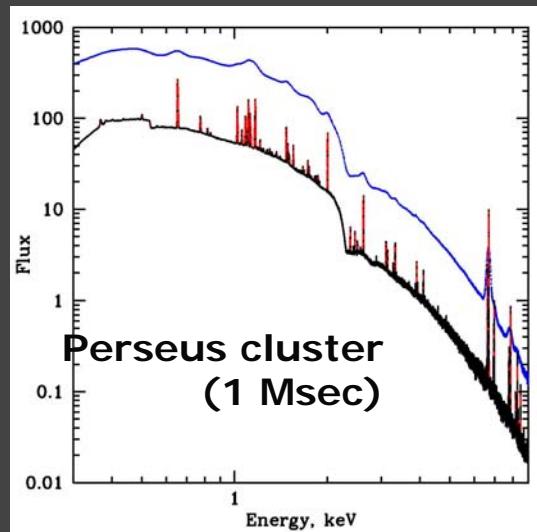
Galactic
Oxygen edge + 1s-2p

2A 0335-096

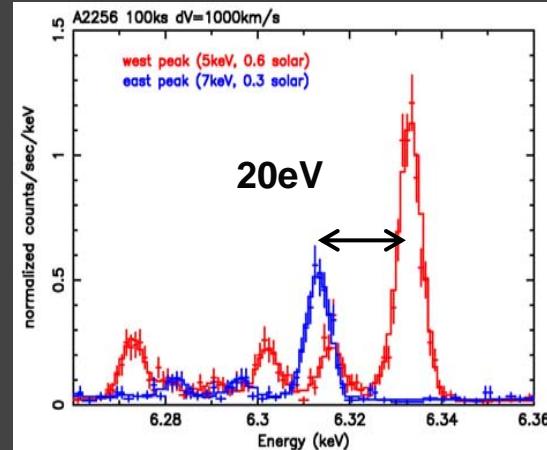
$z = 0.035$
 $NH = 3 \cdot 10^{21}$
300 ks







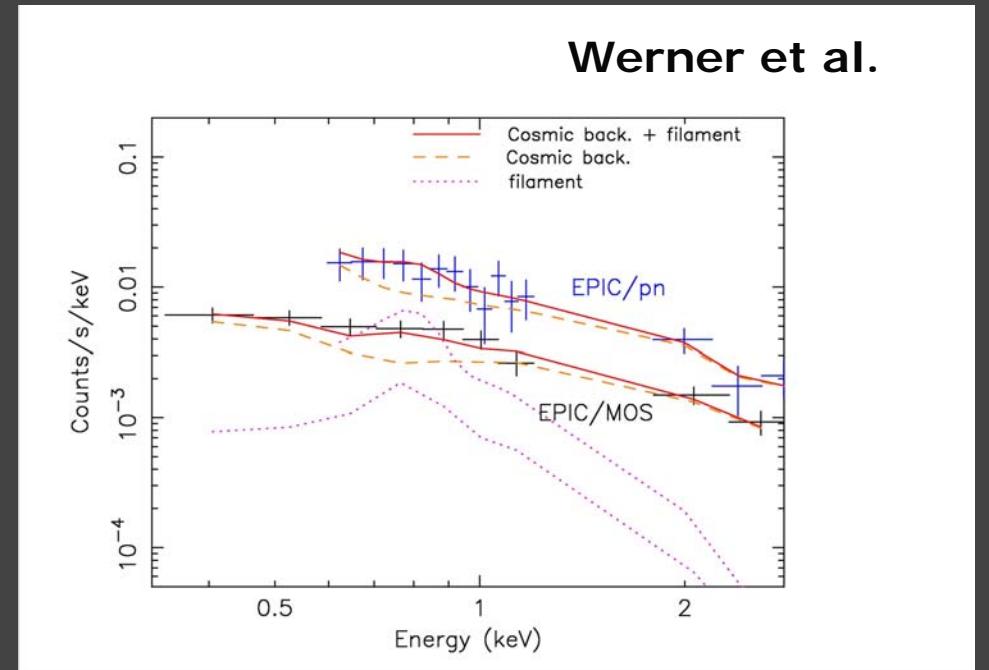
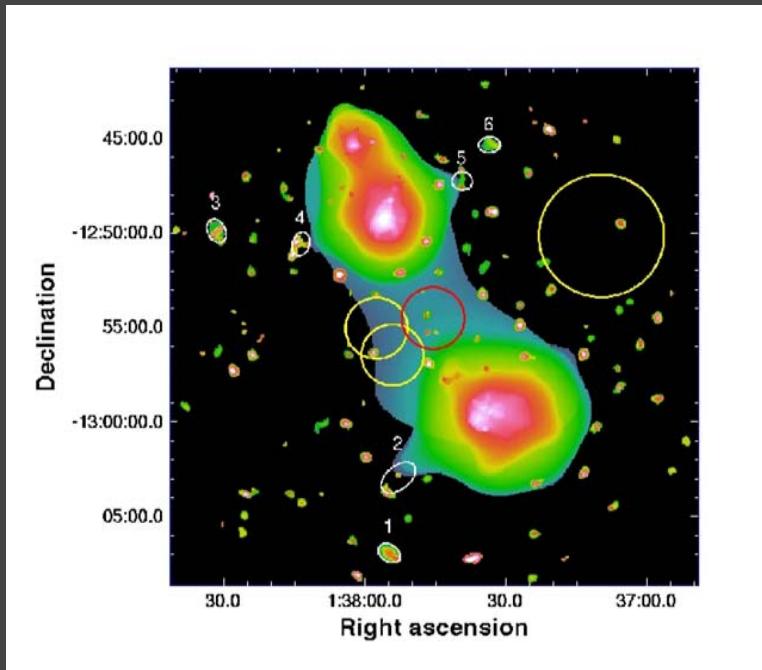
Turbulent velocities
(300 kS A 1413)



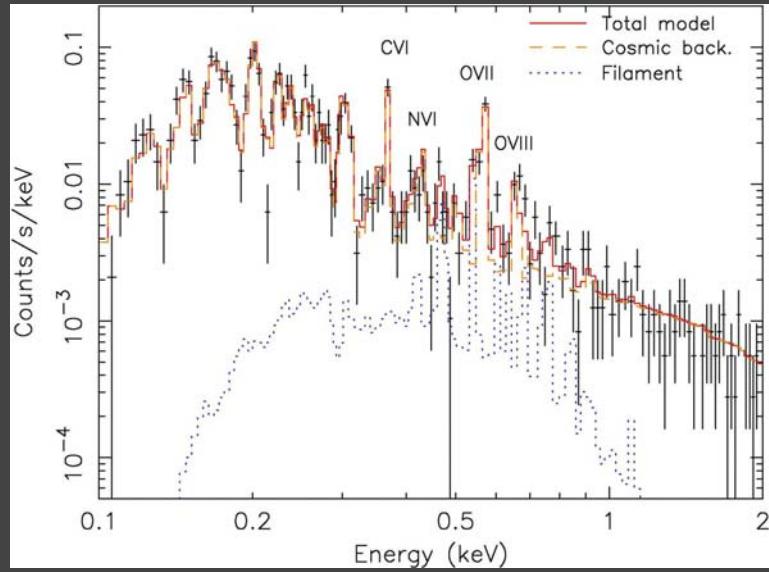
Bulk motion
(A2256, dV = 1000 km/s, 100 ks)

Filament connecting Abell 222 and Abell 223

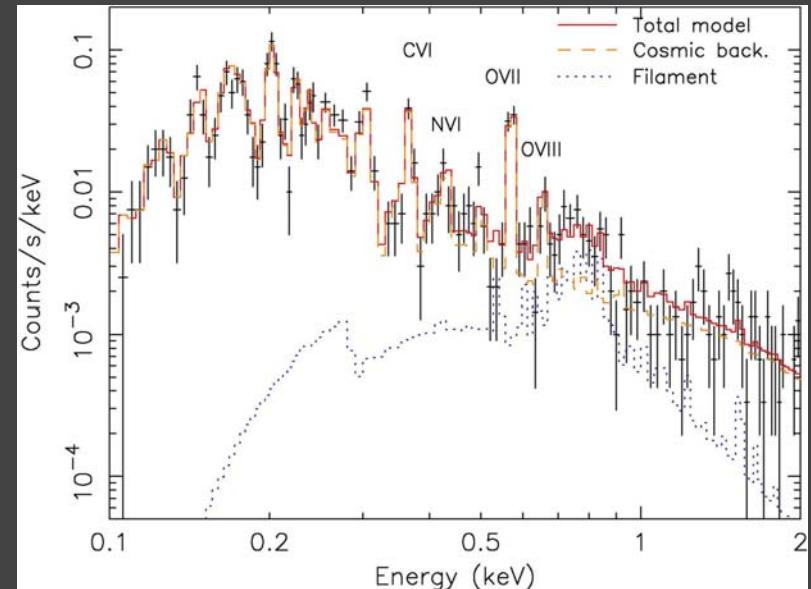
$z = 0.21$, overdensity ~ 150 , 62 ks



SXC results: 300 ks

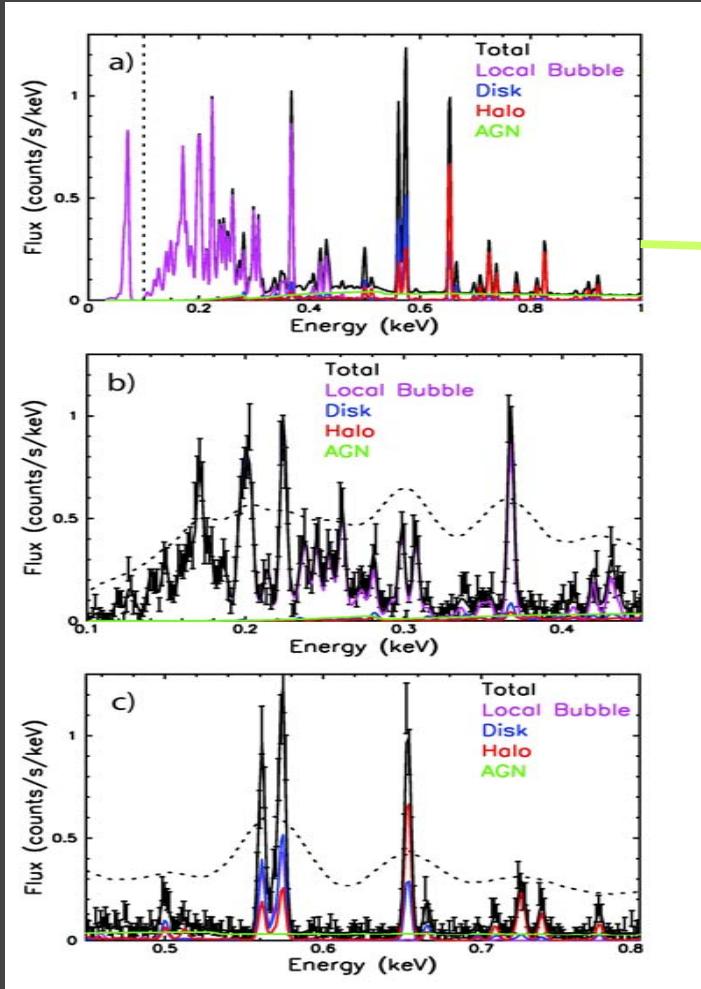


$kT \sim 0.9$ keV
background in data
 4σ significance
 $\Delta kT \sim 0.08$

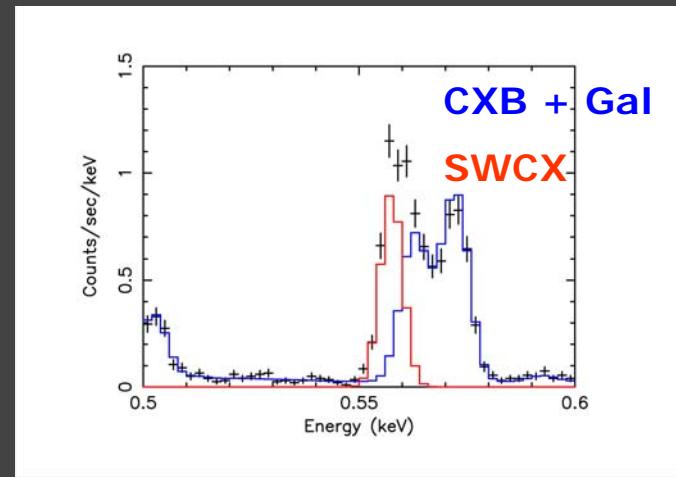
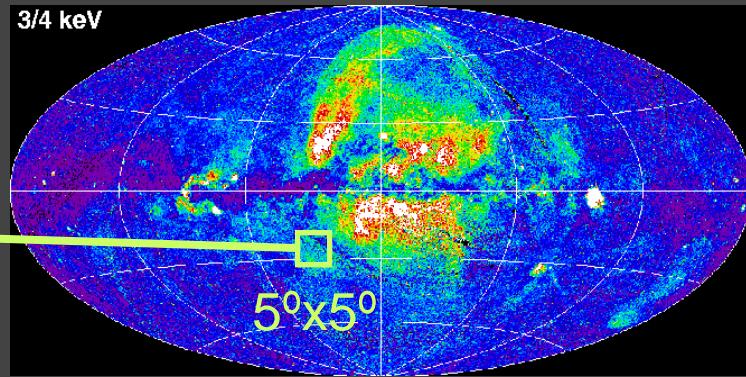


$kT \sim 0.3$ keV
background in data
 7σ significance
 $\Delta kT \sim 0.02$

Survey phase: Hot Interstellar Medium



Hot phase ISM, $5^{\circ} \times 5^{\circ}$



Solar Wind Charge Exchange