

PRESENT AND (NEAR) FUTURE OF X-RAY ASTRONOMY

GIORGIO MATT

***(DIPARTIMENTO DI FISICA,
UNIVERSITÀ ROMA TRE, ITALY)***

THE LANDSCAPE

MISSIONS PRESENTLY IN OPERATION:

*CHANDRA, XMM-NEWTON, INTEGRAL,
SWIFT, SUZAKU, NUSTAR*

MISSIONS TO BE LAUNCHED IN THE NEAR FUTURE (≤ 2014):

ASTROSAT, eROSITA, ASTRO-H

**ALL CLASSES OF ASTROPHYSICAL
SOURCES EMIT SIGNIFICANTLY IN X-RAYS**

OR

**WITHOUT X-RAY OBSERVATIONS OUR
KNOWLEDGE OF ANY CLASS OF
ASTROPHYSICAL SOURCES IS INCOMPLETE**

CHANDRA

0.1-10 KEV

CDFS

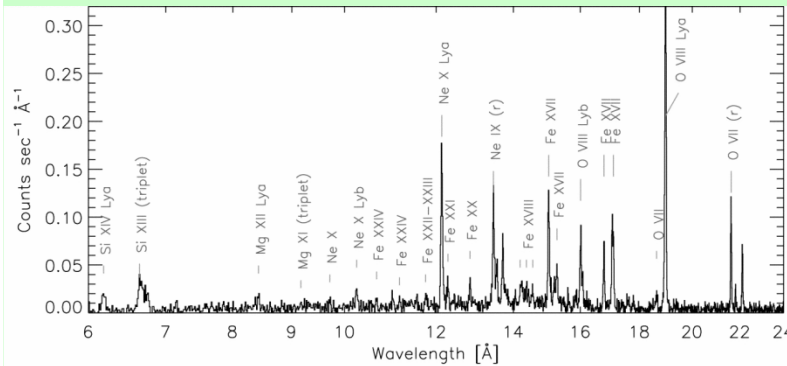
SUBARCSEC SPATIAL RESOLUTION (0.5''
HEW ON AXIS).

MODERATE RESOLUTION ($\Delta E \sim 150$ EV),
HIGH EFFICIENCY SPECTROMETERS
(CCD).

SGR A*

HIGH RESOLUTION ($\Delta E \sim$ A FEW EV),
LOW EFFICIENCY SPECTROMETERS
(TRANSMISSION GRATINGS 0.1-10 KEV).

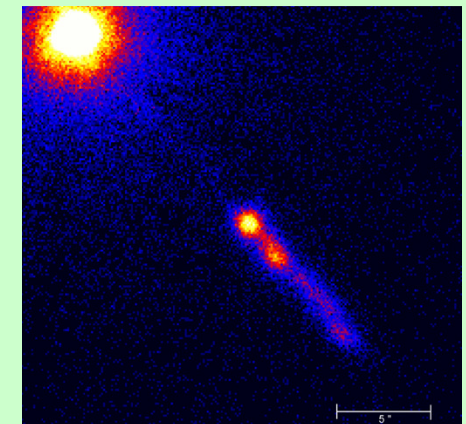
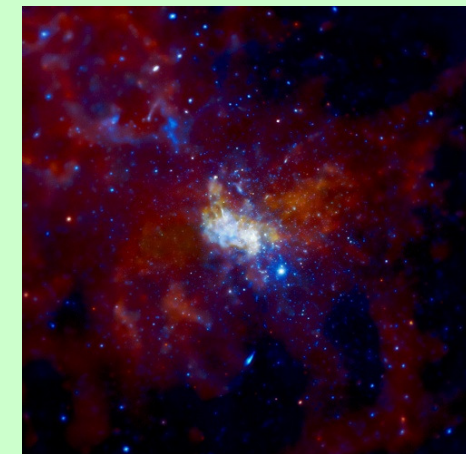
3C 273



AD LEO



BULLET CLUSTER



XMM-NEWTON

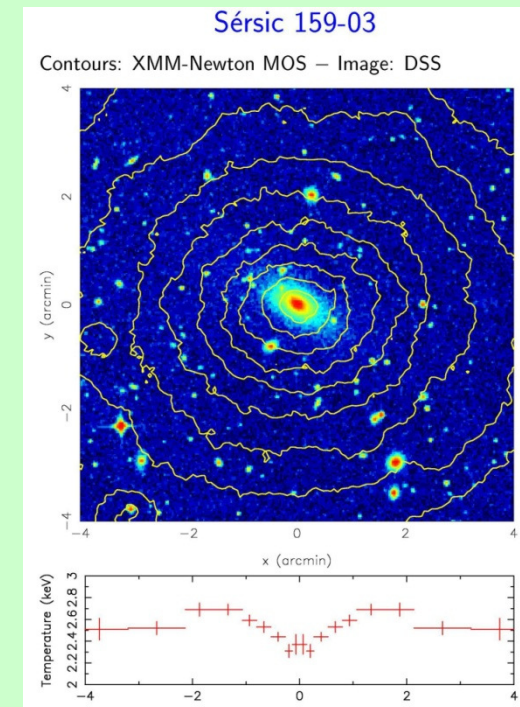
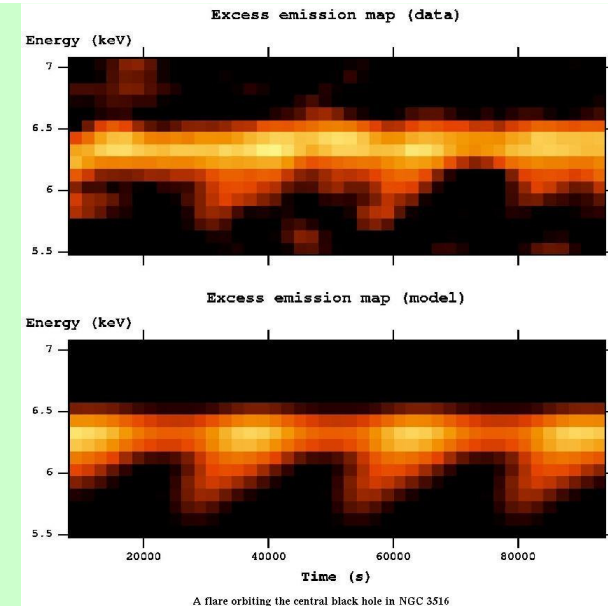
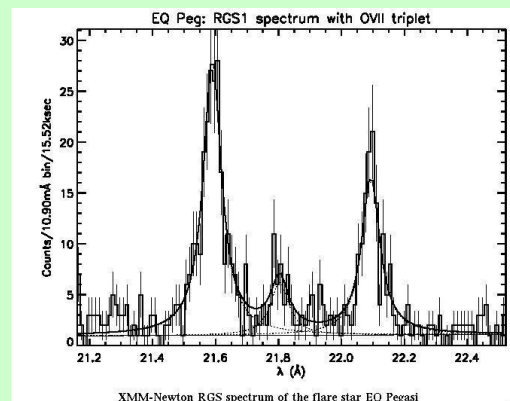
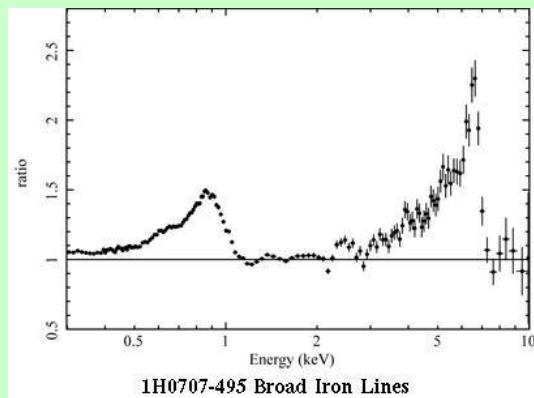
0.3-12 KEV

MODERATE SPATIAL RESOLUTION (15'' HEW ON AXIS).

MODERATE RESOLUTION ($\Delta E \sim 150$ EV), HIGH EFFICIENCY SPECTROMETERS (CCD).

HIGH RESOLUTION ($\Delta E \sim$ A FEW EV), LOW EFFICIENCY SPECTROMETERS (REFLECTION GRATINGS, 0.5-2 KEV).

OPTICAL MONITOR



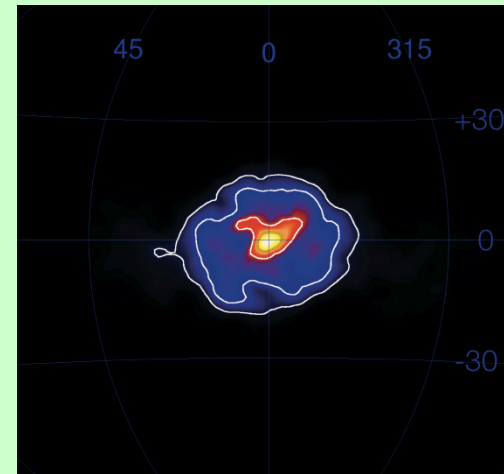
INTEGRAL

SOFT GAMMA-RAY BAND (5-1000 KEV).

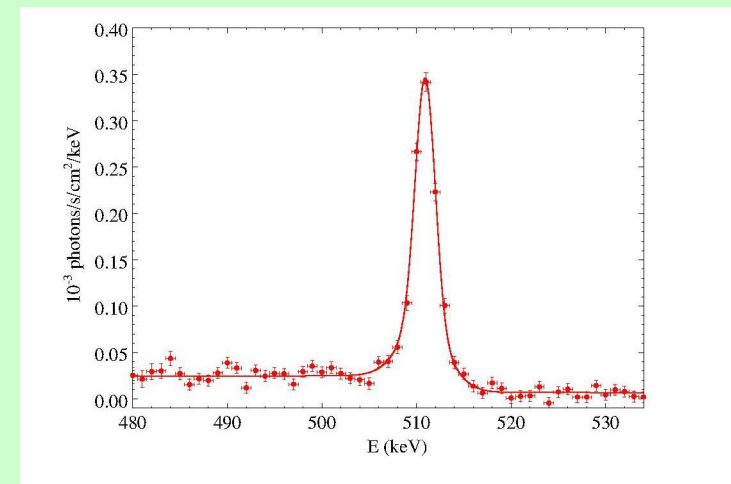
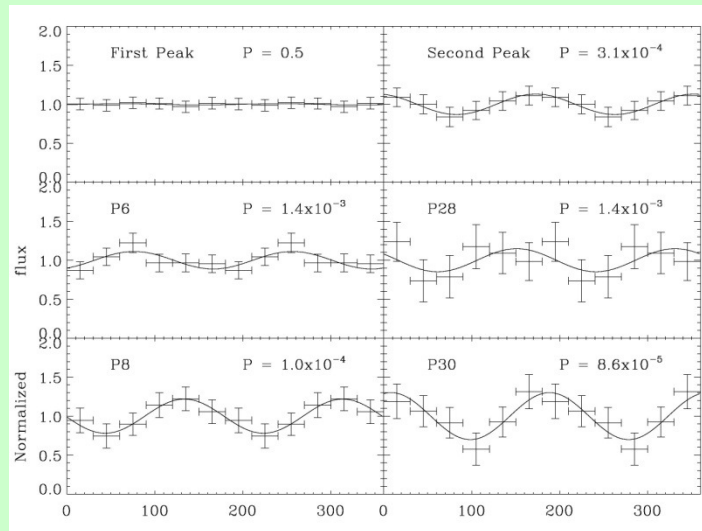
CODED MASK IMAGING. LARGE F.O.V.

HIGH RESOLUTION SPECTROSCOPY.

POLARIZATION FOR THE BRIGHTEST SOURCES.



511 keV

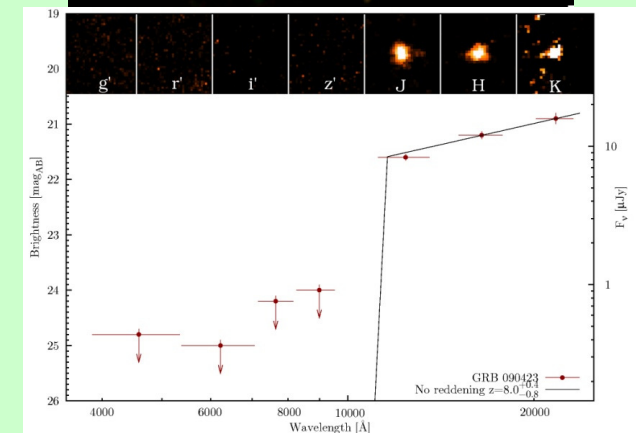
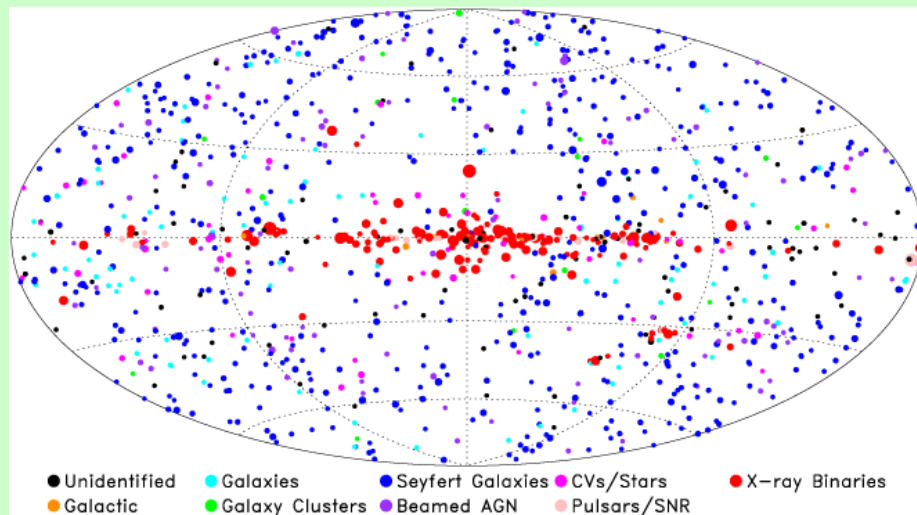
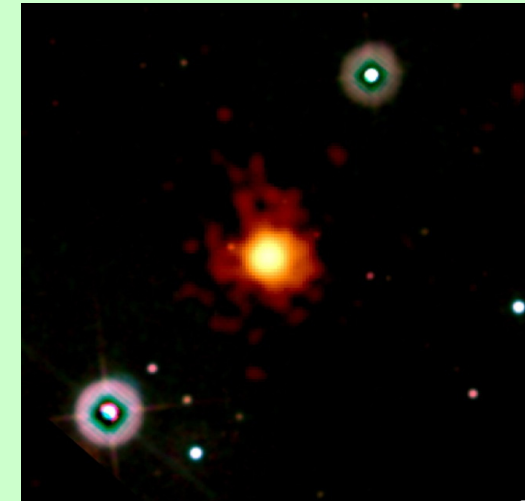
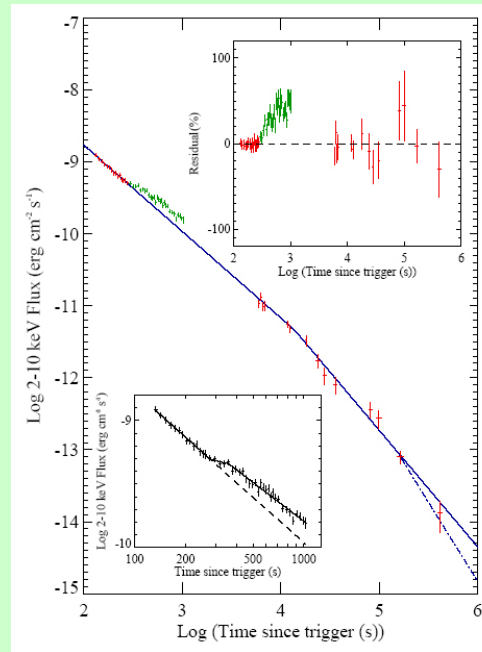


SWIFT

**WIDE FIELD CODED MASK
TELESCOPE (15-150 KEV)**

**0.3-10 KEV FOCUSING
TELESCOPE (18'' HEW).
MODERATE SPECTRAL
RESOLUTION**

UV/OPTICAL TELESCOPE



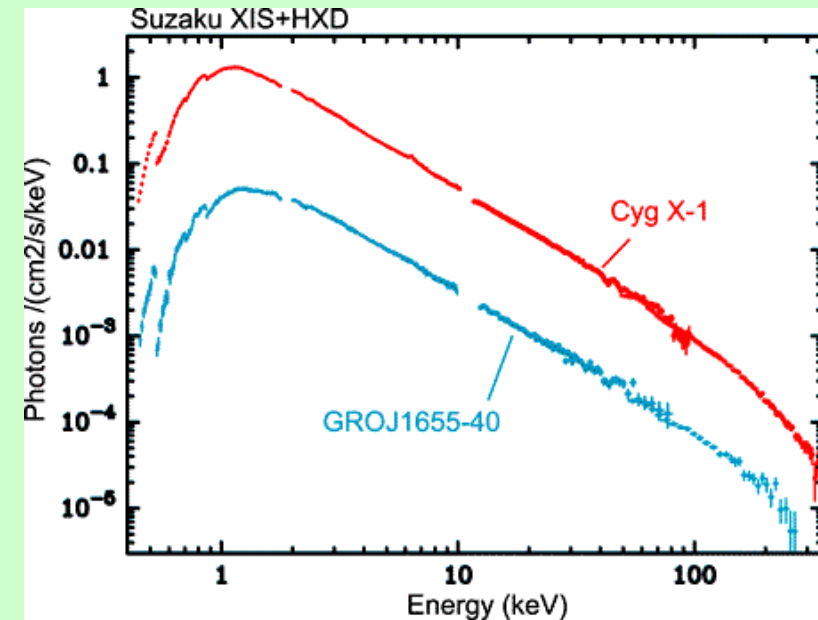
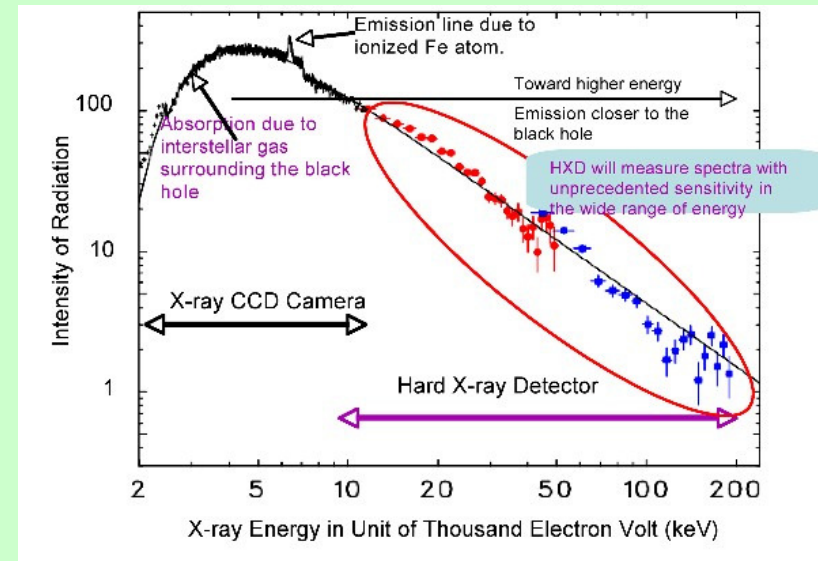
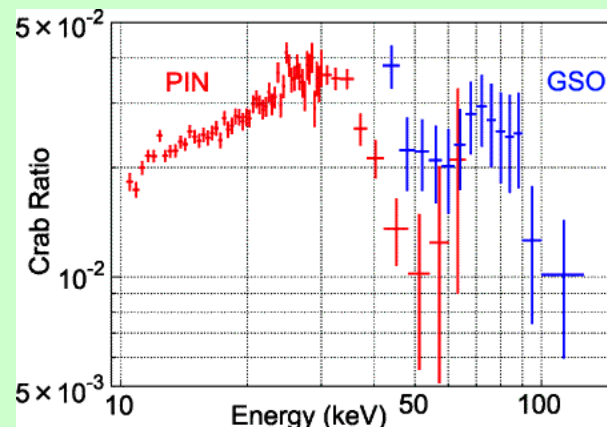
SUZAKU

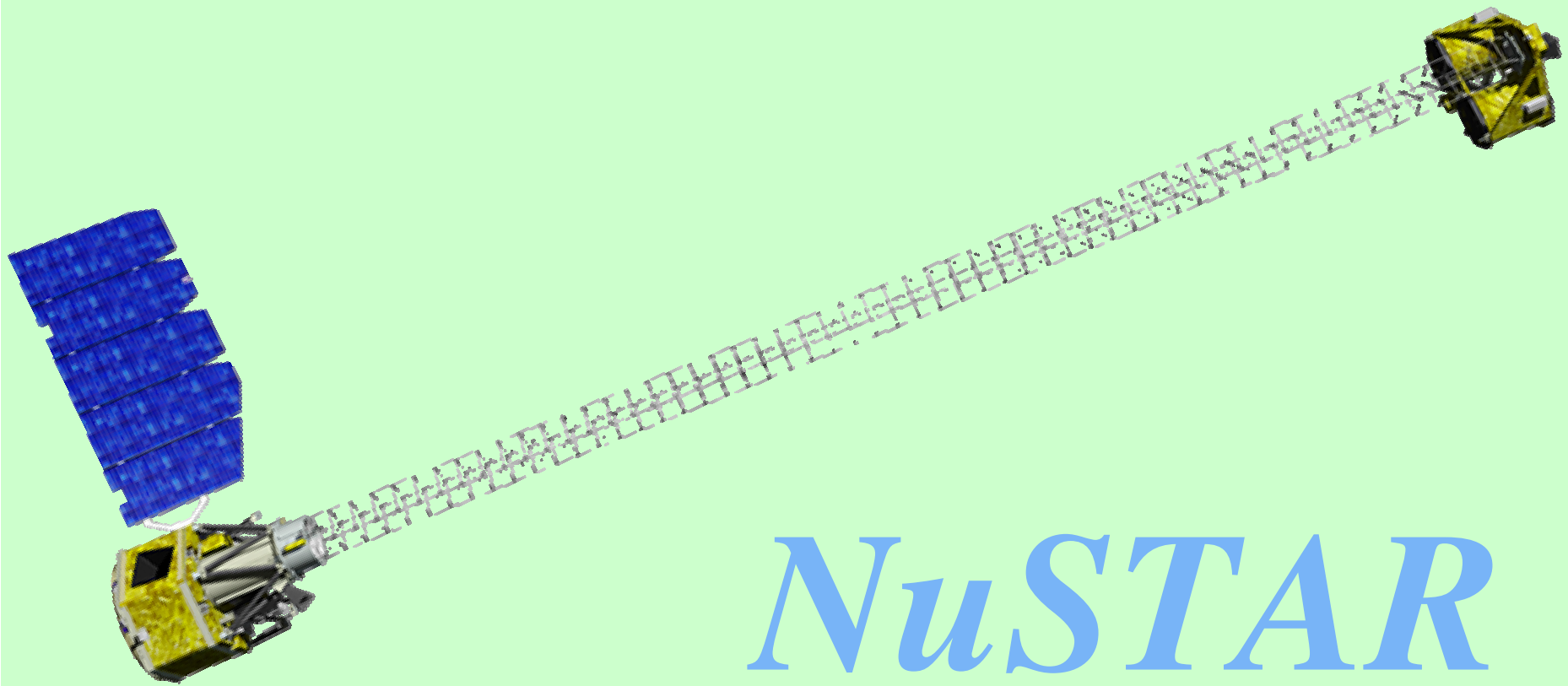
0.3-700 KEV (FOCUSING TELESCOPES <10 KEV)

MODEST SPATIAL RESOLUTION (90'' HEW).

MODERATE RESOLUTION ($\Delta E \sim 150$ EV), HIGH EFFICIENCY SPECTROMETERS (CCD).

HIGH RESOLUTION ($\Delta E \sim 7$ EV), HIGH EFFICIENCY SPECTROMETERS (CALORIMETERS). FAILED JUST AFTER LAUNCH.

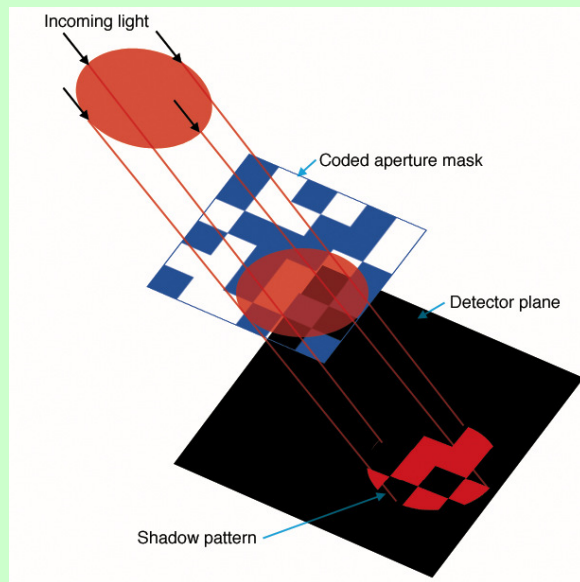
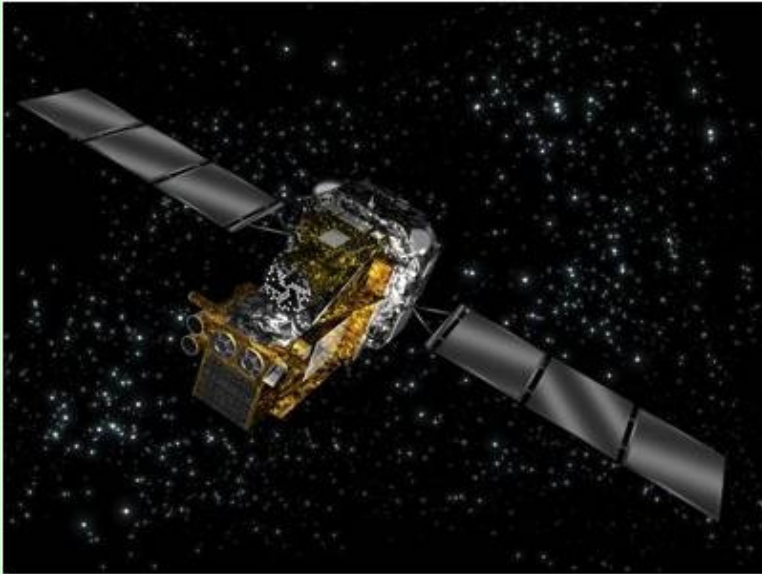




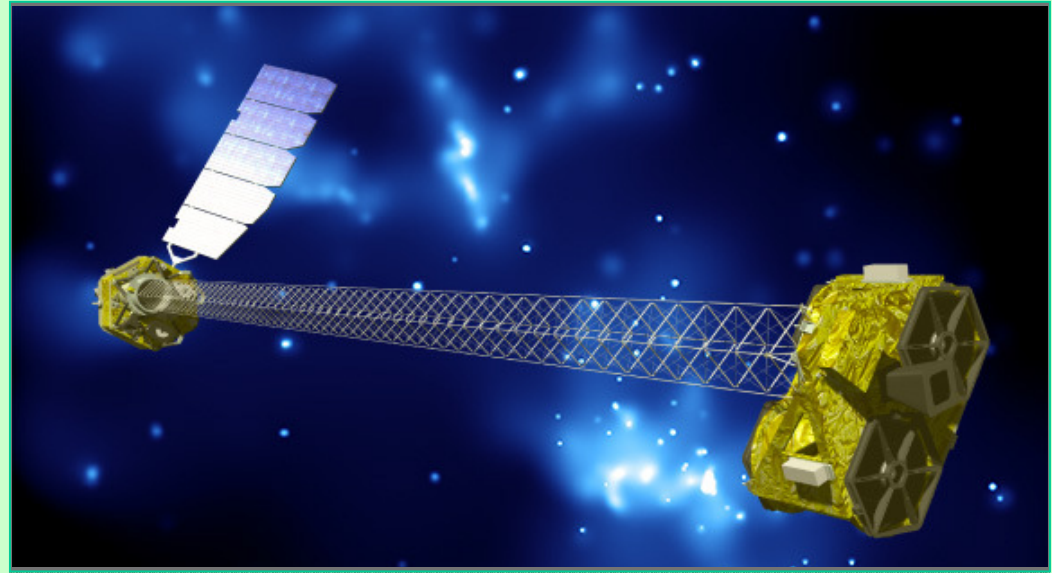
NuSTAR

The Nuclear Spectroscopic Telescope Array

INTEGRAL, *Swift* BAT



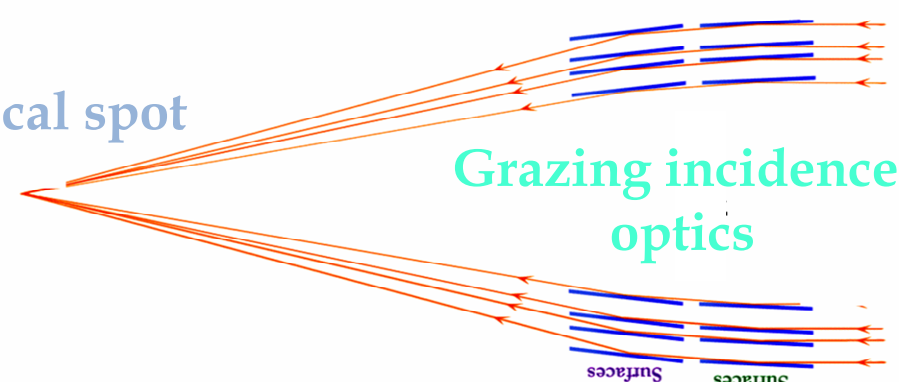
NuSTAR

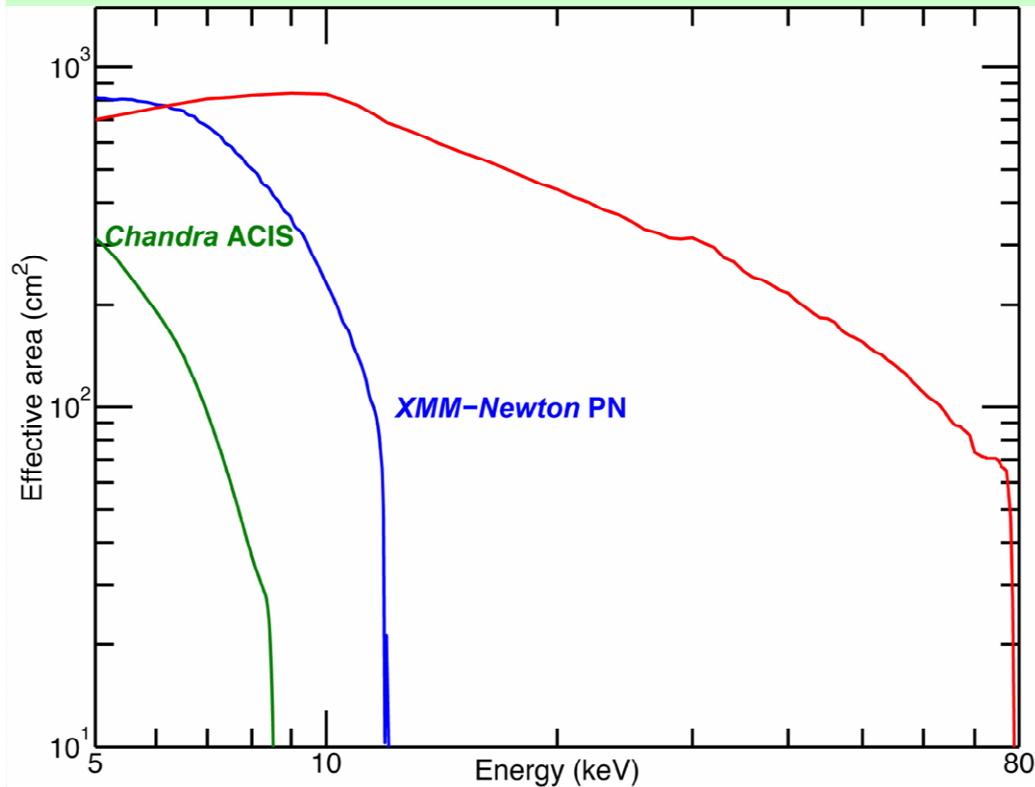


Focal spot

Grazing incidence optics

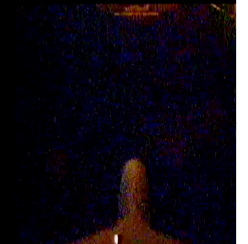
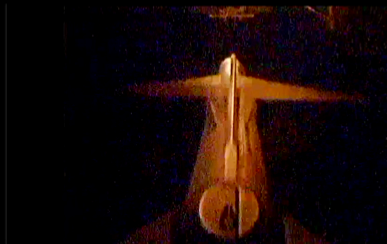
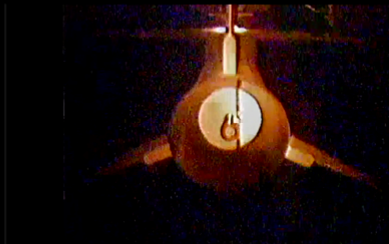
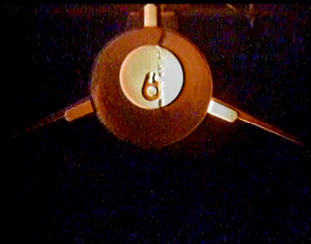
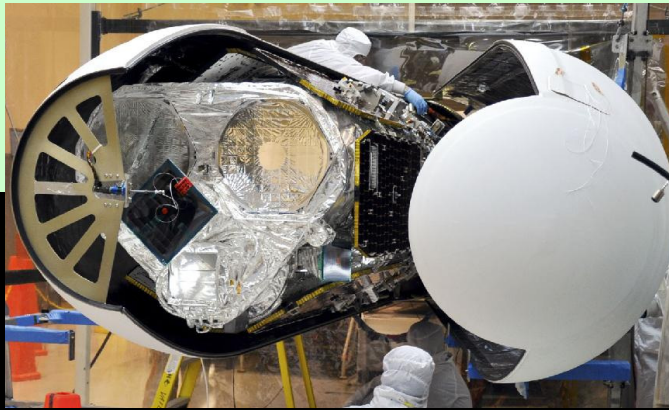
Surfaces





SATELLITE (INSTRUMENT)	SENSITIVITY
INTEGRAL (ISGRI)	~0.5 MCRA (20-100 KEV) WITH >MS EXPOSURES
SWIFT (BAT)	~0.8 MCRA (15-150 KEV) WITH >MS EXPOSURES
NUSTAR	1 μ CRA (10-40 KEV) IN 1 MS

NuSTAR two-telescope total collecting area



Launch June 13 2012
Reagan Test Site, Kwajalein Atoll