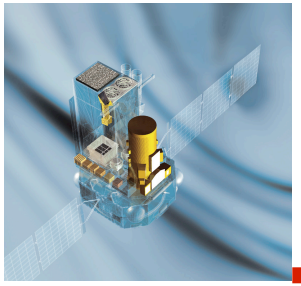
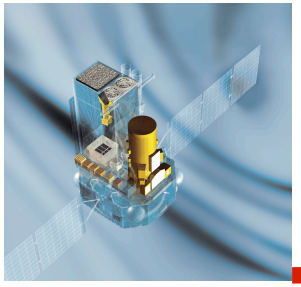


Welcome

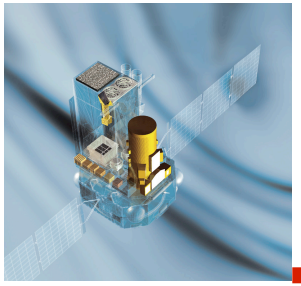
- Workshop staff, participants
- Some logistics
- Agenda modifications
- Workshop goals
- Mission status
- Science highlights
- Future of INTEGRAL & NASA program



INTEGRAL Data Analysis Workshop

Workshop Staff:

Chris Shrader,	NASA INTEGRAL GOF
Volker Beckmann,	NASA INTEGRAL GOF
Steve Sturner,	NASA INTEGRAL GOF
Pierre Dubath,	INTEGRAL Science Data Center
Ada Paizis,	INTEGRAL Science Data Center
Sandy Barnes,	NASA GSFC



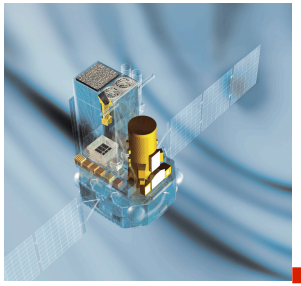
Revised Agenda

November 14

8:30 - 9:00	Registration, Coffee & Snacks	
9:00 - 9:45	Overview of INTEGRAL Mission, NASA Program, US INTEGRAL GOF	Shrader
9:45 - 10:30	INTEGRAL Software Overview	Beckmann
10:30 - 10:45	break	
10:45 11:30	IBIS/ISGRI Data Analysis	Paizis
11:30 - 12:15	Hands On …	All
12:15 - 13:30	Lunch Break	
13:30 - 15:00	Hands On …	All
15:00 - 15:45	SPI Data Analysis	Dubath
15:45 - 16:00	Break	
16:00 - 17:30	Hands On …	All
17:30	Adjourn	
18:30	Worhshop Dinner (location tbd)	

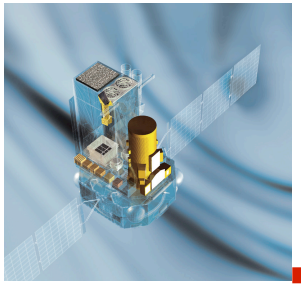
November 15

8:30 - 9:00	Coffee & Snacks	
9:00 - 9:45	JEM-X Data Analysis	Beckmann, Paizis
9:45 - 10:30	Hands On …	All
10:30 10:50	Break	
10:50 - 12:00	Hands On …	
12:00 - 13:15	Lunch Break	
13:15 - 14:00	NASA INTEGRAL Data Archive	S. Sturner
14:00 - 16:30	Hands On …	All
16:30	Adjourn	



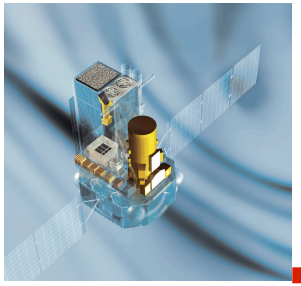
Workshop Goals

- Enhance US participation
- Dispel myth that INTEGRAL data is difficult to work with …
- Substantial US participation in INTEGRAL
  - ~25% of GO programs w/US PIs
  - 3 US Instrument Team Co-I institutions
  - Duplicate data archive within HEASARC
  - NASA Guest Observer Support Facility
- But, relative dearth of US led journal articles
  - Need new blood …



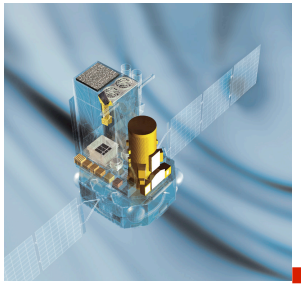
Workshop Goals

- Emphasis on *practical* aspects of analysis rather than on underlying details
  - e.g. typical data analyst may no need to detailed mathematics of image reconstruction algorithm to obtain and interpret results
  - Similarly, many technical aspects of instrument design are beyond our scope here
- Participants should leave understanding basic concepts, working knowledge of data analysis & abundant enthusiasm …



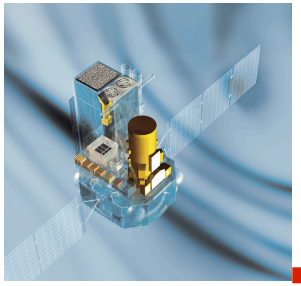
Some Logistical Details

- All meeting sessions, breaks in this room
- Lunch options: 2 GSFC cafeterias, local restaurants
- Visitor badges valid until 6:00 PM
- Various other groups sited here: Swift, RXTE, GLAST, Suzaka, XMM
  - Please go chat with these people as time permits
  - "Escorted" visitors need to let us know whereabouts though



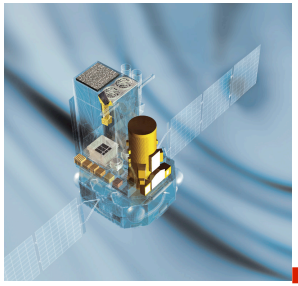
Computer and Network Setup

- Local network access; necessitates 2 steps to archive, outside world
- Use the URL: http://192.168.16.1
  - Quick demo ..
- Various file sets posted there:
  - Documentation, copy of SW distribution, test data sets, etc.
- Also, lots of useful files on CD
  - Some Mac->unix conversion problems



Mission Status

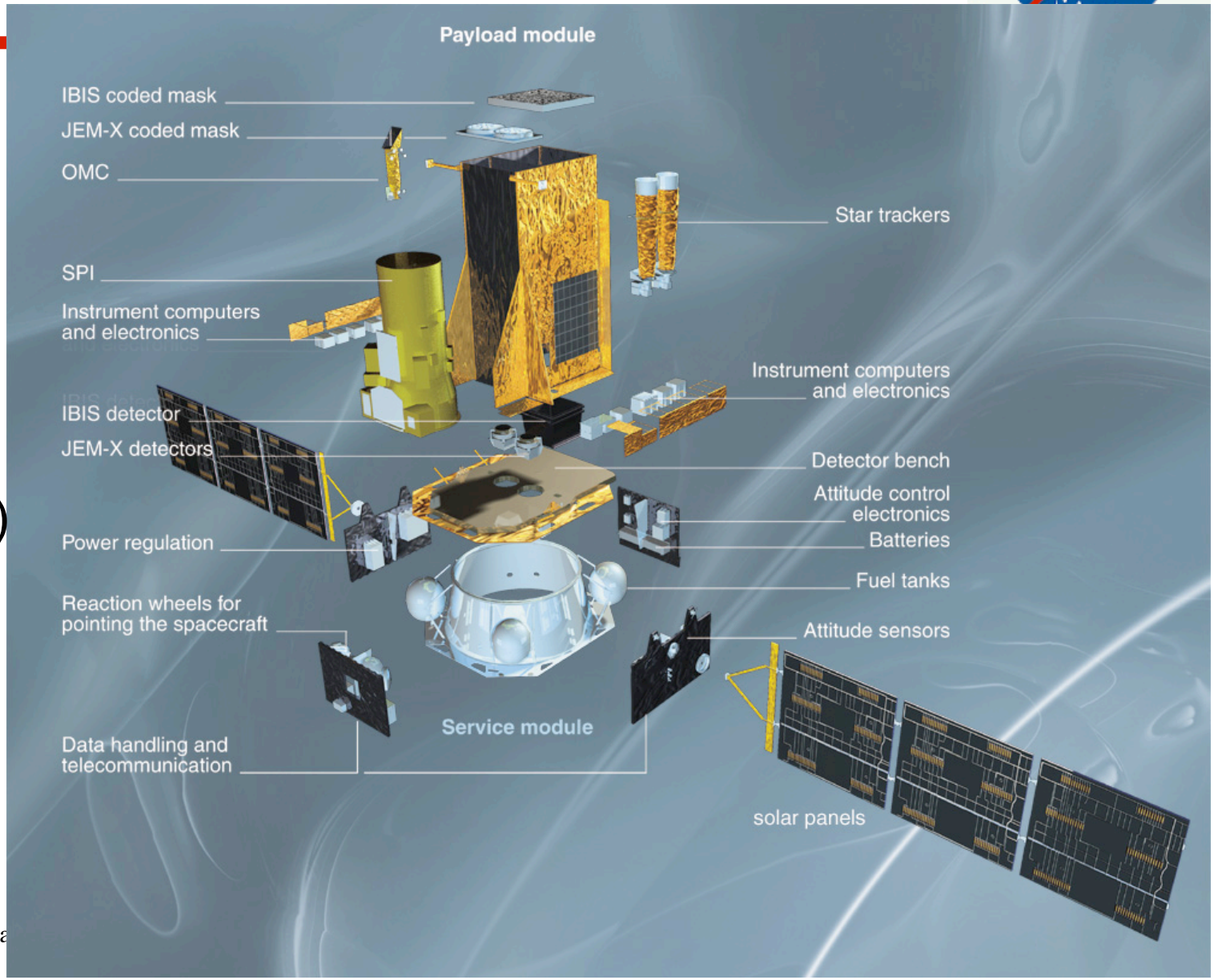
- Spacecraft and instruments performing nominally
  - Abundance of battery capacity & onboard fuel
  - Orbit adjustment; less time in e^- belts
  - Earlier telemetry limitations solved
- Several instrument anomalies, but early in mission & now seem stable
- ESA plans to continue INTEGRAL operations through 2008, and likely to 2010

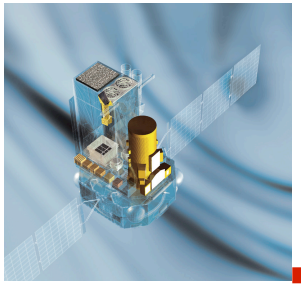


Spacecraft & Instrumentation

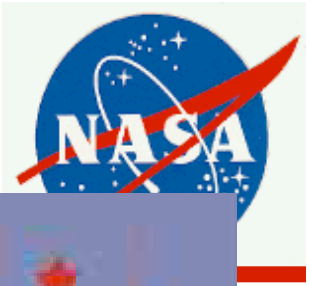
Exploded view of INTEGRAL:

OMC and IBIS lower-layer detector array (PICsIT) will not be covered here.

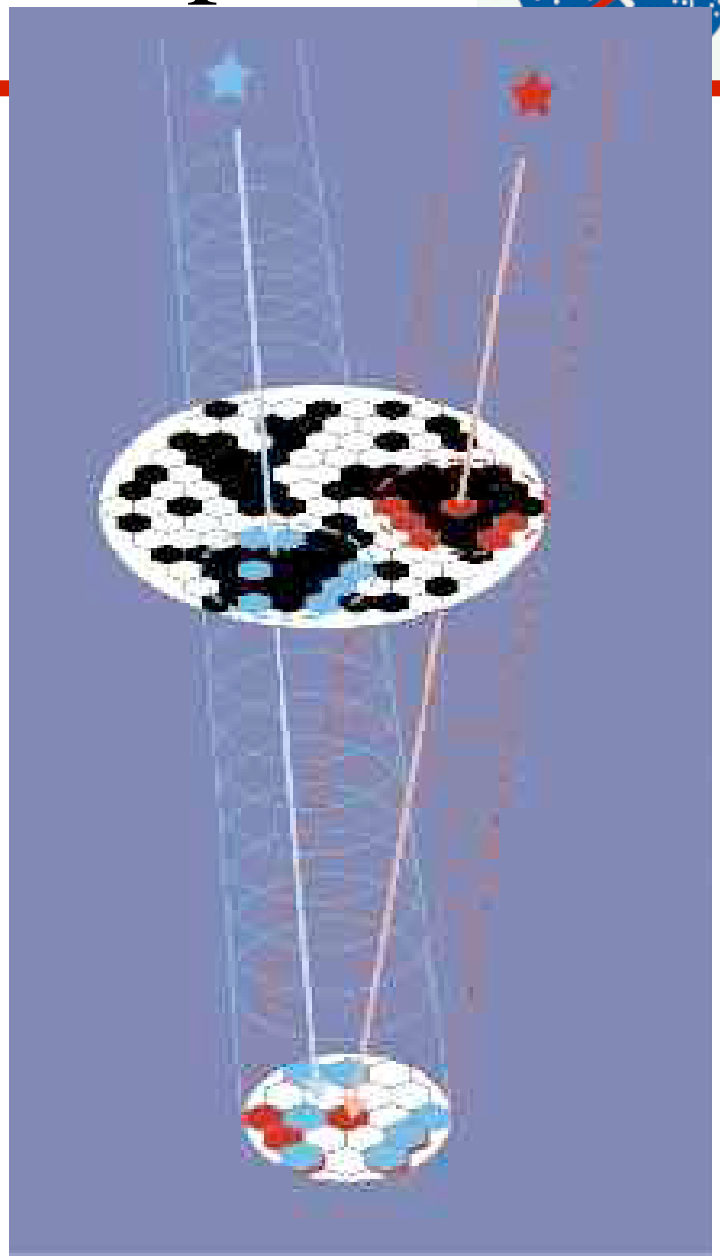


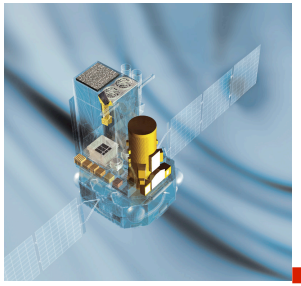


Coded Mask Principles



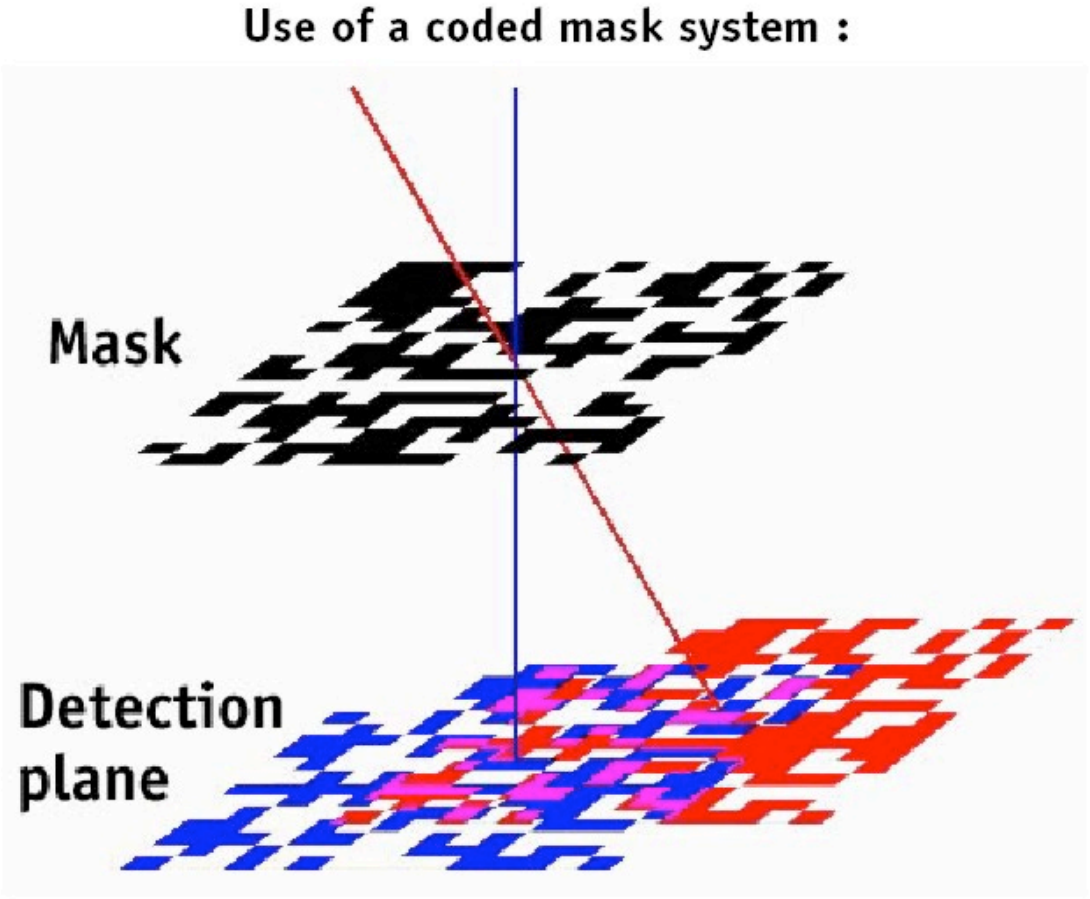
- 2 Main instruments, X-ray monitor use coded aperture technique to image
- Lots of details, but key points:
  - Always source confused
  - Not real “image”, more like probability density map
  - Various reconstruction methods, all w/benefits & tradeoffs

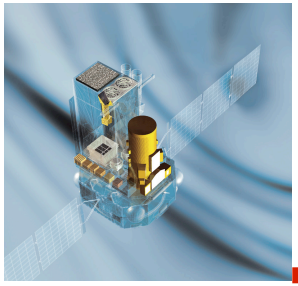




Coded Mask Principles

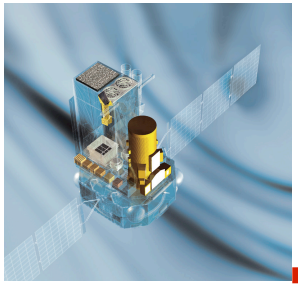
- Other issues, such as non-uniform detectors, non-uniform (time, spatial, spectral) backgrounds, partial transparencies & leakage, ghosts, etc…
- Could be whole workshop focus, but leave that for the aficionados …





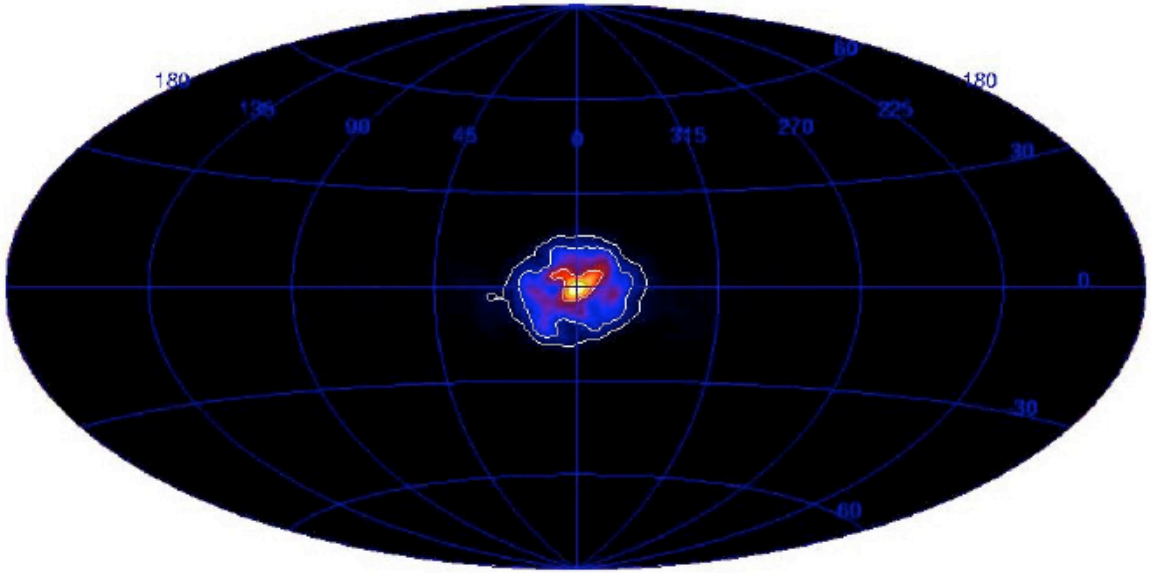
Scientific Accomplishments

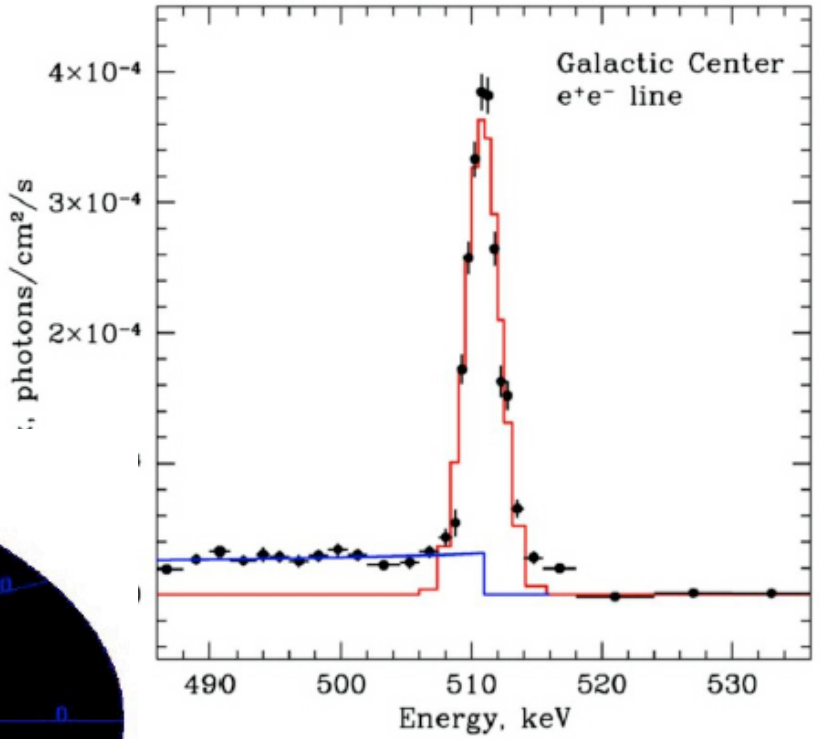
- e^+e^- map: ~8° FWHM, traces Gal Bulge, nominal disk component detection
- Gal plane monitoring, X-ray binaries; sg HMXBs?
- Galactic Ridge; ~20-100 keV component resolved?
- Sag A*, Sag B2 cloud
- ^{26}Al 1.8-MeV line profile resolved in Cygnus, inner Galaxy
- Lots more: fast/slow X-ray pulsars, Cas A lines, AGN samples

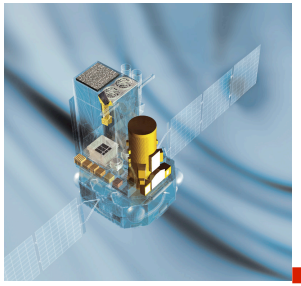


Scientific Accomplishments

- e^+e^- map: ~8° FWHM, traces Gal Bulge, nominal disk component detection
- Need 10^{43} e^+s^{-1}!!

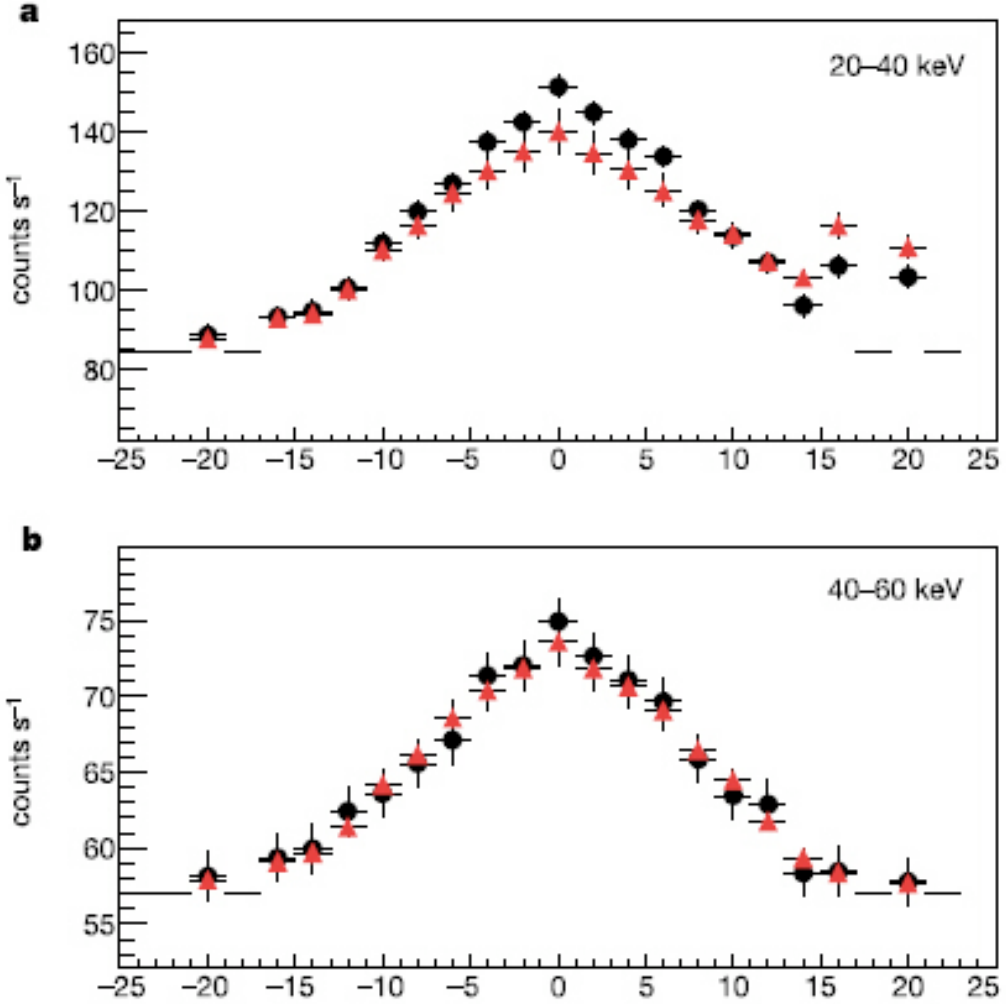


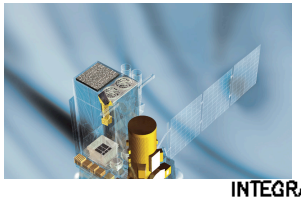




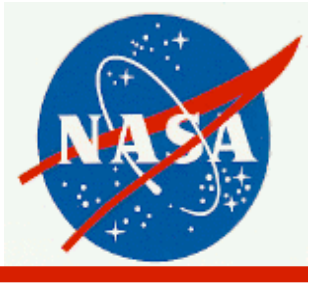
Scientific Accomplishments

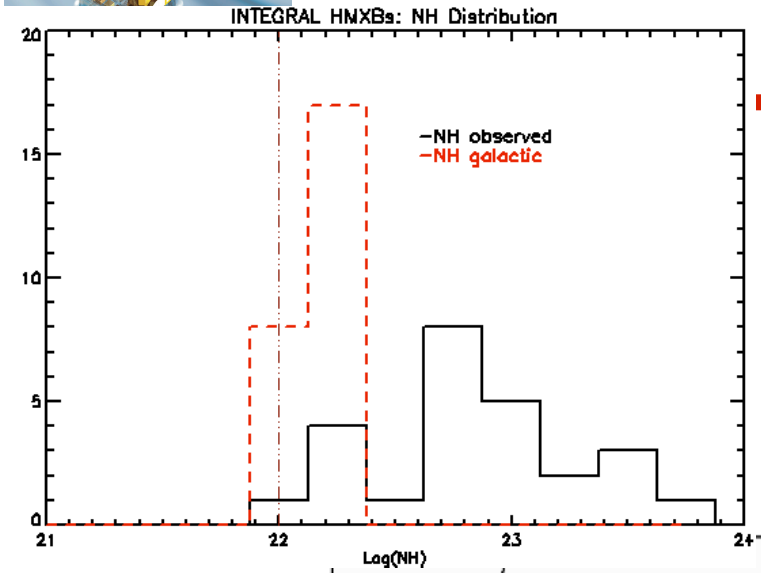
- Galactic Ridge; ~20-100 keV component resolved out?
- Why then are <10 keV X-rays 80% diffuse
- Also, still >400 keV diffuse component including Ps continuum?



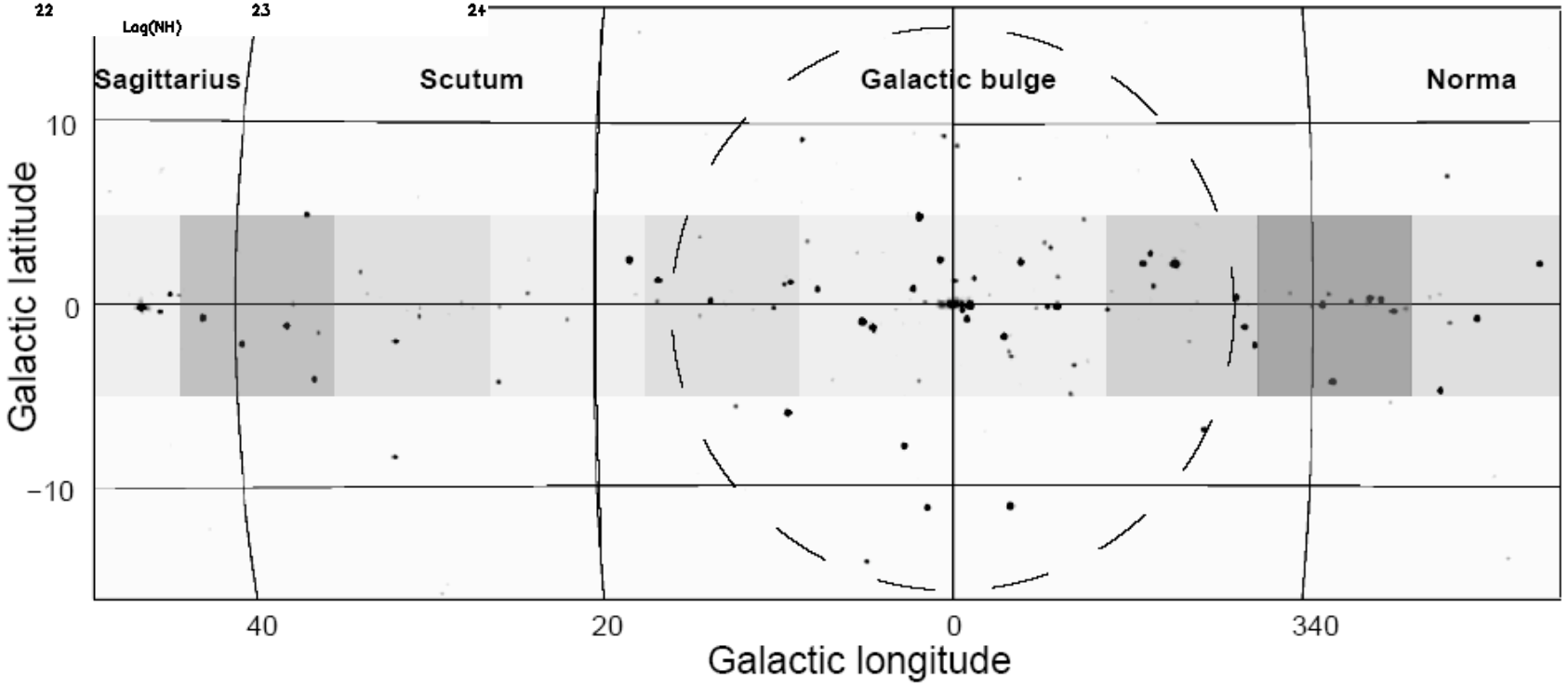


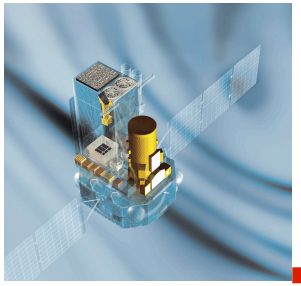
Scientific Accomplishments





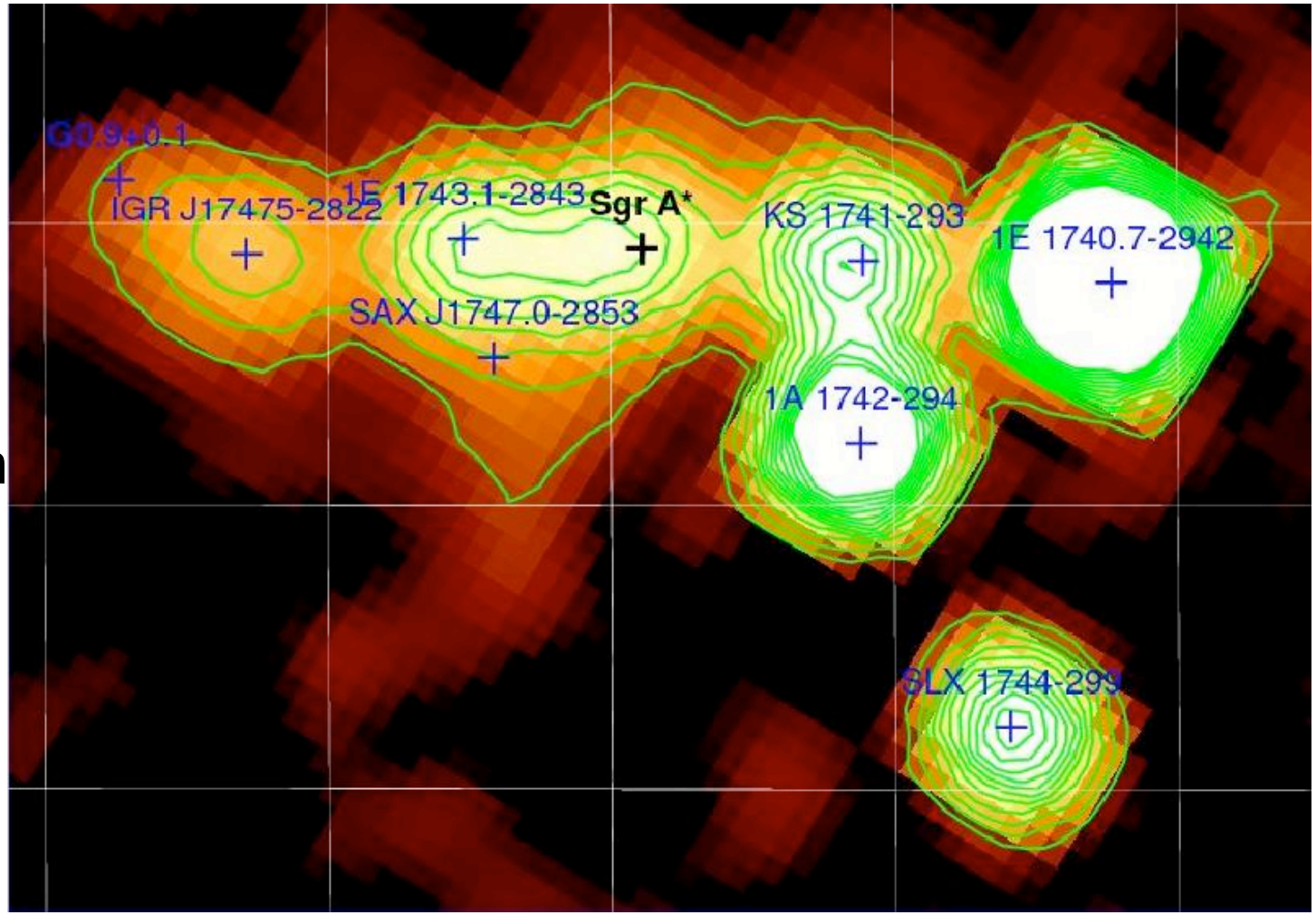
HMXBs: 2X sg systems, intrinsic absorption, trace star formation?

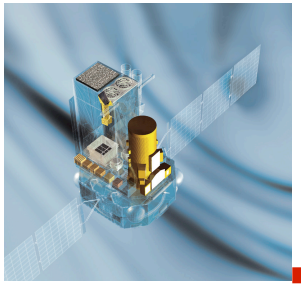




Scientific Accomplishments

IGR source consistent w/Sag A* position. Evidence for extended emission (UL on variability). Sag B2 MC: Compton mirror of earlier AGN phase?





AO-4 Schedule

- Next AO release in early March 06, with proposals due in late April
- AO-4 starts in August 2006
- Likely to be continued NASA support, but possibly at reduced levels
  - NASA 2006 SR determines FY06,07 budget
- Continuation of US archive/theory program???