X-ray Data Archives and Surveys

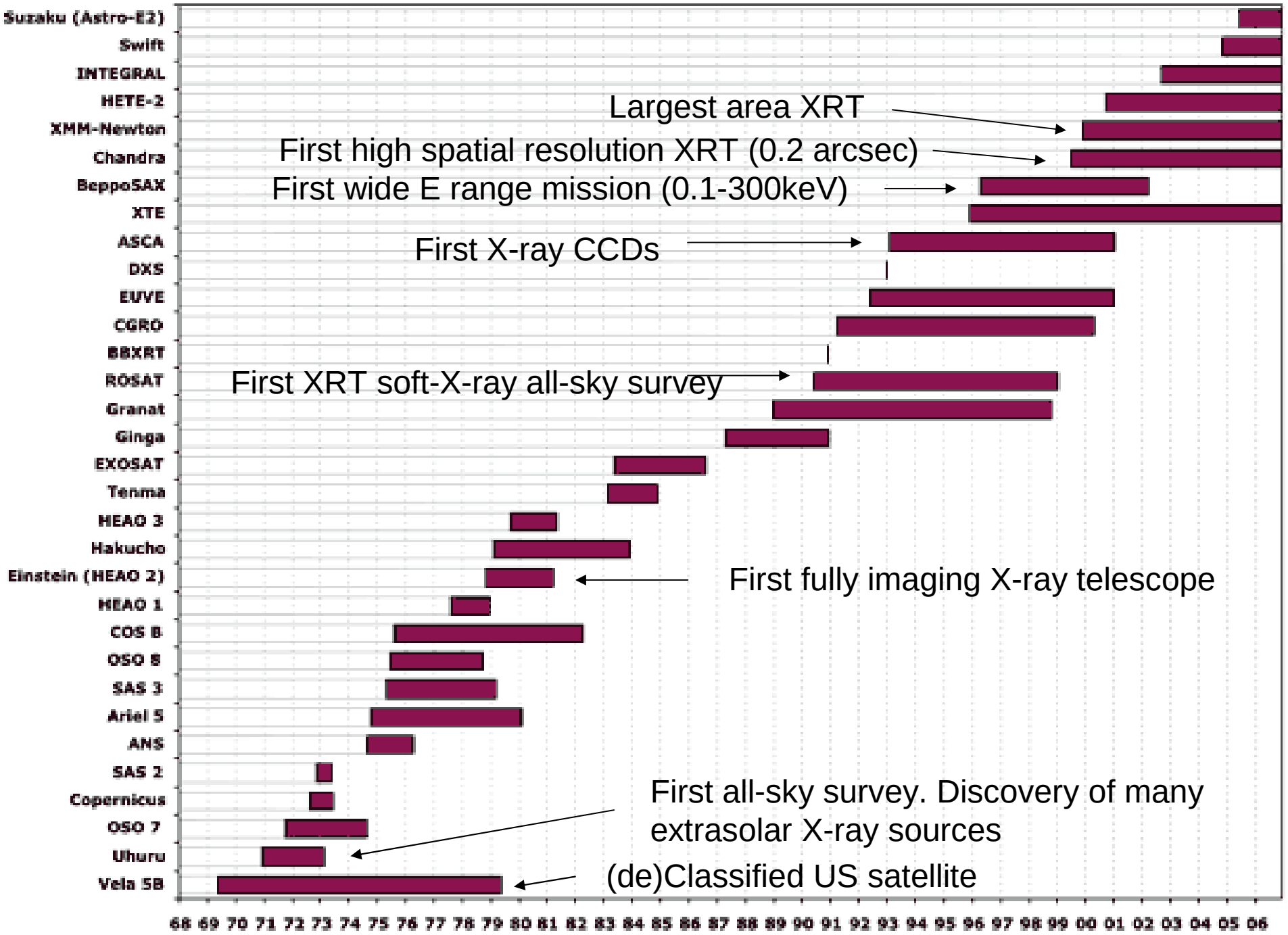
C. Motch

Observatoire de Strasbourg

Survey Science Center of the XMM-Newton satellite

Plan

- A short history of X-ray astronomy
- What can be done with archives ?
- X-ray surveys
- Data centers
- Where to go ?


Suzaku (Astro-E2)
Swift
INTEGRAL
HETE-2
XMM-Newton
Chandra
BeppoSAX
XTE
ASCA
DXS
EUVE
CGRO
BBXRT
ROSAT
Granat
Ginga
EXOSAT
Tenma
HEAO 3
Hakucho
Einstein (HEAO 2)
HEAO 1
COS B
OSO 8
SAS 3
Ariel 5
ANS
SAS 2
Copernicus
OSO 7
Uhuru
Vela 5B
Largest area XRT
First high spatial resolution XRT (0.2 arcsec)
First wide E range mission (0.1-300keV)
First X-ray CCDs
First XRT soft-X-ray all-sky survey
First fully imaging X-ray telescope
First all-sky survey. Discovery of many extrasolar X-ray sources
(de)Classified US satellite
68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06

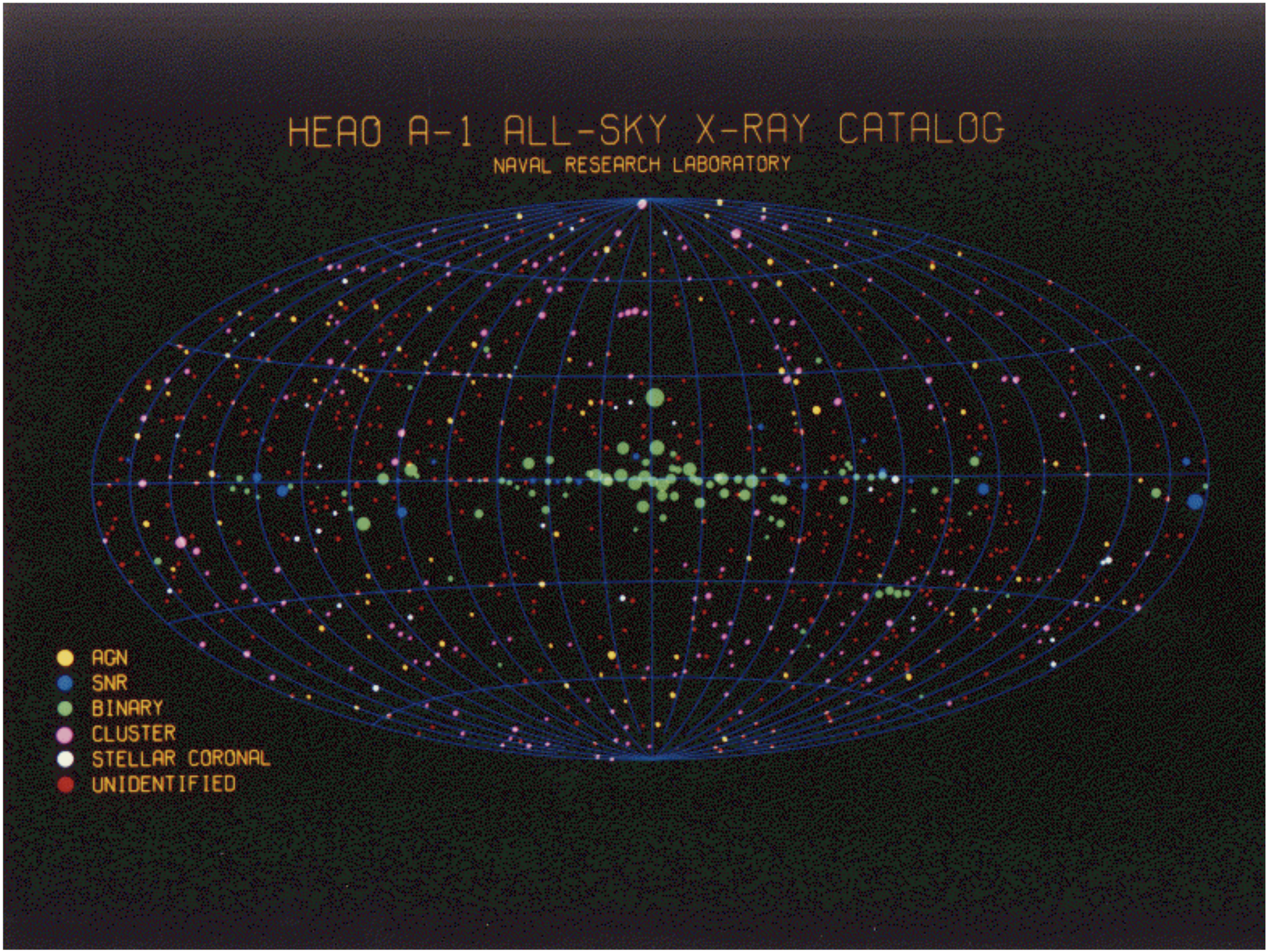
Compared capabilities of some X-ray satellites

Satellite	Mirror PSF	Mirror PSF	E range	A_e at 1 keV	Orbital target	Energy resolution	Field of View
	FWHM [″]	HEW [″]	[keV]	[cm^2][a]	visibility [hr]	at 1 keV [eV]	arcmin
XMM-Newton	6	15	0.15 - 15	4650[b]	36.7[c]	4 (RGS)	30
Chandra	0.2[d]	0.5[d]	0.1 - 10	555 (ACIS-S)	44.4[c]	1 (HETG)	17
ROSAT	3.5	7	0.1 - 2.4	400	1.3[e]	500	114
ASCA	73	174	0.5 - 10	350	0.9[e]	100	20
Suzaku	n.av.[g]	120	0.2 - 600	1760 (XIS)	0.72[e]	50	19
RXTE	n.a.	n.a.	2-250	5000 (6 keV)	1[e]	1125 (6keV)	60
Swift	8.8	18[f]	0.2-10 (XRT)	133.5	~0.8[e]	70	24

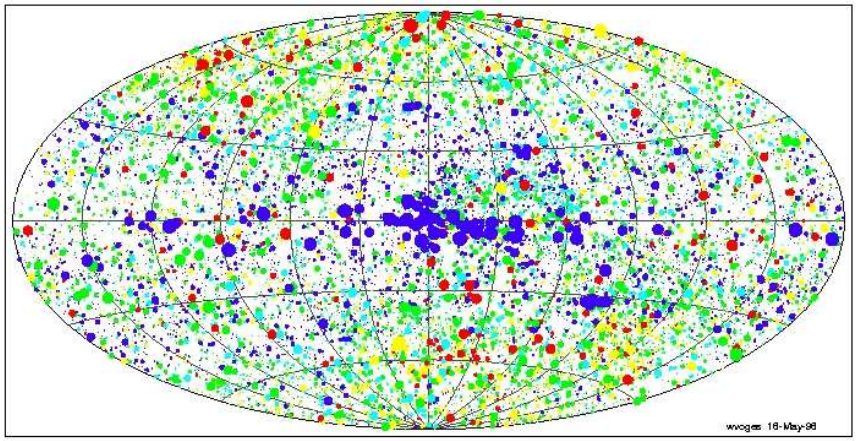
Surveys and Catalogues

Year	Catalogue Name	Nbr of Sources	E range (keV)	Area
1978	4th UHURU catalogue	378	2-20	All-Sky
1984	The HEAO A-1 X-Ray Source Catalog	842	0.25-25	All-Sky
1995	The 2E Catalogue	4809	0.5-4.5	-
1999	ROSAT All-Sky Bright Source Catalogue (1RXS)	18,806	0.2-2.4	All-Sky
2000	ROSAT All-Sky Survey Faint Source Catalog	105,924	0.2-2.4	All-Sky
2000	Second ROSAT PSPC Catalog	95,331	0.2-12	14.5%
2008	The XMM-Newton 2nd Incremental Source Catalogue	221,012	0.2-12	~420 deg^2
2009	Chandra Source Catalogue	136,000	0.2-6.0	~300 deg^2

Imaging wide field X-ray satellite provide the largest catalogues

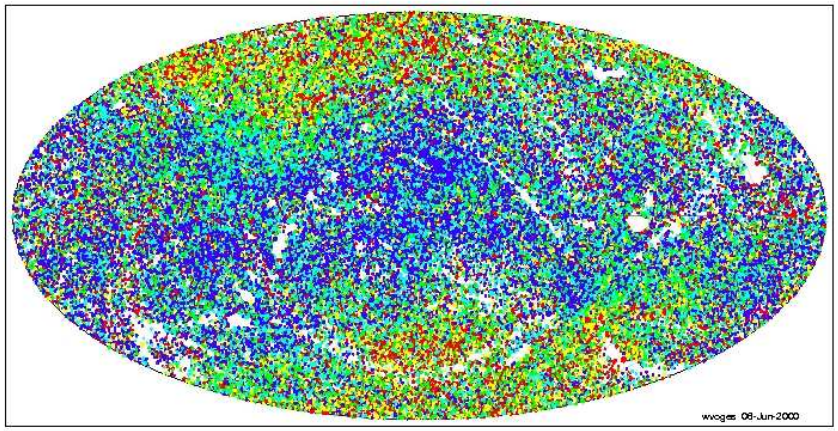

HEAO A-1 ALL-SKY X-RAY CATALOG
NAVAL RESEARCH LABORATORY
AGN
SNR
BINARY
CLUSTER
STELLAR CORONAL
UNIDENTIFIED

ROSAT All-Sky Survey Bright Source Catalogue



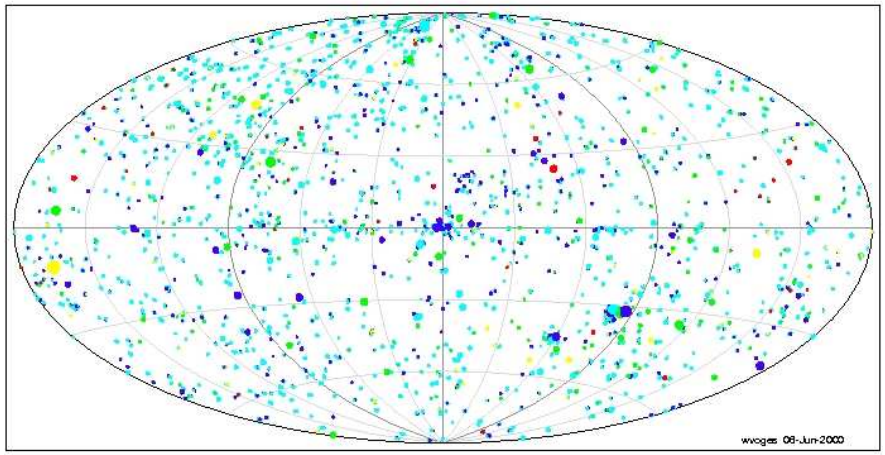
Energy range: 0.1 - 2.4 keV
Number of RASS-II sources: 19130
Hardness ratio: -1.0 | -0.6 | -0.2 | 0.2 | 0.6 | 1.0 (soft -> hard : red - yellow - green - blue - violet)

ROSAT All-Sky Survey Faint Source Catalogue



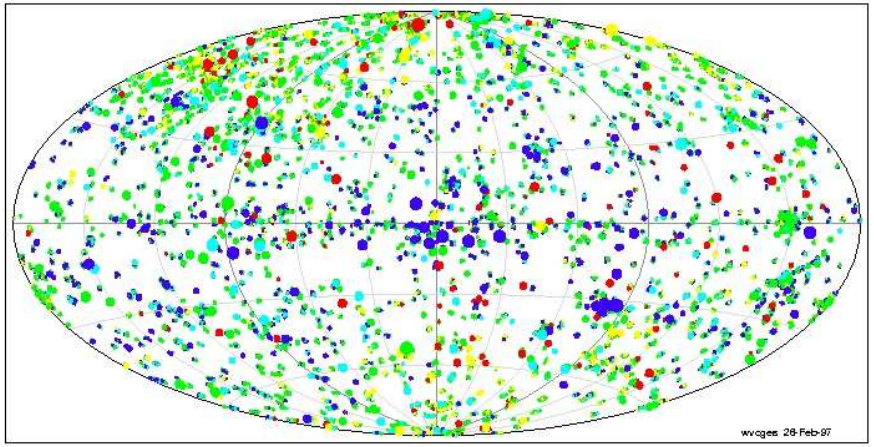
Energy range: 0.1 - 2.4 keV
Number of RASS-II sources: 105924
Hardness ratio: -1.0 | -0.6 | -0.2 | 0.2 | 0.6 | 1.0 (soft -> hard : red - yellow - green - blue - violet)

ROSAT HRI Catalogue



Energy range: 0.1 - 2.4 keV
Number of HRI sources: 27464
Hardness ratio: -1.0 | -0.6 | -0.2 | 0.2 | 0.6 | 1.0 (soft -> hard : red - yellow - green - blue - violet)

ROSAT PSPC Catalogue

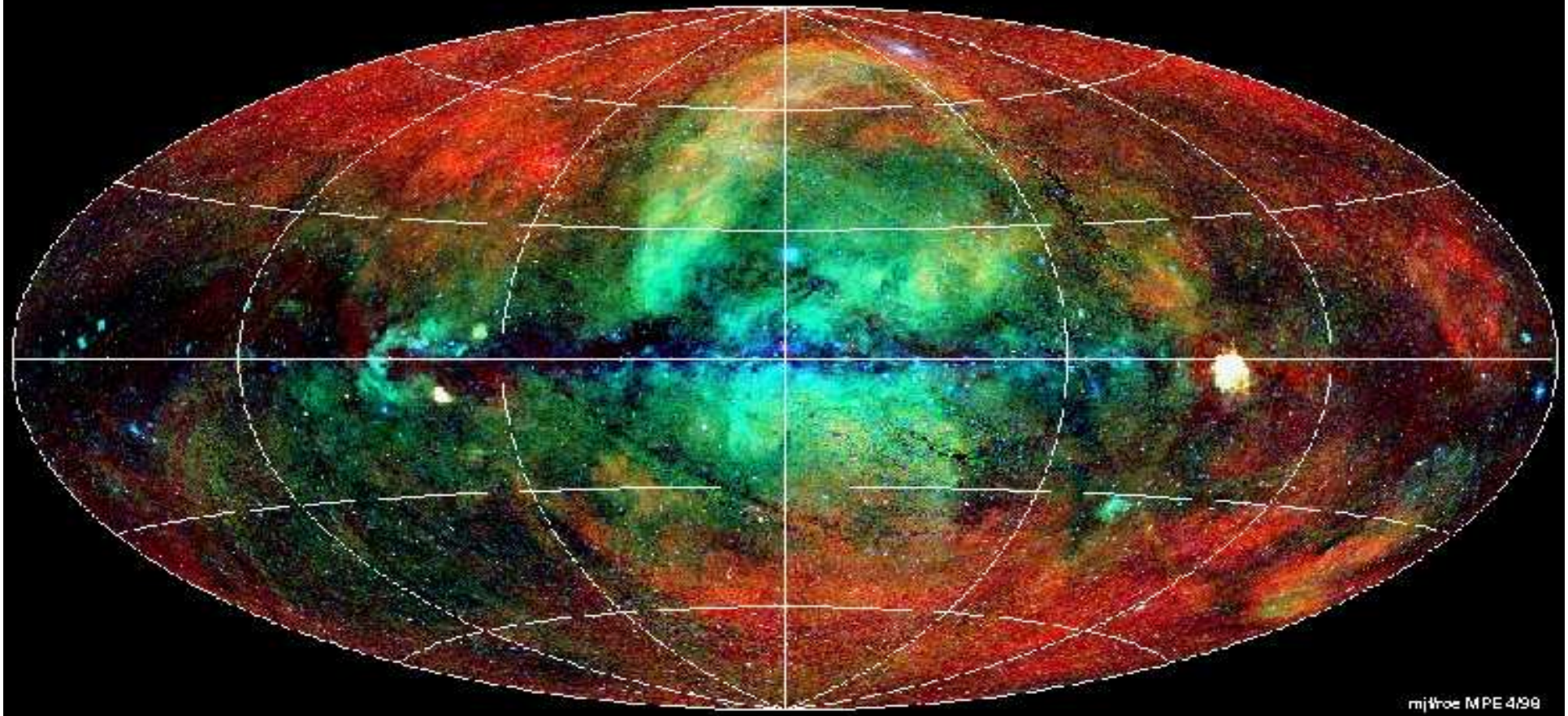


Energy range: 0.1 - 2.4 keV
Number of ROSAT sources: 82221
Hardness ratio: -1.0 | -0.6 | -0.2 | 0.2 | 0.6 | 1.0 (soft -> hard : red - yellow - green - blue - violet)

ROSAT PSPC ALL-SKY SURVEY Soft X-ray Background

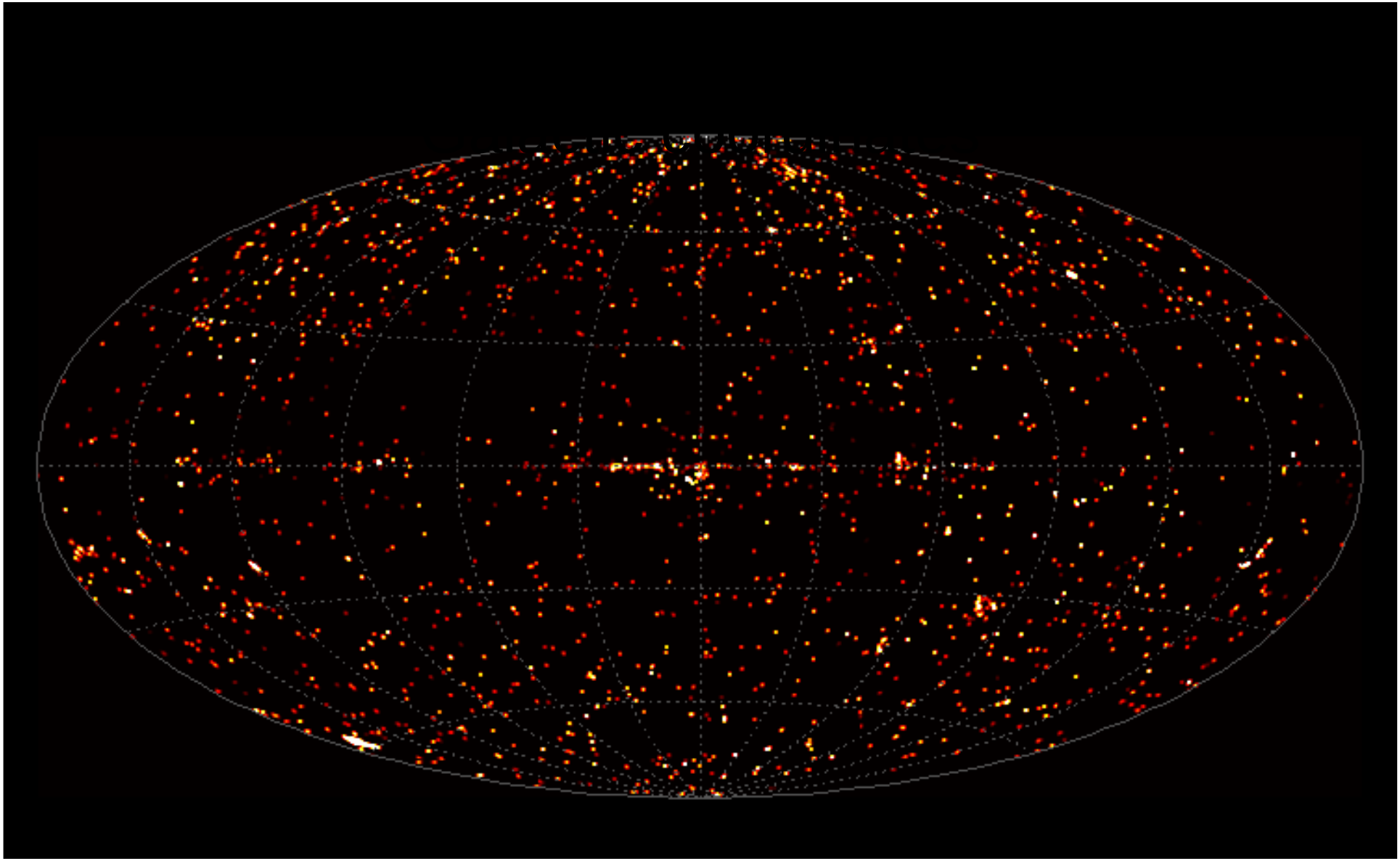
Aitoff Projection

Galactic II Coordinate System

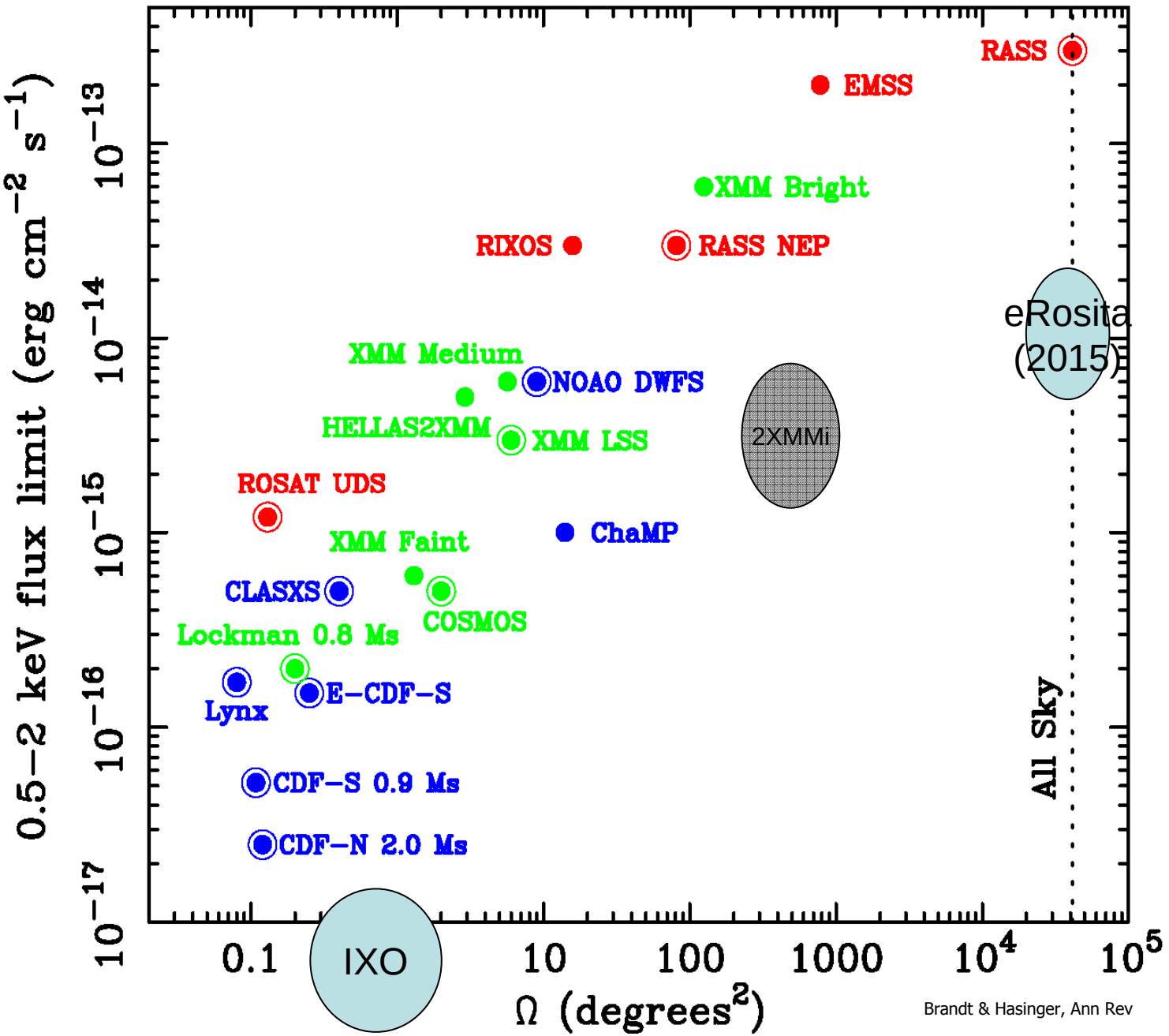


3-colour image:

red: 0.1-0.4 keV green: 0.5-0.9 keV blue: 0.9-2.0 keV



2XMMi, largest X-ray source catalogue ever produced



Brandt & Hasinger, Ann Rev

Why should we use X-ray data archives ?

- Light curves and spectral history of persistent sources (search for periodicities, period derivatives, characterisation of spectral transitions, etc..
- « Prediscovery » X-ray properties of interesting objects (e.g. new X-ray transients)
- Collect and study in an uniform manner large samples of X-ray sources of a given type (e.g. AGN, stars, etc..)
- Etc..

Data Centers

(no complete list here !)

- Space Agency databases
  - NASA : HEASARC (GSFC)
  - ESA : ESAC (Madrid)
  - ASI : ASDC (Roma)
  - JAXA : (Japan)
- Satellite specific databases
  - INTEGRAL : ISDC (Geneva)
  - Chandra : CXC (Boston)
  - Rosat : MPE (Garching)
- Multi-λ databases (mostly catalogues)
  - Vizier + Xcat-DB (Strasbourg)
  - LEDAS (Leicester)
  - See also NED and Simbad (e.g. access to literature)
- Virtual Observatory

  a way to simultaneously access distinct databases

  (see Mark Allen on Thursday)

HEASARC

The High Energy Astrophysics Science Archive Research Center

http://heasarc.gsfc.nasa.gov/

- Provides access to publicly available X- and gamma-ray datasets including general catalogs and datasets held at other data centers (e.g. Chandra and XMM-Newton).
- Delivers mission specific data reduction tools (e.g. ftools for RXTE, ASCA, etc..) and general analysis packages (e.g. ftools, Xronos, Xspec, etc.)
- Browse search engine:
  - Uniform interface for all satellites
  - Allows to search data archives and source catalogues simultaneously for several missions covering (X-ray, UV, Opt, IR, Radio)
- Batch processing and cross-correlation capabilities.

Archive

HEASARC Browse

Tip Archive | Hera | HELP

Other Browse interfaces:
Notification Service New! | Batch | Correlation | Index of all tables | Keyword Search

Query File And Session Uploads

Main Search Form > Search Results > Choose Data Products

Start Search | Reset | Detailed Mission/Catalog Search

1. Do you want to search around a position ... ?
(If you want to search on parameters other than object name or coordinates, select "Detailed Mission/Catalog Search".)

Object Name Or Coordinates: [ ] and/or Select Local File: [ ] Parcourir...

e.g. **Cyg X-1** or
12 00 00, 4 12 6 or
Cyg X-2; 12.235, 15.345 (Note use of semi-colons (;) to separate multiple object names or coordinate pairs)

File should contain objects and/or coordinate pairs one per line or separated by semi-colons.

Coordinate System: J2000

Search Radius: Default arcmin

Default uses the optimum radius for each catalog searched.

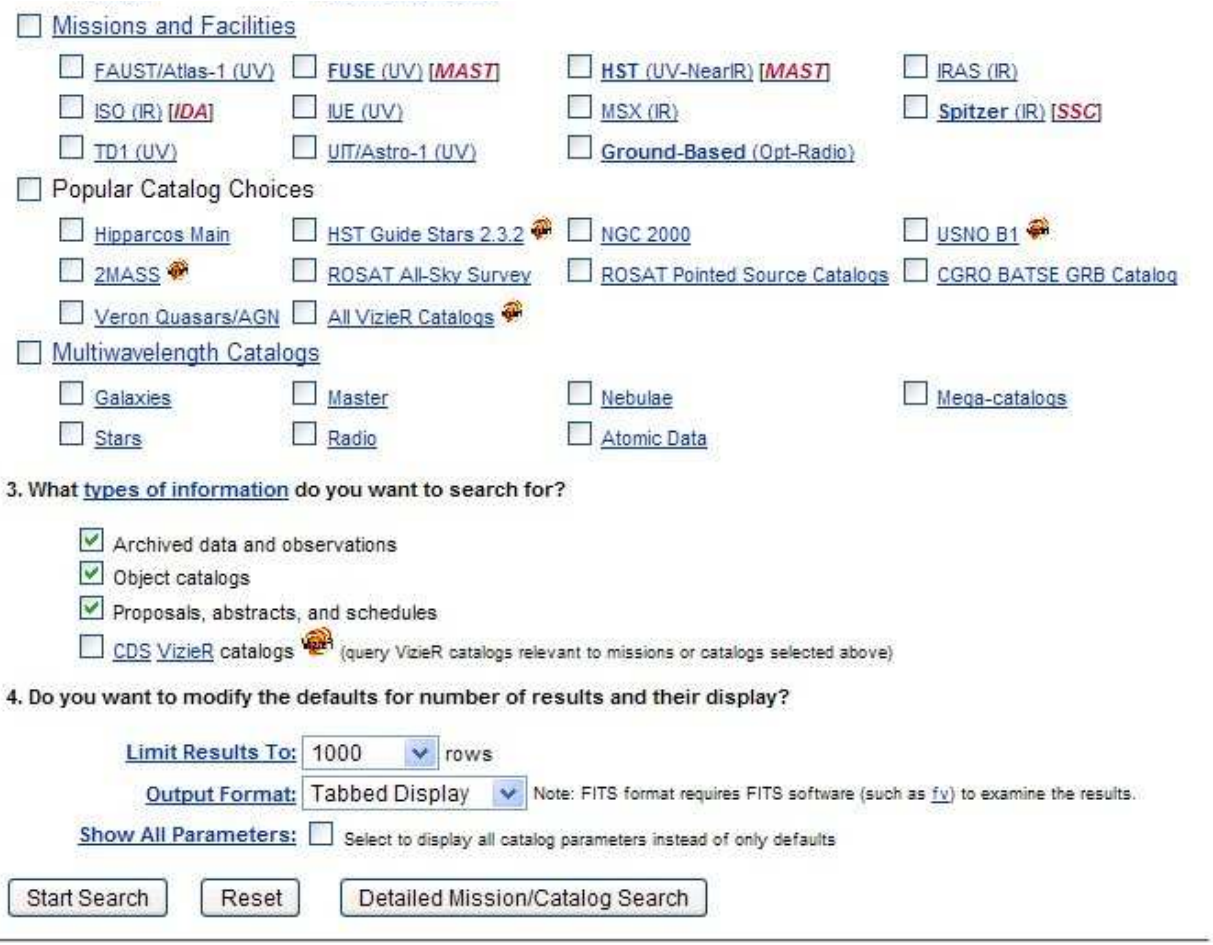
... and/or search by date?

Observation Dates: [ ] YYYY-MM-DD hh:mm:ss or MJD: DDDDD.ddd

The time portion of the date is optional. Separate multiple dates/ranges with semicolons (;).
Range operator is '..'. (e.g. 1992-12-31; 48980.5; 1995-01-15 12:00:00; 1997-03-20 .. 2000-10-18)

2. What missions and catalogs do you want to search? (Bold text indicates mission is active)

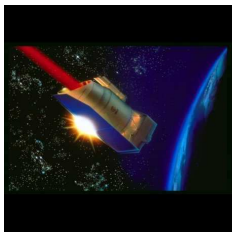
- [ ] Most Requested Missions
  - [ ] **Chandra** [*CXC*]
  - [ ] **Fermi**
  - [ ] ROSAT
  - [ ] **RXTE**
  - [ ] **Suzaku**
  - [ ] **Swift**
  - [ ] **WMAP**
  - [ ] **XMM-Newton** [*XSA*]
- [ ] Other X-Ray and EUV Missions
  - [ ] Ariel V
  - [ ] ASCA
  - [ ] BeppoSAX
  - [ ] BBXRT/Astro-1
  - [ ] Copernicus
  - [ ] Einstein
  - [ ] EUVE
  - [ ] EXOSAT
  - [ ] Ginga
  - [ ] HEAO 1
  - [ ] OSO8
  - [ ] SAS 3
  - [ ] Uhuru
  - [ ] Vela 5B
- [ ] Other Gamma-Ray Missions
  - [ ] CGRO
  - [ ] COS B
  - [ ] **HETE-2**
  - [ ] **INTEGRAL** [*ISDA*,*ISDC*]
  - [ ] SAS 2
  - [ ] Gamma-Ray Bursts

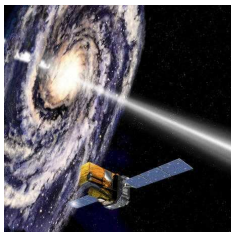

Missions and Facilities
FAUST/Atlas-1 (UV)
FUSE (UV) [MAST]
HST (UV-NearIR) [MAST]
IRAS (IR)
ISO (IR) [IDA]
IUE (UV)
MSX (IR)
Spitzer (IR) [SSC]
TD1 (UV)
UIT/Astro-1 (UV)
Ground-Based (Opt-Radio)
Popular Catalog Choices
Hipparcos Main
HST Guide Stars 2.3.2
NGC 2000
USNO B1
2MASS
ROSAT All-Sky Survey
ROSAT Pointed Source Catalogs
CGRO BATSE GRB Catalog
Veron Quasars/AGN
All VizieR Catalogs
Multiwavelength Catalogs
Galaxies
Master
Nebulae
Mega-catalogs
Stars
Radio
Atomic Data
3. What types of information do you want to search for?
Archived data and observations
Object catalogs
Proposals, abstracts, and schedules
CDS VizieR catalogs
(query VizieR catalogs relevant to missions or catalogs selected above)
4. Do you want to modify the defaults for number of results and their display?
Limit Results To:
1000
rows
Output Format:
Tabbed Display
Note: FITS format requires FITS software (such as fv) to examine the results.
Show All Parameters:
Select to display all catalog parameters instead of only defaults
Start Search
Reset
Detailed Mission/Catalog Search

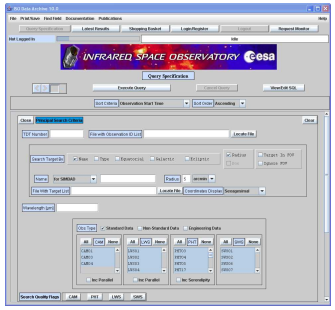
ESAC

European Space Astronomy Center

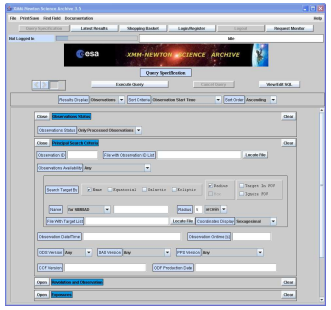
- ESAC is the Centre where most of ESA Scientific Directorate's Scientific Archives are developed, maintained and operated.
- The XMM-Newton SOC at ESAC and the SSC provide specific analysis sofware (SAS) and calibrations.





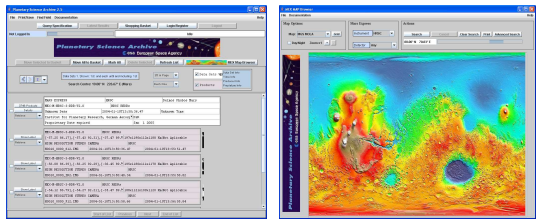


ISO Data Archive
Since December 1998



XMM-Newton Science Archive
Since April 2002

Integral SOC Science Data Archive
Since July 2005



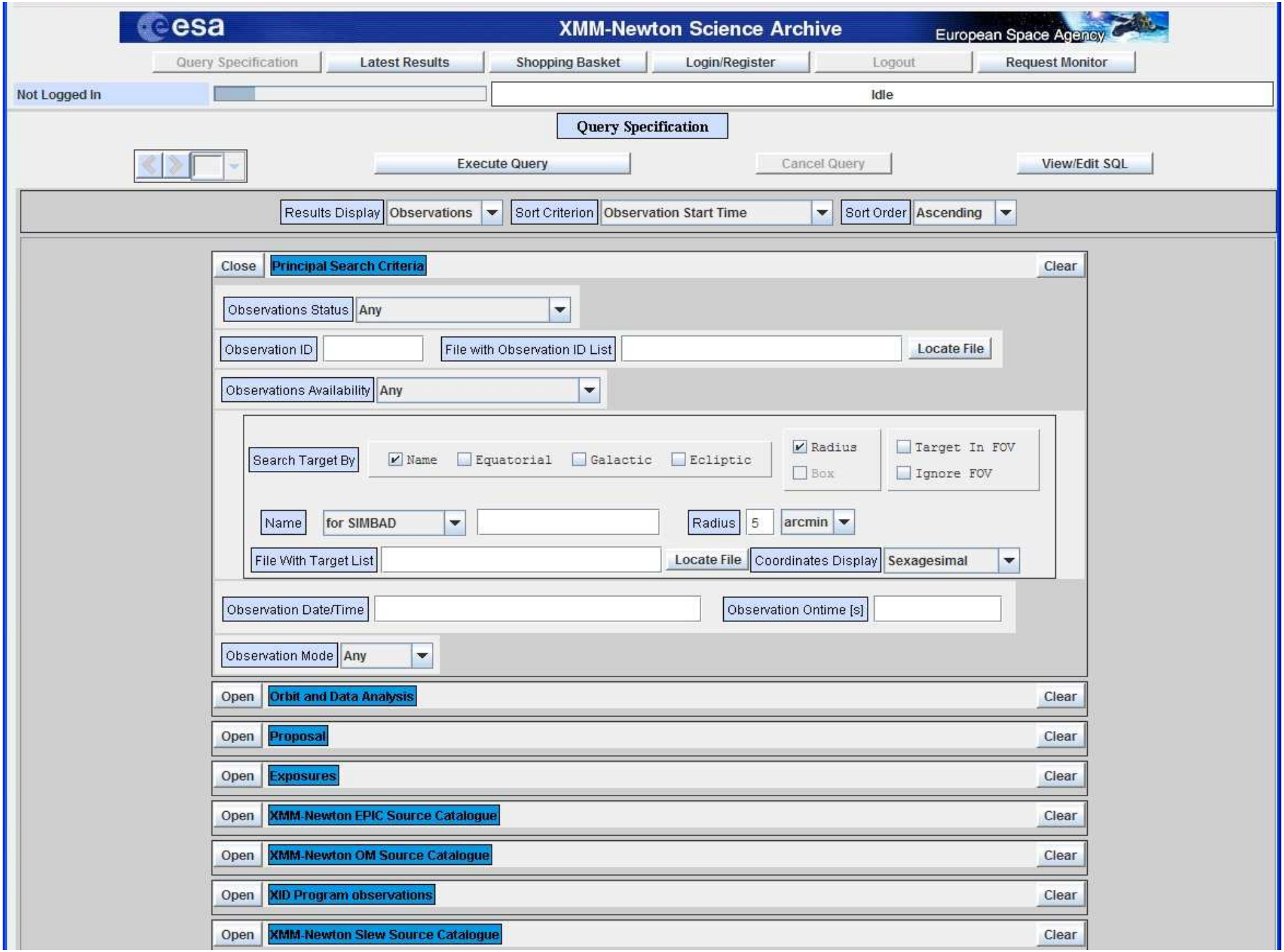
Planetary Science Archive
Giotto, Mars Express
Rosetta, Venus Express
Smart-1, Huygens
Since March 2004

Herschel, Planck, GAIA, … in the future

The XMM-Newton Science Archive (XSA)

http://xmm.esac.esa.int/xsa/

- Provides access to XMM-Newton data, associated data (eg optical images from the source ID program) and sources catalogues
- Query possible on many observation, X-ray source and processing parameters
- Allows for some interacting processing (spectra and light curve extractions)


esa
XMM-Newton Science Archive
European Space Agency
Query Specification
Latest Results
Shopping Basket
Login/Register
Logout
Request Monitor
Not Logged In
Idle
Query Specification
Execute Query
Cancel Query
View/Edit SQL
Results Display
Observations
Sort Criterion
Observation Start Time
Sort Order
Ascending
Close
Principal Search Criteria
Clear
Observations Status
Any
Observation ID
File with Observation ID List
Locate File
Observations Availability
Any
Search Target By
Name
Equatorial
Galactic
Ecliptic
Radius
Box
Target In FOV
Ignore FOV
Name
for SIMBAD
Radius
5
arcmin
File With Target List
Locate File
Coordinates Display
Sexagesimal
Observation Date/Time
Observation Ontime [s]
Observation Mode
Any
Open
Orbit and Data Analysis
Clear
Open
Proposal
Clear
Open
Exposures
Clear
Open
XMM-Newton EPIC Source Catalogue
Clear
Open
XMM-Newton OM Source Catalogue
Clear
Open
XID Program observations
Clear
Open
XMM-Newton Slew Source Catalogue
Clear

DARTS: Data Archives and Transmission System

http://www.darts.isas.ac.jp/

- System for all japanese satellites (excluding Hakucho) and including Suzaku
- Search by position, observation dates, etc by mission. Quick look facilities
- Most advanced query forms are for Suzaku and ASCA

Help (EN) , (JP)

SUZAKU MASTER

SEARCH | RESET | GET URL *New!*

Output List (more info)

Maximum number of rows: 100 | Sorted by: OBSID + | Line is: Short | *New!* Format is: HTML

☐ **Data Status** (more info)

Data Proprietary: Any | PROCESSING_STATUS: Any

☐ **Position Search** (more info)

Search Area: XIS field of view | Radius: 30 arcmin

Target Name

e.g. M31, NGC1399

Coordinate: Equatorial J2000

e.g. "86.63 22.01" , "05h34m31s +22d00m52.0s" , "05:34:31 +22:00:52"

☐ **Parameter Ranges** (more info)

Name	Lower limit	Upper limit	Description
RA			Right ascension (J2000 decimal deg.)
DEC			Declination (J2000 decimal deg.)
LII			Galactic Longitude (degree)
BII			Galactic Latitude (degree)
ROLL_ANGLE			Roll Angle (degree)
EXPOSURE			Effective Total Observation Exposure (s)
HXD_EXPO			HXD All Clock Rate Effective Exposure on Source (s)

ASI Science Data Center (ASDC)

http://www.asdc.asi.it/

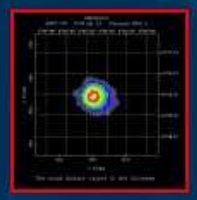
- Mainly dedicated to ASI involved missions (BeppoSAX, AGILE, etc)
- Multi-mission archive (XMM, ROSAT, Chandra, etc…)
- Offers multi-λ services
  - Data explorer to overlay various external catalogues and images on the selected observation
  - Allows SED to be constructed

Home
ASDC Info
Astrophysics
Solar System
Interactive Data Archives
ASDC Source Catalogs
ASDC Conferenc
Tools
Related Links
How to get there
Quick data retrieval
Helpdesk

AGILE Public Data Now Available

Now available: AGILE-GRID public software package and test dataset

Swift discovers the most distant object in the Universe



Fermi-LAT Bright Source List

AGILE First Catalog now available

Meeting Nazionale Fermi

ASDC Multi-Mission Interactive Archive

agenzia spaziale italiana

AGILE | Swift | XMM | Chandra | BeppoSAX | Previous X-Ray Missions

Mission Selected
AGILE

Search Type
Coordinates
Time
Parameter

Enter source name or coordinates: ◉ RA, DEC ○ L, B
(e.g. CYGX-1 or 19 58 21.7, +35 12 05.8 or 299.590333, 35.201611 or 71.334960, 3.06

Radius 30 (degrees)

Output sorted by ◉ RA ○ DEC

Max lines retrieved 300

Equinox ◉ 2000 ○ 1950

Submit

The ROSAT archive at MPE

http://www.xray.mpe.mpg.de/rosat/archive/index.html

- The MPE at Garching hosts a specific database for the ROSAT satellite
  - Search data sets by coordinates and observation parameters
  - Select sources from the various ROSAT catalogues
  - ROSAT specific software (eXsas)
  - Tool to extract all-sky survey and pointed observations images in various format

The ROSAT X-Ray All-Sky Survey

2001-Aug-09: Release of the Completed ROSAT Source Catalogs of Pointed Observations
2000-May-23: RASS Faint Source Catalogue Released!

Help ... Non-Expert Users ... Updates ... ||| ... xray@mpe

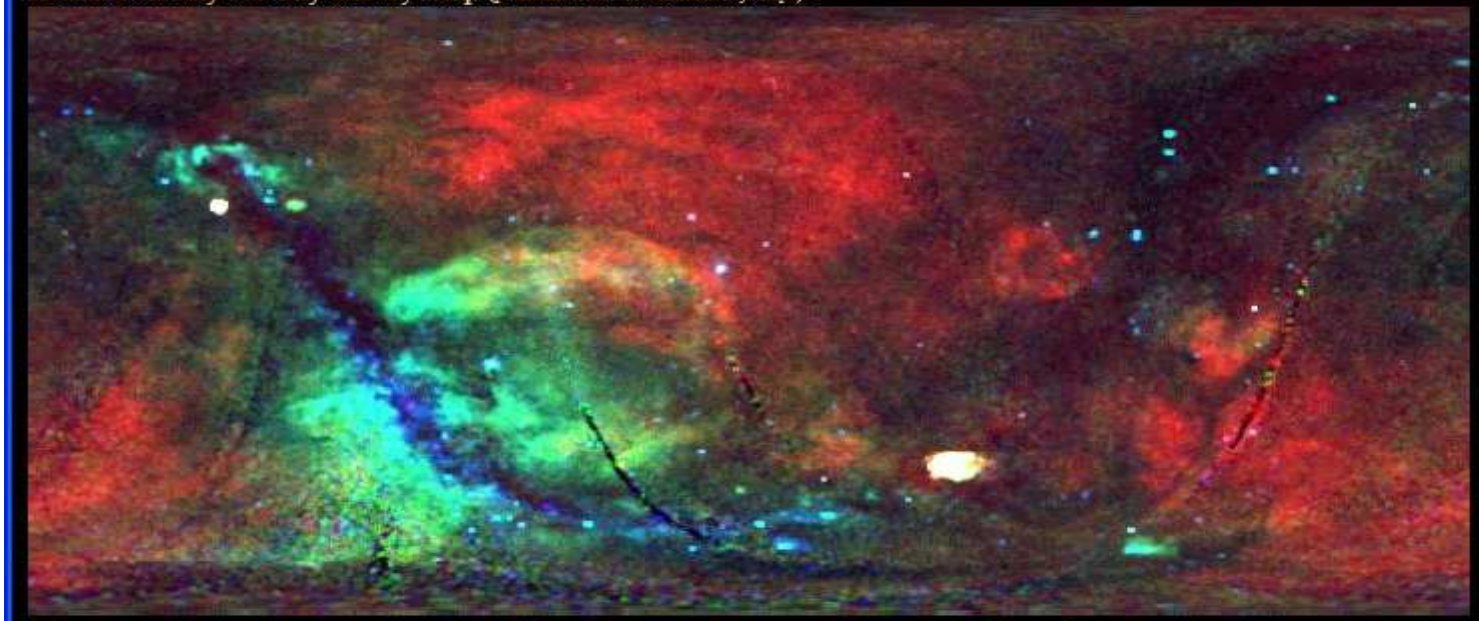
Requested product: X-ray color image (active FOV) from PSPC all-sky survey (s)

Coordinates lon. = 9h55m23s , lat. = 69d01m11s , equatorial crd, equ. 2000

ATTENTION

To check if your browser returns the correct coordinates click on the lower right corner. The selected field should be 933301p
Netscape, Mozilla and Firefox work fine. Problems exist for Konqueror and Internet Explorer

ROSAT X-Ray All-Sky Survey Map (point and click for detailled sky maps):



Data

Zone-wise Field Lists
Complete Field List
Anonymous ftp
All-Sky Maps

Tools

RASS Field Conversion
ROSAT Sequence Browser
ROSAT Source Browser
ROSAT Data Browser

Projects

Bright Source Catalogue
Faint Source Catalogue
Soft X-ray Diffuse Background
ROSAT All-Sky Survey Links

The Chandra X-Ray Center (CXC)

http://asc.harvard.edu/

- Operated for NASA by the Smithsonian Astrophysical Observatory
- Provides Chandra specific software (CIAO) and calibration files
- Access to the Chandra source catalogue (CSCview)
- Offers access to all the Chandra datasets using interfaces tailored for Chandra:
    - ChaSeR: A java based tool and the main CDA Search and Retrieve interface that provides access to all data products
    - Web ChaSeR WEB based, less flexible and sophisticated than Chaser
    - Chandra Fast Image: quick access to images and event files

Chandra X-ray Center

Observation Search

New Search | Retrieval List | Help

Search | Reset

Target Name | Resolve Name | RA/Long/l | Dec/Lat/b | Radius 10 arcmin

Name Resolver: SIMBAD/NED | Coordinate System: Equatorial J2000 | Equinox: 2000

Observation ID | Sequence Number | Proposal Number

Proposal Title | PI Name | Observer Name

Start Date | Public Release Date | Exposure Time (ks)

Status: Archived, Observed, Scheduled, Unobserved, Canceled

Science Category: Solar System, Stars and WD, WD Binaries and CV, BH and NS Binaries, SN, SNR and Isolated NS

Joint Observatories: None, HST, NOAO, NRAO, RXTE

Instrument: ACIS-I, ACIS-S, HRC-I, HRC-S

Grating: None, LETG, HETG

Type: GO, GTO, TOO, DDT, CAL

Observing Cycle: A00, A01, A02, A03, A04

Grid

Customize Output:

Sort Order: Status | ascending | descending

Display: Format: HTML | Row Limit: 50

Coordinate System: Equatorial J2000 | Equinox: 2000 | Format: Sexagesimal (hh/dd mm ss.ss)

For online support please contact the CXC Helpdesk.

Chandra X-ray Center

Search Results

New Search | Retrieval List | Help

View Observation Information | Add to Retrieval List | Primary products | Secondary products

Select all | Unselect all

Select	Row	Seq Num	Obs ID	Instrument	Grating	Appr Exp (ks)	Exposure (ks)	Target Name	PI Name	RA	Dec	Status	Data Mode	Start Date	Publi
☐	1	500027	731	ACIS-S	NONE	10.0	10.28	RBS 1223	HASINGER	13 08 48.60	+21 27 08.60	archived	VFAINT	2000-06-24 10:48:55	2001
☐	2	500240	2790	ACIS-I	NONE	20.0	19.46	RX J1308+2127	Motch	13 08 48.20	+21 27 07.50	archived	FAINT	2002-05-21 01:50:54	2003
☐	3	500420	4595	HRC-S	LETG	100.0	90.83	RBS1223	Predehl	13 08 48.30	+21 27 06.80	archived		2004-03-30 20:00:31	2005
☐	4	500516	5522	ACIS-S	NONE	15.0	15.96	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-02-14 14:02:47	2006
☐	5	500517	5523	ACIS-S	NONE	5.0	5.68	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-02-15 13:16:52	2006
☐	6	500518	5524	ACIS-S	NONE	5.0	5.17	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-02-19 03:15:40	2006
☐	7	500519	5525	ACIS-S	NONE	5.0	5.64	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-03-10 00:01:26	2006
☐	8	500520	5526	ACIS-S	NONE	15.0	15.19	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-07-09 04:05:43	2006
☐	9	500521	5527	ACIS-S	NONE	5.0	5.07	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-07-10 05:17:22	2006
☐	10	500522	5528	ACIS-S	NONE	5.0	5.19	RX J1308.8+2127	Kaplan	13 08 48.30	+21 27 06.80	archived	CC33_FAINT	2005-07-14 17:34:40	2006

12 observations found

Change Search Criteria

Position=cone of radius 10 arcmin around RA: 13 08 48.70, Dec: +21 27 08.00 (frame=j2000 equinox=2000)
Status=archived; observed; scheduled; unobserved
Sort Order=Status ascending

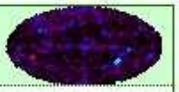
Multi λ databases: Vizier

http://vizier.u-strasbg.fr/

- Catalogues only !
- Harbours 7504 catalogues, among which 531 contain X-ray data (main stream catalogues, + many articles tables)
- Search by position and constraints on any combination of parameters common to the group of catalogues searched
- Provides catalogue “ReadMe”, literature and footprints
- Catalogues extracts in VO tables, FITS, ASCII, etc..
- Has multiple clones for easy access

IX/30 — Second ROSAT PSPC Catalog (ROSAT, 2000)

Similar Catalogues | ReadMe



1.IX/30/2rxp — The 2RXP Catalog *(95331 rows)*

Other tables in this catalogue: IX/30/seqp (The sequences of observations)

Query Setup *(usage)*

Maximum Entries per table: 50 | Output layout: HTML Table | Output Order: + / - | Reset All

Query by Position on the Sky *(Adapt Form to use a List of targets)*

Target Name (resolved by Simbad) or **Position**: Clear | J2000 | Target dimension: 2 arcmin | Submit Query

Position in Sexagesimal, or Decimal ° | Radius or Box size

Output preferences for Position:

	r	x,y	Position	Galactic	J2000	B1950	Ecl.J2000	none
Compute	☑	☐	☑	☐	☐	☐	☐	
Sort by	◉	○	○	○	○	○	○	○

r and **x,y** are the distance to the Target; **Position** is in the same coordinate system as **Target**.

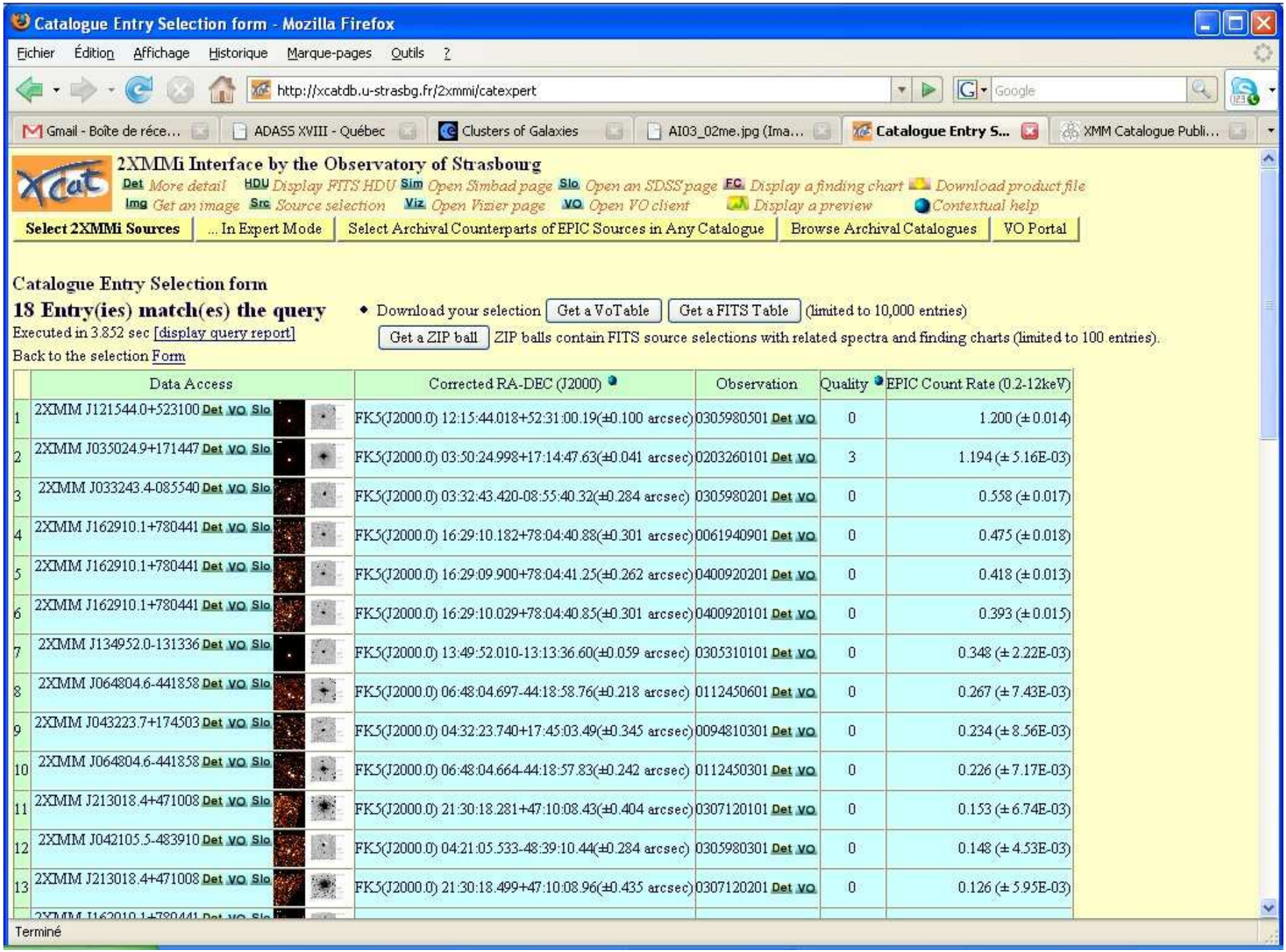
Query by Constraints applied on Columns

Show	*Sort*	*Column*	Clear *Constraint*		*Explain* *(UCD)*
☐	○	recno			Record number within the original table (starting from 1) (meta.record) (RECORD)
☐	○	Seq		(char)	ROSAT detection sequence number (meta.id) (ID_NUMBER)
☑		S		(char)	[S] for source in "short" catalog *(Note)* (meta.code) (CODE_MISC)
☑		m_2RXP		(char)	[a-l] Multiplicity index *(Note)* (meta.code.multip) (CODE_MULT_INDEX)
☑	○	2RXP		(char)	2RXP designation (Jhhmmss.s+ddmmss) *(Note)* (meta.id;meta.main) (ID_MAIN)
☐	○	ErrPos		arcsec	(n) Error in position *(Note G1)* (stat.error) (ERROR)
☑	○	Crate		ct/s	Estimate of net count rate (phot.count;em.X-ray) (PHOT_COUNT-RATE_X)
☐	○	e_Crate		ct/s	(n) Error of Crate *(Note G1)* (stat.error) (ERROR)
☐	○	LhMdet			Source likelihood from the L/MDETEC algorithm (MD_LIKE, truncated at 999.9) (stat.likelihood) (STAT_LIKELIHOOD)
☐		oax		arcmin	Off-axis angle averaged over observation (instr.offset) (INST_ANG_OFFAXIS)
☐	○	ExpTime		s	Exposure time (time.duration;obs.exposure) (TIME_EXPTIME)
☐ ALL cols	Reset All		Clear		(n) indicates a possible blank or NULL column — Submit Query
☐		Var		(char)	[NTP] Source variability flag: Negative / Too few / Possible (meta.code;src.var) (CODE_VARIAB)

Multi λ databases: XCat-DB

http://amwdb.u-strasbg.fr/2xmmi/

- Tailored to the 2XMMi catalogue
- XMM-Newton SSC interface
- Provides access to catalogue and pipeline products
- Offers cross-correlations with archival catalogues and true probabilities of identifications (not just unqualified cross-matches)
- Complex queries in expert mode



	Data Access	Corrected RA-DEC (J2000)	Observation	Quality	EPIC Count Rate (0.2-12keV)
1	2XMM J121544.0+523100 Det VO Slo	FK5(J2000.0) 12:15:44.018+52:31:00.19(±0.100 arcsec)	0305980501 Det VO	0	1.200 (± 0.014)
2	2XMM J035024.9+171447 Det VO Slo	FK5(J2000.0) 03:50:24.998+17:14:47.63(±0.041 arcsec)	0203260101 Det VO	3	1.194 (± 5.16E-03)
3	2XMM J033243.4-085540 Det VO Slo	FK5(J2000.0) 03:32:43.420-08:55:40.32(±0.284 arcsec)	0305980201 Det VO	0	0.558 (± 0.017)
4	2XMM J162910.1+780441 Det VO Slo	FK5(J2000.0) 16:29:10.182+78:04:40.88(±0.301 arcsec)	0061940901 Det VO	0	0.475 (± 0.018)
5	2XMM J162910.1+780441 Det VO Slo	FK5(J2000.0) 16:29:09.900+78:04:41.25(±0.262 arcsec)	0400920201 Det VO	0	0.418 (± 0.013)
6	2XMM J162910.1+780441 Det VO Slo	FK5(J2000.0) 16:29:10.029+78:04:40.85(±0.301 arcsec)	0400920101 Det VO	0	0.393 (± 0.015)
7	2XMM J134952.0-131336 Det VO Slo	FK5(J2000.0) 13:49:52.010-13:13:36.60(±0.059 arcsec)	0305310101 Det VO	0	0.348 (± 2.22E-03)
8	2XMM J064804.6-441858 Det VO Slo	FK5(J2000.0) 06:48:04.697-44:18:58.76(±0.218 arcsec)	0112450601 Det VO	0	0.267 (± 7.43E-03)
9	2XMM J043223.7+174503 Det VO Slo	FK5(J2000.0) 04:32:23.740+17:45:03.49(±0.345 arcsec)	0094810301 Det VO	0	0.234 (± 8.56E-03)
10	2XMM J064804.6-441858 Det VO Slo	FK5(J2000.0) 06:48:04.664-44:18:57.83(±0.242 arcsec)	0112450301 Det VO	0	0.226 (± 7.17E-03)
11	2XMM J213018.4+471008 Det VO Slo	FK5(J2000.0) 21:30:18.281+47:10:08.43(±0.404 arcsec)	0307120101 Det VO	0	0.153 (± 6.74E-03)
12	2XMM J042105.5-483910 Det VO Slo	FK5(J2000.0) 04:21:05.533-48:39:10.44(±0.284 arcsec)	0305980301 Det VO	0	0.148 (± 4.53E-03)
13	2XMM J213018.4+471008 Det VO Slo	FK5(J2000.0) 21:30:18.499+47:10:08.96(±0.435 arcsec)	0307120201 Det VO	0	0.126 (± 5.95E-03)

Multi λ databases: LEDAS

LEicester Database and Archive Service)

http://ledas-www.star.le.ac.uk/

- X-RAY DATA ARCHIVES: Online data archives for ROSAT, Ginga, ASCA and XMM.
- Both data archives and source catalogues (PPS products)
- CATALOGUES: 3000+ astronomical catalogues searchable via ARNIE5, BLASTA and VIZIER.
- IMAGES: Sky images from Digitized Sky Survey.

LEDAS: ARNIE services

Leicester Database and Archive Service

ARNIE Index
ARNIE Quick Help
ARNIE Tutorial

Search...
All Databases
All Helpfiles

For comments or help, e-mail: ledas-help@star.le.ac.uk

Database: 2XMMI

Database HELP

XMM Second Serendipitous Source Survey Incremental: 2XMMi

Database Index | **Basic Search** | Advanced Search

Name Resolver HELP

Name:

RESOLVE NAME

Search Co-ordinates HELP

Co-ords:

SUBMIT QUERY

Co-ordinate system:
Equatorial *Ecliptic* *Galactic*

Equinox: *1950* *2000*

Search Type HELP

- **Cone search**, radius: 5 arcmin.
- **Square search**, width: 5 arcmin.
- **Rectangle search**, size: 5 x 5 arcmin

Output Options HELP

Output coordinates in:
Decimal *Sexigesimal*

Output system:
Equatorial *Ecliptic* *Galactic*

Output epoch:
J2000 *B1950*

Output format:
HTML Table

Display Columns HELP

- Display **default** table columns
- Display **all** table columns

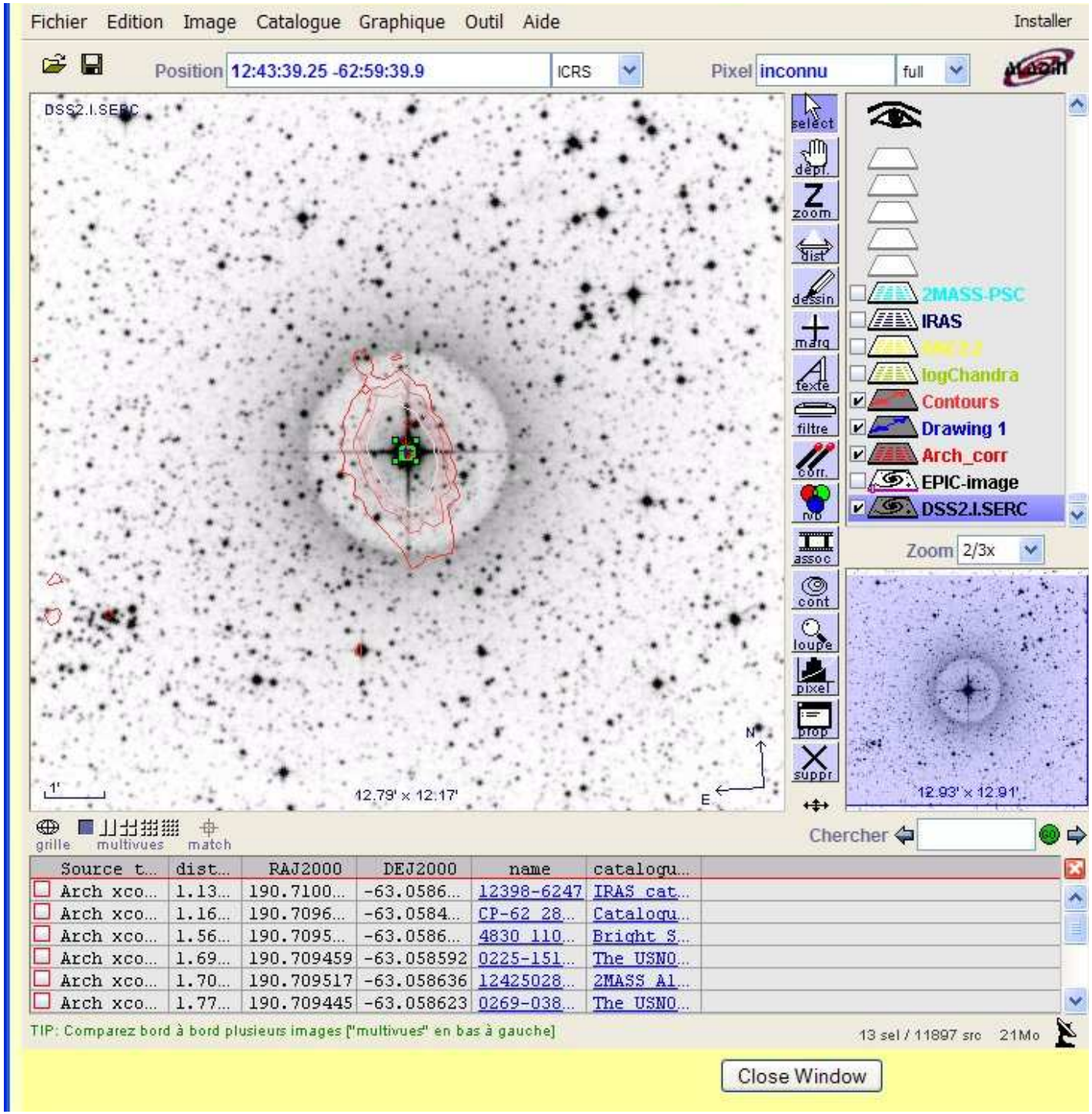
Output number of lines: 100

SUBMIT QUERY

If you have any problems, please consult the help page or mail ledas-help@star.le.ac.uk

And of course the Virtual Observatory

- Usable with high level products (e.g. calibrated images, published catalogues) + local data
- Many important sets of X-ray data are published in the VO (e.g. Chandra images, most X-ray catalogues)
- VO tools, eg, Aladin, VOSpec, etc, offer powerful tools to handle multi wavelength images and catalogues of X-ray sources.
- More with Mark Allen on Thursday …..


Fichier Edition Image Catalogue Graphique Outil Aide
Installer
Position 12:43:39.25 -62:59:39.9
ICRS
Pixel inconnu
full
DSS2.I.SERC
select
dépl.
zoom
dist
dessin
marq
texte
filtre
corr.
rvb
assoc
cont
loupe
pixel
prop
suppr
2MASS-PSC
IRAS
logChandra
Contours
Drawing 1
Arch_corr
EPIC-image
DSS2.I.SERC
Zoom 2/3x
1'
12.79' x 12.17'
N
E
12.93' x 12.91'
grille
multivues
match
Chercher
Source t... dist... RAJ2000 DEJ2000 name catalogu...
Arch xco... 1.13... 190.7100... -63.0586... 12398-6247 IRAS cat...
Arch xco... 1.16... 190.7096... -63.0584... CP-62 28... Catalogu...
Arch xco... 1.56... 190.7095... -63.0586... 4830 110... Bright S...
Arch xco... 1.69... 190.709459 -63.058592 0225-151... The USNO...
Arch xco... 1.70... 190.709517 -63.058636 12425028... 2MASS Al...
Arch xco... 1.77... 190.709445 -63.058623 0269-038... The USNO...
TIP: Comparez bord à bord plusieurs images ["multivues" en bas à gauche]
13 sel / 11897 src 21Mo
Close Window

Remote Chandra processing: Hera

- Data processing facility provided by the HEASARC at the NASA Goddard Space Flight Center for analyzing astronomical data files.
- Provides all the preinstalled software packages, local disk space, and computing resources needed to do general processing of FITS format data files residing on the user's local computer, and to do advanced research using the publicly available data from High Energy Astrophysics missions.
- Different user-interfaces, command lines, GUI,
- Fast link to X-ray archives + a cluster of Linux workstations

A similar facility is under development at ESAC

So what should I use ?

- Many similar data access points, seems that there is duplication of effort, no ?
  - Yes, indeed. Cloning is no longer needed for network speed reasons in many cases. Scientific users can get confused by the various interfaces.
  - Yes and No. Agencies and institutes need to provide a window on their data (visibility, tax payer, etc..)
  - No. Many databases have specific flavours (content, search tools) and their own specific range of applications.

So what should I use ?

- As a rule of (my) thumb:
  - To download raw data and later process them, use data creator access points (e.g. CXC for Chandra, ESAC for XMM, HEASARC, etc)
  - Best « multi-mission » data archive is probably HEASARC
  - See also MAST (STSci) for radio to UV ranges
  - To search and cross-correlate catalogues, use Vizier, specific data bases and VO.

The End