

User Support and Mission Planning

XMM-Newton Users' Group Meeting 19
May 17–18, 2018

Matthias Ehle

On behalf of the *Community Support & Scientific Planning Team* (a.k.a. USG):
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Special Events: Mission Planning (1/2)



Merger of XMM-Newton/INTEGRAL & Gaia Spacecraft Controller (SPACON) teams:

(cf. talk by M. Kirsch)

- Close interactions with MOC
- New version of on-call Scientist Target-of-Opportunity (ToO) procedure:
 - SOC to check and avoid conflicts with Gaia & INTEGRAL critical activities, if possible.
 - 'Manual' activities of SPACON reduced to very minimum (swap of current timeline to ToO timeline)

Possible impact (worst case): rejection of new timeline, later start of ToO (TBC)

- Some losses observed since start of merger operations (April 11):
 - ~10 OM exposures, some intended for fast UV monitoring (simult. HST)
 - One ToO lost: incorrect recovery after slew failure - new procedures
 - One 100 ks observation lost - new procedure for radiation: Ops-analyst needed for restart
 - ~30 ks MOS time lost from high priority coordinated HST obs. - new procedure for radiation
 - One pn exposure lost – idle after telecommand failure: Ops-analyst needed for restart

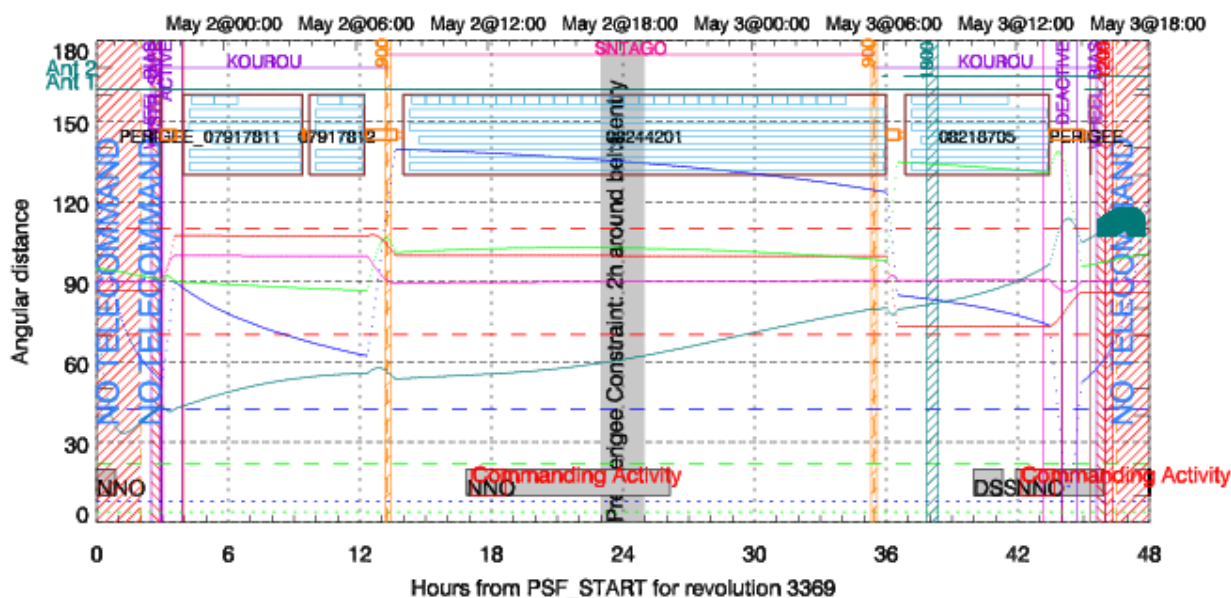
Special Events: Mission Planning (2/2)



Merger of XMM-Newton/INTEGRAL & Gaia Spacecraft Controller (SPACON) teams:

Additional Check during Short-Term planning (ToOs & 'normal' planning):

- **Identify** critical Gaia or INTEGRAL windows (output de-conflicting tool) & **display** them in Planning Tool.
- If possible, move XMM-Newton on-board transponder swap window to **avoid clash**.
- Otherwise: issue **early warning** on windows clash.



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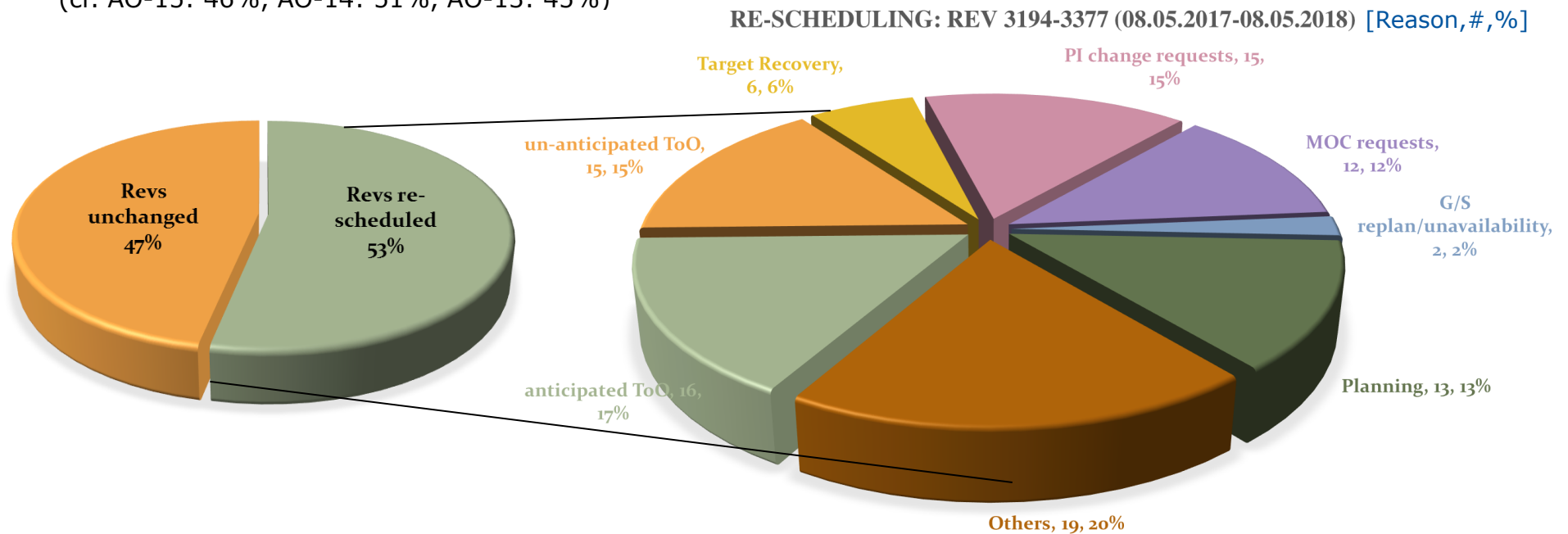
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Scientific Mission Planning: Re-scheduling/Re-Planning



~53% of AO-16 Revolutions re-scheduled

(cf. AO-15: 46%, AO-14: 51%, AO-13: 45%)



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Scientific Mission Planning: AO-17 Proposal Enhancement



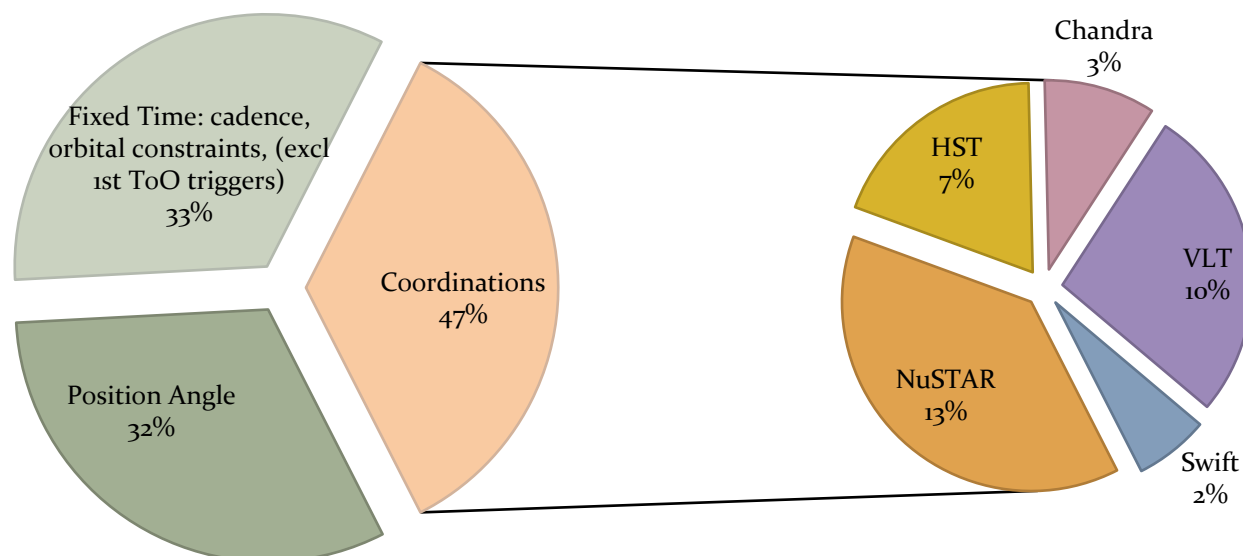
Statistics on AO-17 Enhancement by USG Scientists

- After phase II deadline (Feb 2) and in time for AO-17 start (May 1 minus 6 weeks): OTAC consistency, technical checks, optimization, constraints,...
- Number of proposals: 165; number of observations: 589
- Observation priorities: 250 A+B, 284 C and 55 anticipated ToOs
- More to come from:
 - Joint Programmes (Chandra, HST, INTEGRAL, NuSTAR, VLT): technical evaluation for their TACs & enhancement of accepted observations
 - Routine Calibration Observations
 - Unanticipated ToOs

Scientific Mission Planning: AO-17 Proposal Enhancement

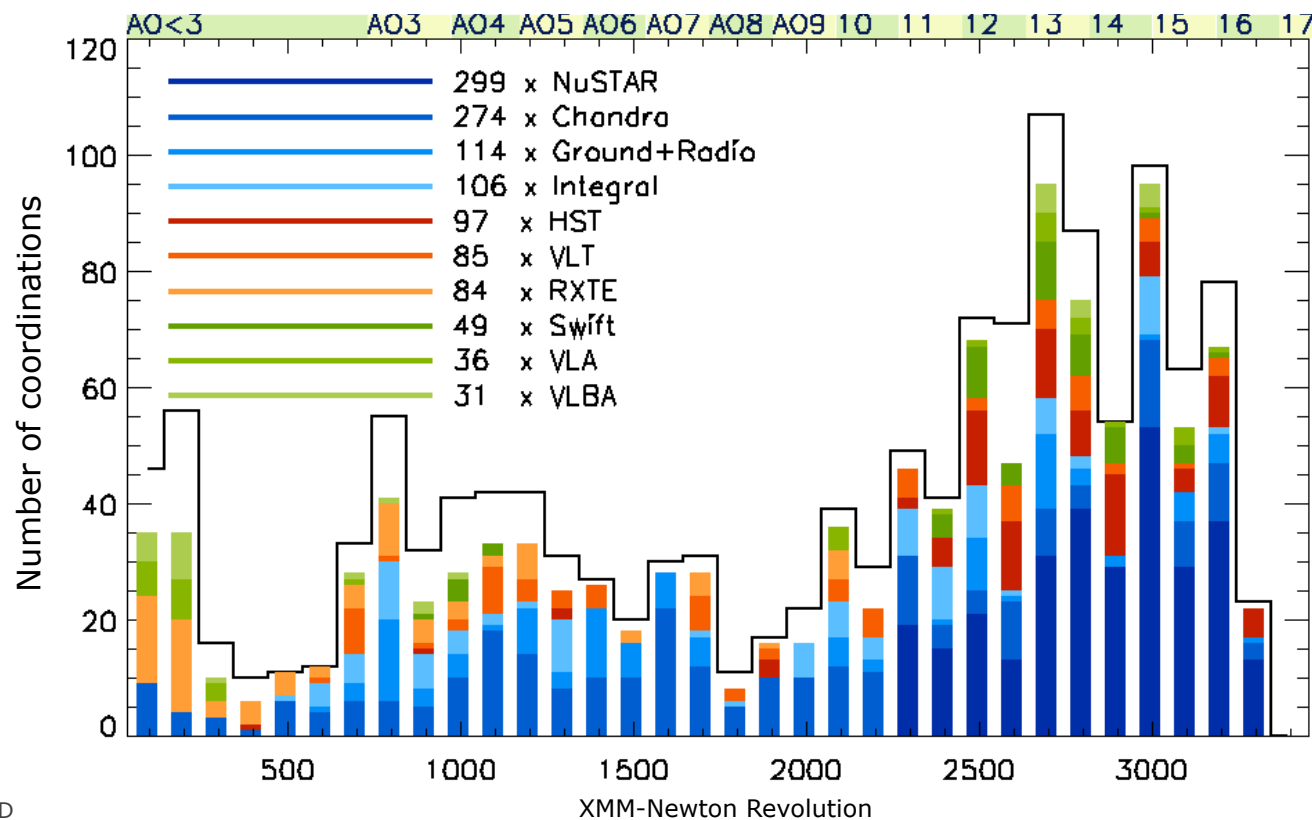


~30% of AO-17 observations are time constrained:



Note: several observations with multiple constraints

Scientific Mission Planning: Evolution of Coordinated Observations



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Scientific Mission Planning: Status of the Observing Program

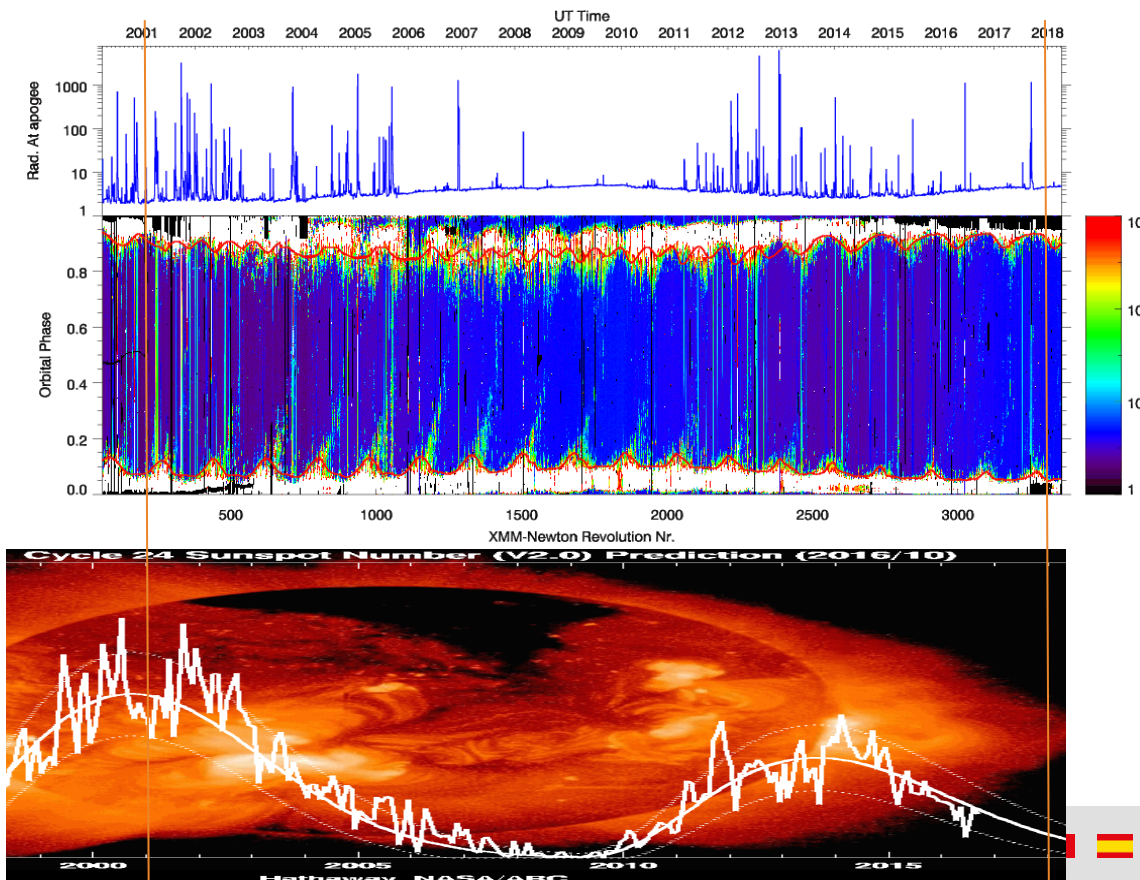


Statistics up to the end of revolution 3370 (5 May 2018)

- **Open Time Programs AO-1 ⇒ AO-15** finished
- **Open Time Program AO-16** (May 2017 – end Apr 2018):

Number of successfully observed targets (A+B):	381	(94.3%)
Successfully observed cumulative exposure time (A+B):	14456 ks	(94.5%)
Number of successfully observed targets (C):	150	(49.3%)
Successfully observed cumulative exposure time (C):	4025 ks	(39.6%)
- **Open Time Program AO-17:**
Just started...

Scientific Mission Planning: Extra 'Scheduling Constraints': Radiation



- **Radiation impact:** instruments need to be closed/saved
- Previous solar maximum peaked ~2014 (Cycle 24: lowest recorded sunspot activity)
- **USG community support:** monitoring radiation behaviour & making it public (XMM-SOC-GEN-TN-0014; updated annually, linked on AO-page & in UHB)

Effects of solar activity:

- **Exposure time lost (X-ray instruments stopped during high radiation)**
- Note: quiescent background higher with less active Sun – but beware of flares...
- Monitor closely what is lost, esp. critical targets needing fast re-scheduling.

XMM-Newton Science Archive (XSA): Content



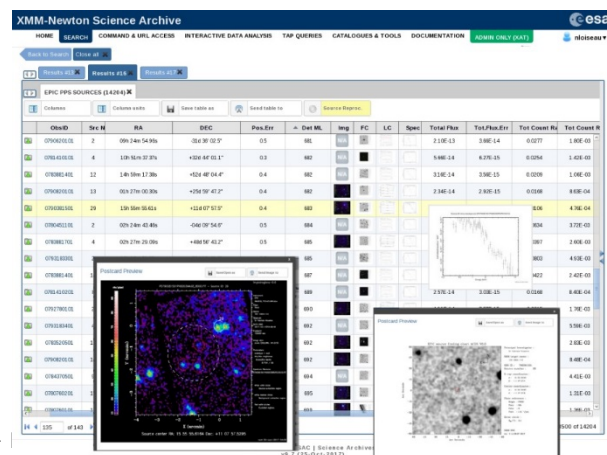
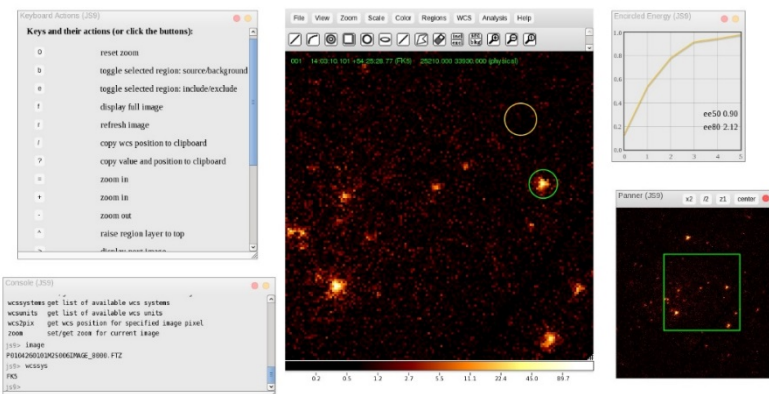
- ODF/PPS of $\sim 13,600$ pointed observations
- ~ 863.000 EPIC PPS sources, $\sim 9.756.000$ OM PPS sources, $\sim 17,000$ Slew Survey PPS sources
- SDF of ~ 4.000 Slew Survey observations (rev.>3137)
- 775.153 EPIC Catalogue detections (3XMM-**DR8** catalogue)
- 6.880.116 OM Catalogue sources (OM-SUSS3 catalogue)
- 72.352 Slew Survey Catalogue sources (XMMSL2)
- Ancillary info: proposal info, publications (>5600!), etc.

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XMM-Newton Science Archive (XSA): New Functionalities (through 7 releases)



- On-the fly data analysis via **RISA**, using **JS9** image viewer
- **New EPIC PPS source products**
- Access to **Radiation Monitor data**
- Moving targets products in their reference frame
- Links to ESASky from EPIC and OM sources
- Publications using Slew observations
- bibcode link to observations, from ADS.



The screenshot shows the XMM-Newton Science Archive search interface. It includes a search bar, filters for observation, proposal, and catalogue searches, and options for downloading Radiation Monitor files. The 'Radiation Monitor' section shows a download button and a date range selector.

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XMM-Newton Science Archive (XSA):

for future XSA releases (main items)

Plans



Content: *ingested when available, e.g.:*

- EPIC Stacked Catalogue
- Include Response Matrix files in the PPS source files
- Improved PPS products, if relevant.

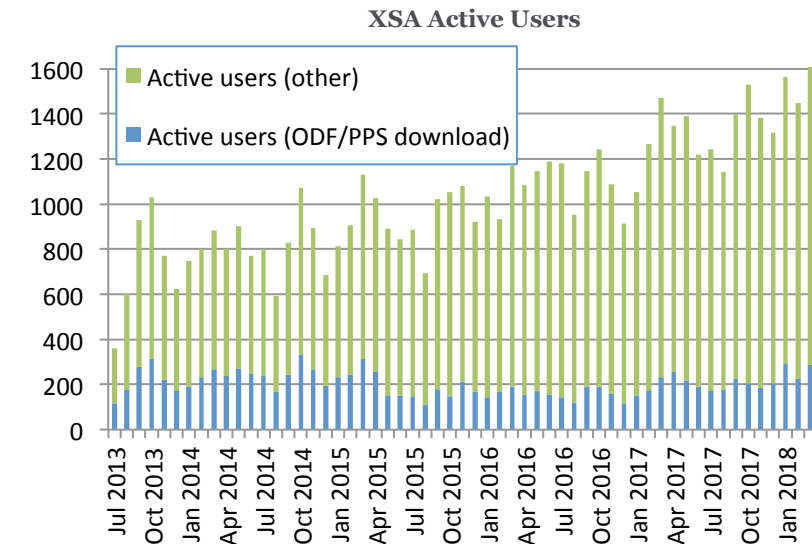
Technical:

- Improved results display for searches on a list of targets
- Integration of **upper limit server** (ULS) tool
- ADQL interface for direct (TAP) queries to the DB
- EPIC and RGS **spectra visualizer** (BiRD)
- More RISA data analysis options
- Migration of XSA accounts to ESA Cosmos.

XMM-Newton Science Archive (XSA): Usage Statistics

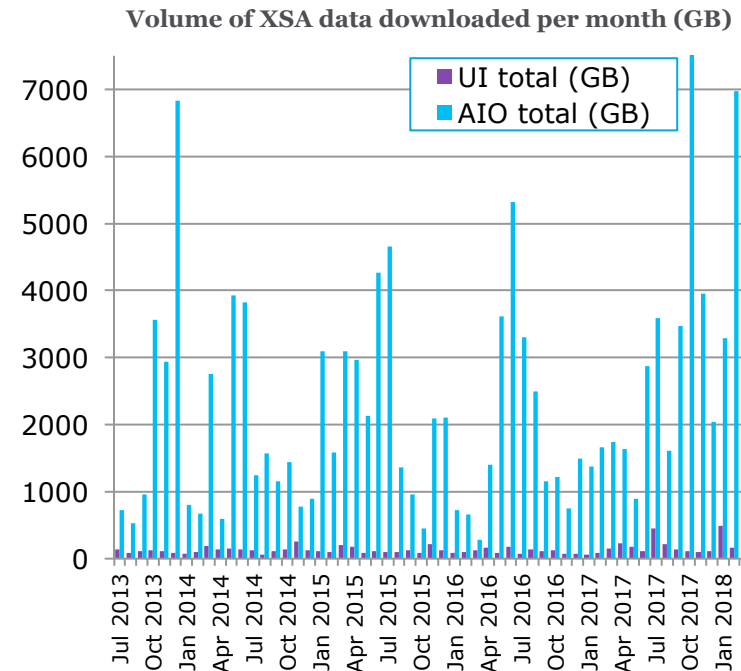


via User Interface (UI) or command line downloads (AIO) (Table Access Protocol (TAP) queries not included)



Active users are defined as users that do at least one of the following actions:

- Download ODF/PPS
- Open postcards and save the FITS from that window
- Send data to other VO tools (Topcat, Aladin, ...)
- Save table of results
- Use SIAP protocol to find/retrieve images



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Scientific Conferences & Workshops



Conference Local Organization

USG: Chair(s) & Members of Local Organizing Committees

Major International Symposium every 3 years (5 done):

- The X-ray Universe 2017, Rome, 6 - 9 June 2017

334 registered participants, legacy web page available

Annual Dedicated Workshops @ ESAC (8 done)

- Time-Domain Astronomy: A High Energy View, 13 - 15 June 2018
- Abstract submission: oversubscribed by ~1.4; authors informed April 16
- 101 registered participants as of May 11, and still counting...



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XMM-Newton Science Archive (XSA): Planned display for the EPIC Stacked Catalogue



XMM-Newton Science Archive - Mozilla Firefox

File Edit View History Bookmarks Tools Help

nxsa.esa.int:8080/nxsa-web/#search

XMM Internal xmmi xmmhelp status_all USGpages Logs-OLB ESAC XMM adm XSA-AIO-SIAP Archives Galaxies/Tools

XMM-Newton Science Archive

HOME SEARCH COMMAND & URL ACCESS INTERACTIVE DATA ANALYSIS TAP QUERIES CATALOGUES & TOOLS DOCUMENTATION ADMIN ONLY (KAT) Basket noiseau

Back to Search Close all

Results #1 Results #2 Results #3 Results #4

OBSERVATIONS (54) EPIC STACKED CAT (136)

Columns Column units Display selected Save table as Send table to

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	IAU name	Obs.ID	Src Id	Distance	RA	DEC	Radec Err	ESAsky	EP Flux	EP Flux Err
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004301.4+413017	-	30109270701.00039	873	00h 43m 01.43s	+41d 30' 18.8"	0.15962		1.03E-12	3.91E-14
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004344.6+412409	-	30109270701.00041	832	00h 43m 44.54s	+41d 24' 09.2"	0.15748		1.48E-13	7.55E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004339.2+412653	-	30109270701.00106	895	00h 43m 39.21s	+41d 29' 54.3"	0.29726		3.25E-14	4.07E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ODF	0109270701		895	00h 43m 39.21s	+41d 29' 54.3"	0.29726		3.27E-14	3.35E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PPS	0701981201		895	00h 43m 39.21s	+41d 29' 54.3"	0.29726		3.18E-14	8.62E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EPIC_PPS									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004356.4+412203	-	30109270701.00118	886	00h 43m 56.35s	+41d 22' 03.8"	0.2594		6.96E-14	6.21E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0109270701			886	00h 43m 56.35s	+41d 22' 03.8"	0.2594		5.04E-14	1.13E-14
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	065620301			886	00h 43m 56.35s	+41d 22' 03.8"	0.2594		1.69E-13	5.59E-14
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0701981201			886	00h 43m 56.35s	+41d 22' 03.8"	0.2594		3.41E-14	6.48E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004253.7+412948	-	30109270701.00415	830	00h 42m 53.74s	+41d 29' 50.6"	0.84472		2.94E-14	1.10E-14
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004350.1+412412	-	30109270701.00434	886	00h 43m 50.18s	+41d 24' 11.6"	0.78197		1.08E-14	5.05E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0109270701			886	00h 43m 50.18s	+41d 24' 11.6"	0.78197		2.63E-15	2.59E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0701981201			886	00h 43m 50.18s	+41d 24' 11.6"	0.78197		1.98E-14	9.33E-15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3XMM J004259.4+412944	-	30109270701.00450	836	00h 42m 59.50s	+41d 29' 46.0"	0.74123		3.47E-14	1.21E-14
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0701981201			859	00h 42m 54.53s	+41d 30' 18.3"	11.08547		6.75E-16	4.46E-14

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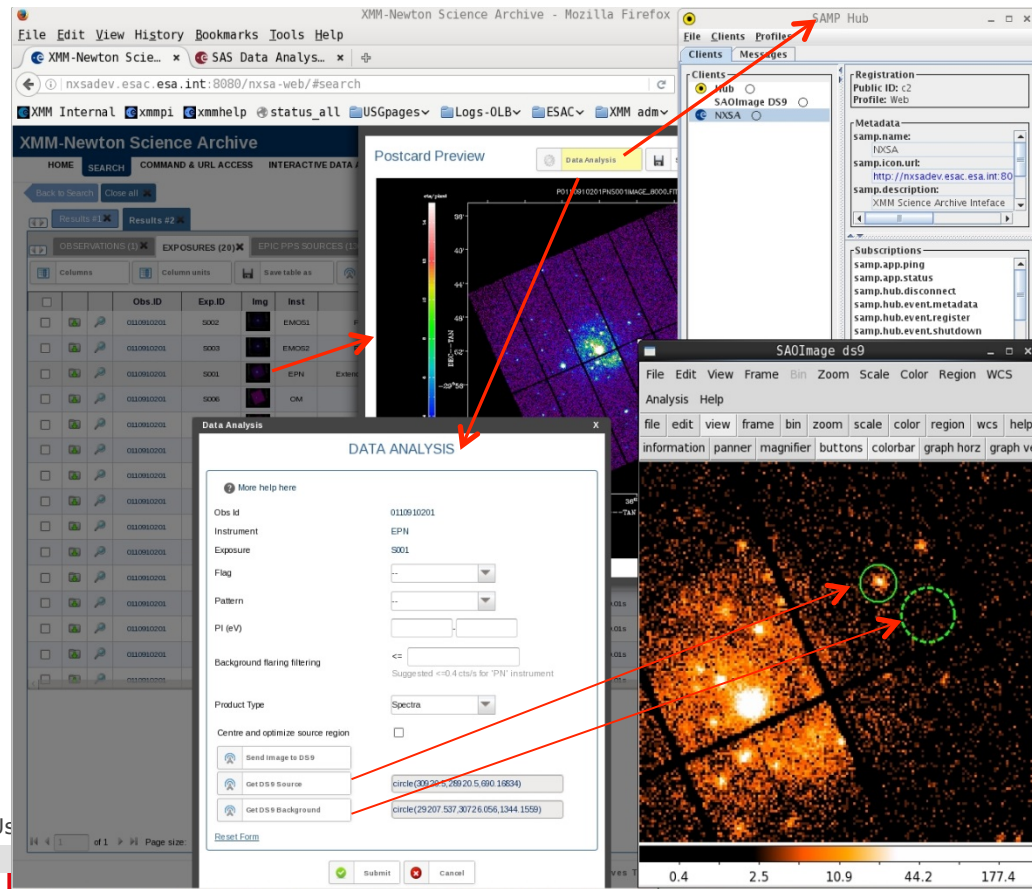
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XMM-Newton Science Archive (XSA): Availability of Radiation Monitor Files



XMM-Newton Science Archive (XSA): Interactive Data Analysis (RISA)



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