

User Support and Mission Planning

XMM-Newton Users' Group Meeting 18
May 11–12, 2017

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On behalf of the *Community Support & Scientific Planning Team* (a.k.a. USG):
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Simone Migliari, Jan-Uwe Ness, Pedro Rodríguez, Laura Tomás

USG continuous providing support in the areas:

- Project Scientist & OTAC Support: *AO, PI support, Proposal catching, distribution to panels, rating tool, results, ...*
- Proposal Enhancement
- Planning & Scheduling, ToO support 24/7, HelpDesk
- Newsletter, Web Pages (*e.g. Background Analysis*)
- Document updates (UHB, Proposal Submission, etc.)
- SAS related (together with IDT and SAS teams)
 - Threads updated & new thread on “Vignetting-corrected background-subtracted EPIC images”; in time for SASv16 release (17th Jan)
 - SAS Manual (28th Feb)
 - Canned Response Matrices
- Filter-Wheel-Closed repositories
- Organization of Science Conferences (LOC)

Proposal: “A roadmap for XMM-Newton post-operation and postmission phases”

(Technical Note by S. Migliari & E. Ojero – dedicated talk)

- P1 - Pipeline Products and Catalogue products
- P1 - Archive
- P1 - Calibration
- P1 - Documentation and Web
- P1 - Helpdesk
- P2 - Legacy Conference
- P2 - Upper limit tool
- P3 - Post-Operation SAS (POAS) frozen in Virtual Machine/dedicated server
- P3 - Analysis level 1 & 2 for EPIC
- P4 - Analysis level 1 & 2 for RGS
- P5 - Analysis level 1 & 2 with background extraction

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

(cf. talk by R. Muñoz)

- Participation in SOC-MOC Meetings
- Adjustment of ToO Procedure (on-going):
 - No 'manual' operations (stop of on-going observations, slew, start of ToO)
 - All by timeline (i.e. possible is a swap of current timeline to a ToO timeline); swap outside critical SPACON activities for Gaia and INTEGRAL

Possible impact: later start of ToO (TBC)

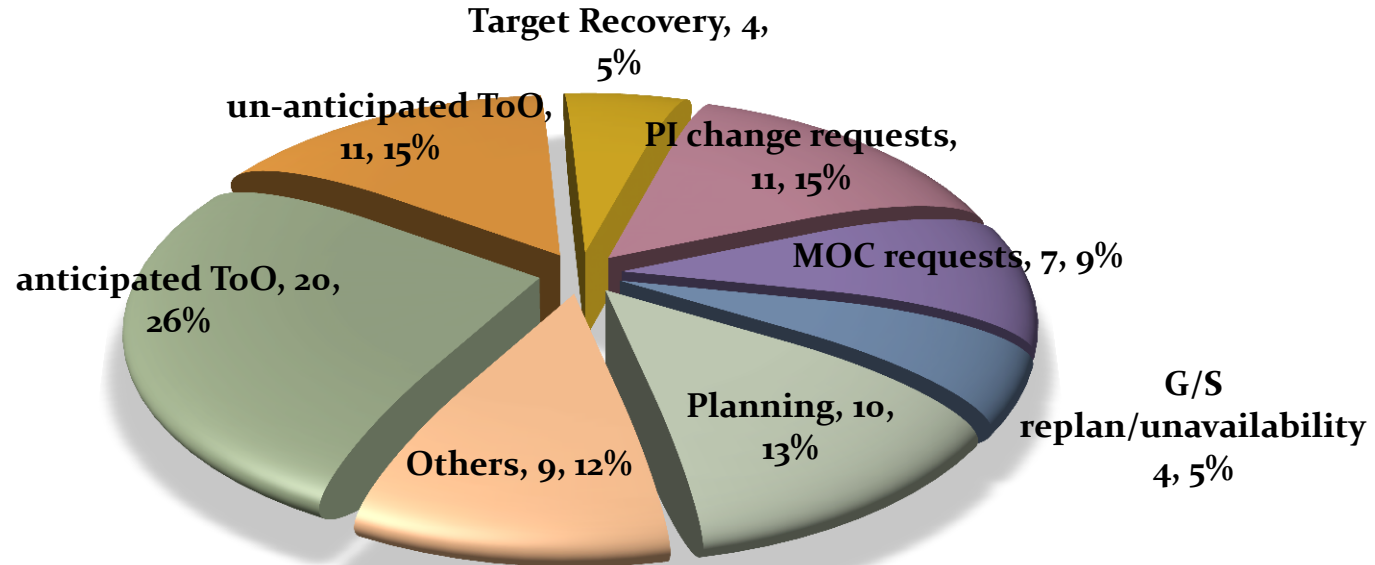
Groundstation issues & impact on science time (stat since Jun 2016):

- Groundstation outages & anomalies; TM drops, loss, corruption of data
- 57 cases, ca. 190ks lost (*well within agreed performance indicators!*), 6 obs. unsuccessful, incl. 2 critical/coord

Scientific Mission Planning: Re-scheduling/Re-Planning

~46% of Revolutions re-scheduled (Reason, #, %):

Re-scheduling: Rev 3019-3183 (24.05.2016-25.04.2017)



Scientific Mission Planning: AO-16 Proposal Enhancement



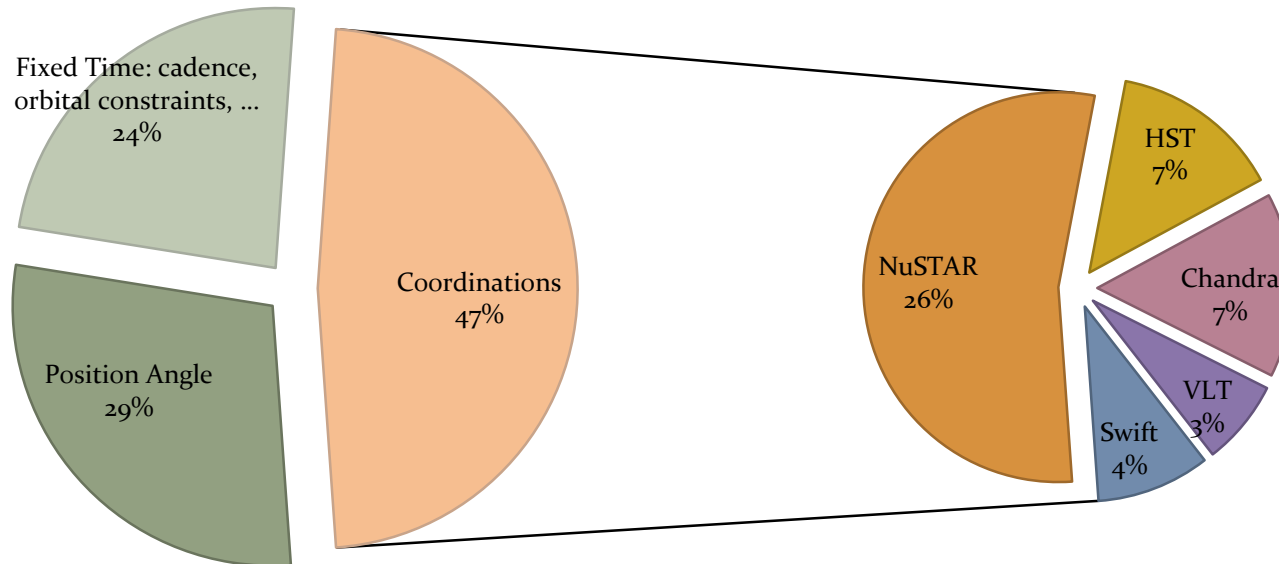
Statistics on AO-16 Enhancement by USG Scientists

- After phase II deadline (Feb 3) and in time for AO-16 start (May 1 minus 6 weeks): OTAC consistency, technical checks, optimization, constraints,...
- Number of proposals: 183; number of observations: 652
- Observation priorities: 342 A+B, 280 C and 30 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-16 Proposal Enhancement

~25% of AO-16 observations are time constrained:



Note: several observations with multiple constraints

Scientific Mission Planning: Status of the Observing Program



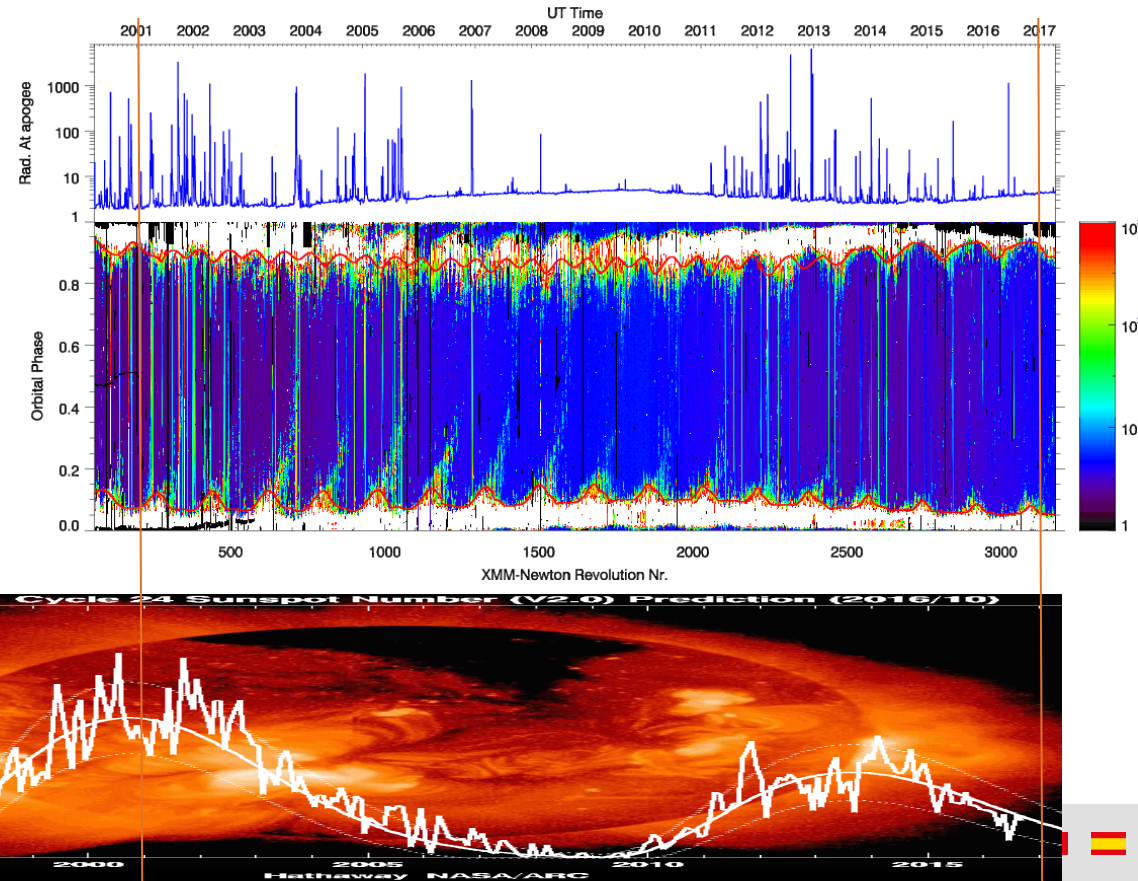
Statistics up to the end of revolution 3185 (1 May 2017)

- **Open Time Programs AO-1 ⇒ AO-14** finished
- **Open Time Program AO-15** (May 2016 – end April 2017):

Number of successfully observed targets (A+B):	360	(99.7%)
Successfully observed cumulative exposure time (A+B):	13105 ks	(99.9%)
Number of successfully observed targets (C):	168	(59.4%)
Successfully observed cumulative exposure time (C):	4540 ks	(43.2%)
- **Open Time Program AO-16:**
Just started...



Scientific Mission Planning: Extra 'Scheduling Constraints': Radiation



- **Radiation impact:** instruments need to be closed/saved
- Previous solar maximum peaked \sim 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.

Pipeline: Scientific Content



➤ **Pipeline Processing at SOC:**

Since March 1st 2012 (observations since revolution 2236)

Full responsibility since June 2013

Smooth daily processing

➤ **Pipeline Scientist** (one of the USG scientists: *cf. talk by P. Rodriguez*)

Looking after **Scientific Content** of pipeline: requirements & validation

➤ **Pipeline Scientist & USG scientists**

Coordination of and contribution to **Products Screening**

Involvement/support to **Pipeline Operations**

New: **Starting activities related to Post-Ops Roadmap** (increased manpower since 2017)

XMM-Newton Science Archive (XSA)



- **Archive Scientist** (one of the USG scientists: *N. Loiseau*)
 - Looking after **Scientific Content and Interface** of XSA: requirements & validation
 - **Data Rights** updates (proprietary periods)

- **Archive Scientist & USG scientists**
 - Involvement in **XSA Release Testing**
 - Provision of info **linking ObsIDs with Publications**
 - **Coordination with Pipeline Production** (new products)



XMM-Newton Science Archive (XSA): Content



- ODF/PPS of ~ 13.000 pointed observations
- ~ 812.000 EPIC PPS sources, $\sim 9.098.000$ OM PPS sources
- SDF of ~ 3.800 Slew Survey observations
- 678.680 EPIC Catalogue sources (3XMM-DR6 catalogue)
- 6.880.116 OM Catalogue sources (OM-SUSS3.1 catalogue)
- 72.352 Slew Survey Catalogue sources (XMMSL2)
- Ancillary info: proposal info, publications ($>5000!$), etc.



XMM-Newton Science Archive (XSA): New Functionalities



Four XSA releases since last UG Meeting, including:

- Ingestion of **new catalogue** versions (3XMM-DR6, XMMSL2, XMM-SUSS3.0).
- Ingestion of **new pipeline products**: Slew Survey PPS sources, EPIC PPS sources newly extracted spectra, light curves, finding charts and source/background regions images.
- **Customizable RA, Dec** and **Distance units**.
- Possibility to ingest, display and download **moving targets PPS** products in their **reference frame**.
- **Public** ODF/PPS can individually be downloaded **without need to login**.
- **On-the fly data analysis** via RISA (*talk by A. Ibarra*)

XMM-Newton Science Archive (XSA): Plans for Future XSA Releases (short/medium term)



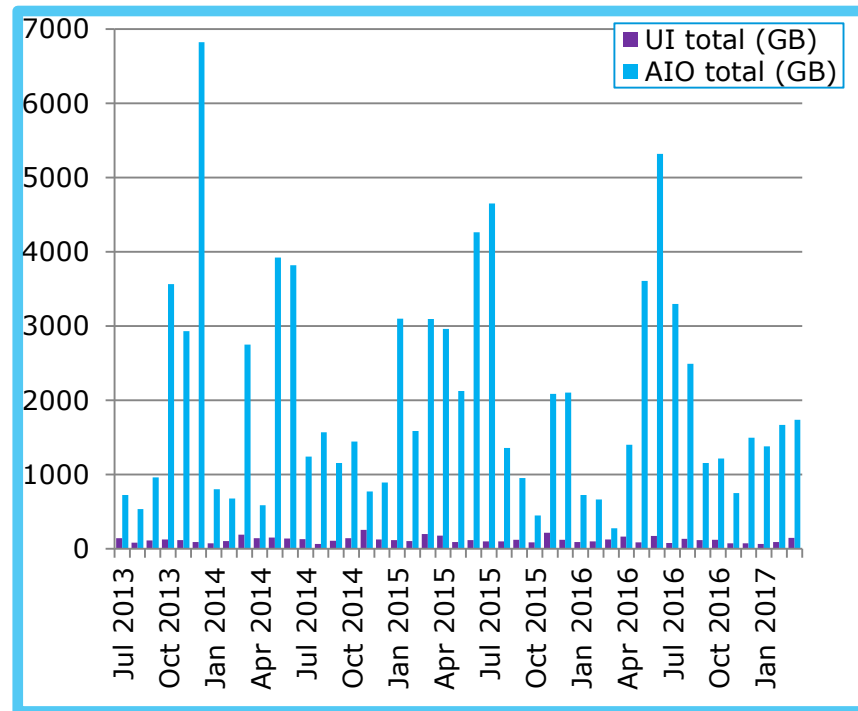
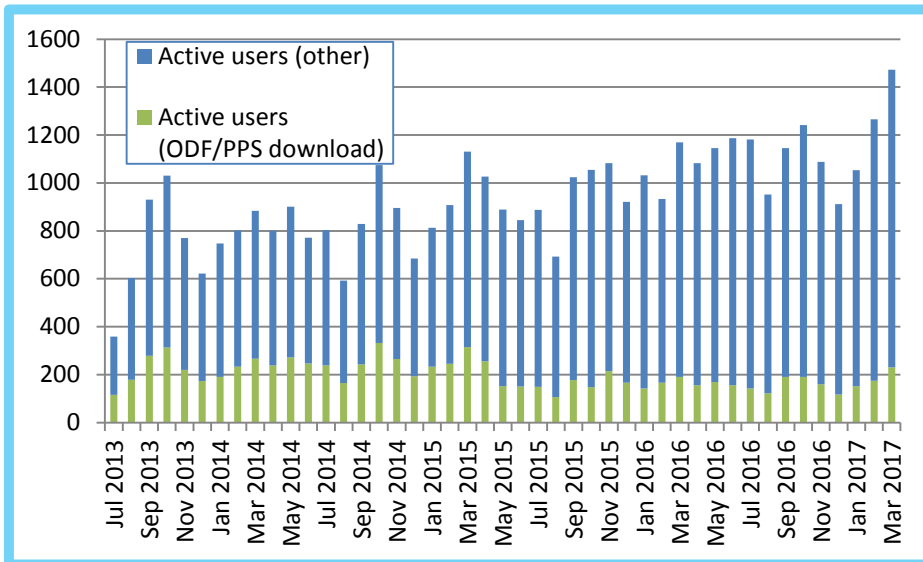
April 2016 requirements sorted by Priority:

- ✓ Ingestion/display of new kinds of pipeline products and catalogues updates
- ✓ On-the-fly data analysis
- ✓ Ingestion/download of PPS products in moving targets reference frame
- Integration of the Upper limit tool into XSA
- ✓ RA, Dec units customizable (sexagesimal, decimal degrees)
- Search/download of Radiation Monitor data
- EPIC and RGS spectra visualizer
- Search by Ecliptic coordinates
- Integrate an image visualization tool into XSA (JS9 instead of DS9)

New requirement:

- Include Response Matrix files in files to download for each PPS source

XMM-Newton Science Archive (XSA): Usage Statistics



- Active users are performing at least one of the following actions:
- Download ODF/PPS
 - Open postcards and save the FITS from that window
 - Send data to other SAMP compatible tool (Topcat, Aladin, ...)
 - Save table of results
 - Use SIAP protocol to find/retrieve images



Scientific Conferences & Workshops



Conference Local Organization

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

Tasks include:

- announcements, web page
- supporting scientific committee & participants
- Web tools: abstracts, registration, proceedings

Annual Dedicated Workshops @ ESAC (8 done)

- legacy web page & refereed proceedings

Major International Symposium every 3 years (4 done)

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

organised by the XMM-Newton Science Operations Centre and **strongly supported by INAF-OAR, INAF-IAPS, University Roma Tre, ASI-ASDC, La Sapienza University**

>300 registrations (as of Apr 28)



Public Outreach: Image Gallery



XMM-Newton Image Gallery: A repository of science highlights & XMM-Newton related images

USG keeps validating new submissions & adding press release images

USING THE XMM-NEWTON GALLERY

The XMM-Newton Image Gallery is a collection of astronomical images and spectra taken with the XMM-Newton X-ray and optical instruments along with other XMM-Newton related images.

- Simply browse our collection of images below
- [Search](#) the gallery for a particular image
- [Submit](#) your own images
- If you feel your results would be of interest as an [ESA Press Release](#) please contact the Project Scientist via the [XMM-Newton Helpdesk](#).
- Access our [Glossary](#) of Astronomical terms

The U.S. XMM-Newton Guest Observer Facility (GOF) maintains a [collection of EPIC images](#) that have been created using the [ESAS tasks in SAS](#).

Additional images and videos related to XMM-Newton are also available from the [ESA Science & Technology, Images and Videos Archive](#) and the [ESA Multimedia Gallery](#).

Latest Images

Solar Systems (13)
Planets (8)
Comets (5)

Stars (55)
Star Forming Regions (17)
Normal Stars (11)
Nebulae (10)
Stellar Clusters (17)

Endpoints of Stellar Evolution (87)
Supernovae (7)
Supernova Remnants (38)
White Dwarfs & Novae (10)
Neutron Stars & Pulsars (19)
Black Holes (1)
X-ray Binaries & Transients (12)

Galaxies (45)
Centre of the Milky Way (6)
Galactic Surveys (0)
Normal Galaxies (19)
Starburst Galaxies (20)

Active Galactic Nuclei (26)
Radio Galaxies (10)

