Community Support and Mission Planning Activities

XMM-Newton Users' Group Meeting #25

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XMM-Newton Science Operations Centre

on behalf of the XMM-SOC Mission Planning, Community Support and SW Suport Teams

The X-Ray Universe 2023, Athens

Community Support

Community Support Group Activities Overview

Web, Conferences and Outreach	○ Newsletter (**discontinued, last sent April 2024**), Web Pages ○ Social Media presence (X) ○ Update of Web contents ○ Organisation of Science Conferences **>> Science Workshop 2024, June 7-9** ○ Outreach

HelpDesk, Validation and Documentation	○ HelpDesk support (working days, 09:00-17:00LT) **>> New HelpDesk System**
	○ Science Analysis Software (SAS) **>> SASv22.0 [starting July 2024]**
	  ○ Scientific validation
	  ○ Development, maintenance and testing of data analysis Threads >> **Jupiter NBs in Datalabs**
	  ○ Edition of Manual
	○ Validation of Pipeline Processing System (PPS) products
	○ Validation of the XMM Science Archive (XSA)
	○ Edition of Users Handbook
	○ Edition of the Proposal Submission Manuals (XIPS & XRPS)

Support during AO and Peer review	○ Support to Project Scientist and OTAC ○ Proposal Submission Systems and OTAC evaluation tools
Proposal Enhancement, Long-term Plan, Coordinations and support for joint programmes	○ Technical evaluation of proposals requesting XMM time submitted to other observatories ○ Enhancement of XMM and joint proposals approved by other facilities ○ Long term Plan: compilation of time constraints and specific requests ○ Coordinations with other facilities ○ Preparation of Calibration observations
Development and Support of Tools	○ XIPS ○ Visibility Checker and Target Search Tool **>> updated May 2024** ○ Target of Opportunity Request Tool **>> updated May 2024**

Community Support

AO Cycle

Technical Evaluation and Proposal Enhancement

HelpDesk

Updated Tools

XIPS

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XIPS

TECHNICAL EVALUATION OF PROPOSALS SUBMITTED TO OTHER FACILITIES REQUESTING XMM-NEWTON TIME

- Feasibility study
- Visibility checks
- Duplications with observations approved by the XMM-Newton TAC

NuSTAR Cycle 10	45
HST	10 [Cycle 31] 10 [Cycle 32]
MAGIC Cycle 19	10
Chandra Cycle 26	9
INTEGRAL AO21	4
NRAO 24B	2
JWST Cycle 3	3
Total	**93**

Community Support

AO Cycle

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HelpDesk

Updated Tools

XIPS

ENHANCEMENT OF PROPOSALS

- Consistency with TAC recommendations
- Optimisation of scientific setup
- Compilation of scheduling requirements

+ Contact with PI and edition of proposals (for other facilities)

NuSTAR Cycle 10	14
HST Cycle 31	2
MAGIC Cycle 19	6
Chandra Cycle 25	7
INTEGRAL AO21	2
Total	**31**
XMM AO23	180
	211

Community Support

AO Cycle

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HelpDesk

Updated Tools

XIPS

November 2023

New system

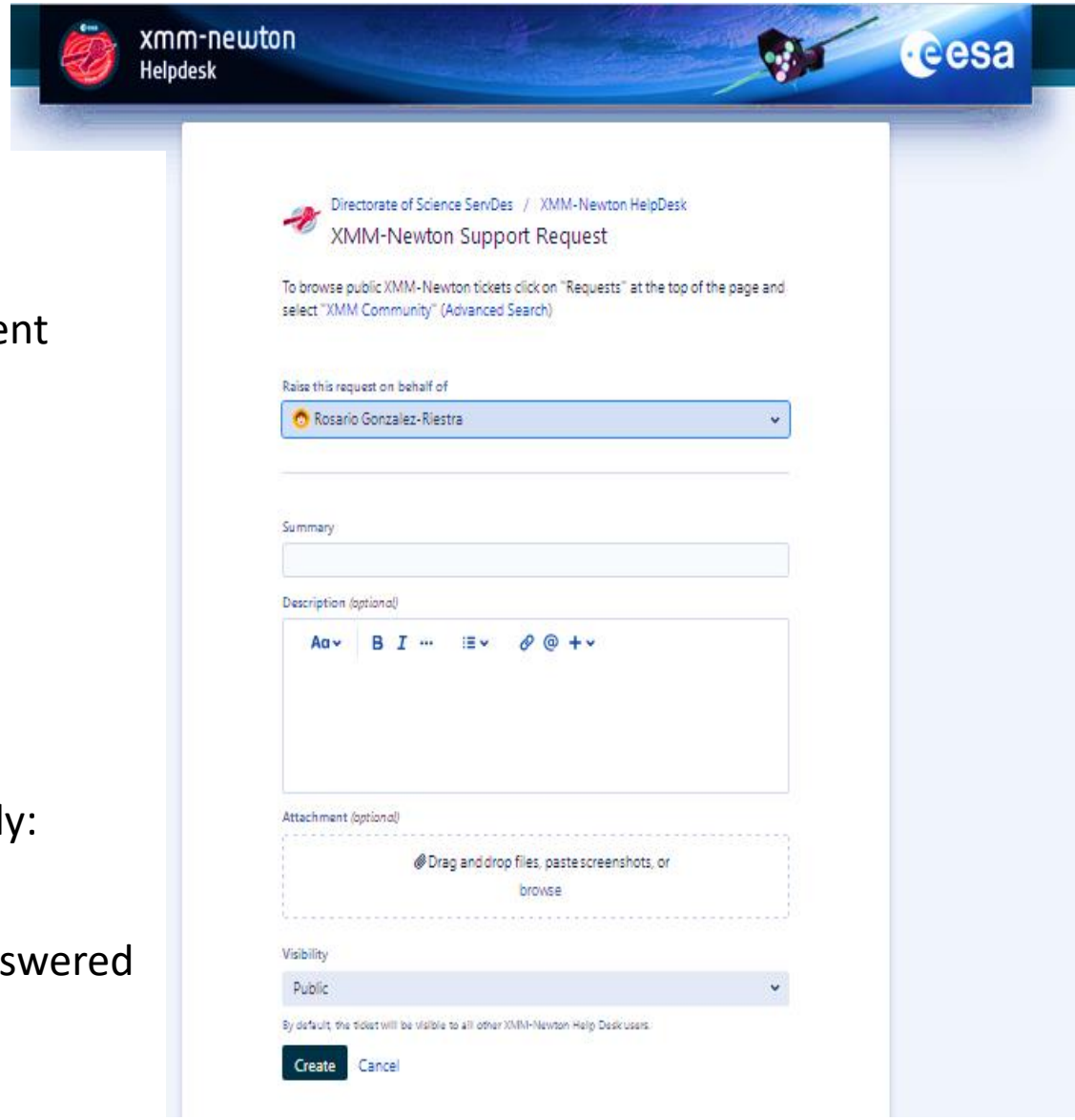
based on Jira Service Management

February 2024

Web interface open

Since November 2023

- 467 tickets received
- Median time to first reply: 12 hours
- 95% of the questions answered in less than 35 hours



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AO Cycle

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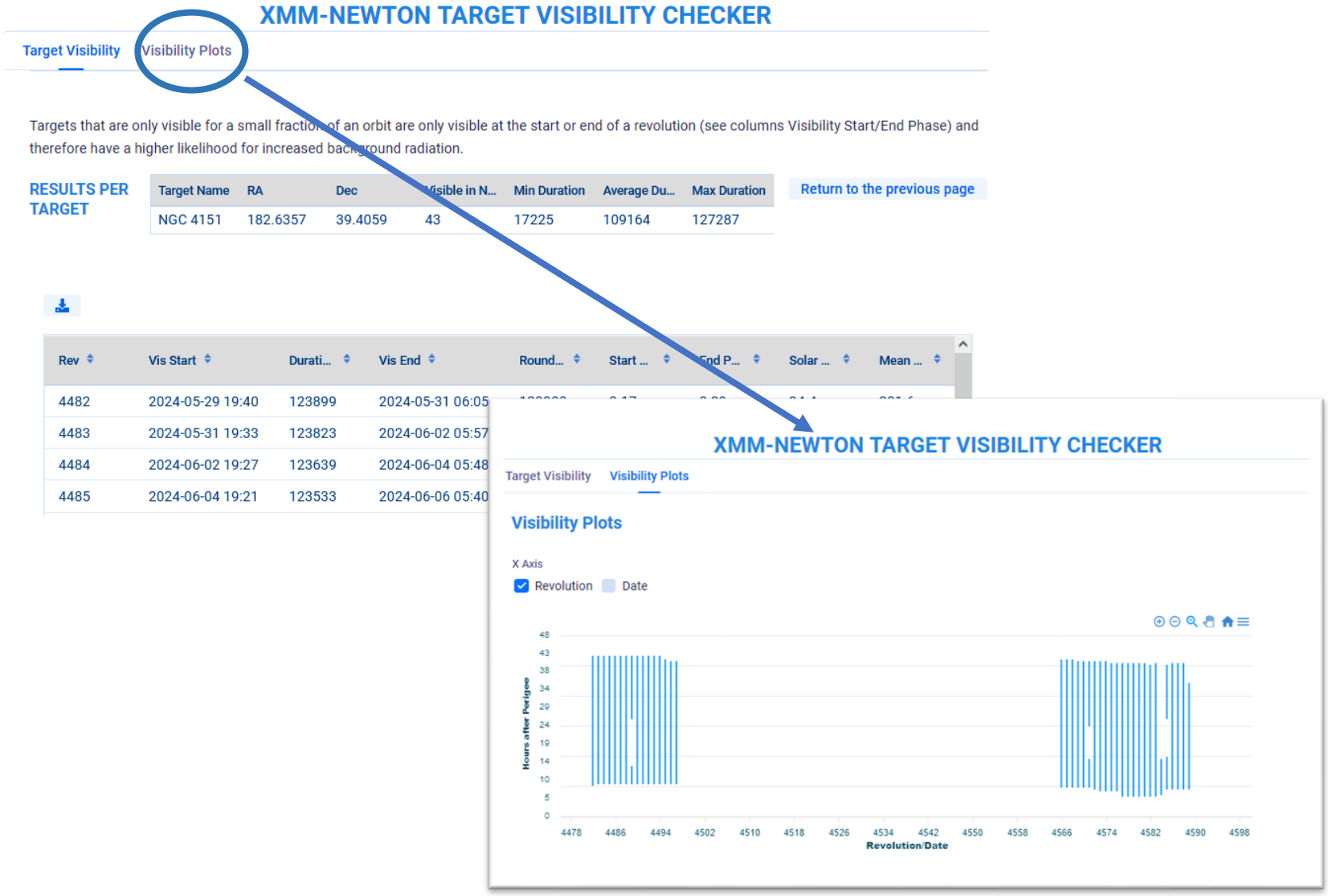

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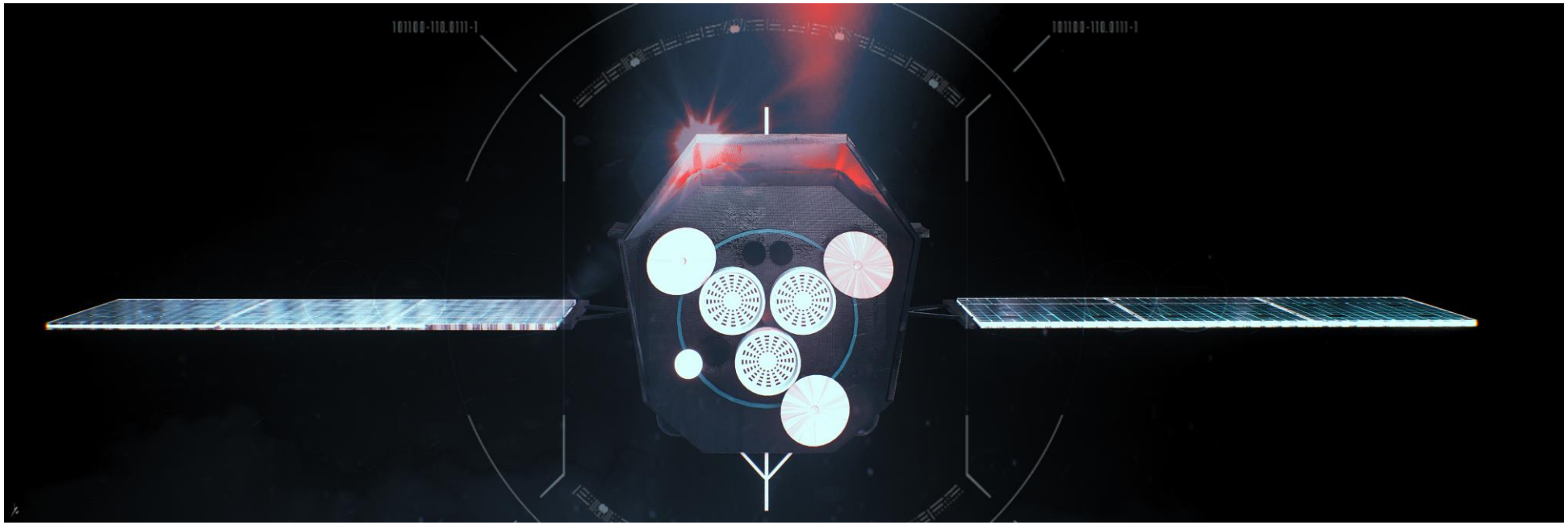
Phase I Proposal Submission System (replaced HRPS in AO21)

- **New IN AO24**
  - ✓ **PI Gender and year or PhD information requested for statistical purposes (UG Recommendation 2023-05-11/18)**
  - ✓ AO21, AO22 and AO23 proposals and targets available to be used in AO24
  - ✓ No INTEGRAL Joint Programme, no MYH Proposals
  - ✓ Technical issues and fix of minor bugs



Mission Planning

Mission Planning Group Activities Overview

Generation and Delivery to MOC of Mission Planning Products	○ Short term Plan ○ Operational Schedule
Downlink Information consolidation	○ Evaluation of observations success/failure (according to the guidelines in the P&P Document) ○ Re-ingestion of failed observation in the scheduling queue
ToOs evaluation and implementation	○ ToO on-call 24/7 for urgent requests ○ Planning and scheduling of anticipated and un-anticipated ToOs ○ Interface with Project Scientist for ToO handling

Mission Planning

Planning and Scheduling

Targets of Opportunity

Tanks Replenishment

GW follow-up

INCREASING SCHEDULING COMPLEXITY

- Growing number of constrained and/or multi-mission coordinated observations

NuSTAR, HST, Chandra, INTEGRAL, MAGIC, VLA, VLT, IXPE, XRISM, NICER…

- Short time changes in coordinations
- Large number of ToOs (also coordinated)
- Short-notice G/S changes (launches, LEO support, contingencies…)
- Scheduling of a single ToO often triggers the re-planning of several revolutions
- Some ToOs request monitoring of the target over several revolutions

As many observations as possible while the target is visible starting inmediately

→ **50% of the revolutions are re-scheduled at least once**

→ **305 schedules generated in one year (for 183 revolutions)**

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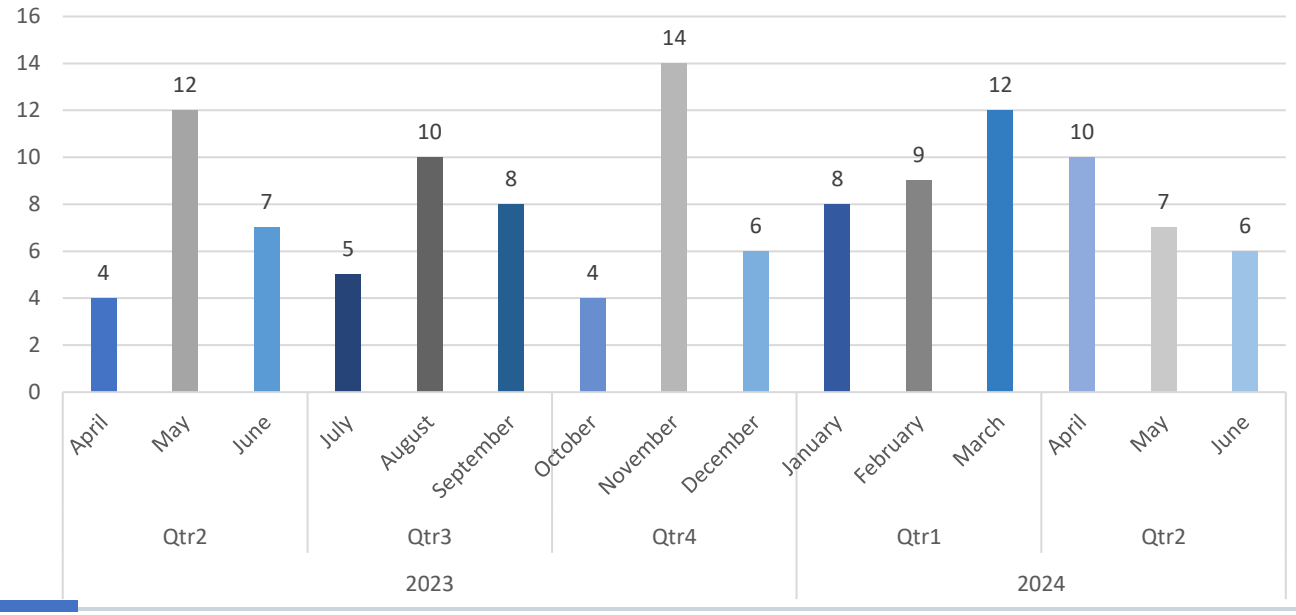
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
2023	Qtr2	Apr					1												1				2											4
		May	1	1	1											1				2		1		1		2		1			1			12
		Jun							1							1	2						1		1					1				7
	Qtr3	Jul			1				1										1		1							1						5
		Aug								1						2		1	1							1	2			2				10
		Sep								2					2					1							1	1		1				8
	Qtr4	Oct					1				1		1												1									4
		Nov					1								2		5	1		1	1				1			1			1			14
		Dec												2		1	1			1			1											6
2024	Qtr1	Jan									1	1						1		1							3				1			8
		Feb			1			1							1	1								1	2			1	1					9
		Mar	2			1			1	1				1		1			1			1		1					1	1				12
	Qtr2	Apr					1		1				2	1					2						1			2						10
		May	1						1	1			1										1							1			1	7
		Jun														1			1	1		1	1			1								6



June 2023 – May 2024

8 triggers per month

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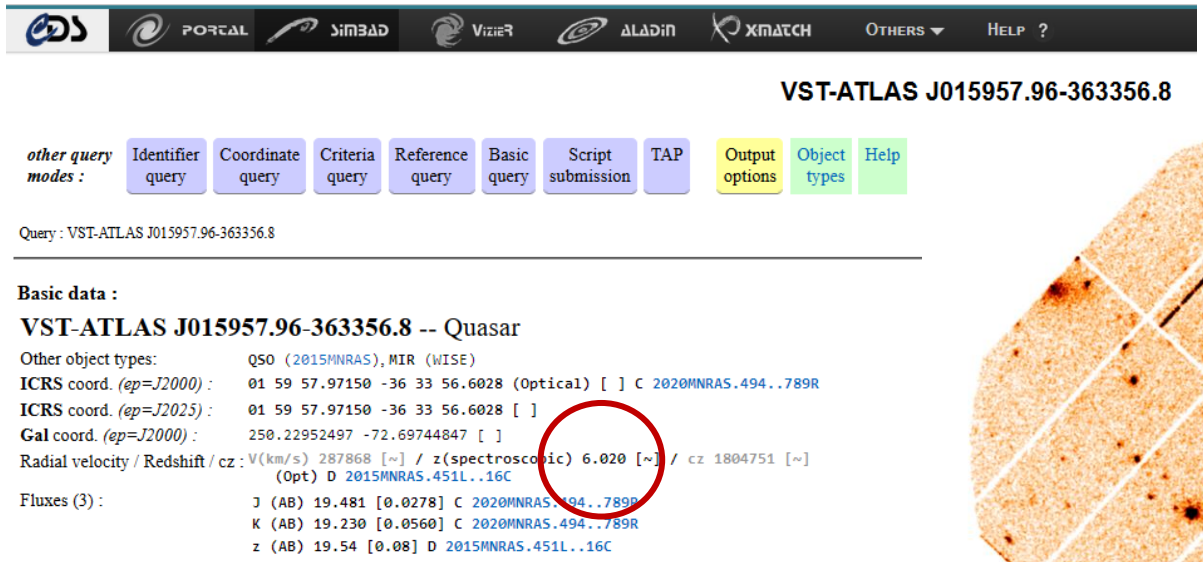
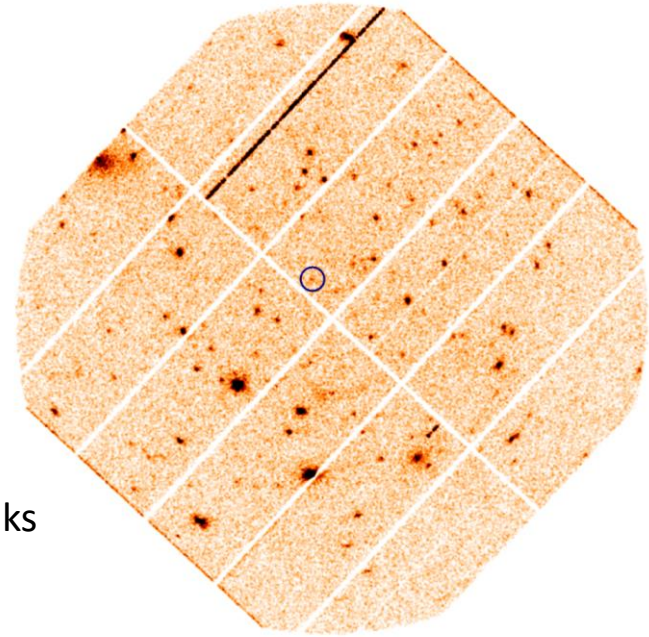
TANKS REPLENISHMENT ACTIVITIES (10-14 JUNE 2024)

Selection of target fulfilling strict specifications of S/C attitude and availability of suitable guide stars

Target selected: The high redshift quasar VST-ATLAS J015957.96-36





Two consecutive revolutions. Total exposure time: 270 ks

Data are public, ODFs already in XSA

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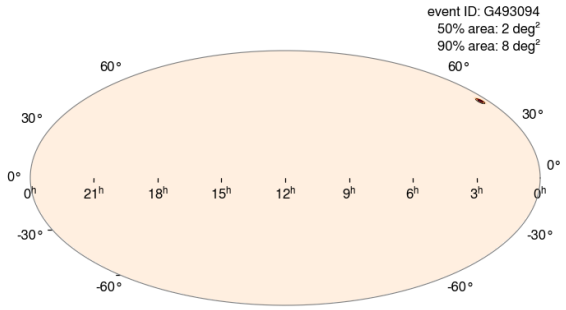
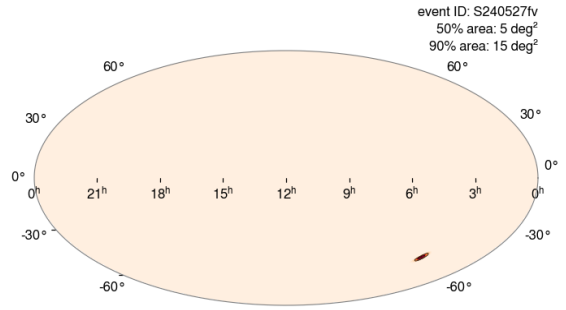
RUN O4B LIGO-VIRGO-KAGRA

p = Probability of GW event within EPIC FoV centered on maximum likehood location

S240615dg p=0.055



S240527fv p=0.021



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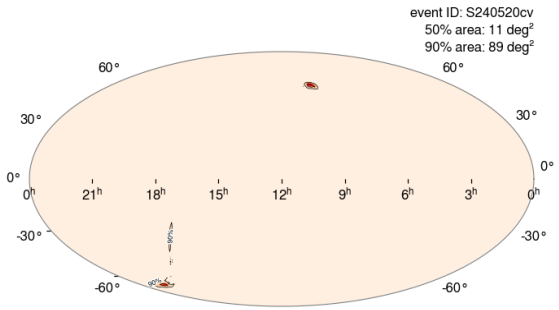
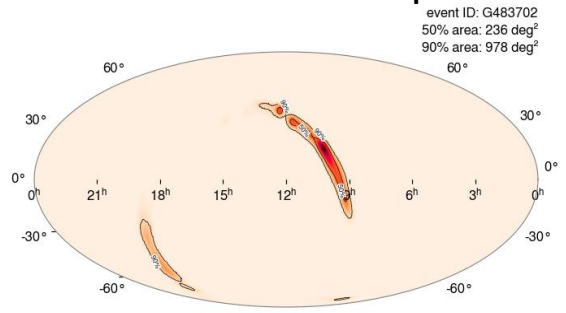


S240515m p=0.001



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RUN O4B LIGO-VIRGO-KAGRA

Fast response to GW alerts:

- Process ***Initial*** GCN/LVC Notices issued after human vetting (minutes)
- Generate SkyMap with detailed information
- If criteria met
  - Automatic generation of schedule

Criteria for XMM-Newton GW alert:

- **Probability** of GW event within EPIC FoV centered on maximum likehood location **> 0.3**
- XMM-Newton **visibility** in on-going revolution **> 5ks**