



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 Support Teams



The X-Ray Universe 2023, Athens

Community Support



Community Support Group Activities Overview

WEB, CONFERENCES AND OUTREACH	<ul style="list-style-type: none">○ 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	<ul style="list-style-type: none">○ HelpDesk support (working days, 09:00-17:00LT) >> New HelpDesk System○ Science Analysis Software (SAS) >> SASv22.0 [starting July 2024]<ul style="list-style-type: none">○ Scientific validation<ul style="list-style-type: none">○ 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	<ul style="list-style-type: none">○ Support to Project Scientist and OTAC○ Proposal Submission Systems and OTAC evaluation tools
PROPOSAL ENHANCEMENT, LONG-TERM PLAN, COORDINATIONS AND SUPPORT FOR JOINT PROGRAMMES	<ul style="list-style-type: none">○ 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	<ul style="list-style-type: none">○ 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

August	
September	Phase I
October	
November	OTAC Meetings
December	OTAC results delivered
January	Phase II
February	
March	Proposals Enhancement
April	
May	Long term Plan and Coordination activities
June	
July	Call preparation and Documentation update

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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

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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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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

The screenshot displays the XMM-Newton HelpDesk interface. At the top, there is a header with the XMM-Newton logo and the ESA logo. The main content area shows a form for creating a support request. The form includes a breadcrumb trail: Directorate of Science ServDes / XMM-Newton HelpDesk / XMM-Newton Support Request. Below this, there is a text box with instructions: "To browse public XMM-Newton tickets click on 'Requests' at the top of the page and select 'XMM Community' (Advanced Search)". The form has a dropdown menu for "Raise this request on behalf of" with "Rosario Gonzalez-Riestra" selected. There is a "Summary" text input field, a "Description (optional)" text area with a rich text editor toolbar (including bold, italic, list, link, and other icons), and an "Attachment (optional)" section with a dashed border and a "browse" button. At the bottom, there is a "Visibility" dropdown menu set to "Public" and a note: "By default, the ticket will be visible to all other XMM-Newton Help Desk users." The form concludes with "Create" and "Cancel" buttons.

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XMM-NEWTON TARGET VISIBILITY CHECKER

Target Visibility **Visibility Plots**

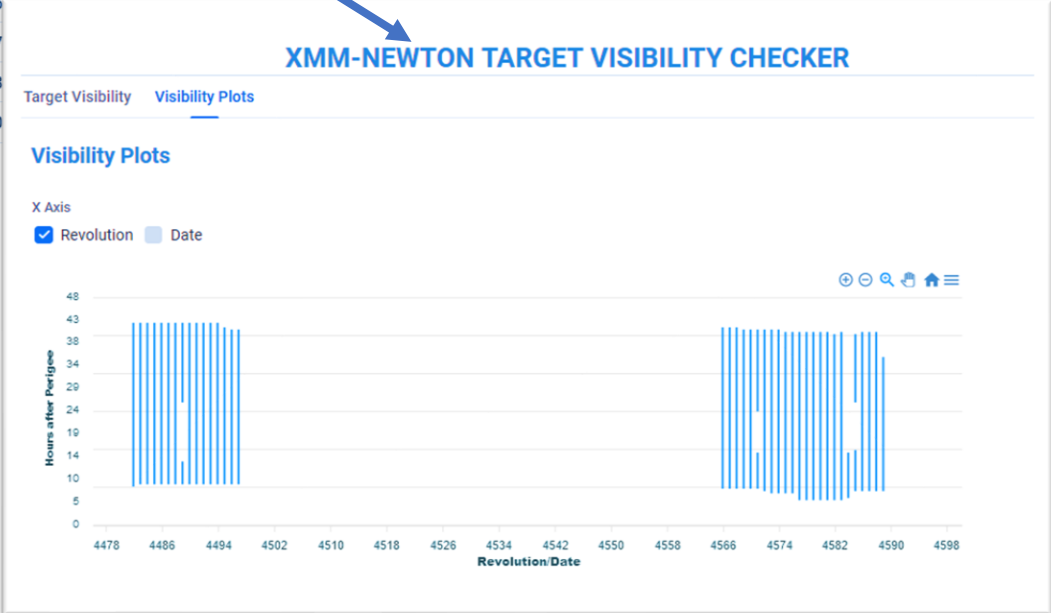
Targets that are only visible for a small fraction of an orbit are only visible at the start or end of a revolution (see columns Visibility Start/End Phase) and therefore have a higher likelihood for increased background radiation.

RESULTS PER TARGET

Target Name	RA	Dec	Visible in N...	Min Duration	Average Du...	Max Duration	Return to the previous page
NGC 4151	182.6357	39.4059	43	17225	109164	127287	



Rev	Vis Start	Durati...	Vis End	Round...	Start ...	End P...	Solar ...	Mean ...
4482	2024-05-29 19:40	123899	2024-05-31 06:05	4482	0:17	0:00	0:14	0:01
4483	2024-05-31 19:33	123823	2024-06-02 05:57	4483	0:17	0:00	0:14	0:01
4484	2024-06-02 19:27	123639	2024-06-04 05:48	4484	0:17	0:00	0:14	0:01
4485	2024-06-04 19:21	123533	2024-06-06 05:40	4485	0:17	0:00	0:14	0:01



Community Support

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Phase I Proposal Submission System (replaced HRPS in AO21)

- **New IN AO24**

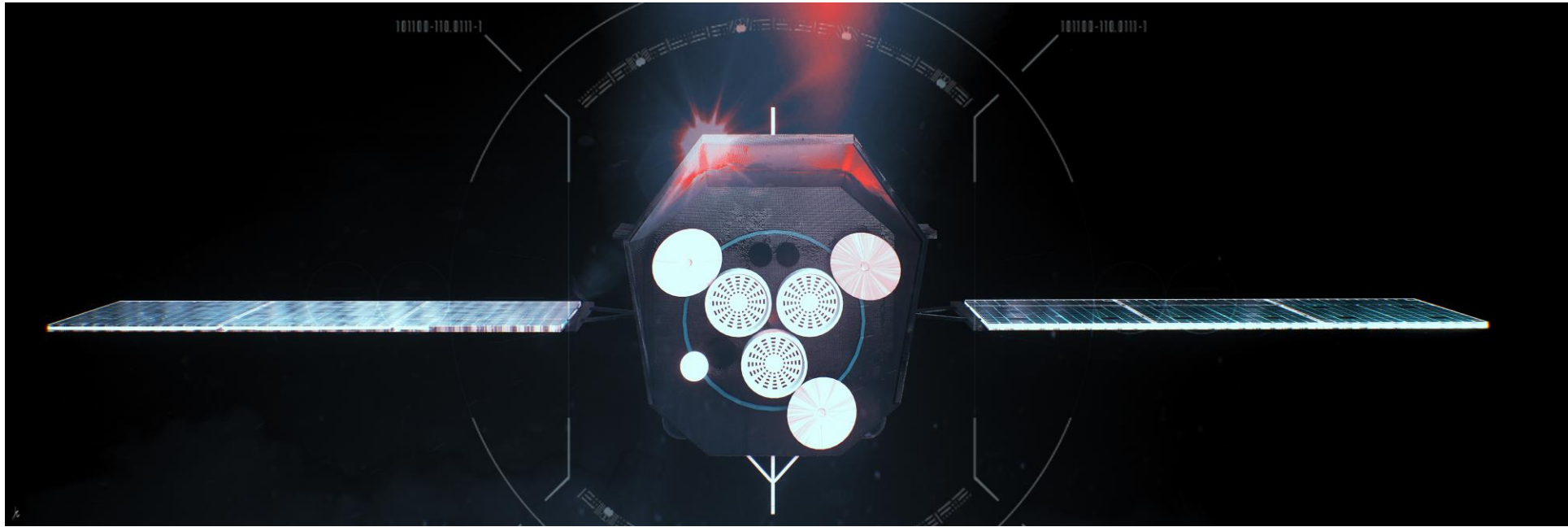
- ✓ **PI Gender and year or PhD information requested for statistical purposes**

(UG Recommendation 2023-05-11/18)

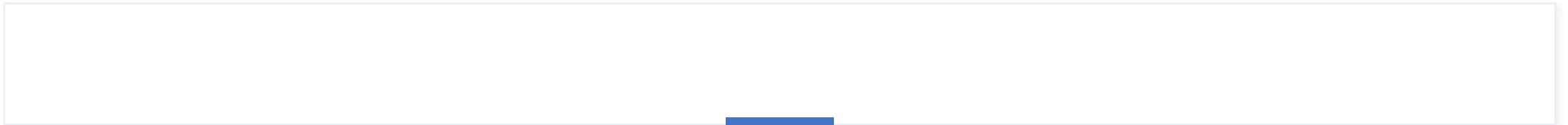
- ✓ AO21, AO22 and AO23 proposals and targets available to be used in AO24

- ✓ 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
 - 50% of the revolutions are re-scheduled at least once
 - 305 schedules generated in one year (for 183 revolutions)

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

Mission Planning

Planning and Scheduling

Targets of Opportunity

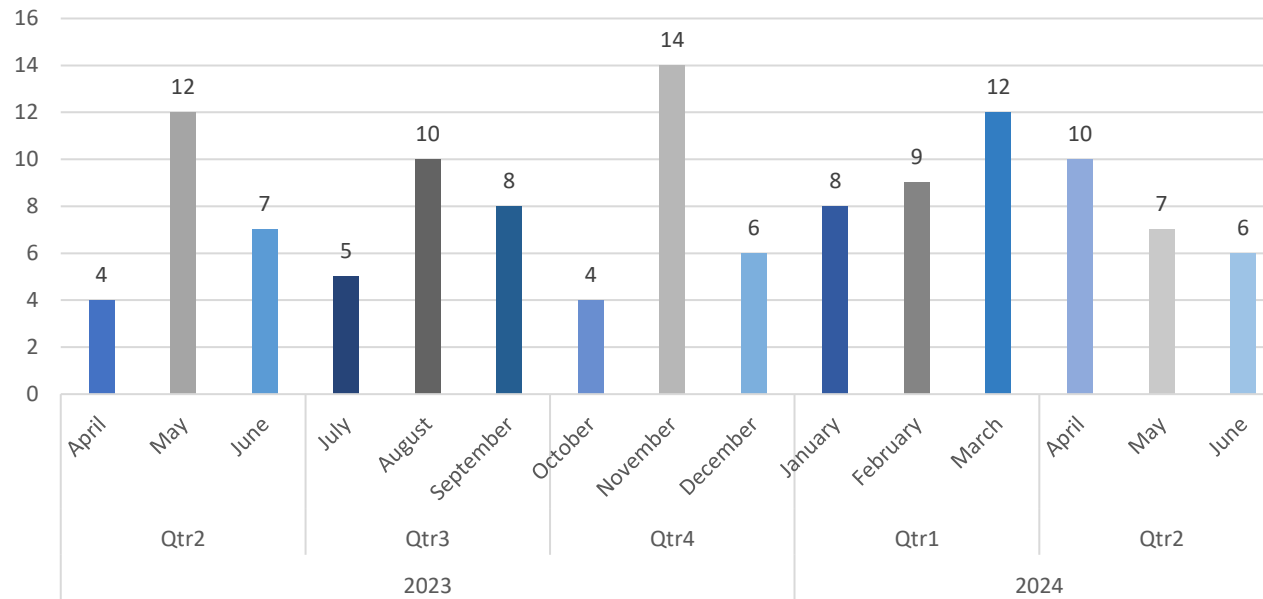
Tanks Replenishment

GW follow-up

			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		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		7
		Jun															1			1	1					1									6

June 2023 – May 2024

8 triggers per month



Mission Planning

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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



VST-ATLAS J015957.96-363356.8

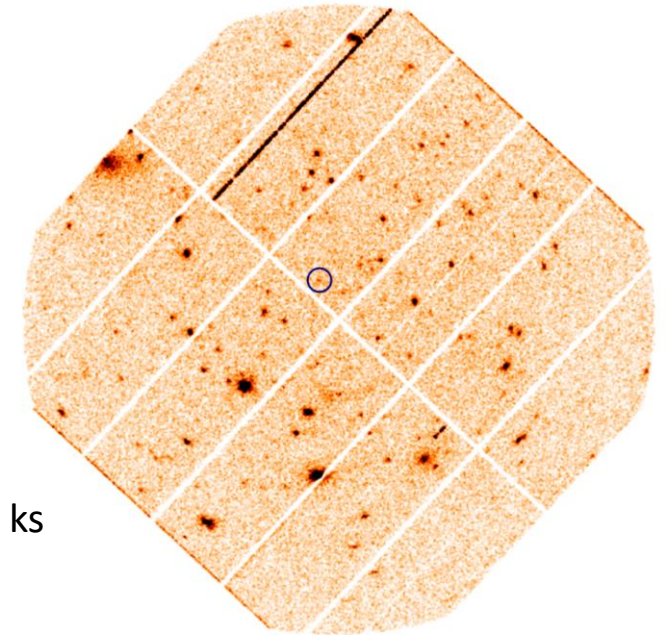
other query Identifier Coordinate Criteria Reference Basic Script TAP Output Object Help
modes : query query query query query query submission options types

Query : VST-ATLAS J015957.96-363356.8

Basic data :

VST-ATLAS J015957.96-363356.8 -- Quasar

Other object types: QSO (2015MNRAS), MIR (WISE)
ICRS coord. (ep=J2000) : 01 59 57.97150 -36 33 56.6028 (Optical) [] C 2020MNRAS.494..789R
ICRS coord. (ep=J2025) : 01 59 57.97150 -36 33 56.6028 []
Gal coord. (ep=J2000) : 250.22952497 -72.69744847 []
Radial velocity / Redshift / cz : V(km/s) 287868 [~] / z(spectroscopic) 6.020 [~] / cz 1804751 [~]
(Opt) D 2015MNRAS.451L..16C
Fluxes (3) : J (AB) 19.481 [0.0278] C 2020MNRAS.494..789R
K (AB) 19.230 [0.0560] C 2020MNRAS.494..789R
z (AB) 19.54 [0.08] D 2015MNRAS.451L..16C



Two consecutive revolutions. Total exposure time: 270 ks

Data are public, ODFs already in XSA

Mission Planning

Planning and Scheduling

Targets of Opportunity

Tanks Replenishment

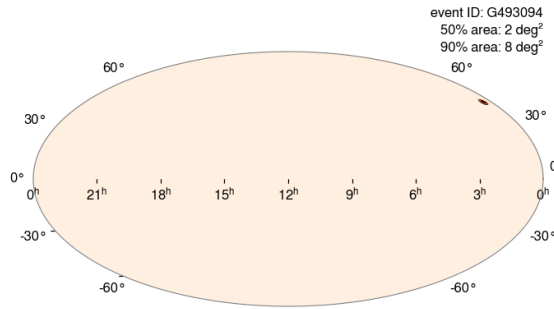
GW follow-up

RUN O4B LIGO-VIRGO-KAGRA

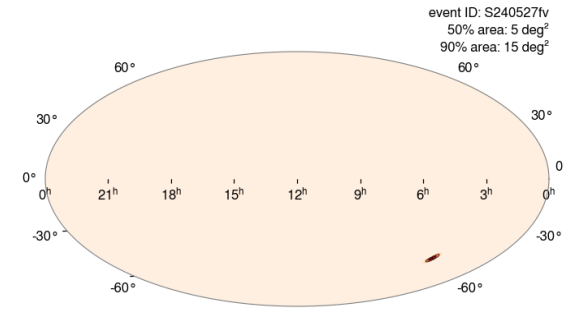


p = Probability of GW event within EPIC FoV centered on maximum likelihood location

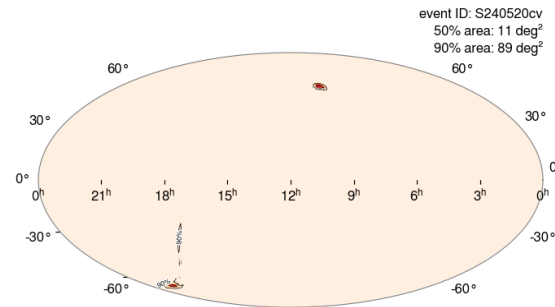
S240615dg $p=0.055$



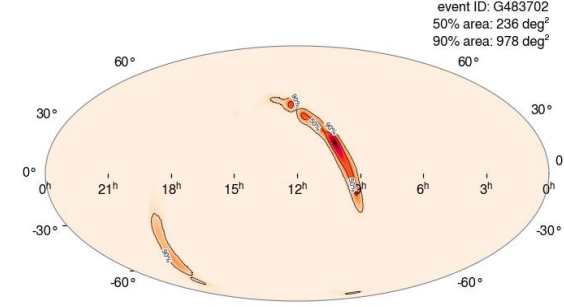
S240527fv $p=0.021$



S240520cv $p=0.007$



S240515m $p=0.001$





Mission Planning

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

Planning and Scheduling

Targets of Opportunity

Criteria for XMM-Newton GW alert:

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

Tanks

Replenishment

GW follow-up