



esac

European Space Astronomy Centre (ESAC)
 P.O. Box, 78
 28691 Villanueva de la Cañada, Madrid, Spain
 Tel (34) 91 8131100
 Fax (34) 91 8131139
 www.esa.int

MEETING

Meeting Date 17-18 May 2018

Ref MoMUG#19

Meeting Place ESAC/XMM-Newton SOC B5/B65

Chairperson Martin J. Ward

Minute's Date 21 May 2018

Participants

UG members: Martin J. Ward (Chair), María Díaz Trigo, Ioannis Georgantopoulos, Jimmy Irwin, Christine Jones, Gabriel Pratt, Beate Stelzer.

In attendance: Norbert Schartel (Project Scientist), Peter Kretschmar (Mission Manager), Maria Santos-Lleó (Science Support Manager), Matthias Ehle (User Support Group Leader)

Invitees: Frank Haberl (EPIC pn acting PI), Jelle Kaastra (RGS PI), Natalie Webb (SSC Project Director); Mike Watson (Survey Scientist); Rudy Wijnands (future UG chair); Presenters and interested staff from the XMM-Newton Science Operations Centre.

Absent: UG members Hans Böhringer, Nanda Rea, Peter Schneider (OTAC Chair), and the invited external experts Mat Page (OM acting PI), Steve Sembay (EPIC MOS acting PI) had sent their apologies.

Subject

Minutes of XMM-Newton Users' Group Meeting 19

Copy

Description	Action	Due Date
Edited by María Santos Lleó. Approved by UG members on 20 June 2018		



WELCOME:

M. J. Ward (Chair) and N. Schartel (Project Scientist, PS) opened the meeting on May 17th at 10:00. They introduced Rudy Wijnands as the next Users' Group chair. He will later take over from M. Ward, who, as has been the case in the past, invited him to this meeting as a means of familiarising himself with the proceedings. A new Users' Group (UG) member Gabriel Pratt and the new Mission Manager (MM) Peter Kretschmar were also welcomed, and all the panel members briefly introduced themselves. M. J. Ward explained the format of the meeting, consisting of an open meeting on the 1st day, and an open discussion session in the morning of the 2nd day, followed by a UG member-only executive session in the afternoon.

ADOPTION OF THE AGENDA:

The agenda of the meeting was presented and adopted by panel members.

PRESENTATIONS:

The following presentations were given on May 17th:

Overall Mission Status	(P. Kretschmar)
Report of the Project Scientist	(N. Schartel)
SPACON merger	(M. Kirsch)
User Support and Mission Planning	(M. Ehle)
Calibration EPIC	(M. Smith)
Calibration RGS	(R. Gonzalez)
Calibration OM	(A. Talavera)
Pipeline development	(P. Rodriguez)
SAS medium and long-term strategy	(C. Gabriel)
SSC Status	(N. Webb)

The slides of all the presentations are available on the XMM-Newton public web site, under the headings "General User Support" → "Users' Group".

DISCUSSIONS:

During the course of these presentations, several questions were raised and discussions took place at that time, and also on completion of each presentation:

After the presentation on the Overall Mission Status, UG members asked whether, in order to ensure some overlap between XMM-Newton and Athena, XMM-Newton instruments could be switched off at some point and spacecraft put into hibernation until such time as Athena becomes active. However, it was explained that this would not be desirable for several reasons. Fuel would be required anyway to maintain the orbit. In addition, there would be no science return during this hibernation period and reactivating instruments after a long period of off-time has significant risks.

The Report of the Project Scientist led UG to suggest investigation of the possibility to establish a joint program with LOFAR. It also triggered some discussion about the need to increase the visibility of high-energy astrophysics in general meetings like the EWASS. The problem is that many active researchers in our field much prefer to attend focussed workshops/symposia rather than these massive very general conferences. Whereas senior administrators tend to prefer the latter. We should encourage high-energy community participants of meetings such as EWASS and the IAU, to attend parallel sessions in this area, when possible.



During the presentation related to the merger of Gaia and XMM-Newton/Integral SPACON (Spacecraft Controllers) teams, there were several questions about instrument recovery actions that are no longer possible, even when the original SPACON member(s) is on-shift, and in general about how and when overall efficiency can be recovered. The UG was informed that the first issue is not possible due to legal contractual issues; the answer to the more general type of question is not currently known. Within current plans, recovery of instruments by SPACON will only be allowed when it can be done in a fully automatic way. Details of the procedure to do this is still under study. Manual recovery by the SPACON is not being studied at this time. Further discussion of this important subject was deferred until the open discussion session on the second day.

The presentation on User Support and Mission Planning was followed by questions from the UG members about the impact of the SPACON merger on the science operations time and about the behaviour of the radiation background in relation to the solar cycle.

UG members asked about the number of revolutions that need to be rescheduled by Mission Planning due to changes in requests by Principal Investigators (PIs). M. Ehle explained that most requests are already implemented during the proposal enhancement activity. A follow up investigation of this issue after the UG meeting and a more detailed analysis showed that most of the 15 re-scheduling cases reported in this category were due to the increasing complexity of mission planning, with a high number of joint programmes, coordinated and ToO observations. For these categories, the final observation set up often needs to be done outside of the routine enhancement activity period and very close to the scheduling date. They are therefore more prone to PI and SOC-internally triggered changes. Purely PI-triggered re-schedulings were only 4-5 in a year, with 75% of those due to the unexpected activity state of the target. It should be emphasised that advanced scheduling of the order of several weeks is important as it allows PIs to organize coordinated observations, and as a buffer in case of problems (s/w or h/w) in the mission planning system, or schedule rejection by the MOC.

After the presentation on EPIC calibration, UG members asked why the effective area correction is not applied by default. There was some discussion about the EPIC-NuSTAR cross-calibration and potentially different results when comparing different types of objects as well as the risk that community pressure in terms of oversubscription on XMM-Newton decreases if the calibration does not meet their scientific requirements. The presentation about RGS calibration was followed by questions about the nature of contaminants; however, the nature of the suspected new component is currently under investigation. During the presentation about OM calibration, there was some discussion about the OM-GALEX source flux comparison and about whether an OM-UVOT comparison has been made. To the SOC knowledge, MSSL has not published any systematic comparison.

The presentation on the Pipeline by P. Rodriguez resulted in some questions about the new products under study, for example improved light curve files or EPIC pn pile-up free spectra (but not planned for EPIC MOS). There was a suggestion to look further at the algorithms used by the EXTraS project for background.

Based on the presentation on SAS medium and long term strategy, UG members asked about differences between RISA and Virtual Machines, how scriptable is RISA and if RISA has been advertised to the community in order to get their feedback? RISA was announced in an XMM-Newton newsletter (#198) where community were invited to test and provide input on how it should evolve. It was also presented in at a number of conferences, e.g. as a poster at "The X-ray Universe 2017" in Rome. The UG stressed the importance of continuing with SAS compiled releases and making the source code publicly available, as already planned by the SOC.

N. Webb presented the status of the Survey Science Centre (SSC) and the release plan for the Stacked Catalogue, and development plans for the 4XMM catalogue. Asked about synergies with EXTraS work, she explained that some of the EXTraS people would be attending the 'Treasures Hidden in High-Energy Catalogues' workshop,



22-24 May in Toulouse, where they will present their results, and this would be a good opportunity to share experience and expertise. I. Georgantopoulos mentioned work undertaken by his team that has derived photometric redshifts for 3XMM catalogue sources.

INPUT FROM THE COMMUNITY

As inputs from the community and for further discussion, UG discussed inputs received asking how much time was allocated to the new Multi-Year-Heritage programme (MYHP), and how it compares with the time that was allocated to the previous Very Large Programme (VLP). The Project Scientist explained that a given sky position has on average about 3Ms maximum visibility per year and this constraint defined the maximum allowed time for a single VLP. Over the 10 years that VLP have been offered, OTAC has accepted ~3Ms-programmes on three occasions. The MYHP has allocated two ~3Ms-programmes to be performed over three years, showing therefore an increase in the time allocated to such big programmes. The PS also explained how the MYHP panel was selected. The aim is to offer MYHP again in AO-20, three AOs after last year's AO-17. In the meantime, there are no plans to set an upper limit to the observing time that Large Programmes can request. At the conclusion of the discussion, it was agreed that no changes for LPs in next AO were required.

The UG then discussed inputs received asking about the possibility to offer a mid-cycle call for proposals. As explained in the Policies and Procedures, the XMM-Newton Project Scientist (PS) can grant 'Discretionary Time' (DDT), which is ~5% of the XMM-Newton observing time. Unanticipated Target of Opportunity observations can be executed in the 'Discretionary Time' of the Project Scientist. The Project Scientist can also use 'Discretionary Time' to increase observing time of accepted targets. The UG agreed that DDT can also be dedicated to rare, interesting discoveries with the potential to make a major scientific impact, e.g. which may lead to publication in high profile journals such as Nature or Science. It was also noted that Chandra has recently increased the fraction of time dedicated to DDT.

The UG did not consider it necessary to make any change in the XMM-Newton DDT policy, and not to introduce a new mid-cycle proposal, which would result in significant extra effort that the SOC might not be able to provide. To conclude this topic, following community input, the UG recommended that the route of DDT for important, but not necessarily time critical, observations should be more widely advertised as it clearly satisfies an important scientific niche in between AOs.

The UG then discussed the Fulfil Programme. This programme was introduced in 2017 for AO-17 following the UG recommendation in 2016. Some UG members had the impression that part of the community does not really understand what it was for and how to use it. Furthermore, the OTAC interpretation did not seem to have been consistent across the various panels. N. Schartel explained that the community always need time to adapt to new initiatives. This was accepted by the UG, but they asked the UG chair to clarify the programme description in consultation with the OTAC chairperson.

As per the XMM-Newton Science Archive, XSA, G. Pratt asked if thumbnail images of the observation background light curve could be display in a new column of the XSA results panel. The Archive Scientist took note for it to be included in the list of requested changes. .

Further inputs from the community were related to the specific case of a pre-approved ToO proposal aiming to observe one object from a list of potential candidates that, when the PI triggered the observation of one of them, it was rejected because the observation had already been approved two days before, as an un-anticipated ToO for a different PI. The proposal remains approved and waiting for the next trigger, but the PI considers that they should have had priority. The PS explained that he always makes every possible effort to avoid un-anticipated ToOs to be observed instead of anticipated ToOs, which do indeed have priority. The PIs of all anticipated-ToO approved proposals are informed that the OTAC sometimes accepts competing ToOs and are encouraged to alert the SOC immediately after the triggering event has occurred. The PS explained that there



are some relatively few reasons for this to happen, as reflected, e.g., in the minutes of previous UG meetings. The UG understood the situation and acknowledged efforts already made to avoid such cases as much as possible.

The meeting concluded, without any further AOB, on the 1st day at 17:45.

DEDICATED DISCUSSION:

Discussions continued on May 18th starting at 10:00. UG discussed items presented or arising from discussions on the 1st day of the meeting.

First item discussed was whether the PS should allow and therefore announce a process for self-nominations from the scientific community to be considered as UG member candidates. The UG agreed with the general idea provided some basic requirements be specified. They made clear that self-nomination should not preclude the Project from contacting people that did not self-nominate, but are considered as appropriate candidates. The UT formulated **Endorsement 2018-05-18/01** (below).

The discussion on the suggestion for mid-cycle proposals was continued and concluded that following community input, the UG recommends that the route of DDT for important, but not time critical, observations should be more widely advertised as it satisfies an important scientific niche in between AOs.

The impact of the merger of GAIA, XMM-Newton and Integral SPACON was discussed. The UG recalled their previous recommendation that every effort be made to limit the impact of this merger to be below 2 % after one year. This was written in the *XMM-Newton-Integra-Gaia SPACON merger assumptions, operations concept and implementation plan* signed in Dec 2016: “Delayed recoveries (Reduction of SPACON availability and instrument knowledge) will lead to an estimated reduction in science performance of 5 - 8 % (XMM), <15%(INT). This might be improved by further automation. The XMM-Newton Users Group strongly recommends that every effort be made to limit the impact to be below 2 % after one year”.

Currently, the accumulated experience of the merger is only slightly more than 1 month, therefore the evolution of the impact is difficult to predict. However, the UG members were very concerned about the negative impact, in particular on the coordinated programmes, which the extrapolation of current performance can have. The situation could change dramatically when plans mentioned in MK presentation are in place, i.e. when instrument recoveries are operated by SPACON, but this was stated as being conditional on recoveries being ‘sufficiently automated or eventually fully automated’. The time scale and priority given to each of these steps was not clear. A major improvement could be achieved at once if SPACON are allowed to implement a few ‘sufficiently automated’ recoveries. This is foreseen and allowed in the merger documentation, e.g. in the SPACON merger procedures, “in some specific cases a first attempt to recover an XMM-Newton instrument will be commanded by the SPACON (pre-validated sequences)”. However, the presentation did not provide a definitive answer on whether high priority is being given to begin with this approach, or, rather to go straight to full automation.

Finally, even assuming as claimed this was due to contractual issues, the UG members could not understand why SPACON personnel previously trained in how to perform instrument recoveries are no longer allowed to do them, at least during this current transition phase until more automation is included in the recovery modes. Moreover, under the new operations scenario the Ops-analyst is the only person that can perform routine instrument recoveries. Given the shift of the perigee passage time across the year, there will be periods when the Ops-analyst working hours coincide with instruments being in their safe perigee configuration, meaning that dedicated instrument support is provided when instruments are not operated, which does not seem to be an efficient use of effort.



The UG raised concern that joint programmes can be jeopardised by the new operations concept and considers it very important to avoid damage to not only to the project but also to project joint agreements that might not be fulfilled as a result. . P. Kretschmar, XMM-Newton Mission Manager, took an action to clarify the situation about instrument recoveries that SPACON can provide. . The UG wrote **Recommendation 2018-05-18/01** and **Action 2018-05-18/01**.

The UG discussed several other topics: Mission Extension support and preparations for the 20th anniversary of XMM-Newton launch in December 2019. There were suggestions about possible events during 2019 such as a special XMM-Newton & Chandra session in the Bologna conference or at the AAS meeting, and various activities organized or supported by national societies and outreach articles.

N. Schartel, on behalf of the XMM-Newton project, expressed deepest recognition and warmest thanks to Prof. Martin J. Ward for all his efforts and support to XMM-Newton over the last years as chairperson of the Users Group.

The open session ended at 11:00 am

RECOMMENDATIONS FROM PREVIOUS MEETINGS

In the UG's executive session that started at 13:00, UG reviewed the status of resolutions, recommendations and action items formulated at previous meetings and formulated new ones. For clarification purposes, the UG noted the following definitions: a recommendation is a suggestion or proposal as to the best course of action; a resolution is a decision to do or not to do something.

The disposition of previous items, grouped by topic is as follows:

On the Proposal for a SPACON arrangement involving XMM-Newton, Gaia and INTEGRAL:

Resolution 2016-06-08/01: The UG recognises the reasons for this proposed arrangement, which is still under study at this time. However, in order to protect the scientific return from XMM-Newton it strongly recommends that every effort be made to limit the impact of this new arrangement to be below 2%, after one year.

Status: Open

On the Erosion of Expertize and Cross-mission Synergies

Recommendation 2017-05-11/03: A significant continuing challenge is the erosion of expertize via staff retirements and the potential movement of staff onto other projects. Whilst this process is inevitable, the UG recommends that consideration be given to cross-mission synergies with future missions, Athena in particular, in the areas of pipeline products and the associated software.

Status: Open

On Calibration Priorities:

Recommendation 2015-05-22/02: The UG identifies the following tasks in order of priority:



1. Cross-calibration of the responses of the XMM-Newton X-ray cameras and spectrometers. This is a longstanding issue, and it should be resolved as far as is possible in the near future.
2. Evidence for a shift in gain of the PN detectors, which is dependent on the quiescent background. This should be investigated and quantified, and a correction implemented.
3. Calibrated spectra from NuSTAR and XMM-Newton sometimes show a significant mismatch in spectral slope and offset above 3keV. This is a matter, which the IACHEC should be encouraged to investigate.
4. Complete the calibration of the PN Burst Mode, RDPHA correction.

Status: All on going.

Recommendation 2016-06-08/01: As result of some recent investigations, there is now a requirement to implement an iterative adjustment to the parameters for the 2-D PSF. This is in order to minimise the spectral residuals between an angular extracted spectrum and the total spectrum. This activity needs to be considered as of the highest priority because of its impact on many other aspects of the calibration.

The UG recommends to continue working on the previous list of calibration matters that are on-going (cf. **Recommendation 2015-05-22/02**) and then to follow on with a new recommendation.

Status: Closed

Recommendation 2016-06-08/02: The time and energy reconstruction of the pn Timing mode should be studied with respect to recently observed discrepancies.

Status: On going.

On Calibration matters of high priority:

Recommendation 2017-05-11/05: The NuSTAR off-axis observation of the Crab has the potential to serve as a “standard candle” in the hard X-ray domain by virtue of the significant overlap with the bandwidth of the EPIC detectors. Therefore, the UG recommends that the SOC study the implications of this observation in the context of the still open UG recommendations on calibration issues: Recommendations 2015-05-22/02-1, 2015-05-22/02-3, 2015-05-22/02-4, and 2016-06-08/02.

Status: on going

On the XMM-Newton Survey Science Centre (SSC)

Recommendation 2017-05-11/01: The UG noted the SSC’s continued valued contribution to the high scientific impact of XMM-Newton, via the production of catalogues and input into other areas such as the SAS development. The SSC is working on provision of a “stacked source” catalogue containing new fainter source detections. This will be a valuable addition to the archive, when it becomes available later this year. Of the various tasks identified by the SSC for the coming years, it is considered highly desirable to give a high priority to new data products that could be used to search for source variability, between separate XMM-Newton observations. Also, it is recommended that effort should be directed towards the provision of one version of the 4XMM catalogue, for the whole scientific community.

Status: on going

On the Post-Operations Road-Map

Endorsement 2017-05-11/01: The post-operations road map identifies all the key elements required for the mission heritage and identifies the optimized pipeline products and the post-mission SAS sustainability as the two most important features, in that order. The UG endorses the road map and recommends its implementation as far as resources permit, i.e. maintaining current SOC activities as recommended last year (see **Recommendation 2016-06-08/03**).



Status: Closed

On the Scientific Analysis System (SAS)

Endorsement 2017-05-11/02: The SAS long term and post-operations survival strategy rests on three pillars: (1) SAS running on a virtual machine platform, (2) RISA and (3) provision of a public source code. The UG endorses this strategy and recommends its implementation as far as resources permit, i.e. maintaining current SOC activities as recommended last year (see **Recommendation 2016-06-08/03**).

Status: Closed

On the Pipeline Processing System

Recommendation 2017-05-11/02: The UG noted the ambitious list of current development activities in the pipeline, incorporating EPIC and OM light curves for a single source into a single file, and including pile-up level estimates in the source products. The UG endorses the current planned developments and recommends continuing the optimization of pipeline products as a high priority.

Status: on going

On the Remote Interface for Scientific Analysis (RISA)

Recommendation 2017-05-11/04: The UG noted that RISA is both a current resource, as well as providing the basis for the long-term preservation of the Scientific Analysis System (SAS). The UG endorses RISA and recommends its further development. Since RISA is still in its early phase, the UG strongly encourages XMM-Newton users, particularly those already familiar with the SAS, to test the RISA in terms of its functionality, and with attention to its key role in maintaining the legacy of XMM-Newton observations. The UG recommends using the feedback from these users and from the UG, to ensure the best possible provision for the post-mission phase.

Status: on going

In addition, UG took the following action:

Action Item 2017-05-11/01: All members of the UG are kindly requested to test out the RISA with the aim of identifying the essential functionality. Reports are to be sent to the Project Scientist (with a deadline of end June 2017)

Status: closed

On the Target-of-Opportunity (ToO) Observations

Action Item 2017-05-11/02: The chairperson of the UG is asked to contact the chairperson of OTAC in relation to the change last year, which removed the possibility for OTAC to accept TOO observations in the priority C category.

Status: Closed (action item completed)

On the Topic for the 2018 Science Workshop



Action Item 2017-05-11/03: All members of the UG are kindly requested to suggest topics for the 2018 scientific workshop to be sent to the Project Scientist (with a deadline of 15 June 2017).

Status: Closed

On Candidates for the UG Chairperson

Action Item 2017-05-11/04: All members of the UG are kindly requested to suggest candidates for the next UG chairperson to be sent to the Project Scientist (with a deadline of 15 June 2017).

Status: Closed

On Candidates for Members of the UG

Action Item 2017-05-11/05: All members of the UG are kindly requested to suggest candidates for future members of the UG to be sent to the Project Scientist (with a deadline of 15 June 2017).

Status: Closed

RESOLUTIONS, RECOMMENDATIONS AND ACTION ITEMS

The UG formulated the following new recommendations, endorsements and action items:

On SPACON arrangements

On the SPACON arrangement involving XMM-Newton, Gaia and INTEGRAL

Resolution 2018-56-18/01: The UG notes with great concern the negative impact (based on analysis over a limited time), of the new mode of combined operations. This was especially serious in the case of several joint programmes offered by XMM-Newton together with other major facilities. The UG urges that all possible measures be taken to mitigate the negative impact of combined operations as soon as possible.

In this regard, the UG recalls **Resolution 2016-06-08/01** in which the impact of this new arrangement is aimed to be below 2% after one year.

Action 2018-05-18/01: Mission manager to investigate all possible means to mitigate negative impact on XMM-Newton, of implementing the combined mission operations.

On Observational Programme Changes

Recommendation 2018-05-18/01: During “XMM-Newton: The next Decade” workshop held in June 2017, community discussions led to several outcomes. The introduction of a new, very large project category (Multi-Year-Heritage proposals), stressing the importance of new (future) joint programs (e.g. CTA, ELT, SKA), and an increased frequency of TOOs to ensure XMM-Newton’s position as a primary astrophysical research facility into the next decade.

Based on the community’s response to the previous proposal call (AO-17), the UG considers that this new “Heritage” category was well received and recommends that it should be offered again in the future.



Concerning the SSC processing and data archives

Action 2018-05-18/02: The Project Scientist should clarify with the SSC the most appropriate means of handling detections of rare, unexpected transients during the pipeline product screening process, where fast follow-up observations may result in major added scientific value.

On Mission Extension

Resolution 2018-05-18/02: With respect to the up-coming request for mission confirmation and extension, the UG very strongly endorses its continued operation, as a crucial element in providing unique stand-alone X-ray data, and synergetic observations with the new space and ground-based facilities e.g. JWST, eROSITA, Euclid, Einstein Probe, XARM, ELT, LSST, CTA, SKA... and gravitational wave observations, in addition to bridging the time gap to Athena.

On the 20th Anniversary

Recommendation 2018-06-08/03: The UG notes this approaching important milestone in 2019. The 20th anniversary of XMM-Newton presents an ideal opportunity for “public outreach” to publicise and celebrate a major ESA success story, as well as a time to look forward to new scientific directions and opportunities.

The UG recommends that all members of the X-ray community, especially members based in ESA member states, consider ways to mark this anniversary, in a coordinated fashion and in collaboration with ESA.

Action 2018-05-18/03: All UG members to consider ways to mark the 20th anniversary of XMM-Newton, with emphasis on the future of the mission, and to coordinate events.

On Users’ Group

Endorsement 2018-05-18/01: The Users’ Group encourages a trial period for “self-nomination”, in order to provide a wider list of possible candidates for future UG member replacements.

The executive session ended on May 18th at 14:30.

Date of next meeting: TBD in May or June 2019, starting at 10:00 at ESAC.