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# MEETING

**Meeting Date** 17-18 June 2020

**Ref** MoMUG#21

**Meeting Place** Virtual Meeting via WebEX

**Chairperson** Rudy Wijnands

**Minute's Date** 11 September 2020

**Participants**

**UG members:** Rudy Wijnands (Chair), Stefano Bianchi, Enrico Bozzo, María Díaz Trigo, Christine Jones, Lida Oskinova, Gabriel Pratt, Silvia Zane.

**In attendance:** Norbert Schartel (Project Scientist), Peter Kretschmar (Mission Manager), María Santos-Lleó (Science Operations Manager)

**Invitees:** Jelle Kaastra (RGS PI), Natalie Webb (SSC Project Director), Frank Haberl (EPIC pn), Mat Page (OM acting PI),; Presenters and interested staff from the XMM-Newton Science Operations Centre.

**Absent:** UG members Jimmy Irwin and Peter Schneider (OTAC Chair) and the invited external experts Steve Sembay (EPIC MOS acting PI) and Mike Watson (SSC) had sent their apologies.

**Subject**

Minutes of XMM-Newton Users' Group Meeting 21

**Copy**

Description	Action	Due Date
Edited by Jan-Uwe Ness. Approved by UG members on		



## **WELCOME:**

R. Wijnands (Chair) and N. Schartel (Project Scientist, PS) opened the meeting on June 17<sup>th</sup> 2020 at 10:00. They introduced two new UG members: Enrico Bozzo and Silvia Zane who were welcomed by everybody.

The meeting consisted of an open meeting on the 1<sup>st</sup> day and a UG member-only executive session in the afternoon of the 2<sup>nd</sup> day.

Owing to the COVID-19 crisis, the meeting has taken place as a virtual meeting via WebEx. Lida Oskinova mentioned that a system compatible with Linux would have been more appropriate because Linux is widely used in the scientific community.

## **ADOPTION OF THE AGENDA:**

The agenda of the open meeting was presented and adopted and contained the following

## **PRESENTATIONS:**

Overall Mission Status	(P. Kretschmar)
Report of the Project Scientist	(N. Schartel)
User Support and Mission Planning	(R. Gonzalez)
Calibration EPIC	(M. Smith)
Calibration RGS	(R. Gonzalez)
Calibration OM	(S. Rosen)
UG Community input: OM fast mode	(S. Rosen)
Pipeline development	(P. Rodriguez)
Status of SAS medium-long term plan	(R. Saxton)
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 directly after each presentation:

After the presentation on the Overall Mission Status, R. Wijnands asks what went wrong previous night during the on-going fuel replenishment exercise. The anomaly was on the ground station, Kourou. Telecommands were sent from ESOC to Kourou but not to spacecraft. Investigations and mitigation, e.g. procedure revision, commenced immediately at night and the review board met early in the morning. It was reported later that all is on good track, there was a small human error on the ground station configuration that could be corrected and will not happen again. C. Jones asked about the temperature behaviour during the on-going exercise and P. Kretschmar explained that behaviour is as expected.

The Report of the Project Scientist was followed by the enquiries:



R. Wijnands asked whether there is any way we can influence the evolution of the number of proposals by nationalities? N. Schartel answers that there are some fluctuations in a few countries, but essentially the number of proposals reflects the number of active scientists that we can hardly influence.

S. Zane asks whether the amount of time for ToOs could be increased. N. Schartel responds that there is no quota on ToOs other than requiring A or B priority ranking

N. Webb asks about the X-ray Universe that was cancelled and whether it could be done online. N. Schartel responds that this has to be studied as we have no experience with such large conferences in the virtual format. Ideal would be to hold it later when restrictions are lifted (see dedicated discussion below).

The presentation on Community Support and Mission Planning was followed by a question from M. Díaz Trigo: for the creation of the Spectral Energy Distribution (SED) plots, how are other catalogue sources cross-checked, e.g. variability. N. Webb responds that the cross-match with other catalogues and SED plots are created by Strasbourg. The technical details are complex and can be found in a Traulsen et al. (2020) paper that is available in the SSC web pages

[http://xmmssc.irap.omp.eu/Catalogue/4XMM-DR9s/4XMM\\_DR9stack.html](http://xmmssc.irap.omp.eu/Catalogue/4XMM-DR9s/4XMM_DR9stack.html)

(see SSC status report presentation). OM data are included afterwards, but 2<sup>nd</sup> step in correlation with other sources.

After the presentation on EPIC calibration:

S. Bianchi asks about the cross calibration activities with NuSTAR (see also discussion under Community Inputs) which is still ongoing and whether NuSTAR is assumed to deliver the better results while XMM-Newton needs to be corrected. This is confirmed, and F. Fürst adds that the NuSTAR straylight observations (without mirrors) are consistent with boresight observations, lending strong support for NuSTAR to deliver the best calibration to benchmark against.

About the pn burst mode calibration improvements, M. Díaz Trigo expects that the correction column by column was going to make a significant difference with respect to the current average among columns per observation. M. Smith referred to slide 16 of the presentation where the average is shown, not the column by column. S. Migliari describes that the calibration team has already repeated the analysis with only the brightest column, so no average along the PSF, but the correction is not significantly changed. The column by column correction work is still ongoing.

R. Wijnands asks about progress of the CTI correction for Large Window (LW) mode. N. Schartel responds that LW is indeed not used a lot because most sources are variable bearing the risk of pile up during some time of the observations. However, for bright supernova remnants the LW is very important, so he recommends to continue maintaining the LW mode.

The presentation about RGS calibration was followed by a question by R. Wijnands about the CCD hotspot. The reason is not known, possibly mechanical stress. It started in revolution 700 and has steadily increased since then.

The OM calibration talk was followed by a question by M. Díaz Trigo: how many observations include UV grism exposures and how many publications use UV grism data, however, this information is not available.

The presentation of pipeline products was received without questions.

The presentation on SAS medium- and long-term strategy was received without questions.

N. Webb presented the status of the Survey Science Centre (SSC). L. Oskinova asks whether and how variable sources are included. In the stacked catalogue it is possible to identify non-detections of sources detected at other times.



## INPUT FROM THE COMMUNITY

How to make the OM data more widely used?

*I wonder if the XMM users group might consider how to make the OM data more widely used. AGN especially are intrinsically multi wavelength and variable so having the simultaneous especially UV data is really useful in tracking the bolometric luminosity. But it is difficult for X-ray astronomers to get the OM data into a useable form - which for X-ray astronomers is XSPEC! I think the barrier to using these points are that first they have to find the OM source in amongst all the others, and then they have to get it into XSPEC. If the pipeline could put the OM data into XSPEC files, and have them be associated with the X-ray sources on the pipeline summary file so they could just click on them and download the OM pha and .rsp files then I think we would see a lot more usage of the data (and better AGN papers as well!)*

S. Bianchi advises that there is a tool that makes it very easy, but it should be better promoted.

Note for information: details can be found in the SAS Manual

<https://xmm->

[tools.cosmos.esa.int/external/xmm\\_user\\_support/documentation/sas\\_usg/USG/sasomrespmat.html](https://tools.cosmos.esa.int/external/xmm_user_support/documentation/sas_usg/USG/sasomrespmat.html)

and methodology is described at the XMM-Newton calibration web pages

<https://www.cosmos.esa.int/web/xmm-newton/om-response-files>

The above method makes use of OM canned response matrices. As explained in the Pipeline and in the OM presentations, work is currently underway to generate OM response matrices for some of the OM detected sources per observation (see Pipeline presentation for more details, e.g. on for what sources these response matrices will be generated).

M. Diaz cautions that OM Grism data are difficult to analyse in any automatic way.

About cross-match between OM and EPIC sources, the decision which X-ray source matches the OM source, should not be automatic and rather be left to the user, therefore, cross-matching should not be included in the pipeline.

Regarding OM Fast Mode data, a user has been advised in a public helpdesk ticket of spurious effects in the light curve, e.g. owing to pointing drift. N. Schartel provides some background information: OM is the most sensitive instrument giving rise to many failures, and that's why it is excluded from success criteria. However, significant improvements have been made. S. Rosen gives a short presentation with viewgraphs included in the archive of presentations. R. Wijnands comments that this information needs to be included in the manuals.

A status update of Cross-Calibration activities of pn with NuSTAR has been requested:

M. Smith reports that the calibration team uses a mixture of Small Window (SW) and Timing mode observations, and also a sample of sources. Crab observations in Burst mode are also used.

N. Schartel comments that no other image mode than SW is used because we need bright sources to get enough statistics and homogeneous effective area over the chip.

M. Diaz remarks that we need at least two modes: SW and Timing are ok

F. Fürst reports that the Crab was only observed in Burst mode, but it transfers well to SW mode observations of, e.g., 3C 273.

F. Haberl makes two cautionary remarks leading to some discussion:

1. Timing mode cannot be said to be worst calibrated. There are intrinsic reasons by definition, i.e. information is being lost and can never be regained by calibration, so there are natural limits in the fast modes.



2. To create awareness: NuSTAR calibration assumes a power law index of 2.1 for the Crab, this is a historical development. However, if this is not the right index, then the cross calibration is not correct. The Crab may not even emit a pure power law since the pulsar and the nebula can have different power law indices. If extracting from different regions of the nebula, one can get a different power law index.

N. Schartel notes that stray light observations do not need the power law assumption, and comparisons with ground-based data confirmed the value of 2.1.

S. Zane asks whether only Crab is used for XMM/NuSTAR cross calibration, and F. Fürst informs that a large sample of other AGN is used. N. Schartel adds that the Timing Mode observations are all ToO observations.

F. Fürst emphasises the close contacts with NuSTAR

S. Bianchi suggests that, until the cross-calibration issues are solved, the community would appreciate to have a single reference that could be cited when needing to discuss discrepancies between XMM-Newton and NuSTAR results. He concludes from statements by M. Smith and F. Fürst that generally, the NuSTAR results are currently more reliable, and a single reference one could quote in scientific articles would be desirable.

M. Santos-Lleo reminds that writing a refereed paper at this stage is not appropriate because work is ongoing and there are no final conclusions. The objective is to reach agreement by cross-calibration, and the SOC focuses on this objective. M. Diaz Trigo notes that some IACHEC publications address this issue that could be cited.

S. Bianchi concedes that it doesn't need to be a refereed paper, the UG minutes as public document would already be enough.

#### OTAC matters:

*Concerning the up-coming XMM Users' Group meeting, we would like to ask whether it is possible to make public the conflict-of-interest protocol for the XMM TAC*

The protocol is given in a viewgraph attached to the UG meeting page.

In this context, it was also discussed to which extent proposals are rejected because they can be better observed with another telescope. A recent specific example was that a proposer found a comment that eROSITA is a game changer for large fields, and XMM-Newton is no longer best. L. Oskinova argues that an argument that another mission can do better is not scientific merit. N. Schartel explains that, if a target has actually already been observed by another mission, e.g. by eROSITA, then this is a reason to reject an XMM-Newton proposal, but it may be better to avoid such comments being sent to proposers in future.

#### Large Programmes and OTAC Chair:

*XMM still has the capacity to do breakthrough science on AGN, both using the RGS and the PN, but I think it is not capturing all of the breakthrough science that is available. The area and sensitivity of XMM mean that it is the only mission that can really drill into the physical processes, and help to explain some of the trends we see in AGN in deep fields.*

*But I think that expertise on such things is excluded from the OTAC process, because anyone who has proposed a large program is barred. At this point in the mission, some fairly long observations are required for progress, and this means that a fraction of the community that is needed to weigh in on the proposals is barred from doing so.*

*I would appreciate it if the UG could consider a recommendation to allow proposers of large programs on time allocation committees, but with due precautions to make sure that self-interest and conflicts of interest are not an issue. This simply has to be possible.*

N. Schartel argues that we do have enough experts who are not conflicted. For one multi-year heritage programme with 50 co-investigators it was difficult, but also in that case, he managed. Moreover the chair of the OTAC, P. Schneider, does not participate in any X-ray proposals and is thus sufficiently neutral and expert. PIs of large programs are not asked to chair a panel, hence they are neither asked to participate on the chairpersons meeting when decisions about large programs are taken. N. Schartel concedes the drawback



that PIs of continuously submitted large programmes are systematically excluded from chairing a panel.

S. Zane asks how many complaints about OTAC comments had been received. R. Wijnands answers that complaints sometimes express concerns about bias of the OTAC but have usually been received from proposers having their proposals rejected which can be considered as “normal noise”. N. Schartel confirms that only a handful of proposers had asked about OTAC comments. Commonly, the response is a recommendation to understand why OTAC has misunderstood something and change description for next time.

M. Diaz-Trigo comments that, rather than looking at individual programmes that have been rejected, better to focus on the balance of the overall science programme, for example, a good balance between low-risk/high-risk, Large Programmes (LPs), etc.

N. Schartel elaborates the situation and his priorities: The allocation of time is done to yield the same degree of competition for normal programmes and LPs. An important difference for LPs is that they are much harder to accommodate because often they cannot be partially approved. Normal programmes with several targets can be allocated a mixture of A+B and C time. Also risky proposals are being accepted, although if there are competing proposals, the lower-risk ones may be preferred.

L. Oskinova likes to emphasise that in the chairs panel, a single voice is less decisive than in a normal panel, owing to the larger size. N. Schartel cautions that there are 8 panel members, and given the oversubscription rate, proposers need to get support of 7 of the 8 panel members, and the challenge is to convince people from other research fields.

S. Bianchi asks for clarification of trigger Validity for Joint ToOs. If accepted by the XMM-Newton TAC, the validity is for 3 consecutive AOs, but it is not clear for how long the trigger is valid for other missions.

N. Schartel has spent a lot of time on this question because some missions do not accept the same carry over rules.

He has now asked all joint missions, and the following have accepted the same carry over rules as XMM-Newton:

HST, NuSTAR, HESS, MAGIC

Whereas the following missions have not accepted them:

INTEGRAL, NRAO, Chandra

From the next XMM-Newton AO onwards, the validity of every joint ToO which does not follow the XMM-Newton rules will be noted in the Policies and Procedures. When another mission accepts a ToO, XMM-Newton always accepts their carry over rules also for XMM-Newton.

S. Bianchi brings up a high degree of misunderstandings about fulfil observations and cautions that much clearer descriptions are needed. Not only the proposers but sometimes also the reviewers have not understood the right meaning.

N. Schartel comments that in the past, regular proposals were moved into the fulfil programme but he wants to stop this practice because it increases by large the size of the C programme. In future he wants only proposals that are submitted as fulfil to be approved as fulfil targets.

The most common reason for not understanding the meaning correctly may be not having read the documentation, no matter how clearly the rules are outlined.

E. Bozzo notes that he finds the rules are clear enough, and from all he could see, the TAC comments had made sense. If anyone misunderstood, he believes it must indeed have been that the rules were not read. He asks more specifically what was misunderstood. A PI has reported that a TAC comment was to submit a programme with multiple targets as a LP, and S. Bianchi emphasises this to be an example of not understanding the spirit of a fulfil programme.



R. Wijnands suggests that panels should contact Norbert for clarification when discussing such doubts.  
 G. Pratt reports that reformulations have been done one or two times, since they were established for AO17, but the ambiguities seem to persist.  
 L. Oskinova seconds this statement and asks for a clarification between C and fulfil programmes.  
 G. Pratt reminds of the different degrees of efforts (fulfil 2 pages, LP 5 pages, normal proposal 4 pages).  
 E. Bozzo clarifies that a difference to normal is that you accept from the start that not all targets may be done as the observation will never get in to the A+B categories.  
 G. Pratt reports that by the clarification that fulfil programmes are most likely observed in C time, a new problem was created in the C time.  
 E. Bozzo praises the good complement with the Swift fill-in programme which also emphasises the incremental character of the observations and finds it perfectly plausible that these targets are prioritized as C category by default.  
 L. Oskinova asks about how a panel should deal with a proposal requesting a long duration observation, e.g. 450 ks, of one target as a fulfil programme with the intention to only get C priority, hence risking that not all the requested time being performed. N. Schartel emphasises that this would be justified if there is a sample with only the last target missing, otherwise it is probably not a fulfil programme. L. Oskinova agrees but notes that it is nowhere written this way. M. Santos-Lleo clarifies that the instructions do make it clear that if only one of several observations is enough, the OTAC can approve as C. Meanwhile, if the OTAC considers only all or nothing is scientifically useful, it needs to either set all targets to A+B or reject all targets. In reference to early comments by G. Pratt, she also cautions that the degree of effort for 2 pages is not necessarily less than for 4 pages as it is more difficult to describe a complex science case in a very short space. Some PIs have indeed complained that writing fulfil programmes is more difficult because of this reason.

R. Wijnands summarizes that a conclusion is difficult as, no matter how to phrase the rules, there will always be misunderstandings. G. Pratt emphasises that most important is that the OTAC chairs understand who can then transmit to OTAC members. N. Schartel remarks that all OTAC members and chairs receive the same instructions. J. Ness remarks that the invitation to ask in cases of doubts is ineffective if people believe having understood well, even if wrong understanding, so they will not ask for clarification.  
 R. Wijnands suggests to discuss further concrete steps in the closed session after re-reading the rules.

## **DEDICATED DISCUSSION:**

L. Oskinova asks about future meetings, and N. Schartel reminds of the meeting cycle, one major conference every 3 years in May/June and in the respective two year between, smaller topic meetings. Depending on how the virus situation evolves, ESA sites may not be available for larger meetings.  
 N. Schartel suggests to drop the large meeting and plan small workshops in 2021 and 2022 trying a personal meeting for 2021 while doing a virtual meeting if necessary. He believes a topical meeting may be possible in a virtual format while for the major meetings, personal interactions are a critical element that cannot be replaced by a virtual meeting. He therefore suggests to continue the regular 3 year cycle of large conference in 2023 by when the COVID crisis should be over. Oskinova would prefer a personal meeting. If ESA premises are not possible and Universities remain closed, perhaps hotels may be available, however, N. Schartel cautions that a hotel venue would incur substantially higher cost. The small meetings had been practically free of charge as the small fee was only used to pay for the proceedings. He also prefers a personal meeting, keeping a virtual meeting only as backup. S. Zane reports that IAU has shifted their meetings to next year as face to face rather than virtual, and March - June 2021 as currently being considered a time when the crisis may be over. L. Oskinova cautions that 2021 is overloaded with big meetings, and thus supports a small focus workshop in summer.



R. Wijnands wonders whether later in the year 2021 may be better, but N. Schartel argues that we have OTAC in autumn, and reminds of gentlemen's agreement with Chandra that we keep our science meetings in spring-summer, leaving autumn-winter window for them, driven by the opposite periods for each mission call for proposal. June or September probably does not make such a big difference.

In conclusion, UG members agree on best plan to go for a small focus workshop in May/June 2021 with parallel planning as personal meeting and video as backup.

OTAC Chairperson: P. Schneider serves last year, new OTAC Chair will be Phil Charles (Southampton)

The meeting closed on June 17<sup>th</sup> at 16:15 CEST.

## **RECOMMENDATIONS FROM PREVIOUS MEETINGS**

The UG's executive session started on June 18<sup>th</sup>, 2020, at 10:00. This was an online meeting using Webex  
Participating: All voting UG members (except Jimmy Irwin), Mission Manager (Peter Kretschmar), Science Operations Manager (María Santos-Lleó), and Project Scientist (Norbert Schartel).

The discussion following the community input to the open session about a clearer definition of the fulfil programme was continued in the closed session. It became clear that the UG represents diverse interpretations of the intentions that guide the fulfil programme. While it is agreed that a clearer definition would be desirable, the value is seen that the TAC has a certain liberty to interpret the rules and the UG trusts the TAC members to select programmes that maximise the scientific return of XMM-Newton. It is therefore decided to keep the fulfil programme in its current form for the upcoming AO. This will also give one year of additional experience with how the fulfil programme is interpreted by the community. Based on this experience, this topic should be revisited in the next UG meeting that will hopefully take place in person again.





In the UG's executive session, the UG reviewed the status of resolutions, recommendations, and action items formulated at previous meetings and formulated new ones. For clarification purposes, the UG uses 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.

### ***1: On the SPACON arrangement involving XMM-Newton, Gaia and INTEGRAL:***

**Resolution 2016-06-08/01:** The UG recognizes 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: Closed**

**Resolution 2018-56-18/01:** The UG noted 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.

**Status: Closed**

### ***2: 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 publicize 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.

**Status: Both the recommendation and the action item are closed**



### ***3: On Calibration Priorities:***

**Recommendation 2019-05-08/02:** The UG strongly recommends to continue the ongoing efforts to cross-calibrate the responses between the XMM-Newton X-ray cameras and spectrometers. In addition, the UG also strongly recommends to continue the ongoing efforts to cross-calibrate the XMM-Newton EPIC detectors with the NuSTAR detectors to resolve the current discrepancies between the two different observatories in inferred spectral shape and normalizations.

**Status: Closed. Significant progress has been made and therefore this recommendation has been reformulated into recommendation 2020-06-18/07.**

**Recommendation 2019-05-08/03:** The calibration of the energy reconstruction of the pn Timing and Burst modes has significantly improved and a new CCF has already been released for the Timing mode. The UG recommends to continue the work on the calibration of these modes including, e.g., the investigation of a column-dependent correction.

**Status: Closed. Significant progress has been made and therefore this recommendation has been reformulated into recommendation 2020-06-18/08.**

**Recommendation 2019-05-08/04:** The long-time CTI correction calibration was completed for the pn small window mode but still is ongoing for the large window mode. However, lack of observations in this mode makes calibration difficult. The UG recommends continuing the work on the calibration of this mode but also recommends that the SOC investigates the usage and the usefulness of this mode so it can be assets if this mode should keep being supported.

**Status: Closed. The usage of the LW mode has been investigated and it is concluded that this mode should keep being supported.**

### ***4: On the XMM-Newton Survey Science Centre (SSC):***

**Recommendation 2019-05-08/07:** The UG recommends to investigate the viability to implement an automatic source variability search (as developed by the SSC and to be delivered by SSC to SOC in case current testing proves successful) on serendipitous sources found in proprietary data.

**Status: Ongoing**

### ***5: On Mission Extension:***

**Recommendation 2019-05-08/08:** Reviews of mission extensions at NASA are done every 3 years. The UG recommends that ESA also performs the review of the mission extension of XMM-Newton once every 3 years instead of once every 2 years.

**Status: Closed**

### ***6: On OTAC:***

**Action 2019-05-08/09:** The UG members are urged to send (as soon as possible) suggestions for a new OTAC chairperson to Norbert Schartel.

**Status: Closed**



## NEW RESOLUTIONS, RECOMMENDATIONS, AND ACTION ITEMS

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

### ***On the impact of Covid-19 on operations:***

**Endorsement 2020-06-18/01:** The UG strongly appreciates the efforts done by all XMM-Newton teams to limit the impact of Covid-19 on operations. The UG compliments everybody on how this impact has been minimized and how well things functioned (and still are functioning) during the Covid-19 period.

### ***On SPACON:***

**Endorsement 2020-06-18/02:** The UG strongly appreciates the efforts done by the mission management to limit the impact on XMM-Newton of the new SPACON arrangement (involving XMM-Newton, Gaia, and INTEGRAL) and congratulates them on how well the impact has been minimized and on the success of the operations.

**Endorsement 2020-06-18/03:** The UG congratulates the XMM-Newton operations teams and the external support from industry on the successful fuel migration exercise.

### ***On the changes of SOC organization***

**Recommendation 2020-06-18/04:** A significant continuing challenge is the erosion of expertise via staff retirement and/or movement of staff into other projects. Whilst this process is inevitable, the UG recommends that any transitions will be smooth and that such transitions ensure that the resources required to keep the high performance of XMM-Newton remain available. In addition, the UG strongly recommends that any changes in staff and/or the SOC structure ensures the conservation of the required specific X-ray expertise (e.g., for TOO planning, calibration, operational, SAS and pipeline software, etcetera).

### ***On the XMM-Newton Survey Science Centre (SSC):***

**Endorsement 2020-06-18/05:** The UG congratulates the SSC on the release of the 4XMM catalogue.

### ***On calibration priorities:***

**Endorsement 2020-06-18/06:** The UG strongly appreciates all the efforts that the instrument calibration teams have done to further calibration the instruments and the significant progress that has been made.

**Recommendation 2020-06-18/07:** The UG strongly appreciates the efforts made by the EPIC calibration team to further improve the cross-calibration of the XMM-Newton instruments and the cross-calibration between the XMM-Newton EPIC detectors with the NUSTAR ones (to resolve discrepancies between the two observatories in inferred spectral shape and normalizations). The UG strongly recommends to continue these efforts and that the final outcomes (e.g., the improved CORRAREA correction) are incorporated into SAS.

**Recommendation 2020-06-18/08:** The calibration of the energy reconstruction of the pn Timing and Burst modes continues to be improved significantly and the UG strongly appreciates these efforts. The UG is looking forward to the implementation of the rate and energy-dependent PHA correction in the upcoming



release of SAS 19. The UG recommends to continue the work on the calibration of these modes (e.g., on the column dependency) and that the final outcomes are incorporated into SAS.

**Recommendation 2020-06-18/09:** The UG recommends to continue the investigations into the pn empirical RMF modelling (e.g., expand to energies >1.7 keV, include other modes, epochs, and spatial regions) and incorporate the outcome into SAS.

**Recommendation 2020-06-18/10:** The UG recommends to implement the spatial and temporal refinement of the pn energy scale as presented in Sanders et al. (2020, A&A 633, 42) as a calibration product.

**Recommendation 2020-06-18/11:** The UG recommends to continue the investigations into the off-axis flux calibration of the EPIC cameras.

**Recommendation 2020-06-18/12:** The UG recommends to continue the evaluation of new methods for background subtraction for the RGS detectors.

**Recommendation 2020-06-18/13:** The UG recommends to continue the investigation of the reduced sensitivity patch of the OM detector so that correct photometric parameters can be obtained for sources within or close to this position.

**Recommendation 2020-06-18/14:** The UG recommends to continue to work on the OM serendipitous UV source catalogue version 5 and is looking forward to the release of this catalogue (anticipated to be at the end of 2020).

**Recommendation 2020-06-18/15:** The UG recommends to continue to investigate the spurious periodicities present in fast-mode data for OM sources that are close to the edge of the fast-mode window.

### ***On SAS development:***

**Endorsement 2020-06-18/16:** The UG strongly appreciate the significant developments made to SAS and is looking forward to the release of SAS 19.

**Recommendation 2020-06-18/17:** The UG recommends that SAS keeps being further developed and improved. In particular, the UG recommends a full ESAS integration; integrating the SAS code into Python infrastructure, replacing some elements with Python and allowing Python scripting; the release of the full source code (first step to allow, in the future, building SAS from the code and to facilitate the long-term preservation of SAS), and the release of the upper limit server integrated into the XSA archive.

### ***On the Pipeline Processing System:***

**Recommendation 2020-06-18/18:** The UG strongly appreciates the improvements made to the pipeline. The UG recommends to continue improving it and to include the following products and options:

1. Merged OM light curves
2. OM broad band fluxes in OGIP compliant files
3. Broad spectral energy distribution plots including OM and EPIC data
4. Improved filtering of EPIC flaring background in case of multiple exposures
5. Core excised EPIC spectra for bright sources
6. FWC scaling according to the relation between the background rate and the NDSLIN in pn.



## ***On the 2021 Science Workshop***

**Recommendation 2020-06-18/19:** The UG strongly prefers to have the 2021 Science Workshop to be held physically at ESAC, however, the UG recommends that preparations are made to host it online in case the Covid-19 crisis has not subsided at that time.

The executive session ended on June 18<sup>th</sup> at 12:30.

**Date of next meeting:** 9 and 10 June 2021, starting at 10:00 at ESAC.