# MEETING

Meeting Date 22 October 2024

**Ref** MoMAAUG#12

ESA-ESDC-GEN-MOM-0064

**Meeting Place** WebEx

**Chairperson** Natalie Webb

**Minute's Date** 30 April 2025

**Participants**

**AAUG Members:** Natalie Webb (AAUG Chair), Annalisa De Cia, Ioannis Georgantopoulos, Christopher Conselice, Sandra Savaglio

**In attendance:** Guido de Marchi (ESDC Science Lead), Bruno Merín (Head of ESDC), Norbert. Schartel (XMM-Newton Project Scientist and Project Scientist's representative), Deborah Baines (ESDC Astronomy Observatory Science Lead), Rachana Bhatawdekar (ESDC Technical Lead), Jos de Bruijne (ESDC Survey Science Lead & Gaia deputy Project Scientist), Maximillian Guenther (CHEOPS Project Scientist), Tim Rawle (Ariel Archive Scientist), Elena Jimenez Bailon (XMM-Newton Support Archive Scientist), Alvaro Labiano (JWST Support Archive Scientist), Maria Santos-Lleo (XMM-Newton Science Support Manager), Hector Perez (ESDC SCO-08 Work Area Manager), Monica Fernandez (ESDC Observatory Archives Technical Lead), Elena Puga (WinterWay), Erik Mellegård (WinterWay), Hector Canovas (Gaia Archive Support Scientist).

**Absent:** Hervé Bouy, Nuria Huelamo, Søren Larsen (all sent their apologies)

**Subject** Minutes of the Astronomy Archives User Group (AAUG) meeting #13.

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| Description | Action | Status |
|---|---|---|
| ESDC to find an 8th member of the AAUG and ask for suggestions from stakeholders. | 2023-04-25/01 | CLOSED |
| | | |
| The ESDC to identify which projects have been accepted in the latest EU calls that will be producing products using ESA data. | 2024-02-19/01 | OPEN |
| G. de Marchi to perform an analysis on the submitted and accepted ARVP proposals to identify any potential imbalances related to country, gender, or other factors. | 2024-02-19/02 | CLOSED |





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| Description | Action | Status |
|---|---|---|
| G. de Marchi to seek feedback from the ARVP visitors on their experiences, particularly whether the visit has led to any publications or proposals. | 2024-02-19/03 | CLOSED |
| D. Baines to split the user survey results between early-career scientists and late-career scientists to help identify new trends. | 2024-02-19/04 | OPEN |
| D. Baines to contact the AAUG in May to start the process of finding a date for the next meeting, to be held online in the autumn. | 2024-02-19/05 | CLOSED |
| | | |
| ESDC to find an 8th member of the AAUG and ask for suggestions from stakeholders. | 2024-10-22/01 | |
| D. Baines to contact the AAUG to start the process of finding a date for the next meeting and the preferred location. | 2024-10-22/02 | |
| D. Baines to arrange a meeting with the HST PS and AAUG to discuss concerns from the European community regarding possible changes in supporting the high level science products. | 2024-10-22/03 | |

# WELCOME:

N. Webb and D. Baines opened the meeting by welcoming everyone and summarising the main topics to be discussed during the meeting. The meeting was held online on Tuesday 22nd October 2024.

This was A. De Cia's final meeting as AAUG member before stepping down. N. Webb expressed her sincere thanks for her valuable contributions, insightful ideas, and involvement over the last past few years. The team also welcomed a new member to the group Nuria Huelamo (travelling to Chile so sent her apologies that she was unable to join this meeting). N. Huelamo is replacing E. Villaver, therefore, with A. De Cia leaving, an 8th member of the AAUG needs to be searched for to replace A. De Cia. Action 2023-04-25/01 was closed and **Action 2024-10-22/01** created.

# ADOPTION OF THE AGENDA:

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

# REVIEW OF ACTIONS:

The actions from the previous meeting were reviewed. Two actions remain open: **Action 2024-02-19/01**: *ESDC to identify which projects have been accepted in the latest EU calls that will be producing products using ESA data*. **Action 2024-02-19/04**: *ESDC to split the user survey results between early-career scientists and late-career scientists to help identify new trends.*

Three actions were closed during the meeting: **Action 2023-04-25/01**: *ESDC to find an 8th member of the AAUG and ask for suggestions from stakeholders*. This was closed with N. Huelamo joining as a member. . The following actions were closed during the meeting since they were all covered in the session about the Archive Research Visitor Programme (ARVP; see section 2): **Action 2024-02-19/02**: *G. de Marchi to perform an analysis on the submitted and accepted ARVP proposals to identify any potential imbalances related to country, gender, or other factors*. **Action 2024-02-19/03**: *G. de Marchi to seek feedback from the ARVP visitors on their experiences, particularly whether the visit has led to any publications or proposals.*

# PRESENTATIONS:

The following presentations and discussion sessions were held on 22nd October 2024:

1. ESDC Multi-Mission Evolution (H. Perez, M. Arevalo)
2. Archival Research Visitor Programme status (G. de Marchi)
3. ESA Astronomy Archives session at EAS 2024 and plans for EAS 2025 (G. de Marchi)
4. Date and time of next meeting
5. AOB
6. Closed session

The slides of the presentations are available on the ESAC Science Data Centre (ESDC) public web site, under the heading Archives User Groups, Astronomy: https://www.cosmos.esa.int/web/esdc/aaug/meeting12

# DISCUSSIONS:

Discussions took place during and after each presentation. This section presents a summary of the discussions and is ordered by the scheduled agenda given above.

## 1. ESDC Multi-Mission Evolution

H. Perez gave an update on the multi-mission infrastructure that was presented to the AAUG in meeting 10 (April 2023). In summary, the ESDC typically develops 4 to 6 archives for missions in the development phase. For missions in operations, it maintains and develops approximately 10 to 12 archives. Legacy missions currently have a similar number of archives as operational ones, but this figure is steadily rising. In the future, legacy mission archives are expected to far outnumber those from development and operational phases. At present, each mission has its own dedicated archive, except for the multi-mission Planetary Science Archive. As missions transition to legacy status, each independent archive must be maintained and updated to ensure consistency, technical advancement, and interoperability across the system. These efforts at the legacy phase all require funding.

Since April 2023, the proposed unified infrastructure for legacy mission archives has developed into a multi-mission infrastructure, not just for legacy data, but also for some missions in operations. These include the smaller missions where ESA are a co- or junior partner, such as SMILE (Heliophysics mission) and Einstein Probe. In this case, for these smaller missions, using the common multi-mission infrastructure is more cost-effective than developing an individual archive, and when the missions reach the legacy phase, their long-term maintenance is insured since their data is already in the multi-mission infrastructure. The rest of the infrastructure is the same concept as that presented in April 2023, i.e. it will include common hardware and data storage infrastructure, a common layer of standards (IVOA, HAPI, etc.), and multiple user interfaces for different needs.

Scientifically, this approach will enable unified access to multi-mission and multidisciplinary data, facilitating cross-mission analysis. Technically, it offers several benefits: archives can be integrated with minimal effort, maintenance costs will be lower than for separate archives, data accessibility will improve, and the system will be flexible enough to support various clients (e.g. mission-specific tools, multi-mission platforms, and ESASky).

M. Arevalo presented the current status and future work for the multi-mission infrastructure. Currently, a server has been set up with continuous integration and continuous delivery established, as well as providing metadata through the International Virtual Observatory Alliance (IVOA) Table Access Protocol (TAP). Other IVOA protocols have also been set up, along with a database containing the metadata from several archives and a connection between the application layer and data layer. The SMILE mission will be the first to use the multi-mission infrastructure and therefore the data download has been developed for SMILE, and it is possible to retrieve SMILE data products through this infrastructure.

Future work involves a first release of the infrastructure with SMILE data, planned for mid-April 2025. This will include CAS (Central Authentication Service) authentication, with authorization for SMILE user groups, a new mechanism to log and review usage statistics, and a helpdesk and user guide. During the rest of 2025, other mission data will be added to the multi-mission infrastructure, including Einstein Probe. Following this, the plans include adding legacy missions, such as EXOSAT and Ulysses, including an ADQL console to the graphical user interface and creating an astroquery module for multi-mission access.

The AAUG asked about the authentication and if all users will need to have an account. ESDC explained that there will be both options. For public data, there will be anonymous access, but there will also need to be accounts for users to access all types of data. N. Schartel asked if there was any documentation yet to explain to missions how to add their archives to this infrastructure and the typical costs. H. Perez said the ESDC have been focusing first on the technical documentation, but afterwards a guide should be created that provides the missions with the steps to join the multi-mission infrastructure. ESDC also emphasized the need for a common data model for all the missions that are added to the multi-mission infrastructure, to perform searches on all missions metadata and retrieve the metadata in a common format.

The AAUG asked about needing feedback to be able to maximise the scientific return from the legacy missions, and if the AAUG could do anything to help. ESDC explained that the feedback will be organised by the Science Leads, who will also ask any experts still within ESA. N. Schartel mentioned that in some cases the data is so old, ESA may need to ask some retired experts (of which there are some who are still active in the field). N. Webb commented that her team also work with EXOSAT data and could provide feedback. D. Baines said the ESDC will start working on this probably towards the end of next year.

## 2. Archival Research Visitor Programme status

G. de Marchi presented first some statistics on the Archival Research Visitor Programme. Typically, there are 25 applications per call every six months, with astronomy the majority at about two thirds. Most applications are to use data from large observatories or surveys, but the missions that people propose to work with does not





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automatically imply the area of research, for example Gaia to study asteroids and INTEGRAL plus Rosetta to study magnetic fields. There is a growth in projects that mention machine learning. And applications are received from all the member states of ESA. As a reminder, anyone who is working in one of the member states is welcome to apply, regardless of their nationality. As of the last cycle, the call includes that strong applications from non-ESA member stars are also accepted, and this is to try to be more inclusive.

The gender distribution of accepted proposals so far, over the seven cycles, is almost 50/50 (52% males and 48% female). The review is advertised as double anonymous, as requested by the AAUG, and this helps provide confidence to applicants. But these are a small number of applicants who are applying in each cycle (and small number statistics), therefore, the ESDC will keep monitoring the gender distribution. Regarding the country distribution of the proposals, i.e. looking at the proposals coming from an institute in one of those countries (and not the nationality of the applicant), the acceptance rate is 29%, and from ESA members states it is 30%. Some larger countries do better, such as France and the UK at 42%, others are in line, such as Italy (31%) and Germany (29%). Spain is somewhat low at 20%. For the smaller countries the statistics are uncertain due to the smaller number of applicants. In summary, there does not seem to be any obvious imbalance in the country distribution.

Finally, G. de Marchi examined whether the ARVP projects lead to publications, and the answer is yes. Every participant who responded to G. de Marchi reported having written one or two papers or published a thesis based on the results of their ARVP project. They also responded that the collaborations established with the host at ESAC or ESTEC were continuing. The only negative feedback regarding the ARVP was that the financial support needs to be given earlier in order for the participants to finance their visit, particularly given that accommodation is expensive close to both ESAC and ESTEC. In most cases an advance is given, but a more structured way of doing this needs to be found.

A discussion followed where the AAUG asked about the gender balance and country distribution but acknowledged that the current figures are based on small smaple sizes and agreed that ESA is making every effort in this area. G. de Marchi confirmed that these aspects will continue to be monitored. S. Savaglio asked if the hosts at ESA enjoy supporting the visiting scientist. G. de Marchi confirmed that the scientists at ESAC and ESTEC are enthusiastic about participating in the selection process and hosting visitors, as it is considered as an effective way to engage in scientific work and build collaborations with the broader community. S. Savaglio also recalled that, during the previous meeting, the idea of creating a standard template was discussed. G. de Marchi said this has been considered and is well supported, but due to time constraints, it has not yet been implemented. While there is a template, it currently does not indicate that applications should be limited to two pages, therefore, G. de Marchi suggests adding this to the recommendations (see ***Recommendation 2024-10-22/04***).

## 3. ESA Astronomy Archives session at EAS 2024 and plans for EAS 2025

G. de Marchi gave a summary about the ESA Archives lunch session that was held at the 2024 European Astronomical Society (EAS) annual meeting on Wednesday 3rd July 2024 in Padova. As in previous years, the





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aim of the session was to create awareness about the ESA Space Science Archives, create awareness about the AAUG and to engage the community in providing ideas and inputs. More than 50 EAS participants were in attendance. The session included presentations about evolution of astronomy archives and the data challenge, the role of the AAUG, the impact of archival papers, the Archive Research Visitor Programme, and a hands-on ESASky demo showing the latest features and data in ESASky.

The final 20 minutes of the session were dedicated to questions and answers. Among the questions raised was whether ESA accepts ARVP applications from individuals who are not nationals of the country in which they are working, and the answer is yes. Another question was whether applicants from outside the EU could apply, and again, the answer is yes. There were questions about the evolution of the archives and what will happen to the mission data once the mission enters its legacy phase, which B. Merin addressed during his presentation. Additionally, a question was raised about the accessibility of ESO and ALMA data in ESASky, to which D. Baines confirmed that the data are available and explained where to find them.

The EAS 2024 ESA Astronomy Archives lunch session page can be found here: https://eas.unige.ch/EAS2024/session.jsp?id=LS4. In addition to the session, ESA again had a booth and members of the ESDC gave archive and ESASky demos throughout the week to participants (both scheduled and on-the-fly demos).

Following the success of the ESA Space Science Archives lunch session in Padova, the ESDC plans to repeat the event at the next EAS annual meeting, which will take place in Cork, Ireland, from 23-27 June 2025. G. de Marchi asked AAUG member swho already know their plans to indicate whether they will attend. He noted that the format used in previous years has proven effective and suggested it be retained, and asked the AAUG if any other topics should be added. He highlighted that a major Euclid data release is expected in March 2025 and most likely Euclid sessions will be held at the conference. In response, the AAUG suggested that, given the significance of the year for Euclid, it would be appropriate to include a presentation or demonstration of the Euclid archive. This would be an excellent opportunity to showcase how the community can access Euclid data (see ***Recommendation 2024-10-22/05***).

## 4. Date and time of next meeting

The next meeting, planned for spring 2025, is being considered for an in-person format. Possible locations discussed were ESAC, ESTEC and Toulouse. D. Baines took the action to contact the AAUG to start the process of finding a date for the next meeting and the preferred location (***Action 2024-10-22/02***).

## 5. AOB

A. De Cia raised the issue about the possible NASA budget cuts to the Hubble Space Telescope (HST) and that one of likely scenarios in the future will be that the Space Telescope Science Institute (STScI) will be limiting the production of high level science data products. STScI may also need to remove the support for certain observing modes. A. De Cia asked if anything can be done on the ESA side to support the production of the

high level products. D. Baines commented that the ESA HST Project Scientist and HST Mission Manager are closely monitoring the situation.

G. de Marchi remarked that an email had just been sent to the HST astronomical community with a survey asking for comments and feedback regarding these possible changes. He will forward it today to the AAUG members. It also contains a link to last week's HST community Town Hall. There are certainly several points that are of importance for European scientists. The AAUG commented that it will be important to encourage the European community to respond with feedback to the proposed changes. D. Baines took an action to arrange a meeting with the HST Project Scientist and AAUG to discuss concerns from the European community regarding possible changes in supporting the high level science products (**Action 2024-10-22/03**).

A. De Cia commented that she is also a member of the Space Telescope Users Committee, and the AAUG are welcome to give her and the STUC direct feedback. This discussion led to the AAUG creating ***Recommendation 2024-10-22/01*** in support for HST high level products.

# RECOMMENDATIONS

The following recommendations were formulated by the AAUG:

## *Support for Huble Space Telescope high level products*

**Recommendation 2024-10-22/01:** ESA plays a significant role in the the Hubble Space Telescope (HST), with both hardware contributions and support to a team of scientists and computer staff working at the Space Telescope Science Institute (STScI), as well as hosting the European science archive for the Hubble Space Telescope. Due to budget cuts, STScI will be limiting the production of high level products, as well as removing support for certain observing modes. The HST products, also proposed through the ESA archives, enable scientists to fully exploit the HST data which has enabled Hubble to become the most productive telescope to date. This can be seen in de Marchi & Parmar (2024) where the number of Hubble publications dominate the number of papers from all other ESA archives. The Hubble archive data are essential to the continued success of the mission, as well as scientific projects conducted by European astronomers. Indeed, 34% of papers using HST data are led by European scientists (de Marchi & Parmar 2024). The AAUG therefore recommends that ESA does everything it is able to do to help support the production of HST higher level products. In parallel, the AAUG will incite the community to respond with feedback to the proposed changes. The AAUG requests that they remain informed of upcoming decisions on the HST products and note that there are significant synergies between the AAUG and the Space Telescope User Committe (STUC) that could be explored.

## *Multi-mission archive structure*

**Recommendation 2024-10-22/02:** Work on the multi-mission archive structure at ESA is going from strength to strength, with new missions being efficiently included by building on the infrastructure already put into place. This is a cost (and time) efficient way of producing the best archives possible. It is clear that feedback on the usage of the archives and the data products proposed is necessary to maximise the scientific return of the data. The AAUG recommends that feedback is sought from the teams producing the archival data, who have specialised knowledge, but could also ask their community for feedback on specific features of the individual archives that need to be incorporated into the multi-mission archive. It would also be useful to receive feedback from users with less background knowledge on the particular archives. The AAUG offer their services to help test and provide feedback for the newly developed archives.

## *The Archival Research Visitor Programme*

**Recommendation 2024-10-22/03:** The AAUG thank ESA for providing an update on the work that has been accomplished as a consequence of the Archival Research Visitor Programme. The AAUG were extremely impressed by the science being published through this Programme, which demonstrates the success of the programme and also helps to publicise the content and potential of the ESA archives. However, it is clear that the current organisation for providing financial support to the laureates is sub-optimal. The laureates, who are





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often still students or young post-docs, need to finance their visit (which may be several months long), before they can be reimbursed several months later. Many laureates find themselves unable to provide this funding. The AAUG recommend that ESA explore ways to provide an advance of at least some of the budget necessary for the laureates before their visit, or to try to reserve and pay for the transport and accommodation costs directly, so that the laureates only have to find their daily expenditure, which will then be reimbursed later.

**Recommendation 2024-10-22/04:** The AAUG is very happy to see a large number of candidates for each round of the Archival Research Visitors Programme, as it shows that the archives are becoming better known and their potential is understood by the community. However, to simplify the review and also allow applicants a similar chance to succeed, the AAUG again recommend that it would be useful to provide a standard template for applications and limit the text allowed for each section of the application. This could be done through an online form with a length limit for each section or a latex form which also limits the quantity of text for each section (in a similar way to proposal forms for telescopes, for example). A reminder should be provided that if the applicant exceeds the maximum length, the proposal will be disqualified. The AAUG also recommend including a statement on the application form reminding the applicant that the form should be filled out in an anonymous manner. They could then be asked to check a box saying that they have respected the anonymity or a phrase could be included to remind the applicant that violations of anonymity will lead to the proposal being disqualified.

## *ESA Astronomy Archives lunch session at the 2025 EAS annual meeting*

**Recommendation 2024-10-22/05:** It is clear that the lunch session on the ESA astronomy archives that has been held at the EAS annual meeting over the last few years has considerably helped to raise the profile of the archives and also helped users to access and exploit the archival data. The AAUG congratulates ESA on requesting another similar session at the 2025 EAS annual meeting and recommends that another demonstration of ESASky is included in the programme, along with other dynamic talks such as that given by Bruno Merín. As a lot of focus will be placed on Euclid due to the large data release expected just before the 2025 meeting, the AAUG recommend that there is also a talk on the Euclid archive and/or a demonstration if possible.

## *Additional items during the AAUG meetings*

**Recommendation 2024-10-22/06:** The AAUG congratulate ESA on organising the AAUG meetings and allowing the community to provide feedback on the ESA astronomy archives, which is essential to ensure that the archives are pertinent to today's research. The AAUG suggest that, as during other user group meetings for other facilities, an extra item could be included on the agenda, providing topical feedback from ESA mission Project Scientists or Managers that can highlight the work being undertaken currently, so that the AAUG can have a better appreciation of the impact of the missions and their archives.





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