



MEETING

Meeting Date 12-13 September 2022

Ref MoMAAUG#9

ESDC-GEN-MOM-0031

Meeting Place WebEx

Chairperson Natalie Webb

Minute's Date 7 December 2022

Participants

AAUG Members: Natalie Webb (AAUG Chair), Hervé Bouy, Annalisa De Cia, Ioannis Georgantopoulos, Søren Larsen.

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 (ESASky Support Scientist), Bruno Altieri (Euclid Archive Scientist), Hector Canovas (Gaia Archive Support Scientist), Jos de Bruijne (Gaia deputy Project Scientist), Peter Kretschmar (XMM-Newton Archive Scientist), Elena Jimenez Bailon (XMM-Newton Support Archive Scientist), Alvaro Labiano (JWST Support Archive Scientist), Rene Laurejjs (Euclid Project Scientist), Arnaud Masson (Heliophysics Archives Science Lead), Sara Nieto (Euclid Mission Technical Interface), Monica Fernandez (PLATO Mission Technical Interface).

Absent: Christopher Conselice, Sandra Savaglio, Eva Villaver (all sent their apologies).

Subject Minutes of the Astronomy Archives User Group (AAUG) meeting #9.

Copy

Description	Action	Status
AAUG members to investigate one EU project each, investigate the type of data products from ESA missions that the project will be creating, advise ESDC what to ask the project PI, and if there is enough information at this point, recommend if the data should be added to any of the ESA science archives.	2019-02-13/13	IN PROGRESS
D. Baines and G. de Marchi to undertake the replacement for the 8 th member of the AAUG. In meeting #6 the AAUG agreed to give suggestions for new AAUG members to ESDC by end of April 2021. ESDC to also poll the AWG and JWST and Euclid colleagues for	2020-10-02/01	CLOSED



Description	Action	Status
names.		
ESDC to send the Gaia statistics on the number of queries received through the different modes of accessing the archive (UI, cone search, astroquery).	2020-10-02/02	CLOSED.
ESDC to begin contacting the PIs of the identified EU projects to gauge their interest in ESA preserving their project data.	2020-10-02/06	IN PROGRESS
ESDC to also contact the PIs for the five recently identified EU H2020 and FP7 projects (action linked to Action 2020-10-02/06).	2021-04-14/03	OPEN
ESDC to email the AAUG and finalise the dates for the next AAUG meeting, to be held in September 2022.	2022-05-10/01	CLOSED
AAUG members to poll their communities for feedback, suggestions and comments that they would like to be raised in the September 2022 AAUG meeting	2022-05-10/02	CLOSED
N. Webb to reply to the Gaia archive user about searching for photometric and spectroscopic redshifts of extragalactic objects in the Gaia archive.	2022-09-13/01	
D. Baines to start the user survey process by setting up the online form and initiating discussions with the AAUG on the questions to be asked.	2022-09-13/02	
G. de Marchi to contact CDS and ESO about the possibility of holding a special session with ESO and CDS at EAS 2023.	2022-09-13/03	
G. de Marchi to make all Archival Research Visitor Programme proposals received in the current round as anonymous as possible before they are sent to the reviewers.	2022-09-13/04	
N. Webb to poll the AAUG for their continued membership and to find a date for the next AAUG meeting in 2023.	2022-09-13/05	



WELCOME:

N. Webb and G. de Marchi opened the meeting on Monday 12th September 2022 by welcoming everyone and summarising the main topics to be discussed during the meeting. The meeting was hybrid, both online and held at IRAP, Toulouse. The latest AAUG member was welcomed, Annalisa De Cia from the University of Geneva, and a round table was held to introduce all members and ESA participants in person and online.

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. Three actions remain open, all related to the EU H2020 and FP7 projects. The actions are the following: **Action 2019-02-13/13**: AAUG members to investigate one EU project each, investigate the type of data products from ESA missions that the project will be creating, advise ESDC what to ask the project PI, and if there is enough information at this point, recommend if the data should be added to any of the ESA science archives. **Action 2020-10-02/06**: ESDC to begin contacting the PIs of the identified EU projects to gauge their interest in ESA preserving their project data. **Action 2021-04-14/03**: ESDC to also contact the PIs for the five recently identified EU H2020 and FP7 projects (action linked to Action 2020-10-02/06). A new external contract covering the data curation and repatriation of ESA data started in July 2022 and work has again started on these actions. Progress will be reported in the next AAUG meeting.

One action was closed during the meeting: **Action 2020-10-02/02**: ESDC to send the Gaia statistics on the number of queries received through the different modes of accessing the archive (UI, cone search, astroquery). This action was closed during the meeting since it was covered in the presentation by the Gaia Archive Scientist on the Gaia query statistics (see section 2).

PRESENTATIONS:

The following presentations and discussion sessions were held on 12th and 13th September 2022:

1. Project for the next Horizon Europe call (H. Bouy)
2. Gaia query statistics (J. De Bruijne)
3. Community feedback (All)
4. ESA Astronomy Archives session at EAS 2022 and plans for EAS 2023 (G. de Marchi, N. Webb, D. Baines)
5. Archival Research Visitor Programme status (G. de Marchi)
6. ESASky updates (D. Baines)
7. ESA JWST archive latest news (T. Marston)
8. Date and time of next meeting (All)
9. AOB
10. 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/meeting9>

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. Project for the next Horizon Europe call

AAUG member H. Bouy presented a project that his team are involved in for the next Horizon Europe call, "HORIZON-CL4-2023-SPACE-8N: Scientific space data exploitation". The goal of the project is to extract sources and measure their positions and photometry in regions with nebulae using a convolutional neural network (CNN) to separate extended emission from stars and galaxies. The project aims to reprocess a large fraction of the ESA archives (Herschel, Planck and HST) using the CNN, which will greatly enhance the sensitivity of these missions, and to deliver new and improved point source catalogues and maps. The tool will also be prepared for present and future missions, in particular JWST and Euclid. It will also include non-ESA missions such as Spitzer, WISE and possibly AKARI.

Because the project's main objective is to deliver a large, reprocessed dataset coming from ESA missions to the community, H. Bouy said that the project would like ESA to host the results. G de Marchi commented that ESA advocates that these types of discussions should happen before Horizon proposals are submitted and asked the AAUG to advise ESA regarding Horizon projects that will be producing vast amounts of reprocessed ESA mission data. A discussion followed and **Recommendation 2022-09-13/05** was



formulated by the AAUG during the closed session.

H. Bouy added that the project also wants to provide the CNNs to ESA. ESDC members said that it may be best to add these to the ESA Datalabs. N. Schartel commented that the technique sounds very interesting for the XMM-Newton catalogues, and he suggested the project might want to consider including other wavelength regimes and specialists, in particular the X-ray and XMM-Newton specialists. The technique might be very good at detecting extended emission of X-ray sources, as well as X-ray point sources. Other AAUG members suggested the proposal is more than sufficient as it is, since the CNNs have been trained on optical to radio data. Expanding to other missions and wavelength regimes could be a follow-on project.

2. Gaia query statistics

J. de Bruijne, the Gaia Archive Scientist, gave a presentation on the Gaia ESA Archive query statistics, firstly giving an overview of the Gaia ESA archive and statistics from the Data Release 3 (DR3) on 13th June 2022. During the first 24 hours after the DR3 release more than 4800 unique IP addresses connected to the archive, almost 190,000 queries were sent to the archive generating more than 730 GB of query results, and 40 TB of data were downloaded from the bulk download repository. Comparing with the Gaia Early Data Release 3 in December 2020, the users increased by 160% and the bulk download increased by 900%.

The Gaia archive was presented to the AAUG during the 5th AAUG meeting, in October 2020 and the AAUG raised an action for the ESDC to send the Gaia statistics on the number of queries received through the different modes of accessing the archive (through the web interface, cone search and astroquery; *Action 2020-10-02/02*). J. de Bruijne addressed this action, as well as showing other query statistics, in the remainder of the presentation. The AAUG raised a question on how queries are processed and kept anonymous and a discussion followed around this on the importance of informing users that the archive usage is monitored (to understand how the archive is accessed and to make improvements accordingly), but that no personal data is collected, nor any scientific goals are collected (see **Recommendation 2022-09-13/06**).

3. Community feedback collected by AAUG members

All AAUG members contacted their national communities, at least one month before this meeting, for feedback, suggestions and comments on the ESA archives that anyone from the community would like raised during this AAUG meeting. One email was sent to N. Webb, from a senior astrophysicist, about finding it difficult to search for photometric and / or spectroscopic redshifts of extragalactic objects in the Gaia archive without the need to use ADQL. This question was discussed with the Gaia Archive Scientist, including what can be search for in the basic search form of the archive. N. Webb took an action to reply to the user (**Action 2022-09-13/01**).

No other feedback from the community was sent to any AAUG members, even though they sent the request



through their national astronomy email lists (potentially reaching thousands of European astronomers). A discussion followed on how to receive more feedback from the community. The first suggestion raised was for the archives to ask for feedback from the users during their session. This could be by reminding users of the feedback or helpdesk button or link. The second suggestion was that it could be a good time to send another user survey to the community since it has been three years since the last survey, and during this time a new archive has been released: the European JWST archive, plus several improvements have been made to the existing archives and to ESASky. An action was given to D. Baines to start the user survey process by setting up the online form and initiating discussions with the AAUG on the questions to be asked (**Action 2022-09-13/02**). It was also agreed to have a session in the next AAUG meeting to finalise the survey questions and then open the survey to the community not long after the meeting and before the EAS 2023 conference (see **Recommendation 2022-09-13/03**).

4. ESA Astronomy Archives session at EAS 2022 and plans for EAS 2023

G. de Marchi presented the ESA Archives lunch session that was held at the 2022 EAS annual meeting, and plans for EAS 2023. The session was held on Tuesday 28th June 2022 and was once again in person (there was no provision for hybrid attendance). The 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 as well as sharing with them the latest tools and features of the archives. About 60 EAS participants attended the session. The session included two demos: ESASky and Datalabs; and two presentations: on the impact of archival papers and the Archival Research Visitor Programme; and on the AAUG. The last 30 minutes was reserved for an open-floor discussions session. A clear message was received during the discussion session that cloud computing is not a top priority currently for the community and that it can wait for the time being. The EAS 2022 ESA Astronomy Archives lunch session page can be found here: <https://eas.unige.ch/EAS2022/session.jsp?id=LS5>. 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).

G. de Marchi asked the AAUG some questions for the next EAS annual meeting, to be held in Krakow in July 2023, specifically: should the session duration be longer; should e-posters be accepted; should the session be more interactive and contain more demos; should the discussion be longer; should more room be reserved at the booth for demos; and should a questionnaire be sent out to EAS participants in advance of the meeting. A discussion followed around these questions and the AAUG agreed that the interactive ESASky demo was well received and suggested that having a longer session at the EAS should be explored. This would allow more time for hands-on sessions and for participants to follow along on their laptops. It was also suggested that having a longer session will allow time to include contributions from the community to demonstrate the science they have been doing with the archives. N. Webb, and other AAUG members, were in favour of accepting e-posters for the session, which will also allow participants to demonstrate their archival science. The AAUG also suggested inviting a laureate of the Archival Research Visitor Programme to present the research that was carried out in the framework of the programme. Finally, it was suggested that it could be beneficial to include CDS and ESO, who also run lunch sessions during the EAS meetings. The possibility of

holding a larger special session with ESO and CDS was discussed, and an action was raised on G. de Marchi to contact CDS and ESO about the possibility (**Action 2022-09-13/03**). **Recommendation 2022-09-13/04** was formulated by the AAUG during the closed session related to this session discussion.

5. Archival Research Visitor Programme

G. de Marchi presented a summary on the Archives Research Visitor Programme proposals review regarding the latest call (the deadline was 31st April 2022). The programme was launched at the beginning of March 2021 and aims to increase the scientific return from ESA missions by inviting scientists to ESAC and ESTEC who are interested in pursuing research based on publicly available data in the ESA Space Science Archives. This is the programme's third call and 18 applications were received: 10 of which were for astronomy archival research and 8 for planetary and heliophysics archival research. 6 visitors were accepted in this round and are listed in the programme's web page: <https://www.cosmos.esa.int/web/esdc/visitor-programme>.

In this call, unexpectedly, only 22% of applicants were women (unlike previous calls where the distribution was more even). The numbers are small, so it is unknown if this is just a statistical fluctuation or something that needs to be addressed. During the last AAUG meeting, the AAUG suggested to monitor the situation in the next calls and if numbers of female applicants continue to be low in future calls, corrective actions could be employed, and suggested adding the following sentences on the call for proposals: 'We encourage applications from women and minorities.'

A discussion then followed on ensuring the fair assessment of proposals and that proposals should be made anonymous before they are sent out to reviewers (see **Recommendation 2022-09-13/02**). An action was given to G. de Marchi to make all proposals received in this next round as anonymous as possible before they are sent to the reviewers (**Action 2022-09-13/04**). The AAUG also suggested for the spring 2023 call that applicants are asked to write their proposals anonymously. Finally, N. Schartel suggested if the visitors come for less time to ESA, then ESA will be able to accept and host even more visitors for this programme.

6. ESASky Updates

D. Baines presented the latest releases of ESASky since May 2022. These include a virtual assistant being added to the tool in mid-May, that allows users to interact with ESASky using simple sentences, typed or spoken, that trigger the commanding of ESASky via its API. Most features of ESASky are included in the virtual assistant. On 13th June, the Gaia DR3 main catalogue was added to ESASky (on the same day as the Gaia DR3 release). On 13th July, JWST observations, HiPS and a Webb Early Release target list were added to ESASky (on the same day that the data became available in the eJWST archive). And the upcoming release, for 15th September 2022, was shown with the new ESA/Webb outreach images feature (very similar to the Hubble outreach images feature, and created in collaboration with the same ESA/Hubble/Webb team). The AAUG were very positive regarding the latest developments and data that has been added to ESASky and recommended the continued development of novel tools which increases both the visibility and the accessibility of ESASky, for the public and astronomers alike, as well as allowing astronomers to use it to

carry out scientific research (see **Recommendation 2022-09-13/01**).

7. ESA JWST archive latest news

T. Marston, the JWST Archive Scientist, presented the latest news on the European JWST (eJWST) archive at the ESDC including a demo of the archive. The purpose of having an JWST Archive in Europe is to provide the official ESA repository of public mission data and to support the community (especially the European community in archival data access and use. The archive became public this year and currently contains more than 60TB of public data. The data in the eJWST is synchronised with JWST data available in MAST/STScI every 30 minutes. Exclusive access to proprietary data is available using the STSCI MAST token that can be used with the eJWST user interface or scripting access, e.g. with astroquery. All products are VO compatible. ESASky is embedded within the archive with a number of related tools and JWST-custom capabilities, as well as all the features found in ESASky, such as data combination with other space and ground-based missions. The JWST ESDC team also recently started to add JWST HiPS, and in the near future these will become automatically updated and accessible in the eJWST archive and ESASky. Finally, the archive is linked to ESA datalabs and a JWST datalab was developed alongside the archive and was used during commissioning, and now into the JWST operations, by the instrument and GTO teams.

Future plans for the archive include: the standard help and monitoring on a daily basis; full datalabs release and exploitation with JWST pipelines and calibration files maintained for standard processing; viewers for all modes; links to DOIs; improved performance; and overall user interface modernisation (e.g. use of Angular software, like the eHST archive).

The AAUG were very impressed with the eJWST archive and all its features. A. De Cia particularly liked the script queries feature, available in the search interface, which provides the users with the commands used in the search form converted to ADQL, CURL, WGET and astroquery code. The AAUG suggested that ESASky should add a similar feature.

8. Date and time of next meeting

N. Webb noted that mid-September may have been a difficult date for some AAUG members to join a meeting, both online or in person. N. Schartel suggested September should be avoided as there are always many scientific and other meetings scheduled in the month. I. Georgantopoulos suggested that November is ideal. It was also discussed to ask all AAUG members if they can still commit their time to the group and attend the meetings. N. Webb took an action on this and to poll all AAUG members to find a date for the next AAUG meeting in the first half of 2023 (**Action 2022-09-13/05**).

9. AOB

G. de Marchi raised an AOB from the ESDC about the long-term maintenance of user interfaces for legacy



mission archives. Discussions have begun within the ESDC on how long the user interfaces of legacy missions can be maintained at the ESDC and what the possible alternatives could be (such as offering access to the data through TAP, then via Jupyter notebooks, python, or simple html pages, as examples). Some of the issues that the ESDC face are that technology ages quickly and archives need updating on a regular basis to the latest technology in order to keep working, however, funding for the legacy archives is limited. G. de Marchi said the ESDC wanted to bring this to the AAUG's attention now in the AOBs for the AAUG to start thinking about the issue. A dedicated session will be planned for the next AAUG meeting, in 2023, where the ESDC will give a presentation and ask for a recommendation from the AAUG.

RECOMMENDATIONS

The following recommendations were formulated by the AAUG:

Ongoing Development of ESASky

Recommendation 2022-09-13/01: *ESASky* continues to go from strength to strength. The introduction of the *ESA Virtual Assistant* (EVA) is a powerful addition to the platform, which is used by both professional astronomers and the general public alike. It is clear that EVA will make the platform more accessible for the general public, and it could be an excellent interface to help astronomers that are not yet familiar with ADQL to implement simple scripts. Further, the introduction of new data products as well as the JWST images, all accessible in a user friendly way, continue to enhance the power of *ESASky*. The introduction of a FITS visualiser overlaying sources on the image is also an excellent resource for professional astronomers. The AAUG recommends the continued development of novel tools which increases both the visibility and the accessibility of *ESASky*, for the public and astronomers alike, as well as allowing astronomers to use it to carry out scientific research.

The Archival Research Visitor Programme

Recommendation 2022-09-13/02: The *Archival Research Visitor Programme* is a great way to raise the profile of the ESA archives and demonstrate the potential of the data in them. In order to ensure a fair assessment of the proposals, the AAUG recommends that the proposals are anonymised before being sent out to the reviewers, which should go some way to mitigating bias with regards to gender and origin (country/institute). Depending on the results, the proposals could be fully dual-anonymised in future rounds. In addition to the sentence (We encourage applications from women and minorities.) proposed following the May 2022 AAUG meeting, to be put on the call for proposals, the AAUG recommends adding ‘The evaluation process will be anonymised to ensure equal opportunities for all applicants. This could be followed with something like ‘ESA is actively committed to the diversity and inclusivity, and has recently obtained the EDGE (Economic Dividends for Gender Equality) Certification for gender equality’. This would demonstrate to the public that ESA are indeed taking action.

Feedback on the archives

Recommendation 2022-09-13/03: In order to get useful feedback on the content and accessibility of the ESA archives, the AAUG recommends two actions. First the AAUG recommends soliciting specific feedback on an aspect of the archive by encouraging users to provide comments during their archive session. This could be by reminding users of the feedback button, or by asking users how they felt that their session went, or through other means. We also recommend carrying out a new version of the ESA Astronomy Archives User Survey, which will provide more generalised feedback on the archives and allow ESA to measure the impact of the many new features added to the archives in recent years. Finally, this also has the added advantage of



raising the profile of the archives through the call to respond to the survey, which will reach many people, including some who may not be familiar with everything that the archives have to offer.

Promoting the archives

Recommendation 2022-09-13/04: With a view to continuing the actions already initiated in promoting the archives, the AAUG recommends that ESA again requests a session at the European Astronomy Society (EAS) Annual meeting that will be held in Krakow in July 2023. In order to extend the practical session that was a real success during the lunch meeting held at the EAS meeting in 2022, the AAUG recommends exploring the possibility of holding a longer meeting. This will allow more time to be dedicated to the practical session, permitting those attending to carry out the demonstration on their own computers/telephones. Having a longer session will also allow time to include contributions from the community, demonstrating the science that they have been doing with the archives, and perhaps inviting a laureate of the Archival Research Programme to present the research that they carried out in the framework of the programme. Another possibility to explore is holding a longer session still, and including ESO and the CDS, who have also run lunch sessions during the EAS meetings. This will help to promote synergies between the archives and facilitate discussions with regards to standards to be used.

Data for the archives

Recommendation 2022-09-13/05: Excellent, high quality software and datasets are produced in the framework of *Horizon 2020* or *Horizon Europe* projects. These can go above and beyond what is currently offered in the ESA archives for the relevant missions, providing value-added products, that can help promote the use of data from ESA observatories. The AAUG recommend that ESA investigate the resources that they are able to attribute to archiving the products and the software generated through these projects. Attributing resources early in the project should facilitate the integration of the data/software by ensuring that products are in formats that can be most easily integrated into the archives and allow the long term preservation.

Monitoring archive usage

Recommendation 2022-09-13/06: The initiative to monitor the archive usage is excellent, as it can be used to understand how the archives are accessed and make access improvements accordingly. The AAUG recommends that a sentence is included on the archive webpages informing the users that the archives usage is monitored but personal data is not collected and information relating to any science goals are processed in a format such that any project is no longer identifiable.