ATUC Report – September 2025

1. ATUC members in attendance

Stas Shabala (Chair), Andrew Zic (Executive Officer), Hayley Bignall (remote), Adelle Goodwin (remote), Saurav Mishra (student member), Sanja Lazarevic (student member), Karen Lee-Waddell (remote), Marcus Lower, Gavin Rowell, Nick Seymour, Tessa Vernstrom.

2. Commendations

- Scientific productivity of ASKAP, including progress on ASKAP surveys, enhanced data quality, and communication of timelines to SSTs.
- Successful commissioning of BIGCAT and high-impact science produced by the ATCA, including the use of rapid response mode.
- Engagement of the user community, including revitalisation of the ATNF student and visitor programs, and continual improvements in supporting ATUC.
- Progress towards establishing a single point of contact for users relating to operational issues across ATNF facilities.
- Commitment to a positive workplace culture, recognised through the Gold Pleiades Award from the Astronomical Society of Australia.
- Successful tests extending LBA capability at L-band with MeerKAT and NARIT telescope.
- Progress on CryoPAF and polarisation calibration modelling solutions is being made available to users at Murriyang.

3. ATNF operations

3.1 Data storage

ATUC is concerned that CASDA cannot keep pace with ASKAP data volumes, which are growing at ~4 PB per year. The original ATNF agreement with Pawsey provided ~10 PB of CASDA storage, but accommodating all ASKAP survey data will require an additional ~15 PB, bringing the total long-term storage need to ~24 PB. The estimated cost of this extra capacity is $2–3M per year, which is a substantial expense that could compromise other activities such as telescope operations. While relevant to ATNF, this issue is also relevant to other radio astronomy facilities. Without action, storage of future observations may be at risk. During the open session, there was considerable discussion in the Teams chat about data compression solutions, indicating strong community expertise and enthusiasm for addressing this challenge.

Recommendation: ATNF to advance efforts to secure medium- and long-term data storage resources by continuing NDRI applications for CASDA infrastructure support and exploring additional funding opportunities.

Recommendation: ATNF to engage with the SSTs to identify old or superseded data that could be removed, and to distinguish essential science-delivering data products from less critical data products for archiving considerations.

Recommendation: ATNF to explore potential collaborations with the community (e.g., SSTs such as DINGO; ADACS) to implement and potentially develop data compression technologies.

3.2 ATCA Transformer

ATUC has been informed that due to a transformer issue in the ATCA, the array can currently only be used up to the compact 750-m configuration. With the next observing cycle due to start on October 20, only a small fraction of the approved proposals are able to observe in this configuration. Delays in fixing the problem are likely to have serious consequences for proposals scheduled in this cycle.

Recommendation: ATNF to endeavour that the repair of the transformer happens at high priority, with the aim of returning the observatory to full power by the start of the October 2025 observing cycle.

4. Policies

4.1 Usage of Large Language Models

ATUC has received concerns from the user community regarding the use of 'Large Language Models' (LLMs) in preparing and reviewing observing proposals. At present, there are no stated policies or guidelines on the use of LLMs in the OPAL users guide for writing proposals, or their usage by the TAC in assessing and grading proposals. There are concerns around the sharing of preliminary or embargoed science results with third parties that may come from uploading proposals to LLM tools, in addition to the limited training datasets of these tools resulting in potentially misleading recommendations if used for critically assessing proposals. Other national facilities (e.g., NRAO) have now implemented clear guidelines outlining the appropriate use of LLM tools in relation to observing proposals.

Recommendation: ATNF to develop policies on the usage of LLMs at each stage of the proposal process. These policies should maintain confidentiality of the proposal contents, and facilitate robust scientific assessment. ATUC suggests that LLM tools should not be used to evaluate the strengths or weaknesses of a proposal.

4.2 ASKAP time allocation prioritisation

The scientific landscape relating to ASKAP science programs has evolved significantly since the original surveys were designed, and continues to evolve. In the open session, it was noted that there are new and time-dependent science possibilities for ASKAP that have emerged since the original call for survey science proposals. One example is LSST shadowing, which currently would not be possible given the relative prioritisation of SSPs and GSPs in ASKAP scheduling. ATUC recognises the need to balance ATNF's commitment to completing proposed SSP observations with the potential for new, high-impact science.

The last review of the scientific merit of the SSPs was carried out approximately three years ago, and both the scientific landscape and progress of SSPs have changed significantly since then. While SSPs are required to submit progress reports to the TAC every other proposal round, it remains unclear how these reports are used by the TAC and ATNF.

Recommendation: ATNF, in consultation with the steering committee, should review the process for determining the relative priorities of existing SSPs and new science programs, factoring in relevant international developments and emerging science cases to maximise the scientific impact of ASKAP.

4.3 DDT and NAPA prioritisation

In the previous ATUC report, the committee recommended that ATNF provide transparency to observers behind the allocation of time to conflicting requests for DDT observations/triggered NAPA projects. This item was not actioned due to time constraints. ATUC supports the continued development of NAPA policies in line with the evolving use of NAPAs by the community.

Recommendation: ATNF to ensure that transparency regarding the reasoning behind the allocation of time to conflicting DDT/NAPA requests is given to observers where possible.

4.4 Ticketing system

ATUC welcomes the implementation of a general ticketing system for user feedback and queries. The committee was pleased to learn that the ATNF webpages are in the process of being updated to prominently advertise this information. ATUC emphasises the importance of visibility of issues/queries raised by community members being acknowledged and actioned by ATNF staff.

Recommendation: ATNF to continue development of this new feedback system. Specifically, to prominently display how to send feedback/queries via the new ticketing system via webpages, and investigate a means of providing transparent tracking of tickets. ATUC requests an update on the usage of the new ticketing system at the next ATUC meeting.

4.5 Commensal access for SSTs to GSP data

The CRACO system is now being offered to the community for Guest Science observations. ATUC's understanding is that the CRAFT SST reserves the right to commensally search and publish results from any ASKAP observations, including GSPs. ATUC has also been informed that the VAST survey now has the ability to perform real time fast imaging searches of the data for transients during processing on Setonix, before data products are deposited to CASDA. This potentially places GSPs performing time-domain science at a systemic disadvantage as their data may be searched by existing pipelines from SSPs.

Recommendation: ATNF to provide a clarification on the policy for SSP access to GSP data for commensal analysis and searches.

5. ATCA

ATUC congratulates the ATNF on their success so far in commissioning the BIGCAT backend for ATCA. This is a major milestone which provides great encouragement for the future use of the ATCA.

ATUC notes that the development of a comprehensive pipeline for reducing ATCA/BIGCAT data is beyond the scope of the BIGCAT project. However, opportunity exists for the ATNF to support the community to develop pipelines for wide use, which would significantly reduce the barrier for non-expert users to use ATCA. This includes ATNF coordination of community activities, in addition to any direct contributions by ATNF staff to pipeline development. A data processing workshop and/or busy day would be useful for kick-starting this effort.

Recommendation: ATNF to support community engagement in the development of ATCA data processing pipelines by creating a forum (e.g., on GitHub) to facilitate contributions and collaboration from the community. ATNF to host a BIGCAT data processing workshop to kick-start this process.

6. ASKAP

Thanks to the ASKAP Key capabilities project, good strides have been made on improving the observing efficiency and data quality of ASKAP. Notable achievements include the firmware fix that was affecting the spectral line data, implementing facet imaging for out-of-field sources, and progress on using reference fields for calibration. ATUC also acknowledges the changes implemented in survey prioritisation work to complete surveys efficiently, track progress, and maintain improved communication with SSTs throughout the process.

6.1 Imaging and data processing

ATUC was pleased to see the work being done on imaging, calibration, and pipeline improvements for ASKAP. There is room for further development, including implementing the multi-frequency information from the multi-band RACS survey and Flint-based processing. The Flint pipeline shows improved handling of artefacts and decrease in image noise. ATUC was unclear about the exact role that additional pipelines such as Flint are meant to play. Will this replace the current ASKAP processing, or would SSTs specifically need to request Flint-based processing?

Recommendation: ATNF to continue developing advanced imaging methods and pipelines. ATUC requests clarity on ways in which these supported algorithms can be utilised by the community or potentially incorporated into the standard ASKAP pipeline.

6.2 SSP timelines

ATUC commends the work undertaken thus far in developing clear timelines for completing the SSPs. It is clear that many factors influence the progress of the SSPs, including survey constraints, data processing challenges, computational limitations, and even solar activity. These timelines are expected to evolve as issues arise and are resolved.

Recommendation: ATNF to maintain transparency in how observations are prioritised on ASKAP. Timelines should be updated regularly (at least quarterly) to provide realistic expectations for SSP completion and to inform the feasibility of GSPs.

A current bottleneck has been identified with uploading data to CASDA (e.g., conducting four spectral line observations in one day, but only being able to upload two spectral line datasets to CASDA within the same period). Coordinating observation schedules with available compute and storage resources could help minimise delays in data delivery.

Recommendation: Ensure that ASKAP observations are scheduled with consideration of downstream processing and data upload capacity.

More efficient use of telescope time via GSPs may be possible if SSP observing constraints are shared with proposers in advance. These include LST ranges and times of year when ASKAP is likely to have more GSP time available.

Recommendation: ATNF to clearly communicate to proposers the constraints placed by SSPs on the times available for ASKAP guest science.

6.3 ASKAP VLBI

ATUC welcomes the presentation of the overarching science case for VLBI with ASKAP, and looks forward to further developments in this area, including identifying community interest.

Recommendation: ATNF to continue to explore the possibility of VLBI with ASKAP, including by engaging the broader VLBI community.

6.4 CRACO

ATUC commends the continued incorporation of CRACO into the National Facility. The committee looks forward to an update on initial results of the LOw-Time-Resolution UNiverse (LOTRUN) survey and efforts to provide value-added data products from the instrument for GSP observations, such as high-time resolution snippets around real-time detected transients, access to voltage dumps, and full polarisation information.

Recommendation: ATNF to provide an update on the progress of the LOTRUN survey, and to continue community engagement and operational support to make additional CRACO capability available to users through Guest Science observations.

7. Long Baseline Array

ATUC was pleased to learn of recent test observations involving the LBA with MeerKAT and the Thailand National Radio Telescope, paving the way to enhanced VLBI science opportunities with future participation of these telescopes in LBA observations. ATUC anticipates that demand for high angular resolution is likely to increase with new transient discoveries, and especially with the SKA and CTAO coming online in the relatively near future. In the immediate future, ATUC looks forward to a return to more regular LBA observing sessions following the BIGCAT upgrade.

ATUC received user feedback noting that continued participation of Australian telescopes provides crucial southern baselines for maintaining the celestial reference frame used to define the positions of astronomical objects, also essential for geodesy. ATUC notes that all ATNF telescopes rely on the geodetic/astrometric data products, and therefore, collaboration and participation with the International VLBI Service (IVS) is essential. Moreover, sensitive telescopes with broadband VGOS (VLBI Global Observing System) capabilities are lacking in the southern hemisphere.

Recommendation: ATNF to investigate the development of VGOS capabilities on one or more telescopes (Murriyang, ATCA), and participation in IVS observations as an Observatory Project.

8. Murriyang

ATUC commends ATNF staff for successfully returning the Murriyang telescope to operation following an extensive period of maintenance, along with the smooth transition from the Medusa to Apollo GPU cluster. The committee was pleased to hear that significant progress has been made on making the full CryoPAF system, in particular the full design bandwidth, available to users in the upcoming semester under shared-risk observations. Further delays to delivery of a usable system may undermine confidence among the user community, along with additional frustrations at proposals having to be re-submitted and re-graded over several observing semesters.

Recommendation: ATNF to continue prioritising the delivery of the CryoPAF for shared-risk observations starting in 2026.

9. Future projects / demonstrators

Several future projects were briefly mentioned in the open session, including a coordinated transient network making use of ATNF facilities, LAMBDA, CASATTA and GINAN, as well as testing of potential PAF upgrades for ASKAP. ATUC requests regular status updates on these and other relevant projects. It would be useful for the updates to be provided well in advance of the next ATUC meeting, and include information on how these projects fit into the long-term vision and strategy for ATNF.

Recommendation: ATNF to provide regular updates on future instrumentation or demonstrator projects to ATUC, and develop a process for determining the community's relative priorities relating to new or possible projects.

9.1 LAMBDA

ATUC is encouraged to hear that the goal of LAMBDA is to demonstrate the technical feasibility and science motivation for low-frequency VLBI with SKA-LOW.

Recommendation: ATNF to investigate the possibility of using external partners like the MWA and international partnerships for technical and science demonstrations.

9.2 ASKAP PAF Upgrade

ATUC was interested in learning about a possible PAF upgrade to one ASKAP dish. ATUC would like to know about potential impacts of the testing of the prototype in operations of ASKAP and the SSPs.

Recommendation: ATNF to continue investigating the feasibility and possible benefits of an upgraded single ASKAP PAF, while ensuring that this does not significantly impact current operations.

9.3. Transient network

Acknowledging a constrained funding environment, ATUC welcomes discussions in the Australian and international communities on the development of a multi-year ARC LIEF proposal for an innovative network using Australian facilities, including the ATCA, Parkes, LBA, and ASKAP, aimed at enabling co-ordinated, high-impact transient science.

Recommendation: ATNF to work closely with the Australian university sector and other relevant partners on development of a feasible proposal within the ARC LIEF scheme.

10. Community

10.1 Student engagement

ATUC acknowledges the updates regarding the ATNF co-supervised student committee. ATUC appreciates the effort of having an Early-Career Researcher (ECR) representative, and conducting monthly catch-ups along with setting up the Slack space for students. While the committee is not yet established, progress is being made towards this goal. Once established, the role of this committee will be to work with the ATNF to determine relevant training and engagement opportunities.

Recommendation: ATNF to establish an ATNF co-supervised student committee before the end of 2025, with clear terms of reference distinguishing between the roles of the ATUC student representatives and the ATNF Student Committee representatives.

ATUC recognises the importance of regular training opportunities provided to students and ECRs to train the next generation of expert radio astronomers that can support the national facility. This may include the radio school, or data processing workshops/masterclasses for various ATNF telescopes.

Recommendation: In consultation with the Student Committee, the ATNF hosts training events for the benefit of the community, particularly students, ECRs, and non-radio astronomers.

ATUC appreciated learning about the positive feedback on the student program from ATNF supervisors. The co-supervision program provides valuable links between the ATNF and the university research sector.

Recommendation: ATNF to develop a mechanism for receiving feedback from university partners on the student co-supervision program. This mechanism should be developed in consultation with university supervisors, via an open-ended set of questions capturing both positive aspects of the program and aspects that could be improved.

10.2 Engaging non-Australian community members.

The ATUC open session was well attended, with ~40 in-person and ~90 remote participants. Using the OPAL email exploder as an invitation list has been a positive step in broadening community engagement. Nevertheless, participation from ATNF users outside Australia remains limited. Very few responses were received via the online ATUC feedback form and there is currently no international representation on ATUC. While inviting international members could improve inclusivity, challenges remain due to restricted travel funding and time zone constraints, which limit participation from certain regions.

Recommendation: ATNF to explore inviting a small number of international ‘regional representatives’ to contribute to ATUC in some capacity, such as providing written templated feedback at least one month in advance of the meeting and/or attending remotely as a formal ATUC member.