ATUC Report – April 2025

1. ATUC members in attendance

Stas Shabala (Chair), Vanessa Moss (Executive Officer), Craig Anderson, Hayley Bignall, Adelle Goodwin, Sanja Lazarevic (student member), Karen Lee-Waddell, Marcus Lower, Yik Ki (Jackie) Ma (remote), Kovi Rose (student member), Gavin Rowell (remote), Andrew Zic (incoming Executive Officer from H2, 2025).

2. Commendations to S&A

- Transition of ATNF to a new leadership structure.
- Effective implementation of the ASKAP Key Capabilities Projects, leading to major improvements in ASKAP data processing, with ongoing high-level observing efficiency now possible.
- Successful fringes measurements with BIGCAT on all six ATCA antennas.
- Parkes "Murriyang" CryoPAF working in continuum, spectral line, and pulsar modes.
- Pulsar discoveries and contributions to the celestial reference frame from archival ATNF data.
- Engagement with the user community through the ATCA science day and graduate student symposium.
- Accessibility upgrades to the Parkes Observatory visitors centre.

3. Future of ATCA

The ATCA science day was well attended, indicating high levels of community interest in the future of the instrument. ATCA is a well-used instrument with unique capabilities even in the SKA era, a fact highlighted by many participants. The ATCA science day showed the significant potential of ATCA in transient, galactic and high-resolution science. In these areas, ATCA and the LBA will be highly complementary to the SKA and upgraded ALMA, optical facilities such as LSST and ESO, and high energy facilities such as the Einstein Probe and CTAO. ATUC notes that the timelines of ATCA transitioning to any new funding model align well with the timescales of these complementary facilities. It has become clear that CSIRO alone cannot commit to fully supporting the continued funding of ATCA beyond late 2026. ATUC stands ready to support the broad community interest in assisting ATNF in exploring alternative funding options for ATCA in the SKA era.

In order for the community to assist in actively seeking funding avenues, ATNF needs to provide clear expectations on timelines for guaranteed BIGCAT operations, and how it can ensure that LIEF partners can deliver the science planned in the original proposal.

Recommendation: ATNF to urgently engage closely and proactively with community members as they actively seek funding avenues for ATCA on the indicated tight timeline, leveraging ATCA's unique capabilities.

Recommendation: ATNF to prioritise BIGCAT operations, ensuring that LIEF partners can deliver on the science goals stated in the funded proposal.

4. Facilities

4.1 ASKAP

The Key Capabilities Project has made important progress, with notable improvements in throughput and uptime, and increasing support for the development of new pipelines (e.g. Flint) driven by SST demand for modularity, extensibility, and advanced functionality, which ATUC strongly endorses. A new sky-model -based calibration technique is expected to deliver substantial efficiency gains—particularly in switching between surveys such as EMU and WALLABY, with potential savings of up to four hours per day, aiding efficient observing and scheduling of the long-track observations favoured by EMU and WALLABY..

However, several key challenges remain that affect the broader survey program. ASKAPsoft remains unready for routine survey operations for a number of teams awarded substantial time under the RASSP process. This has led to delays in data delivery for programs such as the GASKAP surveys. There is a clear need for increased Observatory-side resources to support testing and move ASKAPsoft toward production readiness.

In parallel, solar activity continues to strongly limit daytime observations for spectral line surveys such as WALLABY, which has a major impact on scheduling flexibility. Addressing this constraint through development outlined below may require significant resources but could substantially improve scheduling flexibility.

At a systems level, the rollout of pipeline and firmware changes has occasionally lacked adequate pre-deployment validation. Clear artefacts—such as spectral jumps and mosaicking issues—have been detected post-observation by survey teams, even in data delivered as "calibrated" by the Observatory. In ATUC's view, data quality needs to remain primarily the responsibility of Observatory operations staff with appropriate input from science teams.

Recommendation: ATNF to continue target resourcing to address the most significant blockers to efficient scheduling and execution of the SSPs. Community feedback to ATUC by the SSPs highlights the following areas as high-priority development paths, in priority order:

- **Exploiting sky-model calibration to reduce overheads associated with band switching**, which currently limit day-to-day scheduling flexibility and reduce observing efficiency.
- **Achieve operational readiness of ASKAPsoft for diffuse emission imaging workflows**, enabling timely science delivery for several high-allocation RASSP teams, such as the GASKAP surveys.
- **Delivery of tools for observing near bright sources**, such as peeling algorithms, to expand usable sky coverage for affected surveys.

- **Visibility-level excision and stitching tools** to mitigate effects of solar activity and, potentially, allow multiple shorter-track observations to be combined for imaging—improving prospects to maximally utilise each 24-hour period for SSP observations under dynamic scheduling.
- **Consistent application of pipeline and firmware validation frameworks**, with clear Observatory-side responsibility for identifying and diagnosing issues in calibrated data. Where the complexity prevents this, post-deployment observations should be flagged and prioritised for review in coordination with SSPs.

4.1.2. Survey Science Projects

ATUC received submissions from project leads of multiple ASKAP SSPs. Feedback received by ATUC indicates that the significant delays experienced by some spectral line SSPs are adversely impacting the levels of engagement within science teams. Uncertainties around progression and development timelines pose major challenges for resourcing of the science teams, particularly ECRs on short-term contracts.

ATUC received conflicting suggestions from different SSTs regarding relative prioritisation of projects. ATUC appreciates the challenge of balancing a broad range of competing SSP priorities, and incorporating ongoing progress in addressing constraints such as solar interference and ducting.

Recommendation: ATNF to communicate to spectral line SSTs the timeline on which sky model-based calibration and peeling of bright continuum sources will become available in ASKAPsoft.

Recommendation: ATNF to develop a process for making decisions on relative prioritisation of continuum and spectral line ASKAP SSP observations.

Recommendation: ATNF to communicate updated predictions for progress and completion timelines of all surveys to the SSTs.

4.1.3 CRACO

ATUC welcomed the update on current efforts to incorporate CRACO into the National Facility and progress on archiving data products in CASDA in advance of the 'LOTRUN' survey. We note that there is community interest in leveraging both the higher-time resolution data products that can be produced by CRACO, and the real-time transient detection capabilities for fast radio burst and galactic transient discoveries.

Recommendation: ATNF to continue work on making the wider capabilities of CRACO available to the community through GSPs, as part of its transition to a National Facility instrument. For instance, the upload of high-time resolution snippets of data around transient candidates to CASDA and making the voltage dump capability available to GSPs.

4.2 BIGCAT

ATUC is pleased to see the successful installation of the new BIGCAT system across all antennas and the achievement of first fringes, especially in light of the successful ATCA science day. The planned rollout of expanded bandwidth, zoom modes, subarrays, and other advanced capabilities is well aligned with community science needs, and will be key to securing ATCA's future funding and operation.

BIGCAT marks a major technical upgrade for ATCA and brings with it the potential to modernise the user experience. Community feedback has highlighted a steep learning curve in the current interface and calibration process, which can deter new users or multi-wavelength -focused astronomers. There is strong interest in simplified workflows and increased automation—particularly for those coming from operator-based observing models common with other facilities; especially in the optical community which will form an important user base for transient work in the LSST era. While resource constraints preclude staff-run observing, automation and improved usability could serve a similar function. Feedback from the ATCA Science day suggests that automated observing and science processing pipelines – like the continuum pipeline that ATNF has begun to develop – may increase the number of proposals submitted.

In parallel, ATUC received feedback highlighting the current lack of clear training pathways, documentation, and engagement mechanisms for interested students and ECRs. BIGCAT commissioning presents a timely opportunity to address this gap and build long-term capability across the community. In this context, ATUC supports the revival of the ATCA Forum as an appropriately safeguarded monitored, community-driven space for collaborative development.

Recommendations:

- **Prioritise usability and automation in BIGCAT-era operations**, including streamlined observing interfaces and simplified calibration workflows. CSIRO should actively support and coordinate community-led efforts to develop publicly available, `science-ready' data processing pipelines.
- **Revive the ATCA Forum in a modern platform** as a moderated, community-driven platform for sharing knowledge, troubleshooting, and supporting user engagement in the BIGCAT era.

4.3 Murriyang

ATUC commends the ATNF for the progress in commissioning the CryoPAF over the past six months and the ongoing efforts to make the receiver available for shared-risk observing in the APR2025 semester. These achievements are particularly impressive given the current low staffing levels at the Parkes Observatory, an issue which ATUC was pleased to learn is being addressed. It was noted in the open session that novel strategies for mitigating radio-frequency interference with phased-array feeds exist and there was a suggestion that these strategies should be implemented on the CryoPAF, yet at present no resources are available for this.

Recommendation: ATNF to add implementing radio-frequency interference mitigation techniques as a key part of continued CryoPAF development and deployment activities.

ATUC has received a request that the "polarisation calibration modelling" (pcm) files that are required for calibration of Parkes pulsar data be made publicly available. Presently, these files are distributed on an ad-hoc basis by users with existing access to the original files, or their own copies.

Recommendation: ATNF to make existing polarimetric response models for Murriyang receivers available to users via the 'Parkes Clock and CAL files' webpage.

4.4 Long Baseline Array

ATUC is pleased to see included in the Science Highlights the recent publication of the Radio Fundamental Catalog by Petrov & Kovalev (2025), which involved LBA data. This catalog is an important reference for many broad applications that require accurate astrometric data, as well as for AGN studies. ATUC supports continued focus on developing the role of the LBA in the SKA era, and the connections between LAMBDA and centimetre-wavelength VLBI. ATUC is pleased to hear that development of the UWB mid/high receiver for Murriyang is on track. This will increase the availability of Murriyang for VLBI, and matches the broad bandwidth becoming available with BIGCAT at ATCA, making for a very sensitive, broadband baseline. We note that continued ATCA participation is key for high-impact VLBI science. ATUC is interested to learn more about the future possibility of ASKAP participating in VLBI.

Recommendation: ATUC would like to see a paper on the science case for, and feasibility of, including ASKAP in VLBI observations circulated to the broader community for further discussion at the next ATUC meeting.

4.5. Data and archives

ATUC is concerned that CASDA's storage is approaching its allocated limit, especially since CASDA will be ingesting data from ASKAP, Murriyang, ATCA, and LBA at a rate of ~0.5PB per month.

There is a plan to delete rejected ASKAP data to free up over 2 PB of space on Acacia Storage. As per ASKAP policy, rejected data are not made publicly available and should not be used in publications. It has been identified that different science teams could benefit from rejected data, thereby maximising the potential for ASKAP science. There could be an option to keep continuum data products (that take up minimal storage space) and delete rejected spectral line data products; SSPs are currently being consulted on the nature of rejected data prior to deletion. In ATUC's view, caution should be exercised if rejected data are to be released, and a review of the ASKAP publication policy will be needed if such data are made public.

CASDA expects to increase its storage allocation by 5-10 PB in the next few months, which should be just in time. ATUC is concerned about the lack of certainty related to further increases in storage availability. Upcoming opportunities, such as NDRI applications with Pawsey, should be utilised to acquire additional storage.

Long-term investment in developing/applying techniques to compress data and investigating other space-saving data storing techniques could be beneficial for the longevity of the archives. For example, compression of gridded visibilities is being tested by DINGO and showing promising results.

Recommendation: ATNF to continue pursuing opportunities to acquire more data storage, increasing available storage at a rate that is proportional to projected CASDA requirements.

Recommendation: ATNF to explore opportunities for innovations in data compression and storage techniques.

5. Future technologies (Marcus)

ATUC welcomes the appointment of the new ATNF Chief Scientist and Chief Technologist. ATUC appreciated the overview of the proposed long-term direction for ATNF technology, and description of the challenges and opportunities presented as upcoming mega-facilities come online towards the end of the decade. ATUC encourages further engagement with the community, and asks for clarification on how new facilities such as LAMBDA and CASATTA would be integrated into the national facility.

Recommendation: ATNF to continue community consultation and communication to determine relative priorities regarding upgrades to existing facilities and proposed new instruments, at forums such as the 2025 ASA Annual Scientific Meeting.

6. Policies (Adelle, Vanessa, Hayley, Marcus)

It is encouraging that ATNF recognises the need to update and evolve policies as the usage and time allocation of instruments evolve with the changing science needs. ATUC received feedback surrounding some specific policies as well as queries raised by ATNF staff during the open session. Below, we summarise the specific policies and provide recommendations for each case.

6.1 ASKAP time allocation

ATUC received feedback regarding ASKAP GSPs that, despite a high TAC ranking, scheduling constraints make certain proposal strategies very difficult (or impossible) to observe. There appears to be a lack of clarity on two related issues: (i) what is technically feasible for observing strategies; and (ii) the relative prioritisation of SSPs over GSPs.

ATUC understands that the priority of ASKAP is to observe SSPs, and particularly disruptive GSPs are subject to technical feasibility considerations. However, the priority of SSPs is not currently written explicitly in publicly available ASKAP policy documents. Additionally, ASKAP GSPs with high science scores which are difficult to schedule currently do not have technical feasibility comments released at the same time as TAC scores, leading to unrealistic expectations that these projects will be observed without modification to their strategies.

Recommendation: ATUC recommends that the ASKAP policy be updated to explicitly indicate the relative priority of SSPs and GSPs, and this policy is included in the next call for proposals.

Recommendation: ATUC recommends that a technical assessment of all ASKAP GSPs is carried out by relevant ATNF staff prior to or as part of the TAC review period. ATUC recommends that a technical feasibility statement is included with the final TAC scores and comments, to ensure appropriate scheduling expectations for PIs of proposals with low technical feasibility.

6.2 Murriyang time allocation and scheduling

ATUC acknowledges that commercial spacecraft tracking is a vital source of external revenue for the continued operation of Murriyang (as well as potentially other ATNF telescopes), and the observatory has an extensive history of supporting space missions. Users have, however, expressed frustration at having scheduled observations interrupted or cancelled with minimal notice, particularly for projects that have critical time constraints due to coordinated simultaneous observations with multi-wavelength facilities that are either impossible to reschedule or require a longer lead time than is currently communicated. ATUC notes that efforts are underway to define policies regarding the impact of spacecraft tracking observations on science operations. ATUC is also generally supportive of the continued development of spacecraft tracking modes on Mopra to reduce the dependence on Murriyang.

Recommendation: ATNF takes into account community concerns regarding loss of time-critical observations during the development of spacecraft tracking policies. ATUC recommends directly engaging with leads of affected projects to coordinate re-scheduling of observations where possible, and working with commercial spacecraft operators to ensure minimal impact to time-critical science observations.

6.3 NAPAs

During the open session, the increasing percentage of NAPAs (particularly for ATCA) was noted, and the query raised, "Are policies/scheduling for transients appropriate?". In addition, ATUC has received some user feedback that in certain cases DDTs appear to be preferred over NAPAs when the same time slot has been requested and that it has been difficult to schedule NAPA observations at times/cadences required for the science case. ATUC supports the continued development of NAPA policies in line with the evolving use of NAPAs by the community.

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

6.4 ATCA

During the open session, the possibility was raised of reserving ATCA antenna CA06 for use in spacecraft tracking or other SSA/SDA work, unless explicitly requested by a highly ranked project. ATUC supports this initiative, recognising that CA06 is very rarely required when the array is in compact configurations, and does not foresee strong opposition from the community to CA06 being unavailable during compact configurations.

Recommendation: ATNF to explore re-purposing ATCA CA06 for independent use when the array is in compact configurations, to aid in generating alternative funding streams for the telescope. ATUC recommends that a feasibility study be carried out.

7. Training, user engagement and user support

7.1. Ticketing system

ATUC has previously suggested improvements to the current system of reporting and resolving minor issues with ATNF facilities. During a recent presentation to ATUC, a large list of mostly independent feedback mechanisms was presented. This large number of options can make it difficult for users to find the appropriate method for providing feedback/reporting issues. There is potential duplication of effort by ATNF staff who are maintaining these feedback mechanisms.

Users have reported varied experiences when reporting minor issues using the current systems. Some issues are addressed quickly, and resulting improvements are directly communicated; other issues may not be addressed with any visible action. ATUC recognises that useful information is stored in the existing ticketing tools, fault reporting services, and forums for each telescope. This information should be archived and added to a user-searchable database/library.

Functional examples of effective help desk services can be found at SARAO and NRAO. One example of a tool that could be investigated is JIRA Service Management (JSM), which has the option to utilise AI to assist with triaging and streamlining user support. A central point of feedback is likely to significantly enhance user experience.

Recommendation: Create a single, centralised ticketing system for all ATNF facilities that is easily accessible for users to report minor issues and track the progress of such reports. This system should include a user-searchable database/library to search for historical queries and issues, and possibly utilise AI to alleviate some of the workload.

7.2. Student Community

ATUC commends the ATNF for efforts to improve the experience of and engagement with the ATNF students, including recent initiatives like the student survey, Student Symposium, and increased visibility of the students in staff messages.

Recent student feedback indicates a desire for closer connection between ATNF students, and more input into activities relevant to students. One obvious opportunity is the ATNF Student Symposium; the October 2024 ATUC report recommended that the planning of this event be led by the ATUC student representatives, but a miscommunication about this point resulted in limited student input to this year's event.

Recommendation: ATUC recommends that the ATNF take concrete steps to improve student community cohesion and two-way communication between the student cohort, the Student Coordinator, and ATNF staff. Our suggestion is to restructure the management of the student program into the following components: Community (managed by the students), Advice (an appropriately workload-allocated ATNF ECR), and Support (a continuing ATNF staff person). We note that ATNF would retain responsibility for the specific implementation and accountability for this structure. This structure will enable students to identify and respond to their own needs, leaning on the ATNF ECR for academic advice and liaising on technical issues. The role of the continuing ATNF staff member will be primarily to provide support for logistical and administrative matters.

Recommendation: ATUC recommends the establishment of an ATNF student committee that consists of at least two student representatives, along with key ATNF personnel. The role of this committee would be to facilitate ongoing feedback between ATNF Co-Supervised Students and the ATNF, along with coordinating student activities. ATUC Student representatives would also be involved to ensure that feedback from the broader student-user community (which may include non-ATNF co-supervised students who use ATNF facilities) is represented. **-**

Recommendation: ATUC recommends the addition of a supervisor survey for CSIRO and university supervisors, to be developed in consultation with student, university and ATNF supervisor representatives. ATUC also recommends decreasing the frequency of student progress reports to once a year.