ATUC Report (April 2019)

1. ATUC members in attendance:

James Miller-Jones (chair), Cormac Reynolds (secretary), Shari Breen, Ramesh Bhat, Jo Dawson, Dougal Dobie, Miroslav Filipovic, Bi-Qing For, Stefan Osłowski, Lei Zhang.

2. Commendations for CASS:

- Elaine Sadler and Ron Ekers on being awarded the Order of Australia
- Jane Kaczmarek for Parkes Community Event of the Year nomination and appointment as CASS Diversity Champion
- Outstanding feedback on the performance of the FAST 19-beam receiver
- The successful conclusion of the Voyager Tracking project with Parkes
- Achieving the first fringes from all 36 ASKAP antennas together.

3. CASS Vision and Mission

At the November 2018 ATUC meeting, the Director presented the vision and mission of ATNF to set the scene for the remainder of the meeting. ATUC very much appreciated this high-level context, and would be keen to see this approach adopted in future ATUC meetings, with all the presentations flowing from that high-level context. On a similar note, ATUC would be interested to hear the Chief Scientist's thoughts on the ongoing strategic vision for ATNF science, to enable them to take this back to the community.

Recommendation: *CASS to consider using the Vision and Mission statements to set the scene at the start of future ATUC meetings.*

4. Equity and Diversity:

ATUC commends CASS on the appointment of Jane Kaczmarek as Diversity Champion; this is a welcome step that reflects a meaningful contribution of FTE resources to Equity and Diversity. CSIRO's Bronze SAGE Award is also a positive achievement for the organisation as a whole, and reflects a high-level commitment that should provide an institutional framework in which CASS's ongoing efforts can operate.

ATUC was very pleased to see the prominence given to the diversity committee in the Director's presentation, and the establishment of the Diversity Champion role. It was notable, however, that the gender balance of the committee was predominantly female, in contrast to the gender balance of the institution as a whole, as reflected in public-facing roles such as the Open Session speakers. The success or failure of the diversity committee's efforts is likely to be

affected by the degree of buy-in from all parts of the organisation, making it important for the committee to comprise a broad and representative cross-section of CASS.

Recommendation: *That the CASS Executive ensures that the Diversity Committee is given sufficient support and resources (including recognition during workload planning of the time that the Committee members contribute) to enable them to make meaningful and positive recommendations that continue to enhance the culture and working environment at CASS.*

5. CASS Space Activities:

ATUC recognises that CSIRO aims to position itself as the lead technology partner of the Australian Space Agency, and that this institutional commitment will bring both opportunities and new projects to parts of CASS, particularly Engineering.

Feedback provided to ATUC suggests that staff are concerned about the diverting of already-tight resources into space technologies, particularly given the message from the Open Session presentation that the Engineering groups are already small, working at capacity, and with single points of failure. ATUC recognises the importance of CASS leadership in the development of space technologies, and the role it must play in realising the goals of the Space Technology Future Science Platform. Nevertheless, the committee wishes to strongly support the adopted principle that the core business of astronomy should not be unduly impacted. ATUC suggests that CASS should seek to minimise the short-term impact as far as possible in this transition period until further resources and hires are in place to make these efforts self-sustaining.

Recommendation: *That CASS continue to ensure that the core business of astronomy is not unduly impacted by the allocation of resources to Space Technologies.*

6. ASKAP

ATUC wishes to congratulate CASS on continued progress in ASKAP commissioning, and on the array of impressive recent achievements, including the successful deployment of all 36 antennas, the detection of fringes on all 630 baselines, and the great new results from RACS, Fornax A, UV Ceti, and CRAFT, to name but a few. ATUC also wishes to congratulate CASS and the various science teams on a great showing at the SKA Science Meeting. The Committee, and the community as a whole, are excited about the ramping up of ASKAP science in the near future.

The frequent maintenance issues with Pawsey's Galaxy supercomputer have significantly impacted the recent science data processing. We strongly urge CASS to address this issue with Pawsey to avoid impact on the progress of the pilot surveys, which are starting in May 2019. On a related note, while ATUC understands that ASKAPsoft is in active development, the community has noted that several functions, such as the UV and image continuum subtraction

of bright sources, are still somewhat underdeveloped. Transparent communication to the community regarding the development status of ASKAPsoft would be helpful to aid the SSTs' planning.

ATUC notes that clear and timely communications with the SSTs regarding expectations for the pilot surveys would be helpful.

While ATUC was happy to see the list of the six proposed ASKAP upgrades, which are to be folded into a project plan to commence in the second half of 2019, the timelines and prioritisation of this process were not clear. More detail would have been appreciated, particularly should CASS be seeking any community input into the relative priorities of the different threads.

Recommendation: *That CASS clarify the expectations for the pilot surveys with the SSTs and work with Pawsey to ensure that processing of commissioning data and especially the pilot surveys can proceed smoothly over the coming months.*

7. ATCA

BIGCAT: ATUC was very happy to see the BIGCAT LIEF grant submitted, and was pleased with the LIEF expression of interest process that helped to coordinate possible proposals and set expectations within the community. However, while the final proposal did include eight Australian Universities, it would have been good to have seen an even broader group of Universities participating in such a significant National Facility upgrade.

While it is to be hoped that the LIEF bid is successful, consideration should be given as to the path forward should this not be the case. With only two remaining spare boards, and users reporting subtle failure modes in the CABB, ATUC recommends that its performance be closely monitored, with consideration given to when a replacement program might need to be undertaken. While ASKAP remains to be fully commissioned, it must remain the Engineering priority. However, given the list of six desirable upgrades for ASKAP (including coherent FRB detection, telescope flexibility, advanced pipelines, and tied-array mode), it is not clear at what stage sufficient resources would be freed up to undertake the BIGCAT initiative. Since the ATCA is a crucial follow-up instrument for ASKAP (as outlined below), maximising the ASKAP science yield will depend on a functional ATCA.

ATCA as a follow-up instrument: CASS has reiterated that science and engineering resources are currently focused on Commissioning and Early Science with ASKAP. However, ATUC reminds CASS that as the only Southern Hemisphere array capable of observing between 2 and 90 GHz, the ATCA provides the necessary frequency coverage for multi-frequency and higher-resolution follow-up of any ASKAP discoveries. ATUC therefore

strongly recommends that procedures are put in place to ensure that the ATCA remains operational in the immediate future to ensure maximal ASKAP science output.

Recommendation: *That CASS monitor the performance of CABB very closely, and consider a range of possible scenarios and timelines for replacement.*

Remote qualification: ATUC was very pleased to see CASS giving serious consideration to remote requalification for observers, and was impressed by the Observing Qualifications Summary provided by Jamie Stevens. ATUC supports the continued development of qualification requirements and testing. This testing process will facilitate remote requalification in the future, and further enhance international use of the ATCA. We look forward to seeing the results of the trials implementing these new procedures following the arrival of Vanessa Moss.

Recommendation: *That CASS continue to support the development of a remote requalification process, and provide updates on trials of the new system at a future ATUC meeting.*

Multi-factor authentication: ATUC is extremely concerned by the potential to remove SSH access to ATNF computing facilities and enforce new policies for VPN access and multi-factor authentication. ATUC strongly believes that observer access to telescopes is a non-negotiable operational requirement, and therefore remote access from non-CSIRO astronomers is a necessity.

Recommendation: *That CASS maintain SSH access to the observatory and if that is not possible, develop a suitable alternative such as a fully developed TOS.*

USB access: Security concerns were raised in the Open Session about observers connecting USB drives to ATNF computers. ATUC does not believe that observers require USB access to ATNF computers. While downloading data from the ATOA can be slow and inefficient, it is possible for observers to download data from kaputar via SCP while their observations are ongoing.

Recommendation: *CASS to manage USB access in accordance with security requirements, noting it is not considered essential for observers.*

Automatic overrides: ATUC was pleased to see the progress made towards being able to automatically override observations in 64 MHz mode.

Recommendation: *That CASS implement the 64 MHz override mode. ATUC looks forward to seeing the additional time-critical science that this will allow.*

Legacy surveys: In the previous report, ATUC requested that CASS communicate the process of data release to the Legacy survey PIs and clarify the CASS support offered to the Legacy surveys. Contrary to the response from CASS, these things have not yet been communicated to

the Legacy Survey PIs. Rather, we note that Jamie Stevens has polled the PIs to find out what support they require. ATUC hopes that this process will result in clarity around the support opportunities for Legacy surveys before they conclude. We also reiterate the need to communicate the policy decisions made by CASS (surrounding issues such as data release processes) to the Legacy PIs.

ATUC notes the feedback from the TAC in the last Legacy Survey reporting round included another set of reporting requirements and the provision of information that is not included in the requirements from CASS (as given in OPAL). We urge CASS to liaise with TAC members and ensure that there is one clear set of reporting requirements that can be communicated to the Legacy survey teams.

Recommendation: *ATUC requests that CASS provide clear statements about support that they are willing to give Legacy Projects, what the reporting requirements are, and the process for releasing data products to the Legacy survey PIs.*

Future ATCA observations: ATUC noted that at least two of the Legacy surveys are due to finish within the next semester or two. ATUC agrees that now is the time to consider what future ATCA calls for proposals will include, noting the significant lead time required for any additional Legacy survey proposals, should they be part of a future call. It is possible that the timing will be such that CASS envisages that the ATCA time previously taken up by the Legacy surveys will now be required for ASKAP follow up observations, and so a further Legacy call might not be appropriate. ATUC is interested to hear more about CASS's vision beyond the end of the current Legacy surveys, and what any new processes might entail, especially considering the current subscription rate.

Recommendation: *ATUC requests an update on CASS's vision for the major future science initiatives for the ATCA, now that the Legacy surveys are nearing completion.*

8. Parkes

The performance of the UWB Low front end is very impressive and ATUC is pleased to see the increase in the number of proposals awarded time owing to the high observing efficiency possible with the receiver. However, we note that the community is aware of a number of outstanding issues with the backend in certain modes. These issues were not mentioned or discussed in any detail at the ATUC Open Session. Two examples of such issues are noise cal issues affecting some spectral line observations and spurious delays in search mode data.

While the community is encouraged to use TOS, we received feedback from the community that it lacks functionality and flexibility, particularly in regard to drift-scan observations. While this is understandable at the current commissioning stage, the community would like to see further

development of TOS. We acknowledge that the staff assigned to the development of TOS are very responsive and do provide regular updates to the system.

The performance of the prototype Cryo-PAF presented at the ATUC Open session is very impressive, and ATUC was very happy to see the renewed LIEF bid to fund this exciting new initiative. ATUC is pleased to see the continued investment into the receiver fleet at Parkes, including the Cryo-PAF, and consideration and technical development towards a UWB Mid and/or High. The UWB Low and the receivers under development not only allow Parkes to continue doing top-tier science, but also provide a testbed for new technologies to be deployed on other telescopes, with ASKAP being a prime target for the Cryo-PAF, alongside potential external clients.

We note that the current proposal template for Parkes includes a section on handling the data volume. While recording large volumes of data, enabled by the Medusa backend, can cause substantial issues further downstream, ATUC feels that if a high data volume is justified by the science case and the proposing team demonstrates the capability to handle the data, then no artificial throttling should occur. We recognize that the users should not record the highest possible resolution data without proper justification during the TAC process, and Observatory consent.

Recommendation: *We recommend continuing to provide sufficient resources to finalise the backend side of the UWB Low project, as well as the TOS telescope control system. The community would like to see the system mature before the next observing semester.*

9. LBA

ATUC was very happy to see an update on the LBA during the Open session of the meeting, as well as the continued support from CASS for this facility. It is exciting to see the synergies of the UWB Low and the potential BIGCAT upgrade with the LBA, enabling new opportunities for VLBI with more scheduling flexibility. We are also very happy to see CASS pursuing opportunities to facilitate coordination with other global VLBI facilities, from the EAVN to the EVN. This raises the profile of the LBA within the global community, and enables it to pursue additional high-impact science. ATUC strongly supports the continued operation of the LBA, particularly as the only existing southern-hemisphere VLBI facility, which will be able to provide important follow up of interesting targets detected by the ASKAP surveys.

Recommendation: *CASS should continue the support for LBA at the current level, and pursue further opportunities for coordinated proposals and observations with other global VLBI facilities as appropriate.*

10. Proposed move to Lindfield

ATUC notes that there was no mention of the future of ATNF Accommodation in the overview of CSIRO's Sydney Consolidation Project plans. Observing with ATNF facilities at the SOC requires safe 24-hour access to the site, which necessitates the provision of nearby, affordable accommodation. The ATNF Student Program also relies heavily on the accommodation provided free-of-charge by CASS to students to encourage interstate and international collaboration.

ATUC supports the consideration of all relocation options, including Macquarie University, and would encourage CASS to continue discussions and keep the community informed.

Recommendation: *CASS should keep ATUC informed of plans for the future of ATNF Accommodation as part of future site consolidation plans, and continue discussions around the possibility of relocation to Macquarie University.*

11. Technology Development Priorities

ATUC commends the establishment of a mechanism for community input regarding the prioritisation of LIEF proposals. ATUC recommends continuing this community consultation in the run-up to future LIEF rounds, and notes that the November ATUC Meeting could be a useful forum for this. Regardless, such a process will need to start well in advance, as several Universities have fairly early deadlines for LIEF Expressions of Interest, and require long lead times to ensure the availability of co-funding.

The proposal for the development of a low-frequency, long-baseline array is an exciting prospect that has the potential to provide exciting new science and would allow CASS to develop additional expertise that would be beneficial when deploying and operating SKA-low. While ATUC has not yet seen any detailed plans, at face value the proposal seems to be a low-cost, strategically appropriate endeavour. However, similar to the Space initiatives discussed above, ATUC does have concerns about the FTE resourcing required to build and maintain a new telescope.

The Radio Frequency System on a Chip (RFSoC) is a very promising new technology with potential applications across the broad range of instruments under development at CASS. We are pleased with the Engineering group's progress in onboarding this new development.

Recommendation: *CASS should continue this year's policy of consulting the user community about the plans for support of future LIEF proposals.*

Recommendation: *CASS should consider the impact of developing a low-frequency, long-baseline array on FTE resources and any consequent flow-on effects to existing ATNF facilities.*

12. Data Archiving

The ATOA currently hosts a range of raw (and some fully reduced) data from the ATCA, Mopra, the LBA, and spectral line data from Parkes. Given that the plan is for CASDA to host (e.g.) ASKAP data and ATCA Legacy survey data products, it would seem to be advantageous to consider migrating all of the data currently hosted by ATOA over to the same system.

Recommendation: *CASS to consider migrating data currently hosted by the ATOA over to CASDA so that all ATNF data products are in the same place.*

13. Director's Response

ATUC was pleased to see that the majority of recommendations from the previous report have now been green lighted. However, in future, ATUC would appreciate receiving a timely response from the Director, and would suggest that a six-week time-frame from the date of receiving the ATUC report might be an appropriate aim.

With the upcoming proposal deadline now only 6 weeks away, and the first LIGO/Virgo O3 detections of merging neutron stars having been made, any planned communications to the teams regarding potential coordination (as discussed in our November 2018 report) would need to be made as soon as possible. ATUC supports the notion that the TAC rankings should guide prioritisation of gravitational wave follow-up requests, and urges CASS to award follow-up time in a way to make the best use of limited resources, thereby optimising the overall science coming from the telescope. To that end, in cases where the different teams propose very similar science, ATUC suggests that CASS facilitate discussions between the teams to maximise the scientific output of the observations.

Recommendation: *CASS to confirm a target timeline for replying to the ATUC report, which we suggest to be 6 weeks from receipt of the report.*