

2018 NRAO UC/ANASAC report

May 14/15/16, 2018, Socorro Auditorium

UC report: pages 1-9

ANASAC report: pages 10-15

Executive Summary (UC)

The NRAO Users Committee (hereafter: UC) met in Socorro for 3 days, and appreciated the opportunity to provide feedback on user-facing issues regarding NRAO operations. Overall, the UC was extremely impressed by NRAO's handling of the many ongoing initiatives and NRAO's vision for the next decade(s). The UC commends NRAO for the impressive progress regarding the ngVLA since we met a year ago (including the hiring of key personnel, involving the community, the 'ngVLA white book', and securing significant funding from NSF). Likewise, the UC was very happy to see the ongoing improvements at the VLA site, and was impressed by how quickly and efficiently the VLA team reacted to a recent major power failure at the VLA site which affected the functionality of the correlator.

One concern raised by the UC was the apparent low oversubscription of the VLA. The UC was presented with statistics that implied that not only the best programs are being observed at the VLA. Even though the numbers have been corrected upwards since our face-to-face meeting by NRAO, the oversubscription is still only a factor around 2. This low oversubscription rate is potentially harmful in the context of ngVLA discussions.

The UC recognized and appreciated that NRAO is now tracking potential proposal gender biases and encourages NRAO to continue to monitor any trends very closely in the future. We had extensive discussions regarding a new category of proposals, the so-called X-proposals, requesting 1000h or more of VLA time. Such a proposal category has been on the UC's agenda for many years (essentially since the VLASS recommendation), as it would be a mechanism to further engage the community (also in the ngVLA context), push the facility to the limit, and compete with other emerging radio facilities. The UC is happy to see that NRAO has since our meeting issued a call for 'Expressions of Intent' for X-proposals.

Software was another main focus of our discussions. PST and OST being *the* user-facing components, the UC expressed disappointment that their state has not been changed over the last many years, and plans for improvements have been abandoned. Even though the UC appreciates that there are grand plans for a new suite of software, the timeline for the implementation of such new tools (>2 years) is rather vague. The UC noted that having the 'look and feel' of this new software as close to the ALMA software as possible would certainly be highly beneficial, and may attract new users. The UC also learned about new CASA developments, which overall look excellent with greatly improved documentation. At the same time the UC felt that it is important to continue to debug core CASA functionalities. The UC was somewhat concerned about the plan to release CARTA 1.0 to the community soon, as the previous version

(0.9) had a significant number of issues. It seems to be important to have a beta release to ensure that the general user will have a satisfactory data viewer.

The Science Ready Data Products (SRDP) project is highly welcomed by the UC. It is a critical project for the users, and the UC is happy see it prioritized as it is of critical importance for the existing facilities, but also future ones. A prioritization of items to be addressed by SRDP as well as 'managing expectations' towards the users appears to be critical.

The UC was impressed by the VLASS progress in only half a year. The UC urges NRAO to continue to alert the community at large about this new sky survey. Regarding the CDL, the UC recognizes the need for transition, and was pleased to hear that CDL is now fully integrated in NRAO's (decade) long-term strategic planning. The UC was also impressed how NRAO partly rebuilt their EPO/outreach abilities, as the core of the education effort was lost due to the separation of the GBO. The UC is very excited about the plans for a new visitor centre at the VLA site and encourages NRAO to further explore connections to local universities (NM Tech, UNM, schools) and online sales.

Last but not least, we were pleased to hear that the postdoc programs are going well overall and that a postdoc mentoring program is now in place, though the gender acceptance fraction should be monitored closely in the future. The UC also acknowledges the importance of the student support program and advises NRAO not to cut this vital connection to the community.

This UC was chaired by Fabian Walter, with Dan Marrone as the vice-chair. Dan Marrone will take over the chair in 2019, and Chris de Pree was elected as the new vice-chair in 2019. We highlight the various topics discussed in more detail in the next few pages **where we print issues on which we would appreciate action by NRAO in boldface**. The ANASAC report is also attached to this document.

VLA Operations

The UC recognizes and applauds the continued excellence of the science that the VLA produces, and we are impressed by the smooth operation of the VLA, which reflects the effective organization of a mature observatory. The UC continues to endorse the critical infrastructure improvement program, which is vital to continuing cutting-edge science into the next decade, using 40 year old antennas. We are also pleased to see that the publication rate has not continued to follow a downward trend, and suggest that the metric continue to be monitored, especially in light of the decreasing number of new users.

We are impressed by the speed with which the observatory recovered from the recent (April) power outage, which is a testament to the hard work and effectiveness of the technical staff. We understand and agree with the action taken to mitigate the loss of observing time, and use the Electrical Infrastructure Upgrade time to best effect, with the telescope move to happen concurrently. We also share the concern about the event's impact on correlator operations, and endorse taking steps such as ensuring sufficient spare WIDAR baseline boards to avoid such events in the future.

The committee is pleased to see joint ALMA/VLA presence in the Community Days, as linking the communities as much as possible will be vital going forward to build broad support for ngVLA, and encourages NRAO to continue these efforts in the future.

Proposal Data and X-proposals

At the meeting, the oversubscription rate (defined as hours requested divided by hours available, excluding VLASS) of the VLA being have been reported to be consistently below 2. At the meeting, NRAO noticed that there may have been an issue with the way this number was calculated (related to the requests of 'ANY' array configurations). Lewis Ball forwarded a memo to the UC after the meeting in which this issue is addressed. Indeed, the new calculations show that the previous numbers underestimated the real oversubscription rate by 10-30%. The number is now around 2.0, which is still concerning. This is also reflected by the fact that currently some proposals with relatively poor SRP scores are getting B rankings, with some very poorly rated proposals receiving C time. This suggests that the array is in need of more competition for time. The UC is concerned that low oversubscription for the VLA presents bad optics for justifying the ngVLA, which makes this matter particularly urgent. The UC feels that it is best for the health and future of the array to explore ways to increase the number and size of proposals.

One avenue for increasing proposal pressure is to request very large proposals, or X-proposals. "Legacy" program solicitations are common in mature observatories, often when there is decreased pressure for the groundbreaking observations that are immediately enabled by new capabilities and have already been undertaken. We note that the X-proposals can also be used to engage the community and provide momentum for the ngVLA project. For some areas of research, those that are primarily sensitivity limited rather than resolution limited, large investments of VLA time in prototypical sources can do ngVLA "pilot" science, though the UC appreciated that it may not be possible to produce any relevant results in time for decadal survey considerations at this point.

We are happy to hear that the process to offer X-proposals has been started, and a call for Expressions of Interest has recently been released with a deadline of August 31, 2018 (this happened after the face-to-face meeting). **The UC is eager to review the results of this call later this year. We would like to schedule our next UC telecon around the discussion of the EOI submissions, and greatly appreciate NRAO including the UC and the TAC in the discussions about how to proceed.**

CASA

Overall, the CASA team has been doing a fantastic job in delivering new capabilities. The new automasking/autoboxing option will help end users tremendously. The upcoming performance improvements and crash reporter are both important. The new series of CASA user guides are extremely helpful. A development for backward compatibility between CASA version and delivered calibration scripts was also mentioned, and the UC strongly encourages this

development. Currently, ALMA users have to maintain many versions of CASA to reduce data from different cycles, which has been one of the obstacles for users.

The UC looks forward to the release of CARTA 1.0. One mild concern is that the development of its frontend is driven largely by the SKA community. Only few/no astronomers from the VLA and ALMA communities are involved in this process, and the final product could deviate from the need of NA users. **The UC requests some improvement here and encourages NRAO to consider a beta release before the full release.** The UC would be happy to contribute to the beta testing.

The UC also discussed the perception that CASA may not have established confidence among users in terms of reliability (compared to e.g. AIPS, MIRIAD, GILDAS). This situation appears to be a natural consequence of the constant pressure for new CASA capabilities. **The UC recommends that NRAO considers adjusting the resource balance between software qualities (e.g., testing, debugging) vs. new capabilities.** In this context the UC appreciates that adding new functionalities in CASA was necessary for basic operations until recently. But by now CASA seems to be maturing in terms of capabilities that users need, and basic functions should even be more rigorously tested and debugged than before. Likewise, the UC noted that the responses to user-issued tickets have occasionally focused mostly on workarounds for quick scientific results without fixing intrinsic software problems. As a consequence, some users may not report a bug. The UC recognizes that NRAO is already aware of some communication issues between the internal team and external users. In this regard, the CASA user liaison is an excellent initiative.

Software: PST/OPT/Archive

PST

The failure to develop the session-less PST is disappointing, a feeling that is no doubt shared by NRAO. At the risk of repeating comments from past UC reports, the PST is a user's first interaction with the NRAO environment and it is important that it is intuitive and functional. **We strongly encourage NRAO to stick to a two-year timeframe for developing the next PST.** Finally, we suggest that NRAO involves the community as much as possible in development, even if only through interactions with the UC, to deliver a product that said community will find useful and adequate. We commend NRAO for looking toward a system comparable in feel to ALMA's OT, but appreciate that the OT will likely evolve in the next few years. A new PST from NRAO should make efforts to avoid some of the frustrating aspects of the ALMA OT, e.g., Java incompatibility on Mac OSX.

OPT

There was little discussion of the OPT at this year's meeting. We stress that the user-experience with the OPT is still not up to the standard that it should be. This again has been said in past reports. **The OPT should be integrated as much as possible with the PST, so the ongoing efforts to revamp the PST should be taken advantage of to also upgrade the OPT.** As with the PST, we would appreciate being kept in the loop as plans to revamp the OPT become more definite. The UC is happy to provide feedback.

Archive

The new archive system is intuitive and visually pleasing. The only functionality that does not seem to be there (or that we couldn't find) is the possibility to download a set of different execution blocks in one go rather than one by one. A UC member tried out the 'Restore' functionality for a few recent VLA datasets with good results, but the possibility of batch requests for download and restore would be appreciated. Furthermore, it would be useful to also include an option to download the calibration tables along with the calibrated data. Otherwise, an additional request must be submitted.

Science Ready Data Products

The committee was impressed with the SRDP project and feels it is clearly an important initiative for the observatory and the user community. The SRDP project should help to make VLA and ALMA data accessible to a broader community as well. However, the committee was rather concerned that the scope of the project may be too large for what is planned as a 5 year project **and feels that careful prioritization of the various functionalities will be critical.** The committee was also concerned about the staffing implications relative to other commitments, e.g. that NAASC DAs would be moving from ALMA support to SRDP-related work.

The committee agrees with the high priority given to standard calibration for the VLA and the restore capability for both ALMA and VLA data. Offering optimized imaging for ALMA data was also seen as a useful early functionality. However, there was some confusion among committee members on how "optimized imaging" would be offered to the VLA community before the availability of standard imaging products to provide a guide. On the other hand, the committee does understand that developing standard imaging for the VLA will likely require a few years of effort, given the experience with ALMA.

The committee was somewhat surprised that "combined imaging" (of data from more than one array configuration) is a late development and may even be on the "wish list" rather than a priority. Given that using 2 configurations is a common practice for both the VLA and ALMA, **the UC feels that it is important to develop and offer this functionality in the initial 5 year project.**

Finally, the committee feels that **improvements to the weblog with less details would greatly improve its usability for users** who are not NRAO/ALMA/JAO staff. The volume of information presented is overwhelming even for experienced ALMA users. A "Project summary" tab that led to a list of a few of the most important plots from the full weblog is needed as soon as possible.

User Computing and Helpdesk

The use of the VLA computing nodes see a healthy demand based on the number of user accounts created. The NAASC computing resources appear to be somewhat under-utilized. It is unclear if this is just because people do not know they can use the NAASC computing resources -- some of the UC did not realize that NAASC computing could be used by external users. However, the delivery of calibrated data products, the imaging pipeline, and face-to-face visits

could also lead to lower demand. **The UC recommends that the NAASC reminds users that they can be provided access to the NAASC computing resources.**

The UC appreciates that NRAO has put together documentation for the use of CASA on Amazon Web Services (AWS). No requests have been made to use AWS, but this capability might still be useful in the future and should be maintained.

In the “CASA issues” section above, there are some concerns raised about how certain tickets are handled. Users may be pointed to workarounds rather than the underlying problems being fixed. This gives users a quick way to get results for science, but does not build confidence among users in the long term.

Support of students and postdocs

The Jansky fellowship program continues to be highly successful. The successes of Jansky alumni presented at the UC meeting are quite impressive. In particular, almost no Jansky alumni left the field, and many of them obtained faculty positions in tier 1 research universities or science staff positions in professional observatories. It is becoming more difficult to do forefront research in instrumentation anywhere else. In that regards, the successful hires of two CDL Jansky Fellows was seen as excellent news. The UC is also happy to see the postdoc mentoring program that is now in place for all NRAO postdocs.

Although the Jansky fellowship program is overall successful, the somewhat low acceptance rate of Jansky offers to female candidates caught our attention. At this stage the statistics are quite poor, **but the UC requests continued monitoring as this could indicate problems with the reputation of the work environment at NRAO.** The UC also discussed about the overall package of the Jansky fellowship. It appears competitive in terms of salaries and research funding. Some part of the benefits, e.g., the high deductible of health insurance, might concern some candidates. This is an issue for the visiting committee, but caught the attention of the UC.

The SOS program has been helping the US user community tremendously. Without it, US radio astronomers have to win two proposals to educate students with NRAO telescopes. This is a huge disadvantage compared to EA and EU. The UC recommends at least a continuation, but more preferably an expansion, of the SOS program. There is always a budgetary constraint, but this program is a relatively small investment with big impacts. **In this regard, the UC was disappointed to see the proposed reduction of this program in ALMA. The UC recommends that the SOS ALMA budget not be reduced, or even that it is expanded.** A reduction may not immediately result in unfavorable outcomes, but could have significant impacts in future. The number of students who receive adequate training with ALMA data should definitely not decrease. The UC also notes that increasing the SOS program, and publicizing the increase, could lead to an increase in proposal pressure for the VLA.

Central Development Laboratory

The UC is pleased with CDL's efforts to seek and develop opportunities for engagement with the broader technical community, including universities and other radio astronomy technology organizations in the US and abroad. We encourage CDL to continue these efforts, along with engagement with undergraduate and graduate students. The CDL is intimately involved in upgrades at ALMA and in planning and costing the hardware for the ngVLA. This helps to maintain the expertise NRAO needs to continue to be at the forefront of radio astronomy developments. The UC recognizes the significance of the appointment of 2 Jansky fellows to the CDL as a step toward revitalizing CDL, and encourages continuing this emphasis in future awards.

Future Initiatives / ngVLA

The plans for the Next Generation VLA (ngVLA) continue to develop rapidly, and the recent progress (including the hiring of a project scientist, a project manager, and a project engineer) has been impressive. Securing significant funds from the NSF for developing the case for the ngVLA for the upcoming decadal report was also seen as an extremely encouraging development. The UC is also pleased that ngVLA white papers are now being collected into a science book, as this represents a significant community involvement. The challenge over the coming years will be for NRAO to continue this community engagement. **We encourage NRAO to continue to offer small ngVLA development grants, and to organize ngVLA-specific meetings.**

The plan for the eventual transition period from the VLA to the ngVLA needs careful consideration and input from the community. Shutting the VLA earlier than necessary would be a big loss given other instrumentation coming on line at that time. From our discussions it was unclear whether, e.g., "pulsar town" - turning the VLA into a dedicated pulsar instrument - would serve the community or NRAO's interests.

Even if they are not discussed openly, ngVLA "off ramps" should be in place. In the event that the ngVLA receives unfavorable feedback in the decadal review, NRAO should not be caught flat-footed. While it is true that it is best to ask for the instrument you want, planning the next best thing is important as well.

The large planned size of the ngVLA provides opportunities for auxiliary RF/digital interfaces at ngVLA antennas to accommodate future instruments and experiments, possibly provided by universities or government labs. The UC realizes that providing for these auxiliary inputs is not cost-free. That said, such inputs could be a good way to stimulate interest in the ngVLA from scientists whose research interests will not be met by the current design. If thought is given at this stage, it may be possible to expand the science done on site for a minimal extra cost and to involve a larger fraction of the radio community.

We were happy to see plans taking place for ALMA x2 and x10. This is the right time to begin thinking about major future ALMA upgrades. **We encourage NRAO to use the aspects of the ngVLA development that worked in forming consensus and engaging the community for this effort.**

Although the US is not formally involved in the SKA, it is good to see NRAO explore how they can be partners. We encourage NRAO to continue to explore ways they can leverage telescopes and software to eventually give US astronomers access to the SKA.

Education and public outreach

The UC appreciates NRAO's continuing efforts to build and maintain effective science communications and education / public outreach programs, particularly now that the previous GBT/GBO outreach efforts are not part of NRAO any more. The UC notes NRAO's efforts to increase awareness of their PR capabilities, and encourages NRAO to continue its efforts to make all users familiar with this opportunity. One consideration could be to forward submitted papers, once they request page charge support by NRAO, also to Dave Finley and Charles Blue to examine EPO possibilities. The new visitor center that is planned for the VLA seems very exciting and appropriate.

Community / Gender Issues

Last year, the UC asked NRAO to work on the gender balance on Science Review Panels and Time Allocation Committees. NRAO has made excellent progress on this front, and we commend the quick action that NRAO took to balance the gender representation. **Along these lines, the UC asks that NRAO continues its efforts to improve and maintain the diversity of its outside committees (including the Users Committee).**

We listened with interest to the discussion about making the proposal referee process anonymous. HST has changed some of its review processes, and the UC supports the NRAO decision to wait for HST to report on its outcomes before making changes to the NRAO process. As part of the NRAO data collection process, NRAO should also try to track the career stage of proposers going forward, as this is an added dimension to any gender discrepancy. This information is already contained in user PST profiles if they are correctly filled out.

VCLASS

The committee is very impressed with the progress on the VCLASS project to date. The team has done significant work, and software improvements have led to improvements in the data for all users, such as mitigation for compression due to strong RFI and eliminating ghost images produced by delays in information sent to the correlator. The availability of the web interface that allows users to browse the data and download individual images also represents very good progress.

The UC encourages the team to finish and submit the overview paper on the survey as soon as possible; this will be an important part of advertising the existence of VCLASS to the broader community. In parallel, **the committee would like to see improvements to the usability and user experience of the website, including browser viewable images.** Both steps are important in reaching the larger scientific community, where a potential non-expert user may want a

particular source(s)' 2 GHz flux density, either by a source catalogue or through postage stamp images. To track the size of the user community, the UC encourages the team to put in place methods to track the number of image or catalogue downloads of VLASS data from the survey website.

The committee is impressed with the rapid resolution of both anticipated and unanticipated issues encountered with the survey including the development of the imaging pipeline and the implementation of the postage stamp server now available to the public. The wide-field imaging issues encountered (non-variable PSFs, PSF models for bright sources) and their resolution will be informative for existing and future facilities attempting large scale mosaics, including ALMA. Furthermore, the mode of OTF mapping with the VLA has been greatly improved by VLASS, and the improvements made, i.e., to identify and eliminate "ghost" images will be greatly helpful for future science in this mode.

The committee encourages development of citizen science projects with VLASS maps to further engage the public with the radio community while also raising awareness within the science community. Such a project can furthermore enhance the robustness of the source catalogue in distinguishing astrophysical emission from imaging artifacts through user source identification.

ANASAC report

The ANASAC met on May 14, 2018 in Socorro (NM). ANASAC thanks all presenters for the substantial efforts required to prepare their content for the meeting, and for the clear and detailed talks on the state of North American participation in ALMA. The resulting ANASAC report consists of a summary of findings and recommendations, followed by a more detailed response regarding the charges addressed.

Summary of Findings and Recommendations

Based on our discussions summarized below, ANASAC provides the following recommendations and action items for the NAASC:

- NAASC should continue to monitor the relative publication rates for NA and EU proposals: if the gap between the rates continues to widen, then that should be a concern that will need to be addressed.
- ANASAC is strongly opposed to any reduction in SOS support for ALMA students: such an action would have an immediate impact on the number of people working on ALMA data, and downstream reduces the number of postdocs interested in working on ALMA data, thus exacerbating the gap between NA and EU.
- ANASAC commends NAASC for their success in improving the turnaround for delivery of products for standard data types to close to 30 days.
- ANASAC is also pleased to see NAASC responding to past communication issues within the project by improving lines of communication between NAASC and JAO.
- ANASAC notes the initiation of a pilot study for raw data release as well as access to QA0 semi-pass data, and looks forward to seeing the responses from PIs.
- ANASAC is also glad to see the developments in the archive, and in particular expects that the ability to download individual files will be greatly welcomed by the community.
- Over the next few years, more thought needs to be given to what constitutes the optimal contents of the archive (i.e., not huge image cubes filled with empty planes).
- ANASAC recommends the continuation of the NAASC information emails.
- ANASAC feels that there are scientific topics of high interest in the NA community that could benefit from a NAASC-sponsored workshop, and recommends that a call be issued for interest from potential hosts in the 2020-2021 timeframe.
- No meaningful feedback is provided on the importance of a Maximum Collecting-area Array, since the exact nature of the concept seems not to be widely-agreed upon within the project: a clear description of the concept and its usage needs to be provided before advice can be given.
- ANASAC and UC are in favor of maintaining the current organization of the two meetings (ANASAC first), which permits more UC members to be present for the exit reports.

ANASAC Charges specific to this meeting***ANASAC Charge #1: Scientific outcomes and impact from Cycles 0, 1, 2, 3 and 4. Is North America doing well--what are the challenges?***

The NA ALMA community continues to be doing well in scientific outcomes. The number of ALMA publications from NA is impressive. While NA authors published about 50% fewer papers than EU, the average citation count of NA papers is 30% higher. Since the number of EU astronomers available to work on ALMA data is significantly larger than in NA, ANASAC did not find the difference in publication counts to be an immediate problem.

However, there is a marginal trend that needs to be tracked: the gap in publication counts between EU and NA seems to be increasing with time, although the change is small and within error at present. There was extensive discussion as to whether NA needs to compare ourselves to EU and the appropriate metrics for such a comparison. ANASAC thinks that monitoring trends like this one with respect to a reference (e.g., EU) is valuable, since a trend may turn out to be more telling than a snapshot. Catching a trend early would let NA act promptly when a real problem arises. ANASAC also recommends monitoring of other metrics, such as the percentage of projects that produced publication, the total and average numbers of citations for measuring the success of NA alone, the number of unique first authors as a measure of the size and change of user base. ANASAC feels that the typical timescale expected for an average project to result in a publication may be longer than 2 years, which is the usual estimate used in discussing the current statistics. ANASAC recommends keeping track of the statistics for periods of 2, 3, and 4 years after completion of observations, recognizing that with relatively few cycles to use for assessment there will be significant uncertainty in the interpretation for the next few years.

In addition to the comparisons with ALMA partners, an analysis of type of the projects that have resulted in rapid publication would be useful in identifying causes of delay in publication. Such analyses should recognize the role of the complexity of data reduction, including, but not limited to, comparisons of single-pointing (point source detection) vs multi-pointing mosaic (complicated structures), small vs large projects, etc. For example, if the mosaic projects turn out to be less productive, that suggests directions where users can most benefit from help from the NAASC. ANASAC recognizes that such analyses take time, but recommends that they need to be undertaken at some point.

As in the last review, ANASAC again recognizes the ongoing challenge for the NA community that most radio astronomers in NA need two successful proposals, one to ALMA for data and one to NSF to carry out their science. In this context the SOS program is crucial for the health of the community. ANASAC believes that any reduction in SOS support for ALMA data reduction will harm the success of ALMA in the NA community, and strongly recommends that SOS support at a minimum be maintained at its current level, but more preferably, expanded both in total size and in the level of individual funding. The current cap for each SOS grant is not enough to cover a graduate student for one year at most schools. Although it is helpful support for existing students, recruiting a fresh student on this program is still a challenge. In addition, continuing support for page charges, and broad advertisement of this support, are important as well.

ANASAC Charge #2: Assess the status of Cycle 1, 2, 3, 4 & 5 observations and progress made towards Cycle 6. For Cycle 5, are the data meeting user expectations? Are the data being released to the PIs in a timely fashion?

The ANASAC was presented with significant progress toward timely data delivery on the part of the project, especially in Cycle 5. The top-line number of 33 days for the mean delivery time in cycle 5 is encouragingly close to the goal of 30 days. There have been large backlogs developed in both of the last two cycles, but the software appears to be approaching a point of stability that will make the processing more sustainable. We note that the backlog this year is actually higher than at the same time last year, and that there were many months of hiccups from the start of cycle 5 in stabilizing the new workflow. Most ALMA users lack information that might contextualize the lag between observation and data delivery, and so minimizing these hiccups at the changeovers to new cycles in the future will help ensure satisfaction among the broad community.

There was discussion during our meeting about the large size of (some) “product” deliveries, partially due to the inclusion of images that are not of central concern to the PI (e.g., calibrator or test source cubes). A simple solution - allowing the selection of individual files for delivery - was mentioned as being ready in October, and this is something that will be a welcome development. We encourage the release of this capability as soon as it is ready, and request that it be available on past projects if at all possible, since this will both help current PIs and facilitate users of the public archive.

ANASAC Charge #3: ALMA Development Projects and Studies. Please comment on the process, which was accompanied by specific suggestions ('ALMA2030') developed by ASAC and by reports from previous Studies.

ANASAC is generally happy with the current focus of starting to address the goals of ALMA2030 with Development projects and studies. NA is taking leading roles in the correlator upgrade, the Hardware-in-the-Loop simulator and the Phasing project. The developments in the process for finalizing the Band 2 receiver may permit NA to play a role, providing expertise in an area where NRAO is strong. The other projects and studies are all practical efforts that we can expect will lead to improvements in the scientific output of ALMA. ANASAC therefore supports the current direction being taken with NA development efforts.

Questions from the NA ARC:**#1. Continue to increase the publication rate for NA PIs/Co-Is. How is the best way to notify the community when their observing programs have been not published (> 2yrs). Are they worried about this and if so, what should we do?**

The committee agrees that it is important to monitor NA PI/Co-I outcomes in terms of ALMA publications. The committee feels that 2 years may be too short a publication window to be used as a metric of success for many projects. According to the ALMA archive, 70% of all Cycle 1 and 67% of all Cycle 2 projects currently have an associated publication, which suggests that > 3 years may be a more appropriate break point. As discussed above, the committee suggests monitoring the median time to publication with a view to establishing a more suitable reference length-of-time to publication.

The committee feels that there are additional metrics beyond total number of publications that should be monitored. These include: total number of citations; number of unique first authors of ALMA papers; average and median citations per paper; average and median time from observations to first publication; and percentage of projects with at least one publication, broken down by observing cycle.

The committee feels that a survey of PIs of projects without publications after N years would be useful. This survey should be short (just a few questions) with minimal text boxes needing to be filled in and should be non-judgemental. A possible example is the following:

We have noticed that your ALMA observations have been completed, but that these data have not yet appeared in publication. No judgement.

To help us understand the publication rate of ALMA data, we ask that you rate the following 4 statements from strongly agree to strongly disagree. This should only take 3-5 minutes

- A. My dataset is too large and I do not have access to adequate computing resources

Strongly Disagree - - Strongly Agree

- B. I do not have sufficient funding to reduce/publish these data

Strongly Disagree - - Strongly Agree

- C. I have not had time to reduce/publish these data

Strongly Disagree - - Strongly Agree

- D. I am not sufficiently comfortable with CASA to reduce/publish these data

Strongly Disagree - - Strongly Agree

[Include at the bottom an optional text box for free-form comments]

#2. Overall communication with the community from the NA ARC. Are the monthly emails informative, welcomed, annoying?

There was consensus that at least ANASAC committee members find the communications from NAASC, including those in the NRAO eNews, valuable and worth continuing.

#3. What is the interest in a topical NAASC-led science conference in 2020/2021? Science? Venue?

The committee agrees that a topical meeting in this timeframe would be more appropriate than a broader all-ALMA-science meeting, and suggests that it would be best if the topic chosen was community-driven. The topic of next year's meeting is stellar planetary systems; other topics of high activity in the NA community include high redshift science and early galaxy evolution (last covered in 2014) and intermediate to high mass star formation (not covered specifically since ALMA came into operation). ANASAC suggests that NAASC call for expressions of interest in hosting such a meeting in the 2020/2021 timeframe.

#4. Can the ANASAC/ASAC provide clear science use case for the "Maximum Collecting Area" (MCA) Array and under what constraints should it be offered?

The committee was a bit surprised to be asked this question without a presentation of material addressing the issue (indeed, without even being told what MCA refers to). An array of 64 dishes with a 15% improvement in sensitivity is attractive: while the addition of ACA antennas to extended arrays would produce poor *uv* distributions, there are arrays (in particular C43-3 and C43-4) in which the 7m baselines and additional 12m antennas would produce significantly better *uv* coverage than standard arrays. All science using these arrays, in particular large-field (mosaicking) observations of nearby galaxies and Galactic molecular clouds, would benefit from the increase in number of baselines and sensitivity. Calibration would be improved and detection experiments for compact sources would also benefit, although the 15% improvement in sensitivity is marginal for this application. It is difficult to assess the value of this option without an understanding of the additional resources required to implement it, and without any ability to compare it with alternative improvements that might be competing for the same resources.

Subsequently we heard from JAO that their vision of the MCA is a bit different than the concept that was described to ANASAC. We therefore recommend that the project come up with a document clearly describing what is envisaged for this array: until then, the committee is unable to provide useful feedback.

#5. How closely do the recommendations and feedback from the ANASAC reflect the pulse of the community? (ie. Do we still need to send out user surveys?)

ANASAC recognizes that the committee members are usually expert radio astronomers, and thus not fully representative of the broader user community that ALMA aims to attract. NAASC needs some way to reach out to novice users. In this regard, a survey email might still be a viable option, but the number of questions in the survey should be small (all should fit on one page) and easy to answer. To list selected, focused questions, NAASC needs to identify potential problems in advance, and the above-mentioned analyses, such as the publication rate

as a function of project type, may be helpful. User surveys are useful but should be short (a few questions, not too many open text boxes) and should target specific issues. For example, one could survey users on why they aren't publishing, where they are publishing, is there anything limiting the number of papers (page charge costs etc).

Other topics/Relationship of UC and ANASAC meetings

In 2017 the UC recommended that ALMA presentations not be repeated at the UC meeting in order to shorten the meeting, and that any UC members with any interest in ALMA should attend the ANASAC meeting. NRAO is concerned that this might give the impression that ALMA is not being treated as part of NRAO. UC members with any interest in ALMA were strongly encouraged to attend this ANASAC meeting and that seems to have been successful, since only 2 UC members chose to attend the UC meeting but not ANASAC. One ANASAC member was unable to stay for the UC meeting due to teaching commitments.

NRAO pointed out the discrepancy in the level of detail presented at the ANASAC (high) and UC (lower) meetings, and questioned whether the detail presented at ANASAC was truly necessary for committee members to carry out their responsibilities. The committee still feels that some level of detail is necessary for them to understand the rationale for decisions and recommendations from the observatory, and in particular ANASAC (and UC) members who are not also on ASAC see much less detail than ASAC members, and thus have less background knowledge to inform their advice. However, the committee feels that the presentations do not need to cover all areas in the same detail at all ANASAC meetings. In particular, if the presentations are available before the meeting, oral presentations do not need to cover all the material and can be shorter.

The committee is happy to alternate with sessions devoted to broader discussion of topics and issues relevant to ANASAC's goals and NRAO's need to better serve the NA ALMA community. The specifics of these discussions and any related presentations should reflect the concerns that NRAO would like ANASAC to address, and can be negotiated when the agenda for the ANASAC meeting is established.

Attachments

List of UC/ANASAC participants
Agenda (ANASAC and UC meeting)

UC / ANASAC Participation

Loren Anderson, West Virginia University (UC)
Ilse Cleeves, Harvard-Smithsonian, CfA (UC)
Christopher De Pree, Agnes Scott College (UC)
Steven Ellingson, Virginia Tech (UC)
Trish Henning, University of New Mexico (UC)
Jin Koda, Stony Brook University (UC, ANASAC)
Shih-Ping Lai, National Tsing-Hua University (UC, ANASAC)
Laurent Loinard, UNAM (UC)
Dan Marrone, University of Arizona (UC co-chair, ANASAC)
Giles Novak, Northwestern University (UC, ANASAC)
Fabian Walter, MPIA Heidelberg (UC chair)
Stephen White, Kirtland AFB (UC, ANASAC chair)
Christine Wilson, McMaster University (UC, ANASAC)

Attending by phone:

Edo Berger, Harvard University (UC)
Rachel Osten, Space Telescope Science Institute (UC, ANASAC)

Excused:

Kate Su, University of Arizona (UC, ANASAC)

2018 NRAO USERS COMMITTEE MEETING

May 14-15-16, 2018

Socorro Auditorium

SO-Aud Hub: 192.33.117.12##8109

Audio: 434-817-6519

FINAL AGENDA

Monday, May 14 (ANASAC DAY)

08:30 – 09:00	<i>Executive session (closed)</i>
09:00 – 09:15	Welcome & NRAO Overview – Tony Beasley
09:15 – 09:30	ALMA Budget Status – Phil Jewell
09:30 – 10:15	NAASC Status – Tony Remijan [video]
10:15 – 10:45	ALMA Software Support Team – Brian Mason [video]
10:45 - 11:00	Discussion
11:00 – 11:15	Break
11:15 - 11:45	Science Overview & Publications – Al Wootten (ANASAC Charge #1)
11:45 – 12:15	Data Processing Workflow Efforts – Mark Lacy [video] (ANASAC Charge #2)
12:15 – 14:00	Lunch
14:00 – 14:45	Community Support Initiatives – Tony Remijan [video]
14:45 – 15:00	Discussion
15:00 – 15:30	Telescope Diagnostics Team – Catherine Vlahakis
15:30 – 15:45	Break
15:45 – 16:30	N. American Plan for Science Sustainability – Al Wootten (ANASAC Charge #3)
17:15 – 18:00	Discussion
18:00	Dinner (Bodega)

Tuesday, May 15

- 08:30 – 09:00 *Executive Session (closed)*
- 09:00 – 09:30 NRAO Overview – Tony Beasley
- 09:30 – 10:00 VLA Operations & Development – Mark McKinnon/Bryan Butler
- 10:00 – 10:30 Proposal Data, X proposal implementation – Lewis Ball
- 10:30 – 10:45 BREAK**
- 10:45 – 12:15 Data Management & Software/CASA – Brian Glendenning + Lewis Ball
Topics (in order): PST, OPT, Archive, CASA status & plans
- 12:15 – 13:30 LUNCH – Science Talk**, Emmanuel Momjian, “Resolving the Powerful Radio-Loud Quasar at the End of Cosmic Reionization”
- 13:45 – 14:30 VLASS – Claire Chandler
- 14:30 – 15:30 Science Support & Research, SRDP – Jeff Kern/Lewis Ball
- 15:30 – 16:00 BREAK**
- 16:00 – 16:45 ngVLA – Mark McKinnon
- 16:45 – 17:30 *Executive Session (closed)*
- 18:30 Dinner (El Sombrero)**

Wednesday, May 16

- 08:30 – 09:00 *Executive Session (closed)*
- 09:00 – 10:00 NRAO Futures – Tony Beasley
- 10:00 – 10:30 CDL – Bert Hawkins [video]
- 10:30 – 11:00 *BREAK*
- 11:00 – 11:30 Science Communications/ EPO – Mark Adams, Suzy Gurton
- 11:30 – 12:00 Postdoctoral/SOS Programs – Lewis Ball
- 12:00 – 14:00 *Executive Session/write-up, including LUNCH (closed)*
- 14:00 – 14:30 Exit Interview
- 14:30 *Meeting ends*