

ALMA North American Science Advisory Committee

2012 Face to Face Meeting
Charlottesville, VA Sept. 20-21

The ANASAC met at NRAO in Charlottesville and received updates on the construction and operations of the ALMA facility. Overall we are impressed with the rollout towards full science operations; the NAASC especially is to be commended for decreasing the time for data reduction from three weeks to nine days.

We welcome John Carpenter as the new ANASAC chair. We are experimenting with a slight change to the organization of the ANASAC, by having a deputy chair. Douglas Scott has agreed to serve in this capacity. If this arrangement proves agreeable in the coming year, then the committee will consider adopting this as a standard procedure.

The committee was asked to comment on one specific charge to the ANASAC itself, as well as three charges to the ALMA Science Advisory Committee (ASAC). Below is a summary of our recommendations on these and other topics discussed during the meeting.

ALMA NA Development Plan

We heard updates from several of the development studies currently proceeding, as well as a project which has received development funds (the Event Horizon Telescope). We were asked to comment on the priorities for the NA Development Plan. At the meeting we were presented with a specific project for comments, to fund the University of Virginia's Microfabrication Laboratory for 2 1/4 years. There is a process in place to handle development projects submitted as part of a call anticipated for next year, but this particular request comes before that timeline begins. There was unanimous agreement that maintaining this facility is important; this is a resource for the North American Community that benefits more than the ALMA project. However, many committee members expressed concern about the process by which this request was occurring, as it appears to be bypassing the established procedure for vetting development projects. We understand the need to keep this facility operational, and would not want to see it close. The current plans for a call for development projects appear to be vague, with no specific target date. This lack of detail adds to the concern about whether such a call would be issued in the near future and the impact a delay would have on other potential North American development projects.

ANASAC recommendation: The ANASAC endorses the continued funding of the SIS foundry at the University of Virginia. We understand that the plans are for support of this important resource to be placed within ALMA's North American operations budget in 2015. We have reservations about the current process for selecting development projects. The ANASAC urges NRAO to produce a document that presents the plans to administer the ALMA development fund.

This document should include the timeline to issue the Call for Proposals, the funds that will be available in the program, and the process by which the proposals will be reviewed and selected.

We did not consider other elements of the development priority matrix from 2010, but welcome the opportunity to comment on this at a later date.

ALMA Science Results & Metrics

We heard about efforts underway in different executives to track ALMA-related papers and develop metrics that can be used to assess the science impact of ALMA. This is currently done on a “best-effort” basis. We suggest that the JAO work to develop tools to pull this information out of easily accessible databases like the ADS, to ensure a uniform reporting. This is used commonly by various observatories and telescopes to track publications and has become an important tool to assess impact in the field. It can also be used to track how successful the ALMA project is in attracting non-mm experts. We also heard that analogous tracking of technical papers related to things like ALMA antenna and receiver designs may be trickier to track due to journals not accessible through ADS searches.

We came up with a list of items that could be used to track the scientific outcome of ALMA:

- (1) papers published
- (2) citations to published papers
- (3) archive usage and publications resulting from archival analyses
- (4) downloading of archive data

ANASAC recommendation: As a method to facilitate this data collection, we recommend that the ALMA project consider implementing a self-reporting component in proposals. It is standard practice in proposals for space-based facilities for a proposer to comment on their previous usage of the telescope, in particular papers and results stemming from previous observations. We also suggest that the ALMA project investigate what facilities like ESO, STScI, and Keck use to track the impact of their telescopes.

Science Demonstration & Science Verification Datasets

The ANASAC considered the topic of science demonstration versus science verification datasets. We felt that with the archive opening up, cutting edge data will be available to the astronomical community, obviating the need for demonstration datasets. The emphasis instead should be on engineering and verifying capabilities. While Cycle 0 science verification targets were chosen

only for testing and reproducing earlier results, the overlap of Cycle 1 science demonstration targets with PI-driven science potentially leads to tensions with PIs.

In managing the sometimes competing needs of advancing the functioning capabilities of the array and respecting the efforts of competitive proposal-driven science, transparency is key. We recognize that observations used now for verification purposes far exceed the capabilities of existing arrays. Once they have been shown to verify the new capability, trustworthy data sets should be released as soon as practical if the datasets are not in direct competition with proposals. The targets to be used for science verification need to be publicized in advance of proposal deadlines with as much detail as possible so that proposers will know whether a proposed observation would be duplicated by a verification dataset.

In the past the observatory has adopted a conservative approach to offering capabilities to the community. We would like the observatory to consider a mode of sharing the risk on future capabilities, by harnessing the experience of community members. These “calibration proposals” would originate from the community, and would need to be motivated by science and reviewed by the TAC. An example of this type of proposal would be for calibration of polarization capabilities, by observing scientifically interesting polarized targets that would verify the ability of the array as well as provide targets for groundbreaking science.

ANASAC recommendation: The project should work so that the minimum amount of data necessary to verify capabilities should be obtained for that purpose, and such datasets should be placed in the archive for public distribution as soon as practical. With the archive opening, science demonstration datasets are no longer needed. Transparency about the purpose and appropriateness of science verification targets needs to be communicated to the community. The project should consider a calibration proposal category to advance work on future capabilities.

Science Time for ALMA workers

The ANASAC was asked to comment on how to ensure that scientists working on ALMA get some benefit for their own science. It is incumbent upon management to ensure that those who received job offers with a specified fraction of science time are able to access that time. While these science time fractions may not be able to be preserved on a weekly or monthly timeframe, it should be possible to realize them over longer timescales, and it is the management’s responsibility to oversee this. The ability of ALMA science staff to write and win competitive ALMA proposals reflects well on their understanding of the ALMA array and how best to utilize it for science. Having the time to write refereed journal articles based on these proposals is crucial to career advancements, particularly for younger staff. Likewise, being able to take advantage of travel to scientific conferences is paramount to disseminating cutting edge science results. If the staffing levels are not sufficient for completion of functional duties as well as guarantee of science time, then perhaps the number needs to be adjusted. Otherwise, conditions

may lead to attrition in ALMA staff, and these positions may not be seen as desirable as they should be.

Postdoctoral fellows at ALMA typically have a 50% functional commitment in addition to their 50% science time. We discussed whether having ALMA fellows with 100% science time would help improve the science climate. While the committee did not reach consensus on this, we do strongly urge management to keep track of how much science time and travel opportunities science staff members are making use of.

ANASAC recommendation: The contractually obligated fraction of time available to do one's own scientific research needs to be tracked explicitly for scientists working on ALMA. It should be recognized that such fractions may be realized only over long time periods of a year. Allowance needs to be made during slow periods of project activities for science time and for travel to scientific conferences.

User Support

The ANASAC canvassed the community for their comments on ALMA prior to our face to face meeting. Communication appears to be a common thread running through many comments. Lack of information on when scheduling blocks for a project are to be executed, and when observers may expect to receive their data, leads to frustration on the part of PIs. This could be ameliorated by posting schedules for upcoming observing sessions. NAASC members' efforts to decrease the mean time for data reduction from 3 weeks to 9 days is impressive, and should be commended. The many latencies still existing in the timeline between proposal acceptance to execution to receiving data can create a perception of inactivity, however, in the absence of any information on where an observation lies in this continuum. Automatic e-mails or better project tracking notifying PIs of the location of datasets in this process would help greatly.

ANASAC recommendation: The level of communication between the ALMA project and PIs should be increased. There need to be multiple ways of communicating information to PIs, so the redundancy can overcome inefficiencies in the methods of any one type of communication (e-mail, web page updates, etc.). We recommend that at a minimum PIs be notified when scheduling blocks are executed, and receive updates throughout the process of verification, calibration, imaging and final delivery of datasets.