



ALMA BOARD

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AUTHOR(S): Board's Science Committee

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ALMA Board Science Committee Response to the ASAC: April 2021

The ALMA Board continues to deeply appreciate the ASAC's contributions toward maintaining the scientific vigour of ALMA, especially considering the challenging conditions of the past year. The Board warmly received the latest Report from ASAC prior to our April 2021 meeting. The ASAC Chair, Kotaro Kohno, summarized the Report first to the Board's Science Committee and then again later that week to the entire Board during the Ordinary Session of the Board meeting. After Kohno's first presentation, the Science Committee prepared a preliminary response which the Chair of the Science Committee presented to the Board immediately after Kohno's second presentation. In this document, we elaborate on our response to the ASAC.

Permanent Charge #1

The ASAC recommends a detailed investigation of flux error budgets, in an effort to improve overall flux calibration for ALMA.

Improved flux calibration is always a worthwhile goal, and the Joint ALMA Observatory (JAO) is working hard to provide as accurate a calibration as possible. Nevertheless, we note that flux calibration at submm/mm wavelengths can be very difficult and overall accuracy can depend quite variously on receiver band, atmospheric conditions, calibrator elevation, and array configuration. Indeed, ALMA's current calibration level of about 10% is actually an improvement over those of many earlier observatories at these wavelengths. The Board endorses the JAO's offer to give a presentation about ALMA's calibration strategy to the ASAC at their next meeting. After such a presentation, the Board would welcome any further recommendations on this topic. At present, however, the Board does not believe the JAO should devote its finite resources toward refining the overall current calibration levels further.

Permanent Charge #2

The ASAC encourages the observatory to make appropriate communications with PIs of Cycle 7 programs to encourage resubmission to the Cycle 8 proposal call.

With the ASAC's clear recommendation, PIs of Cycle 7 were indeed contacted by the ARCs (with help by the JAO's Department of Science Operations (DSO) and the Integrated Science Operations Team (ISOpT)) prior to the Cycle 8 deadline to encourage resubmission of their programs. We have not yet received the statistics of resubmissions to Cycle 8, but we know that 1735 proposals were submitted for Cycle 8 with more time requested per proposal on average. Note that proposals that received A grades for Cycle 7 will be automatically rescheduled for Cycle 8 if they were not completed during Cycle 7. Relatedly, the Board agrees that the JAO should give high priority to long-baseline observations given that such data will not be acquirable in Cycle 8. Such efforts are of course entirely dependent upon the weather and the ability of the JAO to provide sufficient staff for such large antenna moves as the pandemic continues. Recent developments, however, suggest that the on-site staff count will indeed increase, making such moves more possible.

The ASAC recommends that the Observatory ensure that the new functionality of CARTA in the ALMA archive be communicated to the community.

The ALMA Board absolutely agrees.

Permanent Charge #3

The ASAC is pleased with the efforts made to compile publication statistics about ALMA, and recommends that the 10% drop in publications in 2020 be put into a global context.

The Board also is very pleased with the efforts by the Observatory to provide statistics about ALMA use. Statistics can provide important guidance to all those involved in ALMA. That said, we recognize the large time investment required to compile such statistics, and some indicators are simply more relevant than others. The Board is presently considering if the statistical information provided to it is sufficient or if the collection of further statistics merits investigation. One statistic that appears well worth knowing is the relative impact of Large Programs so far, given recent moves to emphasize them to the community. The Board would welcome feedback from the ASAC on which specific statistics will help them answer urgent questions on the impact of ALMA.

The 10% drop in publication in 2020 is indeed concerning but (anecdotally) appears to be consistent with drops in academic productivity around the world as a result of the pandemic. Specifically, the Board would like the JAO to investigate whether there are regional partner differences in publication rates. If differences exist, local ARCs should be directed to ameliorate roadblocks to publication, if possible.

Permanent Charge #4

The ASAC recommends that a pan-ALMA Science Meeting be organized sooner than later, and that it be arranged to allow full remote participation.

The Board agrees that a pan-ALMA Science Meeting should be planned in late 2022. We recommend that this next meeting be organized to be entirely online, given the continuing uncertainties resulting from the COVID-19 pandemic. In addition, entirely online meetings can attract larger attendances than in-person meetings can, allow attendees who otherwise may not afford the costs to attend in person, and have much smaller carbon footprints. The JAO hosted a meeting about Circumstellar Disks in December 2020 that had over 600 participants, though the maximum at one time was about 350. This meeting was considered to be very successful and was (anecdotally) well-regarded by its attendees. That said, some planning will be needed to encourage truly global participation, so that attendees in some time zones will not be discouraged to attend.

The ASAC would like the Observatory to explore the possibility of joint ALMA-JWST proposals.

This topic elicited considerable discussion by the Board. Previously, the Board had charged the Integrated Science Team (IST) to present use cases for joint proposals with other observatories in general and potential avenues for implementing them. In the meantime, the Director's Council directed the JAO to develop a joint proposal implementation plan using a single Executive's time fraction and assessing whether it could be feasible for Cycle 9 or later. With JWST becoming available very soon, however, the Board agrees that the JAO should indeed explore joint proposals

with that facility. Though JWST will require time for full commissioning after launch, there is indeed a sense of urgency in proceeding with joint proposals given that JWST's overall lifetime is finite. That said, the Board is mindful that considerable lead time before a given ALMA proposal call is needed to prepare for joint proposals with any participating observatory. For example, the logistics of joint proposals will require considerable discussion between observatories and the Principles of the Proposal Review will need to be modified in advance of the call. Furthermore, a robust mechanism for joint proposals will need to be implemented in the ALMA Observing Tool. A document prepared by the IST about the basic parameters of a joint proposal process is nearing completion. Guidelines for joint proposals based on this document, including specific criteria for a broad range of facilities and eligibility for criteria for joint proposals with ALMA, will be developed by the JAO and presented to the Board for its consideration at an upcoming meeting.

Permanent Charge #5

The ASAC recommends the Observatory further investigate changes to ALMA's proprietary period policy, to reduce the possibility of 'scooping.' In particular, further protections for students should be investigated.

The Board did not think changes in ALMA's proprietary period policy were warranted at this time. The Board in particular appreciated the investment of effort made by the IST to investigate the issue. The current policy of providing PIs with data throughout a Cycle came from earlier demands by the community to start working on some data before all were collected for a given project, starting the "proprietary period clock" with such deliveries. Being 'scooped' is a risk all proposers make at every Observatory and the Board urges all teams to publish their fully analyzed data as quickly as is feasible. The Board was sympathetic to the idea of providing some protection for students. That said, student experiences vary so widely (especially between partner regions) that an effective blanket policy would be challenging to implement. Hence, the Board elected to not alter the proprietary policy specifically for students. They emphasize, however, that requests for extensions of proprietary periods can be made and extensions can be given for situations many students face, e.g., illness, parental leave.

Permanent Charge #6

The ASAC has made in its Report many positive statements in support of the activities related to ALMA's Development Program.

The Board agrees that the progress made toward implementation of ALMA2030 has been very good, though challenges remain. We are confident that the Observatory will continue to make excellent progress, though we are mindful that attention may need to be paid soon toward the maintenance of Observatory infrastructure as it nears the end of its first decade of operations.

We note that the JAO and the Executives are particularly interested in scientific feedback on the progress of the Development Program, and encourage the ASAC to continue to provide such input in the years ahead.

Ad hoc Charges

The ASAC did not have any ad hoc charges to consider at its last meeting. The Science Committee Chair notes that such charges from the Board have been very rare in recent years. Most recently, this situation may have been exacerbated by the atypically short Board meetings of late, giving less time to discuss possible charges.

With these challenges in mind, the Board would like to invite the ASAC to continue to bring science issues to the Board's attention that are outside the specific charges given to the ASAC.

Specific Actions to the ALMA Director

1. The JAO should prepare and give a presentation to the ASAC about ALMA's calibration strategy at its next meeting.
2. The JAO should give high priority to moving the antennas to its wider configurations before the end of Cycle 7, should staffing be available and conditions allow.
3. The JAO and ARCs should communicate the availability of CARTA integration into the Archive to the ALMA user community.
4. The Observatory should compile publication statistics by region to determine if there are differences that may be specific to a region in the face of COVID-19. If found, the respective ARC should devote resources to ameliorate the roadblocks to publication. Moreover, the JAO and the Executives should continue to compile statistics about the relative impact of Large Programs to see if the amount of time invested in such projects is truly worthwhile.
5. The Board recommends that the JAO and the Executives organize an online pan-ALMA meeting for late 2022 to highlight the increasing impact of ALMA on the field of astronomy.
6. The JAO, with input from the Executives, should continue exploring the possibility of joint proposals, in particular with JWST.
7. The JAO should send a representative, e.g., the Observatory Scientist, to meet with the Board Science Committee at a time roughly halfway between regular Board meetings to update the Committee and discuss ALMA science-related issues.