



NORTH AMERICAN ARC  
ALMA Regional Center

North American  
ALMA Science  
Center



## Scientific User Support Services Update

NAASC Memo #

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### ABSTRACT

The NRAO supports its users with an increasingly unified and integrated suite of services that enable them to more efficiently prepare and submit observing proposals, to prepare for their observations, and to access and process their data, thereby enabling them to fulfill their scientific objectives. Within the Science Support and Research (SSR) Department, the Scientific User Services (SUS) Division is responsible for providing the scientific community with the support necessary to execute successful scientific programs with NRAO facilities including the GBT, VLA, VLBA and ALMA. As such, all our efforts under SUS specifically address the following ANASAC Standing Charge: “To provide a mechanism for widening ALMA's base within the community and feedback to the NAASC on community perception of ALMA.” The memorandum highlights the results of these programs over the last year – since the last ANASAC f2f meeting. In addition, a review of all community outreach activities and most importantly their effectiveness on fulfilling the mission of expanding the user base of ALMA and the other NRAO facilities will take place on Wed, September 25, 2013.

## 1. NRAO Community Days Strategy and Assessment

NRAO has participated in several community outreach and training events over the past year. The scope for these events focused on both data reduction and proposal preparation. This report is a response to the ANASAC Standing Charge: “To provide a mechanism for widening ALMA's base within the community and feedback to the NAASC on community perception of ALMA” and “To lead community outreach through leadership of workshops.”

At the AAS in Long Beach, CA, the NAASC participated in a 3 hour CASA tutorial training session consisting of mostly presentations to the community on the current status of ALMA Cycle 0 and Cycle 1; the process of obtaining data from the NRAO/ALMA archives and what that data contained and finally a walk-through of the reduction of an ALMA Science Verification dataset. The AAS Splinter Session attracted ~25 participants.

On Feb 28-Mar 1, 2013, the NAASC hosted a two-day interactive ALMA Data Reduction workshop in Charlottesville. The aim of this workshop was to assist interested observers in learning how to reprocess their ALMA data, and to allow new and potential ALMA users to become familiar with the data format and the available data reduction and analysis tools. The program included a combination of lectures and hands-on sessions aimed at introducing the key concepts in interferometry data reduction and demonstrating their application in the CASA package. Hands-on examples focused on real ALMA data obtained during recent Science Verification observations and emphasized key steps for ALMA Early Science data reduction. The ALMA Data Reduction Workshop had 30 participants and the reviews were quite favorable emphasizing the need for f2f online training workshops for both proposal preparation and data reduction. See the results from the online user survey taken after the workshop at the end of this document.

At the AAS in Indianapolis, IN, the NAASC participated in a 3 hour Splinter Session focused on proposal and observing preparation for all NRAO facilities. This Session featured an overview of on-going and new NRAO telescope and instrument capabilities, interactive walk-throughs for proposing to each facility, and guided hands-on tutorials of the proposal and observing preparation tools for each telescope. In addition to the NRAO eNews announcement, advertising the Splinter Session in the AAS Program, solicitation at the NRAO booth and Tony Beasley highlighting the Splinter Session in his Keynote address, we also sent a personalized email to about 50 of the AAS participants to invite them to the NRAO splinter session. The list of people invited were those who we know and who are non-radio people. The AAS Splinter Session attracted ~25 participants.

The “high level” lessons learned from the Indianapolis Splinter session include:

- Too detail oriented – too specific in many areas especially the ALMA OT in “presentation” format.
- Need walkthrough presentations with non-NRAO community for input first
- Shorter Session(s) – 3 hours was too long

- Change of session scope. Perhaps focus only on “hands-on” help and assistance with little/no formal presentations.
- Need a more formal metric(s) for assessing the success/failure of these outreach efforts

To this end, the main goal of the upcoming community outreach efforts with the emphasis on NRAO Community Days is to reach as broad an audience of scientists as possible to inform, educate and assist in enabling cutting edge scientific research. For new and inexperienced users the NRAO Community Day(s) will be an opportunity to learn about radio astronomy and its relevance to their science, the NRAO facilities and opportunities for student training and support, and sufficient knowledge to embark on planning to begin using the facilities.

### 1.1 Strategy

To reach as wide an audience as possible, our strategy will involve the following targets by December of 2014:

- Two Community Days (CDs) per quarter (Total of eight by Oct 2014)
- At least three of eight CDs in partnership with current or future great observatories (e.g., JWST, LSST, TMT/GMT, Spitzer)
- An additional four CDs internationally (leveraging travel plans of NRAO science staff)
- An additional two CDs at minority serving institutions / liberal arts colleges

This gives us a total of fourteen CDs in roughly 14 months or an average cadence of 1 per month.

### 1.2 Goals

The following are our goals for the CDs through 2014:

- At least 25 participants at a CD (regardless of CD flavor)
- At least 10 new (never used NRAO facilities before attending a CD)
- At least 30% of participants go on to propose for observations with one of our telescopes (except for the two CDs at MSIs/liberal arts colleges)
- For CDs at MSIs/liberal arts colleges – aim to get at least five applications for the NRAO summer program in the following year (may be in 2015 if the CDs are done in 2014).

Overall this means we will reach at least 350 (140 new to NRAO) scientists and get 100 new users as proposers for our telescopes (as PI or co-Is).

### 1.3 Metrics/Assessments

All CDs will be closely monitored for effectiveness. Our overall goal is to increase our user database, especially in non-traditional radio astronomy communities. We also hope to increase the visibility of NRAO and impart information on our operations,

successes and challenges to the broader astronomy community. To do this the following guidelines for assessments will be followed by us:

- All participants will be required to sign in / register for participation in CDs
- Participants will be asked to self-identify their expertise in radio astronomy between new, intermediate or expert radio astronomers and this will be used later on for assessing our effectiveness.
- All participants will be asked to evaluate the CDs for effectiveness
- Feedback from a CD will be evaluated within two weeks of CDs and a report will be made (and filed) on successes and failures of the CDs.
- Feedback from a CD will be incorporated into the planning and execution for future CDs.
- Participants will be emailed before NRAO deadlines to encourage submission of proposals and offered help as needed.
- Following proposal deadline, list of proposers will be culled to match against list of participants to see if goal of 30% noted above is met.

#### 1.4 Current Status

Howard University NRAO CD (Sept 26 – 27):

- Atypical CD – initiation of a national partnership of universities and HBCUs + NSBP with NRAO (Kartik – lead)
- Coordination meeting and initial schedule begun
- Webpage and Registration page for participants set up
- Funded by NAASC
- Meets our goal of a CD at an MSI

DPS NRAO CD (Oct 6-10):

- Scheduled for Monday, Oct 7<sup>th</sup> - 1200-1330
- Will provide lunch for registered participants
- Webpage and Registration page for participants set up
- Several people invited keeping diversity and desire for a broader NRAO footprint in mind. Imke de Pater, Mike Kelley, Amy Lovell have accepted so far. Will get one more speaker (Bryan Butler invited)
- We have start recruiting for CD participation with targeted emails, AAS webpage addition, advertisement in DPS-community newsletters
- New community targeted – Planetary Scientists

U. Wisconsin CD:

- Eric Wilcots – local contact
- Proposed for one day during Oct 8-11 (leveraging Kartik's colloquium visit)
- Webpage and Registration page for participants being set up
- Targeted towards graduate students

Goddard NRAO CD (Oct 28 – 29):

- Stefanie Milam - local contact.
- Webpage and Registration page for participants set up
- One goal is to get more participants from the Fermi group

- Early registration required for non-US citizens to allow for badging
- Targeted as a regional workshop for Baltimore / DC area.

## 2 ALMA Helpdesk Services and Statistics (Sept 15, 1012 – Sept 9, 2013)

The ALMA Helpdesk has seen steady activity over the past year and plans were put in place for a major upgrade for the ALMA Helpdesk right after the last ANASAC meeting (20-21 September 2012). Helpdesk Services over the past year specifically address part of ASAC Charge 2: "... Does the support from the ARCs continue to meet users' needs?"

The major upgrade of the ALMA Helpdesk was needed to ensure continued support from Kayako. This was a major upgrade and impacted the staff and user interface including the overall "look and feel" of the Helpdesk. As we transitioned from Kayako v3.0 to 4.0, we needed to ensure the full use of the ALMA helpdesk given all the functionality that was put in place during the last 2 ALMA observing cycles. As such, testing of the Kayako 4.0 upgrade was designed to ensure the usability of both the user and staff in anticipation of the deployment of 4.0 on Oct 12, 2012. A full transition to the new version of the Kayako version was successful and helpdesk operations continued with little interruption during the upgrade.

There were 2 interruptions of Helpdesk operations over the course of the year. The Helpdesk failed last on March 6<sup>th</sup>, 2013 due to a major snowstorm that knocked out power at the Charlottesville facilities for 14 hours. Given the anticipated amount of snowfall we expected, we did not failover to Socorro the day before as we did with "Superstorm Sandy" earlier in the year because that effort was largely lost given we never lost power in Charlottesville. We did failover to Socorro around 12PM ET on March 6<sup>th</sup> to try and recover helpdesk operations only to find a problem with authentication of users. The failover of the helpdesk hit a hitch due to a database access issue for authentication and tickets. The authentication issue was between the Kayako database and the Science Portal Oracle database. So, in general, people could see the helpdesk and access the knowledgebase but could not log in and submit tickets. Because of this issue, it was decided to take down the Helpdesk completely until power was restored in Charlottesville.

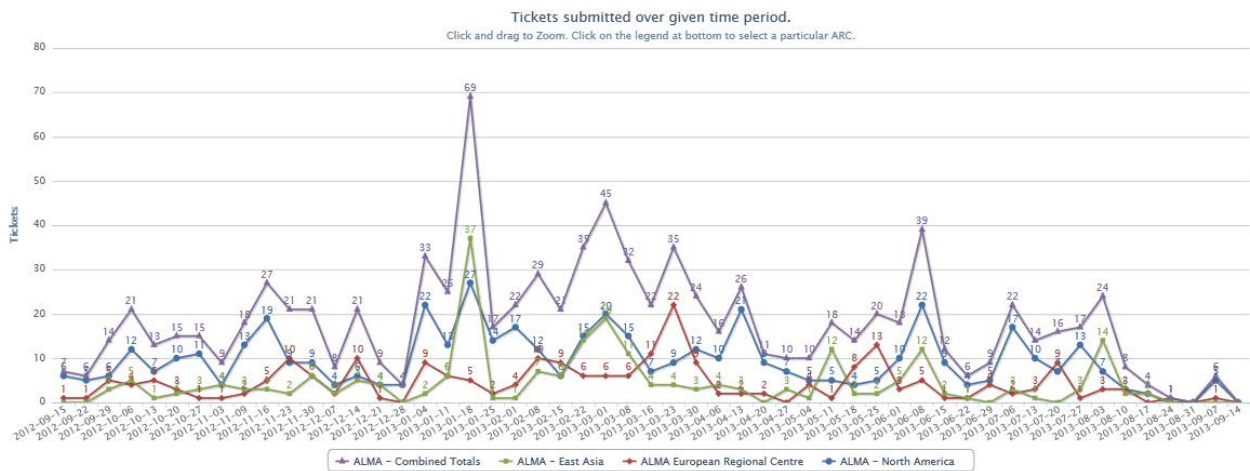
The second instance occurred on Jun 26, 2013 during another storm and power outage in Charlottesville. Failover protocols put in place during the March outage were implemented and a seamless transition to the server in Socorro saw almost no downtime in normal helpdesk operations worldwide. The only caveat to the failover is that no newly registered users at the time helpdesk services are running in Socorro can login to submit tickets due to Socorro helpdesk user registry not having an automatic update when new users register with the ALMA Science Portal. This was discussed at length at the international Helpdesk Policies Working Group and the decision was made to simply put "new users cannot register" on the Helpdesk backup server website during this time.

The international working group routinely meets throughout the year to discuss policy, workflow, issues with helpdesk operations and customizing the helpdesk for ease of use for both the users and staff. The group also meets f2f yearly in anticipation of the next observing cycle – the next scheduled f2f meeting is here in Charlottesville, Oct 8-9, 2013.

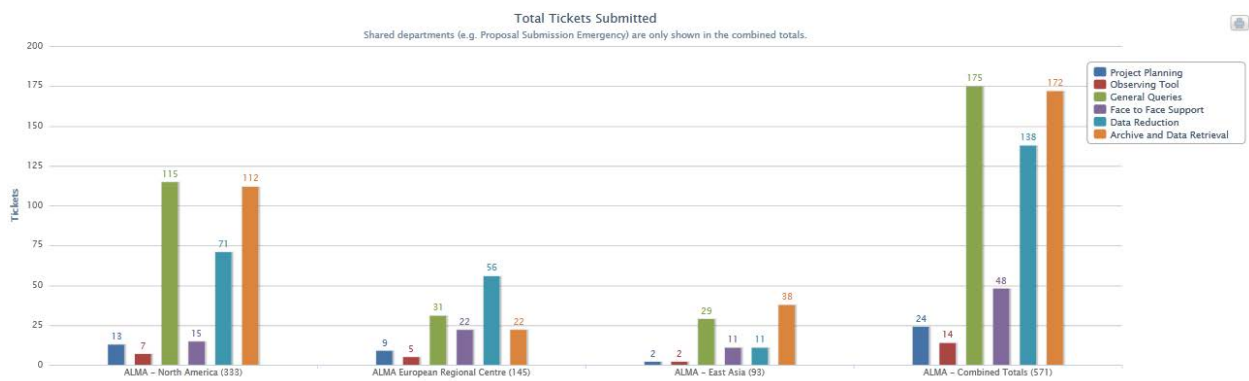
As presented last year, the chart below illustrates the total number of tickets submitted from September 15, 2012 – September 15, 2013 (total and for each region).

The spike(s) are primarily tickets opened for Phase 2 scheduling block generation and data delivery. Recall that the Helpdesk is used exclusively in:

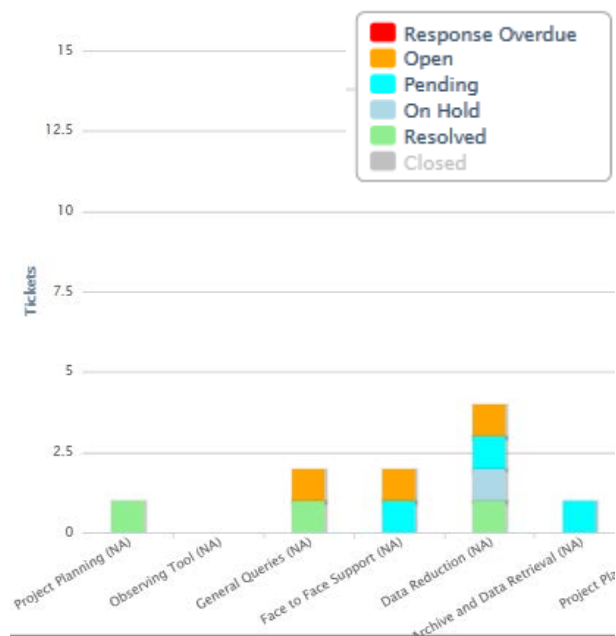
- Working with PIs in preparing SB (Cycle I Observing Programs ~80 pending tickets)
- Requests for data delivery for QA2 both in Cycle 0 and Cycle I (~100 tickets)
- Sending PI data delivery notices



The chart below shows the number of tickets submitted per department over this same time (September 15, 2012 – September 15, 2013). The archive and data retrieval departments are heavily used for internal data reduction requests. The data reduction department is now seeing more activity (as anticipated from the last ANASAC meeting) due to the delivery of Cycle 0 data and data available in the archive. The spike in the “General” is arbitrarily inflated due to the significant amount of test tickets opened during the helpdesk upgrade. There is no real way around this either because we want to test the system on the production server.



Finally, the plot below illustrates the current number of tickets in each Helpdesk department for the NAASC and the associated status of that ticket (i.e. Open, Pending, etc...) that a user can submit too through the normal help.almascience.org interface. As was stated earlier, there are ~80 Pending tickets in the Cycle I Observing Programs department that would skew the scale of this plot and as such is not shown.



NRAO is moving to a combined helpdesk for all NRAO instrumentation. Planning for this has already begun. To begin, the NRAO helpdesk has been upgraded from v3.0 to v4.5 of Kayako. A similar update to the ALMA helpdesk will take place in October to update to v4.5. This is a minor update and will be invisible to the users and the staff but does change the underlying codebase and database access to tickets. The integration of the NRAO/ALMA helpdesks is planned to take place in the Spring of 2014 after the

“Single Sign On” capabilities for cross-authentication of the NRAO and ALMA user databases are fully tested and deployed.

In general there needs to be overall agreement on the level of support provided to an observer submitting tickets to NRAO facilities. The workflow for a scientific staff should be the same (or as close as possible) so the user has a similar experience when a ticket is submitted for a question on ALMA or any other NRAO facility. This will require working with all sites on helpdesk workflow, service level agreements and coordination with the ALMA international partners. As such, plans are being developed for an overall NRAO helpdesk manager to oversee NRAO helpdesk operations and workflow and the roles and responsibilities of the NRAO staff, including statements on professional conduct on answering helpdesk tickets will be defined in our training documents and formal staff training efforts – many of which are already in place.

### 3 Scientific Conferences



From 8-12 April 2013, the NRAO North American ALMA Science Center (NAASC) held its 7th annual science workshop titled Transformational Science with ALMA: From Dust to Rocks to Planets - Formation and Evolution of Planetary Systems. “2013 Rocks!” specifically addressed the ANASAC Standing Charge: “To lead community outreach through leadership of workshops”

More than 150 participants converged on the Big Island of Hawaii to discuss and review a myriad of science topics regarding the formation of planetary systems as observed with the Atacama Large Millimeter/submillimeter Array, including 25+ student researchers and many other early career scientists.

A broad range of exciting new science was discussed at the meeting including:

- Improved resolution and sensitivity are unveiling subtle spatial and kinematic asymmetries in disks.
- Disk asymmetry can indicate vorticity in disks, which was proposed as a mechanism to produce dust trapping, which may lead to planet formation.
- Gaps or spiral structures in disks can be a hallmark of planetary sculpting.
- Chemical asymmetries provide clues to physical conditions; the conditions in the planet-forming midplane are of particular interest.
- Deuteration may provide a signpost for the ‘snow line’ in disks, the regions where molecules may freeze onto grains, providing the building blocks for giant planets and a repository for molecules important to the development of life.
- Subtle kinematic shifts may evidence material flow between inner and outer disk regions capable of shifting material from the snow line and potentially providing atmospheres and oceans for rocky inner planets.



- The newly available sensitivity and resolution are yielding breakthroughs in our understanding of the kinematics, chemistry, composition, structure, and evolution of a range of environments including molecular clouds, protoplanetary disks, debris disks, young planetary systems, and the youngest protostars.

All presentations are available at the 2013 Rocks! Website – [www.cv.nrao.edu/rocks](http://www.cv.nrao.edu/rocks).

Strategic planning has started for the 2014 NAASC workshop to be held in Charlottesville, VA in either August or September 2014 currently with the broad topic of “Galaxy Evolution”. The chair of the SOC is Kartik Sheth and the current SOC membership includes: Itziar Aretxaga (INAOE, Mexico), Ranga-Ram Chary (Caltech), Romeel Dave (UAz), David Frayer (NRAO – GB), Carol Lonsdale (NRAO – NAASC), Karin Menendez-Delemestre (Univ. of Rio, Brazil), Tohru Nagao (Kyoto University), Rachel Osten (STScI), Casey Papovich (Texas A&M), Doug Scott (UBC), Minnie Mao (NRAO – SOC), Tomasso Treu (UCSB), Peter Capak (IPAC) and Chin Fei Lee (ASIAA).

We welcome continued suggestions from the ANASAC on the scientific scope and vision of the 2014 workshop and to help spread the word to the scientific community.

## 4 Other Community Support Programs

### 4.1 Student Observing Support

For ALMA Cycle I:

- 15 proposals considered
- 11 proposals funded, which in fact were all of the considered proposals which received the "highest" ranking from the ALMA TAC.

### 4.2 Face-to-face Visitor Support

Over the course of the past year data reduction visits all were for Cycle 0 except Cycle I DDT 2012.A.00020.S. In total, there 14 people (: 6 faculty/staff, 3 postdocs and 5 students) visited the NAASC for data reduction of which 9 were PIs.

The SUS Division will continue to provide the expert, “hands on” support that has historically always been associated with NRAO f2f visits. The NAASC staff will be preparing in Q1 FY14 for visitors needing assistance with proposal preparation with the ALMA OT along with visitors throughout FY14 who want assistance re-reducing/further reducing, and analyzing, their Cycle I or archival data products. In addition, as with ALMA Cycle I, each successful PI of an ALMA Cycle 2 project will be assigned a NAASC “contact scientist” that will work in reviewing the ALMA Observing Tool Phase 2 scheduling block materials with PIs through the ALMA helpdesk.

To increase the number of visitors to the NAASC for hands on assistance, we are increasing the visibility of the visitor support program to the community by contacting PIs directly through the helpdesk during data delivery, emailing all NA PIs directly

advertising the program, posting monthly eNews articles and advertising the visitor support program off the NAASC webpage. An assessment of these ongoing efforts will also be done to measure their effectiveness.

### **4.3 Supplemental Material**

Finally, much progress was made in FY13 preparing materials for novice users to our facilities including presentations, video tutorials, “did you know?” instructional material, and science highlights that help teach the basics of interferometry, radio to millimeter wave science and how to use NRAO’s suite of tools to prepare proposals and reduce data. Over the course of the next year, NRAO will continue to develop more basic resources to introduce radio techniques to the broader astronomical community. This process will include making an integrated plan and setting the scope and milestones of the planned material. Testing of the materials will be used in the CDEs throughout FY14 and finally set in place for use by the user community by end Q4.