



TO: Anthony Gonzalez, Katelyn Allers, Mark Brodwin, Elizabeth Buckley-Geer, Marla Geha, Kevin Luhman, Karen Meech, Casey Papovich, Armin Rest
FROM: Robert Blum
CC: David Silva, NOAO Executive Committee
SUBJECT: NOAO Response to Users Committee 2014 Report
DATE: December 15, 2014

Dear Anthony, Katelyn, Mark, Elizabeth, Marla, Karen, Kevin, Casey, and Armin,

It is an extraordinary time in US astronomy in general and at NOAO in particular. NOAO very much appreciates the time and effort you are putting into the Users Committee to help us transform NOAO. Our success will be dependent on how well we respond to the changing priorities in NSF funded ground-based OIR astronomy and how well we connect our users to new and different opportunities that are emerging. As always, we seek to provide front line capabilities to allow our users to be maximally scientifically productive. However, the mix of capabilities we will provide is changing and your input as leaders of our community will be invaluable to us as we bring our users into this new era. Thanks!

As a reminder, NOAO asked the UC to comment on the following high-level areas within our program.

- 1. Please comment on the overall NOAO transformation plan/vision. NOAO seeks to provide excellence in open access to telescopes, data, catalogs, and tools for the US community.*
- 2. Please comment on current operations and community engagement with DECam at CTIO. The committee should comment on current scheduling of community time including surveys to ensure the highest productivity.*
- 3. Please comment on the current plans for development of DESI on the Mayall.*
- 4. Please comment on the ongoing infrastructure and science capability modernization programs at KPNO and CTIO including the deployment and early use of KOSMOS and COSMOS and soon TripleSpec.*
- 5. Please comment on current NOAO concepts and plans for the NOAO Data Lab and associated catalog based research services, with particular emphasis on desired user tools (both basic and advanced) to be deployed within collaborative workspaces.*
- 6. Please comment on the current level of usage and scientific productivity of the NOAO share of SOAR. Suggestions about "quick wins" to improve scientific productivity would be particularly welcome.*

7. Please comment on how US observers can best exploit the Gemini telescopes. The Committee should comment on near term capabilities needed by the US community, and specifically what priorities are seen for future Gemini instruments (for example to exploit surveys and LSST science).

8. Please comment on the recent constitution of the Gemini large survey and long program TAC.

Below, please find our responses to each of your recommendations for these areas.

1. Overall Transformation Plan and Vision

Recommendation 1: *We recommend that NOAO continue to take opportunities to engage the user community about this process through the newsletter and town hall meetings.*

NOAO agrees that communication with our users is one of the keys to succeed in the coming years as our program shifts to providing more access to scientifically rich data sets while maintaining a core of open access facilities. We will have a strong presence at the January AAS meeting in Seattle. We will host a town hall meeting at the AAS and organize other community activities through out the year as described below.

Recommendation 2: *We recommend that NOAO stay the course that they have charted for transformation of the organization, continuing to place an emphasis on maintaining productive open telescope access when possible.*

NOAO is actively working on designing new data centric capabilities that will form a major theme within our new mission. Significant changes begin to occur in our FY15 plan to start the Data Lab, evolve science data management infrastructure, and lay the foundation of an effective LSST Community Science Center (LCSC).

At the same time, NOAO is maintaining a high level of activity surrounding the Blanco, Mayall, and SOAR telescopes. New spectrographs are now available for Blanco and Mayall. TripleSpec4 will be commissioned at the Blanco this year. DECam remains a priority for high impact science and community led surveys.

NOAO sees an opportunity to bring users of open access facilities in the North to SOAR. We are working with our SOAR partners to make this happen and raise the profile of SOAR.

Recommendation 3: *We encourage NOAO to prioritize outreach to US astronomers to help develop a strong community capability to exploit the new generation of large databases as they become available. NOAO should consider summer schools or community workshops aimed at educating the user community (from students through*

faculty) about tools to access astronomical databases, methods of mining these resources. This should provide significant return for the required investment of resources.

NOAO agrees that this is a vitally important aspect of bringing the community along. In FY15 NOAO shall:

- Connect with users at the AAS with a data science themed booth
- Continue a successful La Serena Data Science School¹ program with other partners
- Host a community workshop on Big Data² in Tucson in the spring of 2015
- Host a DECam community science workshop³ in Tucson in the spring of 2015

Since the UC meeting in June, NOAO also hosted a successful LSST cadence workshop in Phoenix along with LSST (see Resources/Summary: <https://project.lsst.org/meetings/ocw/>).

2. DECam

Recommendation 1: *We encourage NOAO, in collaboration with the DES team, to provide more detailed guidance to proposal writers on the availability of community time in the B semesters. In particular, a breakdown of the availability of bright/dark time each month would be useful for proposal preparation.*

NOAO will make this a priority in the 2015B call for proposals.

Recommendation 2: *We encourage NOAO to continue to pursue the remote observing capability for DECam.*

NOAO will investigate what can be done along these lines in FY15. Additional computer hardware has been purchased for the remote observing room in La Serena and we will experiment with remote observing by staff from there during the 2015A semester. This will then be followed by tests from NOAO Tucson. A stretch goal would be to allow experienced users to observe from NOAO Tucson.

Recommendation 3: *We feel that it is important for time to be available to the community throughout the B semester.*

NOAO will make some time available in the B semester to accommodate community users. The mix of community DECam time and f/8 time will depend heavily on scheduling constraints, proposal pressure (for f/8), and commitments to DES, Chile, AAT and Brazil time trades. In 2014B, 28 nights have been scheduled for communi-

¹ See http://aurao.ctio.noao.edu/winter_school/

² See <http://www.noao.edu/meetings/bigdata/>

³ See <http://www.noao.edu/meetings/decam2015/>

ty users, 16 nights for community surveys, and 12 nights for time trades/Chilean time.

3. DESI

Recommendation 1: *To the extent appropriate, NOAO should engage with the DESI team regarding the test bed instrument DESI-240. There are a small number of spectrographs currently in the world with more than 200 fibers and none are available to the US community (apart from time trade nights through the AAT). This provides unique capabilities for the US system, and access to this instrument during the bridge period would enable unique science.*

DESI has presented the protoDESI (aka DESI-240) concept to the DOE as part of the formal conceptual review known as CD-1 Design Review. The project and review committee have both prioritized protoDESI highly. However, due to resource constraints on the DOE side, it now appears protoDESI will not encompass a scientific capability, but will rather concentrate on a limited set of risk mitigation tasks centered around acquisition and guiding.

Recommendation 2: *We encourage NOAO to explore, to the extent possible, routes towards community access to ancillary data products or bright time observing during the DESI main project period.*

NOAO is actively pursuing both these routes with NSF and DOE.

4. KPNO and CTIO Modernization

Recommendation 1: *Exposure time calculators (ETCs) are critical to the productive operation of the K/COSMOS spectrographs and TripleSpec. We strongly urge NOAO to provide these tools to the user community as soon as feasible.*

NOAO has no current plan or resources to build ETCs for K/COSMOS. However NOAO recognizes that ETC's are important tools for science productivity and will pursue a solution within the context of other demands on resources and priorities.

Recommendation 2: *Given the success of past and current time swaps (such as AAT), we encourage NOAO to investigate potential time trades with other observatories that can provide the community with access to scientific capabilities not otherwise available to the US community.*

NOAO will carefully consider making new time trades to gain access to important capabilities seen as in demand for our community. NOAO would welcome solid, focused suggestions for capabilities from the UC.

NOAO shall continue its active agreements with AAT and Brazil (time trade of DECam for SOAR nights) in FY15. NOAO shall continue to provide access to Subaru time via Gemini.

Recommendation 3: *As a result of ReSTAR, the Mayall and Blanco telescopes are now outfitted with a strong instrumentation suite. As the Mayall moves towards the DESI era, the committee supports an investigation of ways to maximize the return of this new generation of instruments. On the timescale of DESI, a migration of instruments such as NEWFIRM to the Blanco and a rebalancing of the instruments between Blanco and the SOAR telescope may be warranted. Similarly, it is worth investigating whether some instruments such as KOSMOS may benefit the community on this timescale via redeployment at other facilities in exchange for community access.*

NOAO agrees NEWFIRM and the ReSTAR instruments represent a current opportunity for highly productive science now as well as in the future. NOAO will seek to make KOSMOS as productive as possible in the bridge period between now and DESI operations. NOAO is open to potential loan of the ReSTAR instruments as appropriate/feasible.

NOAO will make COSMOS access a priority on the Blanco and will consider options for NEWFIRM and TripleSpec4 if and when they emerge and are feasible.

Recommendation 4: *We encourage NOAO to explore how to enable community access to data reduction tools that are developed by the users. NOAO can provide a valuable service to the community by facilitating the sharing of such tools in a single, centralized location.*

While NOAO does not foresee providing a generalized data reduction tool repository at this time, we are certainly receptive to receiving and distributing data reduction tools developed for instruments we directly support. Currently, we are investigating how to capture and serve such tools for ODI and C/KOSMOS.

5. NOAO Data Lab

Recommendation 1: *The committee feels that the most important task should be to get the basic functionality of the catalog and image server online and functional well in advance of the DES DR1. We recommend that NOAO prioritize development of easy-to-use interfaces for the community to access products.*

NOAO agrees enabling catalog science is a top priority. NOAO is in the process of organizing a conceptual design review for the Data Lab in Q2 FY15. This includes a set of foundation documents that describe the Data Lab and the tools and facilities it will provide that will be reviewed by an external committee of experts. NOAO will update the UC on the Data Lab conceptual design review at the 2015 UC meeting.

Recommendation 2: *The committee recommends that NOAO be strongly proactive in educating and training the community on how to make the transition to an era of big data.*

NOAO agrees it needs to be proactive. NOAO is carefully studying how to be most effective in training its community in order to complement and not duplicate the other efforts in this area already being done by other groups. Initial programs are described above in item 1R3.

Recommendation 3: *In the near future NOAO should focus significant near term effort in clearly defining the goals and objectives of the Data Lab and soliciting additional community input. NOAO should investigate existing solutions that can be adapted to this new application, expending efforts on things that add value, while not repeating developments done elsewhere.*

NOAO agrees it should add value for its community without duplication. See R2 response in this item. NOAO is actively discussing effective strategies with community members and NOAO collaborators with significant experience in this area.

6. SOAR

Recommendation 1: *To understand current barriers to publication within the community, the committee strongly supports the idea that the NOAO Director contact PIs to obtain feedback. We recommend an anonymous survey to understand what issues are most significant in hindering publication of data.*

The director has organized a user survey, which will be aimed at understanding productivity success stories as well as areas like SOAR that need improvement. NOAO shall execute this survey in 2015 and report the results to the UC.

Recommendation 2: *The committee recommends that NOAO at minimum ensures that all instruments are well documented with data reduction cookbooks.*

NOAO shall produce a list of active instruments and data reduction cookbooks/tools available for each for the UC to review at its next meeting in 2015.

To preview that list, NEWFIRM and Mosaic 1.1 have working science pipelines, and NOAO is currently investigating adapting an OSMOS pipeline (developed at Michigan) for use with C/KOSMOS. These will be the three instruments at the Mayall going forward in 2016 – 2018. For WIYN instrumentation: ODI has a science pipeline. HYDRA has the IRAF package “dohydra” (documented) and WHIRC has an online data reduction handbook.

At CTIO DECam uses community pipeline and data handbook. COSMOS will take advantage of the Michigan pipeline and/or NOAO will at a minimum construct an analysis handbook covering basic cases..

Recommendation 3: *The committee supports an ongoing discussion within NOAO to assess how SOAR can provide the best future value to the US community as the capabilities of the US system evolve.*

NOAO is working with its SOAR partners to assess productivity and will report on progress at the next UC meeting in 2015.

Recommendation 4: *As a potential quick means of improving the scientific productivity, we suggest that NOAO support scientists check with PIs before they leave the telescope to make sure they know how to reduce the data. NOAO should provide encouragement for observers to stay a day or two after the run in La Serena to get the data reduced.*

NOAO believes this is an excellent idea. NOAO shall implement an explicit process in 2015 to check with PIs while they are at NOAO to see if they need assistance reducing their data. Specifically, NOAO will connect with observers so observers know what resources are available for their instrument/data. NOAO instrument scientists will be available for consultation on data reduction questions.

7. Gemini Capabilities and Priorities

Recommendation 1: *With Phase 2 support transitioning to Gemini staff, we encourage NOAO to continue working closely with Gemini to ensure positive results for the US community.*

NOAO will continue to work with Gemini should Gemini have concerns about phase 2 support. So far the handoff has gone smoothly from what NOAO has heard.

Recommendation 2: *We encourage NOAO to actively participate in efforts to facilitate Gemini data reduction, including implementation of cookbooks and/or support for a data reduction forum.*

NOAO agrees. NOAO shall work with Gemini to develop plans for post observing support. NOAO shall host a data reduction workshop (including Gemini data reduction) at the AAS meeting in 2015 in Seattle and will report on the workshop at the next UC meeting in 2015.

8. Gemini Large Surveys and Long Programs

Recommendation 1: *We recommend that NOAO continue to run this TAC and work closely with Gemini.*

NOAO shall execute the TAC program for Gemini large programs in close collaboration with Gemini in 2015. NOAO will report on the program and TAC process during the 2015 UC meeting.