

# **NOAO Users Committee 2014 Report**

## **08 July 2014**

This report from the Users Committee of the National Optical Astronomy Observatory (NOAO) is based upon its annual meeting at NOAO, which was held in Tucson on June 17-18, 2014. The 2014 charge for the UC requested input on the following:

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.

The current NOAO UC includes nine members, Katelyn Allers (Bucknell), Elizabeth Buckley-Geer (Fermilab), Karen Meech (Hawaii), Marla Geha (Yale), Kevin Luhman (Penn State), Casey Papovich (Texas A&M), Mark Brodwin (University of Missouri-Kansas City), Armin Rest (STScI), and Anthony Gonzalez (Florida, Chair). Prior to the meeting, members of the UC solicited feedback from the community via email and direct contact. The committee also reviewed a number of relevant documents, listed in the charge, in preparation for the meeting. Five of the members participated in the UC meeting (Allers, Buckley-Geer, Meech, Geha, Gonzalez). Those members unable to attend were provided access to all presentations from the meeting, and the UC held a teleconference on July 3 to discuss key elements of the charge and recommendations. Eight of the nine members of the committee (Allers, Brodwin, Buckley-Geer,

Geha, Gonzalez, Meech, Luhman, Papovich) participated in this telecon. The recommendations in this report reflect the consensus of the entire UC.

We structure the remainder of the report in sections aligned with the items in the charge.

## **1 Overall Transformation Plan and Vision**

We commend NOAO on the progress that has been made during the past year in refining their vision for the future of the organization. We feel that NOAO is developing a strong plan for the required increased emphasis on its role as a portal to provide access to large databases, while working to maintain open access to facilities to the extent possible. We are particularly heartened by the improved prospects for telescope access during the next few years. The potential bridge period for the Mayall is viewed as providing valuable additional access for the community during that period.

The transformation of NOAO represents a significant change for the US community, and not all of the community is fully aware of the changes or the opportunities for new science that they present.

**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.

**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.

**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.

## **2 DECAM**

The Committee is very pleased to see that DECAM is proving to be a popular facility instrument with an over-subscription rate of 2.2 in 2014B. We commend NOAO on the successful operation of the instrument and the community pipeline for reduction of the data. To increase the efficiency with which high priority community programs can be scheduled during the highly constrained B semester, while simultaneously satisfying the needs of the DES, it would be advisable to establish

the schedule as early as feasible and provide detailed guidance to proposers on telescope availability during the semester. The option of remote observing will be particularly valuable for both survey programs with multiple nights spread over many years and repeat users with standard programs.

**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.

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

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

### **3 DESI**

The Committee is impressed with the progress made on the DESI project and the positive communication between NOAO and the DESI team. We encourage continued communication with DESI to ensure a successful and productive bridge period, and support the active role of NOAO in this endeavor. We also note that bright time science with DESI would provide an extraordinary opportunity for the US community, enabling large science programs such as GAIA follow-up and LSST precursor work.

**Recommendation 1:** To the extent appropriate, NOAO should engage with the DESI team regarding the testbed 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.

**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.

## 4 KPNO and CTIO Modernization

The committee was pleased to see the completion of the KPNO Instrument Handling Facility. Additionally, the committee commends NOAO for a strong plan of addressing regular facility maintenance issues.

Providing the user community with the information and tools to reduce data is important to address issues of telescope productivity. In an era with more complex and sophisticated instruments not all researchers have the ability to efficiently reduce the data they produce. However, not all instruments are amenable to data pipelines. The committee was pleased to see that support for IRAF is continuing and that the legacy IRAF algorithms are being made accessible through a python interface.

**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.

**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.

**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.

**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.

## 5 NOAO Data Lab

The feedback from the community to the UC showed that many researchers are concerned that open telescope access is being reduced by NSF. We are transitioning to an era of large database

access, which requires new skillsets for many astronomers. NOAO is uniquely positioned to enable the US community to utilize upcoming large data sets both through training and software development. The NOAO Data Lab effort is a positive step towards addressing this need, and we are pleased to see NOAO stepping into this role.

**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.

**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.

**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.

## 6 SOAR

In light of the decreasing access to 4m time in the US community, the SOAR telescope is potentially a valuable component of the US OIR system moving forward. While we see no “quick wins” for improving productivity, we feel that the important first step in this direction is to better understand the underlying reasons for this issue. Looking at publications from approved observations is expected to be the most effective, as oversubscription is comparable to the other 4m telescopes in the system. We are pleased to see more support for remote observing as this will encourage more diverse use of the facility for high profile science that can help increase productivity at a time when it is more difficult to secure travel funding.

**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.

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

**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.

**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.

## **7 Gemini Capabilities and Priorities**

For both current science needs and future follow-up of DECam and LSST targets, the UC views general workhorse instruments as the top priority for Gemini facility instruments. Gemini's support of MPI and visitor instruments is viewed favorably. The UC is pleased to see the current upgrade to Hamamatsu detectors on GMOS-S and looks forward to the detector upgrade on GMOS-N.

**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.

**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.

## **8 Gemini Large Surveys and Long Programs**

The committee views the advent of the Large Surveys and Long Programs on Gemini as a positive development. We see such programs as having the potential for high scientific return for the US community.

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