

NOAO Users Committee 2013 Report

27 June 2013

The Users Committee (UC) of the National Optical Astronomy Observatory (NOAO) held its annual meeting at NOAO in Tucson on May 22-23, 2013. The UC was asked by NOAO Director David Silva to comment on the following:

1. The priorities that NOAO is pursuing as it transitions to a new type of organization in response to the significant funding reductions recommended by the NSF Portfolio Review;
2. Current operations and community engagement with the Dark Energy Camera at CTIO, including scheduling of community DECam time during the B semester;
3. The on-going infrastructure and science capability modernization programs at KPNO and CTIO, including the ReSTAR program and the proposed ODI upgrade for WIYN;
4. The plans for development of a Dark Energy Spectroscopic Instrument (DESI) on the Mayall;
5. How US observers can best use the Gemini telescopes, including needs for near term capabilities and priorities for future instrumentation.

The UC does not consider its discussions restricted to the specific items of its charge but felt that the first item was sufficiently broad that any additional aspects of NOAO operations of concern to its user community could be commented on therein.

During the past year, the UC expanded to twelve members. Eight of the committee members were present for the meeting: Elizabeth Buckley-Geer (Fermilab), Marla Geha (Yale), Anthony Gonzalez (U. Florida), Kevin Luhman (Penn State), Ginny McSwain (Lehigh), Casey Papovich (Texas A&M), Armin Rest (STScI), and Eric Gawiser (Rutgers, Chair), with Katelyn Allers (Bucknell), Mark Brodwin (U. Missouri), and Karen Meech (Hawaii) attending via a remote connection. In preparation for the meeting, UC members read key documents relevant to the charge and discussed related issues with colleagues at conferences, in university departments, and by telephone and email via direct “cold calls” to NOAO users. We also used our Facebook group to solicit feedback from users.

During the two-day meeting, NOAO staff members gave the UC presentations on the transition envisioned in response to the Portfolio Review as well as updates on the status of CTIO and KPNO and NOAO’s involvement with Gemini, DESI (formerly known to some as BigBOSS) and LSST. We greatly appreciate the effort that went into preparing those presentations, updating us on the status of NOAO programs, and engaging in frank discussion with us about the status and future of NOAO.

Our report follows and is split into sections according to the items in the charge.

1 Overall Priorities

The Users Committee recognizes that federal budget constraints and the resulting recommendations of the NSF AST Portfolio Review have forced NOAO into a period of transition and uncertainty. These recommendations include divestments that would rapidly eliminate more than half of the open access observing nights available to the US community on telescopes operated by NOAO. These budget cuts are extremely painful to the OIR user community and would result in a tremendous loss of scientific capability and productivity. Nonetheless, in both the short- and long-term, data from PI observing nights on telescopes in the U.S. system, public surveys, and the NOAO Archive will combine to enable a wide range of exciting science. NOAO has expressed a vision in which it plays a key role in increasing users' access to and productivity with these data, in other words as enabling access to bits more often than to the original photons.

In many scientifically crucial cases, these data will still result from open access to PI observing time on world-class facilities operated by NOAO at CTIO and, potentially, KPNO. Indeed, in an era with significantly reduced open access, maximizing the peer-reviewed time available on high-quality facilities will be crucial both for non-survey science and for spectroscopic and time domain follow-up to large surveys.

Recommendation 1.1:

While lamenting the severe budget reductions that require it, we support the vision expressed by the NOAO Directorate of transitioning by the end of this decade from an organization that emphasizes open access to PI observing time to one that places a greater emphasis on open access to OIR data for the U.S. astronomy community.

Recommendation 1.2:

Recognizing that a significant reduction in open access nights will occur in the near future, the UC urges NOAO to minimize the rate of loss of open access to smooth this transition and to make continued open access a key goal of negotiations with potential partners in telescopes from which it is considering divestment.

1a NOAO and The Large Synoptic Survey Telescope (LSST)

NOAO envisions LSST as a cornerstone of its revised role in the next decade. It has formed the LSST Community Science Center (LCSC) in order to begin the crucial process of enabling members of the U.S. astronomical community to utilize the revolutionary LSST dataset. LCSC is already active, e.g., serving the re-reduction of SDSS Stripe 82 data obtained from the LSST pipeline to the community and hosting annual meetings of LSST Science Collaboration chairs. LSST offers tremendous scientific potential for a broad range of users, but many users will need training to take advantage of this. We endorse the LCSC for its capability to interface members of the community (whether members of the LSST science collaborations or not) with the LSST Project and eventual datasets.

Recommendation 1.3:

The UC supports NOAO's vision of enabling and enhancing community access to LSST data as a cornerstone of its mission for the next decade.

1b IRAF

We note that the user base contains a large number of people who use IRAF directly, others who access it through Python wrappers (PYRAF), and others who avoid it entirely using e.g., native Python packages and IDL. The trend among the user base is clearly a shift beyond IRAF.

Recommendation 1.4:

We commend NOAO for maintaining the IRAF data reduction platform, but we recommend that NOAO explore industry standard languages for future software development.

2 Community Use of the Dark Energy Camera (DECam)

We commend NOAO on its productive engagement in DECam commissioning, Science Verification, and development of the Community Pipeline. The very successful SV phase is already leading to community science, and NOAO has been effective in raising community awareness of this new capability. NOAO should also be commended on the strong working relationship that it has developed with the DES Data Management team, and their support during Science Verification, including the wiki that was maintained for user support. The availability of DECam has prompted the consideration of assigning blocks of telescope time in smaller quanta than 1 night (e.g. 1/2 nights).

Recommendation 2.1:

We recommend that NOAO maintain its current active level of engagement with DECam and the DES Data Management team.

Recommendation 2.2:

We recommend that NOAO work to maximize the number of nights available to the community during the B semester. Having a significant allocation in each semester with a range of lunar phases is viewed as an important means of enabling timely access to targets at all right ascension ranges.

Recommendation 2.3:

We recommend that NOAO continue to pursue remote observing capabilities with DECam. Given that there are now good observing tools in place, any effort that makes these tools effective from remote locations would benefit the community.

Recommendation 2.4:

We strongly encourage NOAO to provide good documentation as part of the DECam Community Pipeline so that users will know what processing has been applied to go from raw to reduced data.

Recommendation 2.5:

We encourage NOAO to explore a mechanism for continuing to assign access to DECam in half nights when proposals justify such a request.

3 Modernization at CTIO and KPNO

3a Infrastructure

NOAO has embarked upon a wide array of infrastructure improvements, many with ARAA funds. Upgrades to the CTIO dorms and Tololo mountain roads have been positively received by visiting observers, while other upgrades to mountain water systems and electrical power systems are less visible but just as important. A new Instrument Handling Facility is under construction at KPNO and expected to be completed in July 2013. The water systems at KPNO and the La Serena Recinto are remaining challenges. KPNO water storage tanks should be brought up to code for safety. La Serena has experienced a long-term drought and faces potential water shortages, so the well at the Recinto should be maintained and upgraded as necessary. Also, the road access to the Recinto has been a challenge since one gate is shared with the Universidad de La Serena, is frequently blocked, and may be permanently closed in the future. The other gate is less accessible due to traffic patterns but can serve as a temporary solution.

Recommendation 3.1:

The UC recommends that NOAO continue to pursue necessary upgrades to infrastructure, particularly with essential needs such as water systems.

3b ReSTAR

The UC is pleased to learn that new instrumentation development for the KPNO and CTIO 4m telescopes is coming along well. The Blanco f/8 secondary mirror has been successfully repaired and is expected to be back in service by November 2013. The ReSTAR Phase 1 instruments KOSMOS and COSMOS have suffered modest delays due to the thermal requirements for gluing the optics, but NOAO has made good progress with an alternative plan. Securing the optics is the last remaining task as the mechanical assembly, detector, and optics manufacturing are complete. These instruments are expected to begin commissioning during 2013 and be available to the community by 2014A and 2014B, respectively. The timing for COSMOS is slightly later which is consistent with the need to re-commission the f/8 secondary mirror. The ReSTAR Phase 1 instrument TripleSpec is on track to be delivered to

CTIO in early 2015. These new instruments are eagerly awaited by the community, and the return of spectroscopy and other f/8 instrumentation to the Blanco 4m will make better use of the bright time that is not in high demand with DECam users. We commend NOAO for this progress.

Recommendation 3.2:

The UC recommends that NOAO continue to view the prompt installation of the f/8 secondary, KOSMOS, COSMOS, and TripleSpec as high priorities for the user community.

3c Remote Observing

The UC is also pleased with initial steps to offer remote observing to the community with the WIYN and KPNO 4m telescopes. NOAO has solved the problems of cyber security and has offered remote observing to a limited number of experienced observers.

Recommendation 3.3:

The UC recommends that NOAO expand remote observing capabilities for experienced WIYN, KPNO 4m, and CTIO 4m observers within the limits that resources and labor allow.

3d The partial One Degree Imager (pODI)

The UC notes NOAO's plan to expand pODI from a 24x24 arcmin array to a 48x48 arcmin One Degree Imager (ODI). While a full degree field imager is highly desired by the community, the looming NSF divestment from the WIYN telescope makes the extent of open access that will be available with ODI uncertain. Nonetheless, the UC recognizes that ODI offers a unique capability for US astronomy.

4 DESI on the Mayall

The UC views community access to a Dark Energy Spectroscopic Instrument (DESI) as a high priority. The BigBOSS Community Science White Paper demonstrates the wide range of unique science that DESI will enable and lays groundwork for multiple different pathways towards community access to this facility. These multiple pathways include using the DESI data itself once it is made public as well as the availability of community fibers during DESI observing time and community access via PI nights, particularly during bright time.

Recommendation 4.1

The UC recommends that NOAO explore with NSF how such PI access and community fibers might be incorporated into the DESI MOU between DOE/NSF.

Recommendation 4.2

The UC recommends that NOAO explore how to encourage and facilitate community proposals for non-dark energy science with DESI.

5 Gemini

The UC is pleased with the interaction between NOAO and Gemini, which benefits the needs of the US astronomical community. Gemini remains a competitive facility, providing a significant amount of large-aperture telescope open access to the US community. The UC encourages NOAO to continue their interaction and communication with Gemini. The UC believes that the avenues discussed in the following subsections can further improve the impact of Gemini.

5a Instrumentation

The UC is pleased with the return of GNIRS, the successful commissioning of GeMS, and the availability of visitor instruments like TEXES and DSSI/Speckle. The UC looks forward to the commissioning of GPI and the upgrade of GMOS-S to the Hamamatsu arrays later this year. The UC also hopes that a similar upgrade to GMOS-N will occur in the near future. The progress of science verification for GeMS is impressive, and demand for this instrument is expected to be high.

There is a strong need in the US community for near-IR multi-object spectroscopy; the UC hopes that MOS on F2 is commissioned as soon as possible. The UC is pleased that the process of developing GHOS has begun.

The UC is pleased with the time trades of NOAO between the Gemini and other telescopes to broaden US access to instrument capabilities otherwise unavailable.

Recommendation 5.1:

The UC recommends that the upgrades to the GMOS-S arrays proceed rapidly given the high demand for GMOS and the significant improvement the upgrade would provide to sensitivity.

Recommendation 5.2:

The UC urges NOAO to advocate that GeMS be made available frequently enough to satisfy the expected demand for it.

Recommendation 5.3:

The UC recommends that NOAO maintain the current level of time trades, with the option to adjust the amount of time trades based on user demand.

Recommendation 5.4:

For future Gemini instrumentation, the UC recommends that priority be given to instruments that support imaging surveys by other facilities, such as LSST.

5b Data Cookbooks

Given their nature, some of the Gemini instruments produce complex data products. A clear way to improve the scientific impact of Gemini observations is to provide to the community enhanced data tools, including documentation and cookbooks with specific examples of reducing observations of common types of Gemini data products. The UC is pleased with NOAO's past responsiveness to producing such documentation for instruments on telescopes that it operates.

Support of Gemini Phase II submission by NOAO has been quite good, but it appears that Phase II support will now transition to the Gemini Observatory itself.

Recommendation 5.5:

The UC strongly encourages NOAO to produce data reduction cookbooks for the Gemini user community since it is likely to have a significant impact on the productivity of users.

Recommendation 5.6:

The UC recommends that NOAO work with Gemini to maintain the high quality of Phase II support as the support role transitions to Gemini.

5c Observing Modes

The UC commends Gemini on implementing remote and eavesdropping observing modes and encourages Gemini to continue to support and improve these modes for their user community.