NOAO Users Committee
2006 Report
14 December 2006

The Users Committee (UC) of the National Optical Astronomy Observatory (NOAO) held its annual meeting at NOAO in Tucson on 5 and 6 October, 2006. The committee's charge, as given by NOAO, was to

1. evaluate the strengths and weaknesses of NOAO facilities (Kitt Peak National Observatory [KPNO], Cerro Tololo Interamerican Observatory [CTIO], and the National Gemini Science Center [NGSC]) in the context of the system of US telescopes;
2. comment on the NOAO Major Instrumentation Program (MIP) proposals for the next 4-meter instrument, and on the MIP Long Range Plan;
3. comment, from the perspective of community involvement, on science planning for the Large Synoptic Survey Telescope (LSST);
4. comment on any new issues with respect to current telescope time assignment procedures; and
5. comment on the possible impact of the recommendations of the National Science Foundation Senior Review (SR) on users of NOAO facilities, projected through 2011.

Committee members present were James Lowenthal (Chair), Ian Dell'Antonio, Ata Sarajedini, Nathan Smith, Angela Speck, and Nicole Vogt. Absent were Timothy Beers and Stacy McGaugh.

In preparation for the meeting, UC members discussed the relevant NOAO issues with optical astronomy colleagues at conferences, in home university departments, and by telephone via direct "cold calls" to NOAO users. During the two-day meeting, the UC was given presentations on the status of and plans for Gemini, KPNO, CTIO, MIP, Data Products Program (DPP), and LSST.

The NSF Senior Review of NSF's Division of Astronomical Sciences facilities, including NOAO, was released on 3 November 2006, one month after the UC met. The committee subsequently read the SR report and held a teleconference on 10 November to discuss its implications for NOAO users, and another teleconference on 20 November with Todd Boroson of NOAO.

We are grateful to NOAO and Director Jeremy Mould for the opportunity to weigh in on these important issues affecting the future of NOAO, and for the assistance and information we were provided to help us make informed recommendations. Our report follows below.

1 Users' Committee: Improving the interface between the community and the NOAO.

The Users Committee is intended in part to be a forum through which the users (and potential users) of NOAO facilities can give feedback to NOAO itself. However, the UC largely fails in this goal because it receives next to no direct feedback from users. This situation has improved somewhat with NOAO's help in providing lists of NOAO users to contact. But members of the UC must still base their comments and recommendations largely on their own experience and on anecdotal evidence, rather than on the experience of users at large.

There are likely several factors that limit the flow of user information and feedback to the UC. Primarily, we believe that many users are still unaware of the committee's existence, and that the channels for providing feedback to the committee are often not clear.

1.1 Improving user access to the UC

NOAO has improved advertising of the UC's existence by providing a link to the UC webpage directly from the NOAO home page and by running an article in the NOAO Newsletter soliciting input from users. The UC believes these are both important steps and should be continued in the future. However, the UC has to date received exactly zero input from users through those channels. While we cannot be sure of the main reasons for this lack of communication, we have several suggestions.

We think that the UC webpage – and perhaps the link to it – can be further improved. The UC page is currently rather opaque, containing only a list of members with their email addresses. This could be remedied by adding a short introductory paragraph explaining what the UC's mandate is and inviting feedback. Furthermore, the UC webpage has only a tiny link to "Send input to the NOAO Users Committee"; this could be made more prominent. Finally, the link from the NOAO home page is rather buried and could also be made more prominent.

The NOAO newsletter article soliciting feedback to the UC was a good start, but unfortunately it ran in the issue that most users received just days before, if not after, the UC met.

While we are all inundated with email, it remains an effective mode of communication for all astronomers. We believe that an annual direct email solicitation for feedback from users would produce many helpful responses.

Many NOAO users attend AAS meetings, making these gatherings an ideal place to advertise the UC. Those UC members attending a AAS meeting should have an identifying badge so that users can accost us as they see us and give spontaneous feedback. Similar badges are

already worn by AAS council members and even undergrads. We have initiated contact with the AAS to explore this option.

Recommendation 1.1

The Users Committee webpage should be expanded to include a description of the committee's functions and charge, a more prominent email link, and a user-friendly feedback form that will get sent directly to the UC. Committee member Ata Sarajedini has drafted such a feedback form and posted it online for NOAO's consideration at `http://www.astro.ufl.edu/~ata/Feedback.html`. NOAO should also consider making the link to the UC page from the NOAO homepage more prominent.

Recommendation 1.2

NOAO and the UC should ensure that future newsletter articles about the UC appear with sufficient time for users to respond before the UC meets.

Recommendation 1.3

We suggest that an email be sent to all AAS members soliciting feedback on their use of NOAO facilities (or lack thereof). We will be glad to work with NOAO on the content and wording of such an email.

1.2 Organizational issues for future UC meetings

This year we allowed the initial executive session to be forfeited. In hindsight, this was a mistake on our part. In future meetings we recommend that an executive session at the very start of the UC's meeting be maintained.

While the many presentations we were given were informative and indeed essential for completing our charge, in some cases they are too much of a good thing or present information not directly relevant to the UC's mission, and could be shortened to allow time for more discussion. In addition, prior access to the powerpoint presentations would make the talks more effective.

This year we had more overlap with the Gemini SAC, which was extremely valuable and worth continuing. In addition we would like to schedule an overlap of executive time with the Gemini SAC to further facilitate the collaboration between these two committees.

Recommendation 1.4

We ask NOAO to maintain an executive session scheduled at the start of future UC meetings; to exercise more restraint in scheduling long presentations of perhaps secondary relevance

to the UC's mission; and to maintain overlap with the Gemini SAC, including an executive session.

2 NOAO in Context of the Telescope System

The Users Committee recognizes that CTIO, KPNO, and Gemini are all vital components of the national system that serve the great bulk of the users community well. Despite the community's access to 8-m class telescopes through Gemini and TSIP, the majority of comments received by the UC reflected the necessity of maintaining access to moderate- and small-aperture telescopes. While the UC recognizes the need to attract outside funding just to keep telescopes open, we reiterate our strong feeling that offering at least 50% of 4m time for public access is a bare minimum for maintaining a healthy and vibrant scientific community.

We liked very much the new CATCH information page and believe it will facilitate the telescope time application process significantly.

The choice of instrumentation suites for the 4m and smaller telescopes remains of great concern to the users; we make more specific comments below. In general, the committee was very concerned about the razor-thin margin of error at CTIO and KPNO, with little or no safety net should any significant instrument or telescope component fail. We agree with the NSF SR (see Section 6 below) that deferred maintenance on these facilities is becoming an urgent issue. Increased downtime seems inevitable in such a fire-fighting mode.

The UC has heard from numerous users that data reduction documentation is inadequate for several instruments. Instrument cookbooks are absolutely essential for students who are learning to reduce data from the telescope, but currently the data reduction procedures are rather cryptic for some instruments. Complete and user-friendly data reduction cookbooks would help increase the efficiency of reducing, analyzing, and publishing NOAO data, especially if, as the NSF SR recommends, NOAO is expected to cut staff that could potentially answer users' data reduction and analysis questions.

Recommendation 2.1

We urge NOAO to maintain community access to at least 50% of the time on the Blanco and Mayall 4m, as well as 50% of the NOAO time on WIYN and SOAR.

Recommendation 2.2

We strongly support continued access to small telescopes, e.g. through the SMARTS II program.

Recommendation 2.3

We urge NOAO to seek or reallocate funds to carry out deferred maintenance urgently needed on core KPNO and CTIO facilities.

Recommendation 2.4

The UC recommends that NOAO develop complete and user-friendly data reduction "cookbooks" for all major instruments that do not currently have them. In future instrument programs, supplying such cookbooks should be an explicit requirement of the team building the instrument, whether that team is external to NOAO or not.

2.1 CTIO

The UC recognizes that CTIO remains the southern workhorse for the community, as shown by its consistent oversubscription rates, publication rates, user comments, and science completion rates as measured by end-of-run surveys. We commend the observatory for their updating and enhancement of the webpages, which now serve the users much more effectively, and we appreciate the summary of the user satisfaction information presented by Allistair Walker.

Many users expressed strong desire for the implementation of a remote observing mode at CTIO. The current classical observing mode on the Blanco telescope and constraints on instrument blocks strongly favor observing programs of a few consecutive nights. However, this excludes potentially important scientific programs that are increasingly relevant as we move toward more emphasis on time domain astronomy in the era of LSST. For example, some observers who require cadence observations of variable sources are forced to request large amounts of time that make their proposals unattractive to the TAC, while many more simply do not submit proposals. Furthermore, the expense associated with travel to Chile is prohibitive for many users. Remote observing with facilities at CTIO would greatly enhance access for all users. We understand that there are financial considerations for enabling remote observing, but we strongly encourage CTIO to find a way to make it happen. CTIO should consider this a high priority while carrying out the necessary maintenance and upgrades to mid-sized and small telescopes suggested by the NSF senior review.

The UC remains concerned about the dwindling access to optical spectroscopy on 4m class telescopes, and strongly recommends that current spectroscopic capabilities be at least maintained until suitable replacement instruments are available. We endorse keeping the RCSpec available until the Goodman spectrograph is fully available at SOAR. Even though the RCSpec has not been heavily requested recently, its basic capability of medium-resolution spectroscopy remains vital to NOAO's suite of instruments.

In a similar vein, there is an unfortunate lack of access to high-dispersion spectroscopy for southern targets, following the decommissioning of the 4m echelle spectrograph. Therefore, the UC strongly supports the current plan to mount Phoenix on the SOAR telescope.

The UC is also concerned about the lack of existing imaging backup in case of the possible failure of MOSAIC. The committee recognizes that DECam is coming as the workhorse imaging instrument on the Blanco 4m, and we appreciate NOAO's lobbying for blue sensitivity. However, continued access to the narrow-band wide-field imaging capability currently provided by MOSAIC is a high priority.

The UC was very surprised to learn that there is no staff associated with software development - a lack that explains why some users have experienced increased downtime due to repeated TCS failures and other technical problems while observing.

The users with whom we communicated strongly supported continued access to the small telescopes, including the SMARTS II program.

Recommendation 2.5

We urge NOAO to seek ways to implement remote observing modes for CTIO facilities.

Recommendation 2.6

We strongly recommend keeping the RC Spec available at the Blanco 4-m until the Goodman spectrograph is fully available at SOAR.

Recommendation 2.7

We support the current plan to mount Phoenix on the SOAR telescope to maintain access to high-dispersion spectroscopy in the south.

Recommendation 2.8

The UC urges NOAO to maintain continued access to the narrow-band wide-field imaging capability currently provided by MOSAIC.

2.2 KPNO

Despite its age, Kitt Peak continues to produce voluminous first-class science. This is reflected in the number of publications, and also in the user comments we collected. Because it provides 4m-class access in the northern hemisphere to a very large segment of the astronomical community, Kitt Peak is still an integral part of the national telescope system. At the same time, the UC is aware that KP faces significant challenges.

The committee applauds acting director Buell Jannuzi's intense efforts to enhance long-term communication and respect for the Tohono O'odham nation. We feel that these efforts are essential for the continued success of the site, and furthermore it is the right thing to do.

Second, the UC (and virtually every KP user we contacted) is concerned that the observatory is operating on a shoe-string budget. The lack of instrument scientists for even popular instruments is a glaring example. The detailed budget we were presented (and which the UC found very useful) made it clear that there is little or no margin for recovery in case of equipment failure. Furthermore, it is apparent that KP is already borrowing resources from downtown groups (primarily the MIP and data products groups) in order to continue operations. The UC is concerned that this dependence makes Kitt Peak doubly vulnerable to budget pressures.

Given the balance between the great importance of Kitt Peak to the system and the serious budgetary constraints, we strongly support Jannuzis decision to continue to support the existing complement of instruments, even those with no backup or servicing plan, at least until they break. The UC is very pleased to see that new instruments developed as a result of the partnership relations with WIYN (ODI/QUOTA) and Maryland (NEWFIRM) are starting to be deployed and are demonstrating that partnerships with other groups for instrument development can work to the overall benefit of the user community.

On the long-term front, the UC was a little worried about a lack of a spectroscopic successor to Hydra in the northern hemisphere 4-m class telescopes.

Recommendation 2.9

We strongly endorse the continued support of the existing complement of KPNO instruments.

Recommendation 2.10

The UC recommends that NOAO plan ahead actively for Hydra's successor.

2.3 Gemini

The Users Committee feels that in general the current state of the Gemini instrumentation is strong.

There is some concern that the observatory staff observers are not always competent to perform certain observations. This concern has inspired multiple user requests for an eavesdropping observing mode for the Gemini queue. The current mode of queue observing essentially ignores the huge talent pool available among the users community. Several users complained about blatant mistakes made by Gemini queue observers that could easily have been avoided, or quickly corrected, with the user present in eavesdropping mode, thus greatly increasing the overall observatory efficiency. There are clearly issues that would need to be resolved regarding how best to alert users to potential queue observations of their program, and how to avoid the queue staff being "pestered" by insistent potential eavesdroppers. But a system in which

users were alerted of a substantial probability that their programs will be run within, say, the coming week, could allow many of them to participate productively in the observations.

The UC would like to see both Gemini and the NGSC play a significant role in student training, to develop the next generation of astronomers. Due to the current prevalence of queue scheduling and the lack of eavesdropping capabilities, students are becoming increasingly removed from the process of obtaining their Gemini data. We would thus like to propose a way to allow PIs to send students, and/or themselves, to either the telescopes or to Tucson for focused training. Here are two possibilities:

1. Allow students to spend 1-2 weeks at a Gemini telescope. Have them observe the queue in action, if possible on the instrument used to obtain their data. Have them work with on-site personnel on reducing their own data (if their queue observations have begun) or on canned or fresh data from other projects, so that they can then work more efficiently at home.

2. Hold a 1-2 week "working school" in Tucson. Bring in small groups of students who have Gemini data from a couple of instruments. Have each group receive guided instruction, and then let them work on their data at Tucson with some assistance.

This would help to expedite publications, particularly for new users and for existing users using an instrument for the first time. It would bring the next generation of astronomers into the Gemini fold, and link them more directly with the telescope and with instrumentation, and enable them to better understand their own data.

The UC heard the concern that large, well-ranked programs can be shifted out of band 1 because they do not fit fully within it, and then end up being artificially down-graded. This situation will be somewhat ameliorated by the planned expansion of band 1, but we nevertheless request that NOAO clarify the process of program assignment to the various bands.

Since most Gemini observers are scheduled in queue mode, there is currently no explicit mechanism for them to provide direct feedback to the observatory or the UC about the success or failure of their program. The UC would therefore like Gemini users who receive their data in queue mode to be able to provide end-of-run reports on their data, as do classical observers.

We note the Phase II process continues to be cumbersome, and is particularly vexing for PIs of band 3 programs (who do not expect to receive much data but must still go through the entire process). We endorse the idea of having the libraries more available to users who begin their Phase II process, rather than the current skeletons.

Finally, we note the existence of serious PIT problems, specifically the failure of expected "what you see is what you get" (WYSIWYG) modes, that impede the proposal process.

Recommendation 2.11

We urge NOAO to increase efforts to implement eavesdropping modes for Gemini queue observing.

Recommendation 2.12

The UC suggests that NOAO help train graduate students and other young astronomers in Gemini observing and data reduction and analysis via short visits or workshops at the telescopes and/or in Tucson.

Recommendation 2.13

We ask that NOAO clarify the process of program assigment to various Gemini observing bands.

Recommendation 2.14

The UC recommends that Gemini users who receive their data in queue mode be invited to provide end-of-run reports on their data, as do classical observers.

Recommendation 2.15

We recommend that the Phase II process and associated online help pages be further streamlined and improved.

Recommendation 2.16

We recommend that the WYSIWYG problems in PIT be corrected.

3 Major Instrumentation Program

The UC is encouraged by the prospect of NEWFIRM first light occurring in January 2007. The UC supports and is excited about the continuing development of the SOAR Adaptive Module.

With the projected availability of ODI in the north and DECam in the south, the UC feels strongly that the next major instruments for the 4-meter telescopes should be versatile, workhorse spectrographs that serve a broad component of the community. This means a

range of spectral resolution, with both long-slit and multi-object capability. While wide-field imagers may be more popular, access to optical/IR spectroscopy at low, moderate, and high dispersion is vital to the health of the astronomical community. Providing such access for astronomers at institutions without private facilities is a core part of the mission of NOAO. As more research is pursued with archival analysis of survey image data, the ability to obtain follow-up spectroscopy will continue to be essential.

We commend NOAO for its policy of open source development effort for its MONSOON image acquisition architecture. Making it available to the wider community will help other observatories, but will also make it easier to bring visitor instruments to NOAO and will make NOAO instruments easier to replace if necessary.

We agree with NOAO that, in forging its long-range plan, NOAO needs to poll users for their input. It is encouraging that NOAO's instrumentation plan includes an emphasis on spectroscopic and narrowband imaging capability in addition to broadband wide-field imagers. The utility of single-object spectrographs is more questionable, although we recognize the obvious tradeoffs between cost and multi-object/wide-field capability.

Recommendation 3.1

We strongly recommend that for the next generation of 4-m instrumentation NOAO focus on versatile spectrographs with a range of spectral resolution and both long-slit and multi-object capability.

Recommendation 3.2

We recommend that NOAO continue its support of MONSOON architecture.

Recommendation 3.3

We recommend that NOAO continue its efforts to solicit user input on its long-range instrumentation plan.

4 Large Synoptic Survey Telescope

NOAO has taken a leadership position in the LSST partnership, and the UC strongly encourages NOAO to maintain an active and visible role to provide a conduit for the community to weigh in effectively on the project. The UC was presented with a proposal for increasing community participation in the project via regular solicitations for participation in existing working groups and for the establishment of new groups.

We feel that regular (annual or biannual) solicitations to join existing or start new groups are

essential to broaden the LSST user base. In order for the community to take advantage of these solicitations, however, the LSST collaboration will need to communicate clearly the sampling criteria, cadence rates and imaging depth tradeoffs being discussed for the project. For example, the scheduler/simulator program should be made publicly accessible with adequate documentation for users.

The UC cautions NOAO about the format of LSST participation solicitations. As they were presented, it sounded as if LSST were looking for potential users and groups to bring financial or auxiliary observational resources to the project. The UC was concerned that this might lead the rich to get richer and exclude segments of the astronomical community from a say in LSST. We recommend that NOAO consider carefully the mechanisms and obstacles to participation in the working groups.

Recommendation 4.1

NOAO should regularly solicit community participation in existing or new LSST working groups. Such solicitations should be accompanied by full and clear information on the basic parameters of LSST surveys being considered.

Recommendation 4.2

We recommend that NOAO consider carefully the way LSST participation is solicited to ensure that all members of the potential users community have equal opportunity to participate.

5 Time Allocation Commmittee Issues

Based on the informal polling that the Users Committee conducted, the community seems generally happy with the manner in which the TAC now operates. One concern raised was the possibility that there is not enough turnover in the membership of the TAC. Institutional memory is important for a number of reasons, but, at the same time, fresh viewpoints among members of the TAC maintain vibrancy among the accepted science programs. In addition, some users feel that proposals in the area of resolved stellar populations in external galaxies are not adequately assessed because they fall between the Galactic and Extragalactic realms. They use the tools of stellar and galactic astronomers but often-times address questions more relevant to extragalactic astronomers. Some users emphasized the importance of an experienced chair to lead the TAC deliberations wisely and productively. Finally, one user noted the brevity of NOAO Scientific Justifications (1 page compared to 2 pages or more for most other major observatory proposals), and suggested increasing the limit to 2 pages to allow proposers better to explain their science.

The Users Committee sees the merit in these points and therefore has the following recom-

mendations; only the first one is a strong recommendation.

Recommendation 5.1

NOAO should move to ensure that proposals to study resolved stellar populations are reviewed by panelists with experience in that field. Additional panelists with resolved stellar population expertise could be brought in, or perhaps a new panel dedicated to resolved stellar populations (perhaps at the expense of one of the existing galactic or extragalactic panels) could be initiated.

Recommendation 5.2

The UC suggests that NOAO consider reducing the tenure of members of the NOAO TAC from the current 5 semesters to 4 semesters.

Recommendation 5.3

The UC suggests that NOAO consider increasing the Scientific Justification page limit from 1 page to 2 pages.

6 NSF Senior Review

As noted above, the UC read the Senior Review as soon as it became available and discussed together its implications for NOAO. Our response is as follows:

1. We agree with the SR that NOAO should continue to provide public access to small and medium aperture telescopes in addition to Gemini (Base Program Recommendation 2 and Section 5.2.2), and that such access is a "core part of its mission and one that cannot be divested."

2. The UC was confused by the SR's recommendation that NOAO should be "leading and coordinating" the "provision of new instrumentation for small and mid-sized telescopes" and aspiring "to lead and manage large teams...in constructing the $50-100M instruments that wil be needed for GSMT" (6.1.2) on the one hand, while the NOAO instrumentation group should also see "further contraction" (Section 6.1.2 and Transition Program Recommendation 5) on the other. The UC was concerned that further erosion of NOAO's instrumentation program would seriously jeopardize its ability to provide or oversee provision of basic, high-quality, up-to-date, workhorse instruments for its small- and medium-aperture facilities, let alone Gemini.

3. The UC was concerned that the reduction in the Data Products Program recommended by the SR would spell serious shortcomings in essential software and even software

documentation needed by users to process data efficiently. Indeed, the UC felt strongly that end-user data reduction software packages for each NOAO instrument, along with cookbooks describing their use, are essential for the observatory's scientific productivity, and support to provide them should be augmented, not cut.

4. The UC agreed with the SR that deferred maintenance at KPNO and CTIO was becoming a critical issue (5.2.2.2) and that NOAO should actively seek one-time allocations to support urgently needed repairs, upgrades, and backup systems.

5. The committee agrees with the SR that Gemini "will remain at the center of the US program in large aperture OIR astronomy for a long while" (6.1.1) and that its success is vital to the US astronomy program.

6. As noted above, the lack of instrument scientists for even popular instruments at KPNO and CTIO often poses serious problems for users. The UC is concerned that further cuts to NOAO staff, as advocated by the SR, will only exacerbate this problem.