

NOAO Users Committee

2009 Report

Submitted 13 July 2009

The Users Committee (UC) of the National Optical Astronomy Observatory (NOAO) held its annual meeting at NOAO in Tucson on 24 and 25 June, 2009. The committee was asked by NOAO Director Dave Silva to comment on:

1. the on-going modernization programs at KPNO and CTIO;
2. current ReSTAR plans, including the proposal to the NSF and potential follow on phases of ReSTAR;
3. desired balance between traditional and survey programs for the NOAO 4-m telescopes;
4. how improve US observers interactions with Gemini telescopes;
5. NOAO's efforts to connect the community-at-large to the LSST program;
6. the proposed NOAO System Science Center (NSSC);
7. the current activities for Science Data Management (SDM, formerly Data Products Program);
8. whether or not NOAO is involved in the right balance of activities to meet the current and future needs of its user community.

In addition to the official charge from the NOAO Director, we have added several categories below which relate to discussions with colleagues and common issues raised by NOAO facilities users.

Eight out of the nine committee members were present for the meeting: Ian Dell'Antonio, Eric Gawiser, Sangeeta Malhotra, Vera Margoniner, Stacy McGaugh, Ginny McSwain, Nathan Smith, Angela Speck (Chair).

We are impressed with the progress NOAO has made in the last year. NOAO has responded quickly and effectively to the recommendations of the NSF Senior Review, ALTAIR and ReSTAR reports, and is well on its way to being the strong and supportive national facility it should be. We commend NOAO for its efforts towards building a national telescope system and renovating existing facilities. NOAO seems to be in the best shape it has been in for years.

In preparation for the meeting, UC members discussed the relevant NOAO issues and documents with optical astronomy colleagues at conferences, in university departments, and by telephone and email via direct "cold calls" to NOAO users as per lists provided by NOAO. We also created a Facebook group to provide a forum for feedback from users.

During the two-day meeting, NOAO staff members gave the UC presentations on the status of and future plans for the ReSTAR implementation, CTIO, KPNO, NGSC, Science Data Management, LSST, and NOAO System Science Center. In addition, we heard from David Schlegel regarding the proposed BigBOSS experiment. We appreciate very much the effort that went into preparing those presentations, updating us on the status of NOAO programs and initiatives, and engaging in fruitful and frank discussion with us about the status and future of NOAO.

Our report, structured loosely on the committee charge, follows below.

1 Renovation at KPNO and CTIO

The Users Committee is grateful to the NSF for providing an opportunity to acquire funding under the aegis of the American Recovery and Reinvestment Act (ARRA; stimulus bill) to address much needed repairs to the infrastructure of the National Observatories. That such work is necessary, and indeed, well overdue, is glaringly obvious to anyone who has worked at or visited the observatory recently. This work will enable NOAO to address some of the most basic needs of both Kitt Peak and Cerro Tololo.

We applaud NOAO's implementation plan for utilizing the stimulus funds. NOAO has developed a clear, well prioritized plan of action. Addressing the highest priority items is essential for continued safe and effective operation of the Observatories. Delayed maintenance has reached a level where much work would absolutely have to have been done in the very near term, with no obvious source of funding within the framework of NOAO's already overstretched base budget.

Indeed, the prioritized planning motivated by the stimulus opportunity provides a sobering look at the infrastructure needs of the Observatories. The Users Committee greatly appreciates that the highest priority repairs are likely to be implemented. Nevertheless, even after the infusion of stimulus funds, a long list of pressing concerns will remain.

Recommendation 1.1

We encourage NOAO to maintain its action plan for renovations at KPNO and CTIO to be funded by ARRA and to actively seek funding to make progress on remaining deferred maintenance needs as expeditiously as possible.

In addition to the ongoing maintenance and renovation of the facilities, there are plans to provide new spectrographic instruments for both KPNO and CTIO. As these fall within the purview of ReSTAR they will be addressed in § 2.

2 ReSTAR

In December 2007, the ReSTAR committee published its report on NOAO telescopes in the aperture range 1–6 meters. The Users Committee is encouraged by NOAO's response to the recommendations of the ReSTAR Committee. A proposal for Phase 1 of the ReSTAR Implementation Plan was submitted to the NSF in November 2008, and the results are pending at the time of writing this report. From this supplementary NSF funding, NOAO

plans to form partnerships with non-federal facilities to increase small telescope access for the community, deliver several new spectrographs for the Optical/IR System, fund graduate student instrumentation internships, and fund infrastructure improvements at NOAO and non-NOAO facilities. Phases 2 and 3 of the ReSTAR implementation proposal will tentatively be submitted in FY 2011 and FY 2013. Below, we comment on each item in the ReSTAR implementation plan.

NOAO's 5-year plan does a nice job of anticipating users' needs for both world-class imaging and spectroscopic instruments on its system of small telescopes.

2.1 New Partnerships

NOAO's plan to form partnerships with non-federal 4-meter class telescopes is heading in the right direction. Two potential partnerships have emerged, contingent upon the success of the ReSTAR Phase 1 proposal. NOAO has expressed an interest in acquiring 50 or more nights on the Hale telescope for a 3-year term, to begin in FY 2010. Partnering with the Hale telescope will enable immediate community access to its existing spectrographs. The addition of the Hale O/IR spectrographs to the NOAO System by 2010 is appreciated since other planned ReSTAR spectroscopic instruments will not be commissioned for some years after that time. NOAO is also exploring a 30% partnership in the Discovery Channel Telescope (DCT), with planned first light in December 2010. NOAO will begin design of an optical echelle spectrograph for the DCT in FY 2010, and the instrument is expected to begin commissioning in FY 2013. This committee anticipates that the proposed partnership will provide enough nights to create a strong and scientifically productive group of Hale and DCT users within the NOAO community. With the addition of the Hale and DCT partnerships, NOAO will provide a solid network of four 4-meter class telescopes in the northern hemisphere during the next 5 years. While the proposed 3-year partnership with non-federal facilities is appreciated, the committee recommends pursuing longer periods of 5-10 years commitment especially for the Hale telescope.

Recommendation 2.1

We recommend that NOAO pursue strategies that will allow longer term (5-10 year) commitments to partnerships with non-federal facilities in order to facilitate building a community of users for the new parts of the NOAO System.

2.2 Instrumentation

The ReSTAR Phase 1 proposal also includes plans for several new O/IR spectrographs for the KPNO Mayall 4-m and CTIO Blanco 4-m telescopes. In collaboration with The Ohio State University, NOAO will deliver a near-clone of the multi-object OSMOS medium-resolution optical spectrograph for the Mayall during FY 2011. Should sufficient funding from the ReSTAR Phase 1 proposal be obtained, another copy of OSMOS will be built for the Blanco telescope. NOAO will also partner with Cornell University to build a copy of the (single object) TripleSpec near-IR spectrograph, which will be delivered to the Blanco telescope in late FY 2012. Should funds be available, a second copy of TripleSpec will also be built for the Mayall. New spectroscopic instrumentation in the north will feature OSMOS and

possibly TripleSpec on the Mayall, Double Spectrograph and TripleSpec on the Hale, and an echelle spectrograph on DCT. We anticipate that existing spectroscopic capabilities, the RC Spec and echelle instruments on the Mayall, and Hydra and SparsePak on WIYN, will also continue. The committee commends NOAO for addressing the community's need for medium resolution optical/IR spectroscopy as recommended by the ReSTAR report. With the addition of these new spectrographs and telescope partnerships, NOAO users will have substantially improved choices in instrumentation for spectroscopy.

The push to acquire spectrographic instruments was predicated on the assumption that current and upcoming wide-field imaging capabilities would fulfill the recommendations from the ReSTAR report. Imaging instrumentation will feature the new ODI camera, MiniMo, and WHIRC on WIYN and the MOSAIC and FLAMINGOS cameras on the Mayall. The infrared NEWFIRM imager may be shared between the Mayall and the Blanco over the long term. ODI promises to be a world class wide-field imager, but with only 40% share of time on WIYN, NOAO users may not have sufficient access.

We anticipate the oversubscription rate on WIYN to skyrocket once this camera is commissioned, so we are pleased that NOAO will continue to maintain and upgrade the MOSAIC camera with NOAO base funds. MOSAIC will remain a productive imager, even after ODI, due to its ample set of filters available and a strong community user base. Because the large size of ODI filters makes them prohibitively expensive, maintaining access to MOSAIC is especially important.

In the southern hemisphere, available imaging instruments will be the premier Dark Energy Camera (DECam), ISPI, and possibly NEWFIRM on the Blanco, and SPARTAN and SOI on SOAR. Choices in spectroscopic instruments will include the Goodman spectrograph and the upcoming SIFS and STELES on SOAR, TripleSpec on the Blanco, and perhaps OSMOS on the Blanco as well. NOAO base funds will also support the development of the SOAR Adaptive-optics Module (SAM), the world's first adaptive-optics system deployed on a 4-meter class telescope.

Phase 1 of the ReSTAR implementation will also create one graduate student instrumentation fellowship for each new instrument built through a partnership with a university instrumentation group. Each student will be able to work on the instrument construction, commissioning, and science verification stages of development. The committee is pleased that students will gain experience both in building instruments and using them for scientific observations.

Recommendation 2.2

ODI is essential to NOAO's capability in wide field optical imaging, the highest priority of the ReSTAR report (which assumes a fully functioning ODI). We encourage NOAO and its partners to complete ODI as rapidly as practicable. It is also important to deploy a fully functional ODI, with complete OTA functionality. The Users Committee considers a fully functional reduction and scientific software pipeline to be an integral part of the deployment of such a complex instrument.

Recommendation 2.3

We recommend that MOSAIC on Mayall be maintained even after ODI comes online on WIYN. This is due to the large number of unique filters available for imaging with MOSAIC.

At \$100K-\$200K a filter, it would be prohibitive to reproduce these filters for ODI.

Recommendation 2.4

NOAO should continue supporting graduate student instrumentation fellowships in future phases of the ReSTAR implementation plan.

2.3 Las Cumbres Observatory Global Telescope Network

One of the ReSTAR recommendations to NOAO was to provide access to a global network of small telescopes for time domain investigations. The Las Cumbres Observatory Global Telescope Network (LCOGTN) is developing a network of 0.4–2-m telescopes that will be longitudinally distributed around the world. NOAO is already supporting the construction of three LCOGTN 1-m telescopes at NOAO South. NOAO has also entered discussions with LCOGTN about the possibility of housing two networked 2-m telescopes at KPNO and CTIO. The Phase 1 ReSTAR implementation plan will complete design and development work for the 2-meter telescopes in the LCOGTN. Construction of the telescopes will be funded by the Phase 2 proposal or other funding sources, and construction is not included in the current 5-year plan. Through NOAO, the US community would have up to 50% of the time on this network. The committee is pleased to see NOAO participation in a longitudinal telescope network that can accomplish significant breakthroughs in time domain science. We expect that new time domain facilities will be very useful for a variety of projects in stellar astrophysics, GRB followup, and other transient objects, and there are tremendous opportunities for breakthrough transient science in the coming era of wide-field time-domain surveys such as PanSTARRS and LSST.

Recommendation 2.5

We recommend participation in the LCOGTN network at $\sim 20\text{--}30\%$ level for US community, possibly higher depending on the demand from users and quality of the science.

2.4 Oversubscription rates

The current oversubscription rate is hovering between 1–3 for most of the 2–4-meter telescopes in the NOAO System. While this rate may be slightly low due to the current availability of instrumentation or other reasons discussed in this report, we view an oversubscription rate of 2–3 as optimal and urge NOAO to seek additional access when an oversubscription rate for a particular telescope (or telescope/instrument combination) becomes higher than 3 for two consecutive semesters. These small telescopes are crucial for many diverse science and educational needs, and users (especially graduate students) need to have confidence that time can be acquired for important projects within a reasonable time period. As we look ahead to the long-term future, we urge NOAO to regularly re-examine its partnerships with WIYN, Hale, DCT, and other non-federal facilities within the NOAO System. Especially after ODI begins operations in 2010, there may be a significant rise in community demand for WIYN access. We encourage NOAO to pursue increasing its share of WIYN time as appropriate. ODI may not have been operational long enough to evaluate user demand

before ReSTAR Phase 2 is submitted, so this may be an issue for Phase 3 or other funding sources. NOAO should also evaluate user demand with the Hale and DCT telescopes and possibly extend the length of those commitments beyond 3 years. If necessary, NOAO should add or terminate partnerships with non-federal facilities, with the end goal to offer enough nights on all small telescopes to maintain optimal science productivity within the US community. If any oversubscription rate consistently climbs above 3, NOAO should expand existing partnerships or find comparable parallel facilities.

Recommendation 2.6

We recommend NOAO regularly re-examine its partnerships with WIYN, Hale, DCT, and other non-federal facilities in the NOAO System. This will be especially important if ODI increases the oversubscription rate at WIYN as predicted.

Recommendation 2.7

We recommend that an optimal oversubscription rate of 2–3 be maintained on the 2–4 meter telescopes to ensure reliable community access as well as high-quality science.

2.5 Personnel needs

The committee is excited by the upcoming instrumentation within the small telescope system, but we are concerned that there will be a shortage of person-power to commission all of the new instruments coming online in such a short time period.

Recommendation 2.8

We recommend that NOAO plan ahead to hire additional scientific staff at KPNO, CTIO, and NSSC that will be required to handle the commissioning stages and subsequent instrument and user support required for successful operations. Personnel appointment should be made with sufficient overlap periods for new staff to gain expertise.

2.6 ReSTAR Phase 2 proposal (and beyond)

The success of the NOAO System hinges upon world-class facilities available at all apertures in the NOAO system. A number of new instruments will be added to the NOAO System during ReSTAR Phase 1, both through this supplementary NSF funding and other sources. After these new instruments come online, NOAO should look forward to adding new capabilities that will increase scientific productivity of the 2–4-meter telescopes. In particular, optical and near-IR interferometry capabilities were recommended by the ReSTAR report. Interferometry poses significant technological challenges that may not be solved or fully funded during ReSTAR Phase 2 alone, and full implementation may require funding and development through Phase 3 or beyond. Community involvement during Phase 2 offers an opportunity to further explore this possible addition to the NOAO system.

The ReSTAR report recommended further investment in remote observing with small telescopes. NOAO should continue to explore non-traditional observing modes as new facilities come online. Queue and remote observing options are optimal for many science projects, while classical visitor-mode observing is optimal for others. This committee is pleased that

the SOAR telescope has offered a remote observing option as a shared-risk trial for a few observers in the 2009B semester. This is a positive step towards increasing the options for all observers in the coming years.

We are encouraged by the plan to add time domain capabilities to the NOAO System. Pending successful partnership agreements and design of the LCOGTN network, we support including construction funds in Phase 2 for new 2-m telescopes in this partnership.

We encourage NOAO to engage the US community and determine which science cases demand new and/or improved instrumentation beyond the current environment. Should the need for one or more new instruments arise, NOAO should open a call for new instrument proposals with the goal of selecting the best instrument(s) to be funded by the Phase 2 proposal to NSF.

Recommendation 2.9

We continue to endorse NOAO's three-phase plan to implement the ReSTAR initiatives and reinvest in KPNO and CTIO.

Recommendation 2.10

While we understand the expediency of the approach taken in Phase I to acquire spectrographic capabilities, we encourage NOAO to pursue a transparent and open peer-reviewed instrument selection process as Phases 2 and 3 come into play. This should include broad discussion with the users community and careful review of competing options.

3 Surveys and the 4-m telescopes

NOAO is considering a call for proposals for a new major science project on the Mayall, comparable to the scope of the Dark Energy Survey and DECam on the Blanco. The users' committee commends NOAO for looking ahead with regard to Mayall's role in the coming decade and for taking the initiative to keep Mayall in the business of doing cutting edge science. Keeping KPNO scientifically attractive is crucial to maintaining a strong national system of telescopes. Furthermore, we recognize that the combination of a high impact science result combined with a great capability would provide enthusiasm from the community and the public and will be a valuable piece of a strong NOAO System at the end of the next decade.

The proposal to solicit collaboration on a new instrument on Mayall is commendable. However the committee felt that there needs to be more of a sense of guardianship on the part of NOAO to protect community access in the spirit of the ReSTAR report, where users recommended increased access to 4-m class telescopes. NOAO should ensure that the number of nights available on small telescopes does not decrease suddenly with the addition of such a project.

NOAO should also give sufficient lead time to the community between the announcement of opportunity and solicitation of letters of intent, in order to get maximal participation from the community. A larger pool of potential projects will lead to an optimal outcome. The review committee for these proposals should include members from the ReSTAR and ALTAIR committees as well as a member from the Users Committee. As part of the proposal

process, any team must make the case for why their survey instrument is of broad scientific use. The review committee should also be cognizant that there does not have to be a successful proposal for this instrument/project. Whatever the final outcome of the process, the process itself must be transparent.

There should be a requirement that the proposed instrument/project have significant community involvement and should enable a broad range of auxiliary science. Any new instrument should be compatible with the use of other instruments at the Mayall, in terms of cost of instrument change.

Recommendation 3.1

We recommend that NOAO allow at least 6–8 weeks of lead time between the announcement of opportunity and solicitation of letters of intent, in order to get maximal participation from the community.

Recommendation 3.2

We recommend that the time promised in exchange for an instrument be carefully considered, such that the scientific value of open access retained by users is at least as good as it would be without the new instrument. This may be achieved either through the formation of new telescope partnerships or creative integration of the major science project with community access.

Recommendation 3.3

We recommend that NOAO ensure that any proposed survey make its data public on a reasonable timescale.

Recommendation 3.4

We recommend that the proposal review committee have a member from Users Committee in addition to the proposed membership of ReSTAR and ALTAIR committee members.

Recommendation 3.5

We encourage NOAO to ensure that any survey instrument should be compatible with a versatile suite of complementary instruments.

Recommendation 3.6

NOAO should keep open their legal right to back out of the agreement for as long as possible before the formal agreement is signed.

4 Gemini

The US community's attitude to Gemini remains luke-warm and stems from a perceived lack of responsiveness from Gemini to the needs of US users. This problem is not the fault of NOAO/NGSC, but rather stems largely from NOAO's position in the broader Gemini structure, i.e., while Gemini and NOAO are both run by AURA, the direct connection between NOAO and Gemini is tenuous. NOAO, through NGSC, is the conduit for US users to access Gemini, and does a good job of working with US users. However, neither NGSC

nor NOAO is currently in a strong position to persuade Gemini to respond to the needs of the US community. Consequently, we encourage both NOAO and NSF to investigate how NOAO could be better fit into the Gemini structure during the negotiations of the new agreements in 2013.

Having said this, we are encouraged by the efforts made to increase the connection between Gemini and its US users. The strategy of increase in the fraction of classical observing seems to be effective. Unfortunately, classical observing is not the best mode for all observers/programs. We reiterate that NOAO should investigate some form of remote observing. This would be particularly useful for very short observing programs.

One of the major concerns for US users is that the overhead required during Phase 2 is too onerous. The ability to access templates for observing was very useful, but some seem to be no longer available. We understand that Gemini removed these templates and replaced them with components. We urge NOAO/NGST we push Gemini into reinstating the template access for Phase 2.

We are glad to hear that NICI is coming along well, and that FLAMINGOS2 is en-route to Gemini. We are delighted that the GMOS red CCD upgrades are finally going ahead. The demise of WFMOS has caused some concerns about the process by which instruments are chosen. The Aspen process is considered a failure. The US community has made its priorities for instrumentation clear through the ALTAIR survey, and desire for high resolution optical and near-IR spectroscopy is abundantly clear.

The US is clearly the dominant user of the mid-IR facilities, but Gemini remains predominantly an optical facility despite its infrared optimization. Several users have expressed concerns that with the demise of Spitzer's cold mission, and SOFIA not yet available, Gemini has become the only facility many US IR astronomers can use. Data-mining of IRAS, ISO and Spitzer continues, and combined with upcoming observations from Herschel, mid-IR facilities need to be accessible for follow-up work.

Recommendation 4.1

We encourage NOAO/NGST to follow the ALTAIR recommendations and facilitate action towards procurement of new high resolution spectroscopic instruments for the Gemini telescopes.

Recommendation 4.2

We urge NOAO/NGST to push Gemini to make and keep available the templates for observing in order to reduce the burden of Phase 2.

Recommendation 4.3

We recommend that NOAO modify the Phase-I Tool (PIT) in order to facilitate upload of target coordinates. Users would like to be able to upload files containing their target coordinates, rather than having to input each object individually.

Recommendation 4.4

Gemini remains the premier open access observatory capable for US mid-IR observers. With results from Spitzer (and other IR space observatories) still appearing, and new observations from Herschel soon to be available, the need for ground-based mid-IR access remains important. Therefore we recommend that NOAO/NGSC engages US users to encourage use of

the mid-IR capabilities of Gemini.

5 LSST

We commend the LSST collaboration for the creation of a living science book and for the opportunities for new individual participants to join existing science collaborations, as well as for encouraging the creation of new science collaboration groups. We suggest that the proposal for new collaborations process be reviewed in an effort to delineate a more clear path for the creation of new science collaborations. The committee would like to see a new science group be formed and its path serve as an example of the successful creation of new science collaborations. Although we are aware that LSST’s website summarizes the parameters of the survey, many in the community are either unaware of these parameters or feel that not enough details are available. We suggest that it is important to make LSST parameters more clearly available to the community and to promote the collaboration between the scientists running the simulator and scientists that are interested in possibly becoming new members. This kind of information will help individual scientists or new collaborations evaluate the feasibility of achieving their science goals using LSST data before proposing to join a collaboration or to create a new one. We also want to stress the importance of advertising these opportunities more widely.

Recommendation 5.1

We recommend a review of the process by which new science collaborations are proposed in order to define the path more clearly.

Recommendation 5.2

We recommend that communication between potential LSST users and the scientists running the simulator be improved.

6 NSSC

NOAO plans to reorganize the NOAO Gemini Science Center into the NOAO System Science Center (NSSC) in order to streamline user access to Gemini, Hale, DCT, TSIP facilities, and other telescopes in the NOAO system. The NSSC will provide user support for all System facilities and data processing, improve the interface of non-NOAO facilities to ensure more uniform user manuals, web pages, engineering data, and other documentation, and work with the US community to define and prioritize new capabilities within the NOAO system. The committee is very supportive of the idea of creating an NSSC. Even though we are in principle skeptical about reorganizations, the existence of an umbrella organization that would be the “face” of the access by users to the US System would greatly assist the acceptance of and the enthusiasm for the concept of a US Observatory System.

The committee feels that the plan of building upon the existing NGSC office is the correct choice, in that it emphasizes the central position of Gemini in the current US Open system and it allows NOAO to build on the familiarity that users have with dealing with the NGSC office. There was some concern expressed that the current organizational chart separates the

support of the KPNO and CTIO users from the support of the other telescopes, undermining the central nature of the current KPNO and CTIO facilities in the current US system. We recognize that this is ameliorated by the fact that a portion of the staff of NSSC will also be supporting users of the two central facilities, and that it makes more sense for the support of the KPNO and CTIO facilities to be tied more closely to the hardware, as is impossible with all the telescopes supported by the NSSC. NOAO should ensure that the uniform feel of System user support and documentation should also apply to KPNO, CTIO, and SOAR. The NSSC web pages and other documentation should also refer users of those observatories to the appropriate staff.

Although the establishment of the NSSC is greatly encouraged, particularly with the potential for significant time on Hale and DCT as detailed in the ReSTAR proposal, the Users Committee realizes that this level of increased support invariably will entail increases in staff commitment and cost.

Recommendation 6.1

We recommend that NOAO complete the creation of an NSSC to serve as an interface between the user community and the non-NOAO facilities available for national use through TSIP, ReSTAR and Gemini.

Recommendation 6.2

We recommend that there be some mechanism for NSSC staff to coordinate with KPNO and CTIO user support to ensure that the NOAO users receive as uniform an observing support experience as possible.

Recommendation 6.3

We recommend that the NOAO director carefully balance the strongly endorsed goal of expanding NSSC with the priorities of maintaining the support and health of the currently supported facilities.

7 Science Data Management

In the 2008 Users Committee report, we had advised that NOAO prioritize work on finalizing the MOSAIC and NEWFIRM pipelines and that cookbooks for all instruments are urgently needed by users, while full pipeline-processed archives for other instruments are a lower priority although still desirable. The Users Committee is therefore pleased to see the completed work on the MOSAIC and NEWFIRM pipelines and the availability of pipeline processed data through the NOAO Science Archive. The online availability of NOAO data through the NOAO Portal is also an excellent and useful development. The Users Committee is also very pleased to see the excellent progress made on the NOAO Data Handbook. When it is completed with information for all instruments available through NOAO it will be an invaluable resource for all NOAO users.

We appreciate the fact that resources are limited, but to the extent possible, the Users Committee strongly encourages NOAO to run the pipeline on all available MOSAIC data. The Science Archive with processed MOSAIC data currently only includes data extending

back to semester 2008A. Archival MOSAIC data stored on disk, however, extend back to 2004 and earlier on tape. There is a strong science case for making these data available to the community. As we enter an era where time-domain astronomy is increasingly important with facilities like Pan-STARRS, PTF, and LSST, a user-friendly archive of reduced 4m wide-field images would be of great value to the community because of the potential for investigating long-term variability, for example. Pipeline-processed wide-field images would also be of great value for comparison with wide-field data at other wavelengths obtained with other facilities, such as the many legacy surveys conducted with Spitzer, or Galex, as well as many other types of studies that require an optical image for reference. The highest priority then should be to pipeline process all MOSAIC data available on disk and make them available in the Science Archive. Similarly, all non-MOSAIC archival NOAO data that are currently saved on hard disk should be made available through the online archive in the NOAO Portal.

Retrieving and processing older data on tape (including MOSAIC and other instruments) would also be of great value but would take more significant effort, and can be delayed until resources become available.

Finally, concerning new instruments that are coming online, there are cases where various levels of pipeline processing are not overly demanding in terms of resources, are feasible, and would be enormously beneficial to users. In cases such as cross-dispersed spectrographs with only a single configuration, for example, a full pipeline with wavelength calibration is quite feasible. Other levels of pipeline processing may be more appropriate for other instruments, but full cookbooks are a minimal necessity for all.

Recommendation 7.1

We recommend that all available MOSAIC data be run through the pipeline and made available through the Science Archive as resources allow.

Recommendation 7.2

We encourage NOAO to make all archival data available via the NOAO Portal.

Recommendation 7.3

We encourage NOAO to ensure that full cookbooks for data reduction are made available for all new instruments coming online, and where possible pipelines should also be available.

8 Overall Balance

The Users Committee recognizes and endorses NOAO's efforts to respond to the NSF Senior Review, and in particular its implementation of ReSTAR recommendations. We endorse NOAO's recommitment to community engagement and to facilities of all apertures, including especially those at KPNO and CTIO, while at the same time providing leadership and pathways to community access in the development of LSST and GSMT. We believe the overall balance of those current efforts is generally appropriate and well-considered.

The necessity for dealing with infrastructure renovation and deferred maintenance issues raises questions regarding how to balance these needs with the need to support development of new instrumentation and user access. We are encouraged by the work undertaken

thus far on renovating existing facilities. NOAO should continue to add infrastructure renewal/maintenance costs to the future (Phase 2 and 3) ReSTAR proposals. We heard that the NSF is aware of the problem with infrastructure support, and we were encouraged by the suggestion that a MREFC-like program may become available to fund maintenance to infrastructure.

We recognize the merits of partnerships and endorse pursuing more, while also reiterating our strong belief that NOAO facilities should remain available for open access for the great majority of the time (see § 2, 3).

As for balance in instrumentation, the current plans to provide workhorse spectroscopy instruments discussed in § 2.2 are in line with both the ReSTAR report and recommendation from the Users Committee in years past, and are a welcomed development.

Funding of observational astronomy remains a hot topic. While there are barriers to distributing funds for data reduction/analysis, we urge NOAO to cooperate with various groups investigating this issue in order to end the “double jeopardy” of applying for telescope time and data analysis funding separately. A solution to this problem would be a major improvement in the research climate for ground-based astronomy in the U.S.

We did not engage in a thorough review of NOAO’s Education and Public Outreach (E/PO) activities, as there is a separate outside committee charged with that task. However, NOAO has integrated E/PO into its various scientific and operational activities, so the committee was given an impression of the breadth and quality of these activities. They strike us as outstanding, but we were concerned that funding levels for these activities may not be sufficient to maintain this excellence. In short, additional E/PO funding from NSF and other sources would allow NOAO to do even more in this realm; the enthusiasm and expertise is available.

Recommendation 8.1

We encourage NOAO to view deferred maintenance as a critical part of the balance in the near and far term.

Recommendation 8.2

We endorse pursuing more partnerships, while also reiterating our strong belief that NOAO facilities should remain available for open access for the great majority of the time.

Recommendation 8.3

We encourage NOAO to cooperate with the efforts to develop a funding source to ground-based observational studies and remove the necessity to apply for telescope time and data analysis funding separately.

9 Telescope proposal process

Proposing for telescope time on NOAO facilities is the activity in which the greatest number of NOAO users participate. As the NOAO system of observational capabilities becomes larger and more complex, it will become more important for users to be able to search for desired capabilities across the full range of instruments offered on NOAO telescopes. A great step towards this end is the “Capabilities Search by: Observing Mode, Wavelength,

and Aperture Class” at <http://www.noao.edu/science-capabilities.php> but it appears that many users who could benefit from this feature are not yet aware of it.

As the capabilities of the telescope system increase, including some telescopes on which small numbers of nights are available through TSIP, it is becoming more common for a given observational program to be feasible on more than one telescope/instrument combination offered through NOAO. Radically different oversubscription factors can cause users to apply for the second-best instrument for their science if the best match appears to be less likely to succeed, or to submit multiple proposals for the same project. The current proposal form does not allow users to specify a “second choice” or “alternate” telescope/instrument combination, although some do so informally in the proposal text and NOAO has shown flexibility in being willing to consider this under some circumstances.

Recommendation 9.1

The capabilities search page should be linked directly from the proposal information pages. If possible, it should be updated to specify the range of wavelengths covered by each instrument (only some offer this information) and to allow multiple boxes to be checked for a given category (e.g. both Small and Medium sized telescopes).

Recommendation 9.2

The NOAO proposal form should be augmented to allow proposers to specify explicitly a “second choice” combination of telescope/instrument/number of nights in case the first choice is already unavailable when time is being assigned.

10 Time Allocation Committee review

The most frequent source of disappointment for users is having their proposals declined by the Time Allocation Committee (TAC). This is inevitable, as a healthy observing system requires oversubscription factors of at least two so that competitive pressure leads to high quality proposals receiving time. However, it is easy for disappointed proposers to suspect political motivations for what were actually scientifically honest decisions. The best way to create faith in the review process is to make it as open as possible by letting users know that the instructions given to TAC members match the posted “policies for time allocation” and that TAC members are drawn from all sections of the astronomy community.

In particular, there appears to be some confusion over whether the “Use of Other Facilities or Resources” box is part of the TAC evaluation; the current latex template says under (1): “We will use this information to guide the evolution of the NOAO program; it will not affect the success of your proposal in the evaluation process.” but it is not clear if this statement applies (or should apply) to (2) about grant status

Recommendation 10.1

If possible, the instructions given to TAC members should be made public, so that proposers know the criteria on which their proposals will be judged.

Recommendation 10.2

NOAO should publicize widely the invitation to volunteer for the TAC that appears at

<http://www.noao.edu/gateway/tac> .

Recommendation 10.3

NOAO should clarify, in the TAC instructions, LaTeX template, and Policies for Time Allocation, whether the “Use of Other Facilities or Resources” box is part of the TAC evaluation. Any part of the proposal that is not supposed to be reviewed by the TAC should appear on a separate page that can be removed before the TAC sees it.

11 Communications between NOAO and its User community

NOAO makes a strong effort to communicate information about its facilities and activities to the user community, through its website, the quarterly Newsletter, and the shorter web-only Currents publications. The revamped NOAO website offers added value for both the public and the astronomy community, although minor improvements are still needed (such as a clear link to the Users Committee on the Astronomers main and “Contact Us” pages). The Newsletter and Currents are highly professional and offer valuable information, but the Newsletter in particular is not well matched to a user community that is inundated with electronic and print information and often ignores both except when it is directly needed. Indeed, Users most typically seek out information at the moment it is needed by using the website, and the online documentation is not always as thorough as one would like.

Recommendation 11.1

NOAO should recalibrate its communications efforts to focus on full online documentation that gets updated dynamically (the NOAO Data Handbook is an excellent example), with Newsletter/Currents focussed on drawing attention to updates.

Recommendation 11.2

NOAO should consider sending targeted emails to groups of users most likely to be interested, e.g. announcing the MOSAIC data reduction pipeline to all recent MOSAIC run PIs. Even email sent to all users is more likely to be read by those interested if it covers a single topic with a related subject line.

Recommendation 11.3

NOAO should consider publishing the Newsletter once per semester, to coincide with the Call for Proposals when users naturally begin looking for info on new instruments, last semester’s proposal statistics, etc. NOAO should also provide an online list of recent Newsletter (and Currents) article titles with links to PDFs of the articles, so that astronomers can skim the list or search the HTML for e.g. “NEWFIRM” and/or “2009A.”.