NOAO Response to the 2008 User's Committee Report

NOAO thanks the users committee for their thoughtful report and hard work on behalf of the users of Cerro Tololo, SOAR, Kitt Peak, WIYN, and Gemini. Community feedback and input are the lifeblood of the National Observatory.

1-KPNO and CTIO

Recommendation 1.1
NOAO should continue its maintenance and upgrade programs on small- and medium-aperture telescopes, and, as much as possible, upgrade their instrument complement at both CTIO and KPNO, especially on the 4m telescopes. These facilities remain the centerpieces of the system as envisioned in the ReSTAR report.

NOAO: We plan to continue efforts to upgrade and refurbish the facilities at CTIO and KPNO which began with the Senior Review. A positive response for the NSF regarding ReSTAR funding will be acted upon quickly for new instrument starts. The TCS upgrade and primary support work at the Blanco are on-going as part of the DECam project.

Recommendation 1.2
NOAO's efforts to maintain and enhance relations with the Tohono O'odham nation should be continued and supported.

Local outreach and relations with the Tohono O'odham Nation are among the four primary roles for NOAO's re-scoped Education and Public Outreach Office (EPO). In addition, the Kitt Peak Director's office will continue to build its relationship with the Nation.

Recommendation 1.3
We endorse the plans to celebrate the 50th anniversary of KPNO in conjunction with IYA 2009.

Elizabeth Alvarez and the KPNO Director's Office along with the 50th Anniversary Steering committee are spearheading the effort to celebrate and publicize fifty years of merit based, open access observing at the National Observatory. EPO head Steve Pompea will play a major role in the IYA as PI of a joint NOAO/AAS grant to support this activity in FY09. The KP 50th was a centerpiece of the NOAO AAS booth in Long Beach.

Recommendation 1.4
Adequate analysis tools and cookbooks are essential to the scientific output of the observatories. The current efforts towards final Mosaic and NEWFIRM data reduction pipelines should continue. For the other existing instruments, adequate support to ensure that there are cookbooks for data reduction and analysis is a high priority.

Among the specific, high-level items considered to be top priority for the new Science Data Management Program (re-scoped Data Products Program) are Wide Field imaging data processing (i.e. pipelines) and a NEWFIRM cookbook. The ReSTAR program will include, at a minimum, new data reduction handbooks for all new instruments that will use available IRAF tools. SDM is also tasked with updating existing handbooks.

Recommendation 1.5
Some mechanism should be implemented to keep observers informed about the efforts being made to address the issues they report on end-of-run reports.

Both KPNO and CTIO track user input and concerns. We agree that it would be beneficial to close the loop an report back to users. We will investigate the means to do this.

Recommendation 1.6
An additional effort should be made to emphasize to the community the availability of new instruments and capabilities on SOAR.

NOAO will work with the rest of the SOAR partnership to ensure that the capabilities now becoming available are publicized (for example, through the NOAO newsletter and web announcements) and that useful descriptions of these capabilities are available through the NOAO website.

Recommendation 1.7
We emphasize the importance of wide-field imaging capabilities in the north, and encourage NOAO to pursue all creative solutions to the ODI cost overruns. For whatever ODI modes are eventually supported, a data pipeline should be provided.

NOAO has been working with WIYN management and the WIYN board to craft a plan to finish ODI. NOAO is committed to the current board resolution authorizing ODI be funded to completion at the $11.1 M level (this includes $0.9M contingency). NOAO will cover its share of the extra costs to completion which include resources for a phase 1 data pipeline which will produce images with the instrument signature removed and quick look capabilities.

Recommendation 1.8
We endorse pursuing additional partnerships for instrument and/or telescope time sharing when such partnerships provide tangible benefits (i.e., instrument or software that would not otherwise exist, rather than simply financial support). At the same time, we reiterate our strong belief that NOAO facilities should remain available for open access for the great majority of the time.

*NOAO has completed, or soon will, its current agreements with the University of Maryland, Clemson University, the University of Illinois, and Yonsei University (*Korea*). These agreements have been based on both instrumentation partnerships and operations partnerships and have provided telescope time to the partners in exchange for valuable contributions to the Observatory. The NSF has directed NOAO to minimize future partnerships in order to maintain the highest percentage of publicly accessible time possible on its facilities. Future partnerships will continue to be approved by NOAO oversight groups as well as the NSF just as past partnerships have been.*

No further agreements are presently planned for KPNO, but the Dark Energy Survey (DES) will make a major contribution to the Blanco 4m instrumentation suite with its Dark Energy Camera (3 degree prime focus CCD imager). The DES will begin in 2011 and run for five years during which time the DES team will be awarded approximately 30% of the Blanco time.

NOAO continues to offer small (<10%) allocations to be made by NASA TACs through HST, Spitzer, Chandra, and GLAST cycles. Historically, the amount of time allocated through this peer reviewed path is < 10% in total, but has been effectively used as evidenced by publication statistics.

Recommendation 1.9

In anticipation of NEWFIRM's move to the south, NOAO should continue to work to guarantee access to mid-to-wide-field NIR imaging in the north.

Planning for the NEWFIRM move to CTIO is on going. Part of the process will be to consider what additional capabilities could be provided in the North while NEWFIRM is in the South. Current capabilities include WHIRC (3' FOV) on WIYN and possibly the continued use of Flamingos (10' FOV) at the Mayall. We believe Flamingos requires some refurbishment to remain a top-notch instrument, and we will consider working jointly with the University of Florida to refurbish it when NEWFIRM goes south.

The timing of the move south is also under discussion at this point in time. We want to avoid an overload of activity at the Blanco 4m with the installation and commissioning of the Dark Energy Camera.

Recommendation 1.10
We recommend that food services at both KPNO and CTIO be improved, especially for vegetarians at CTIO.

KPNO and CTIO remain committed to providing excellent food services for our observers and clients on Kitt Peak, Cerro Tololo, and Cerro Pachon. We are happy to note that the KPNO director received no complaints from users about food quality or service during 2008, but rather several compliments on the quality of the food provided. There were requests for more options for "night lunch," but increasing options would currently require an increase in cost (stocking more food) that cannot be supported at this time. We will take as an action item the improvement of vegetarian options for visitors at CTIO.

2- ReSTAR

Recommendation 2.1
We endorse NOAO's three-phase plan to implement ReSTAR initiatives and reinvest in KPNO and CTIO.

We appreciate the Committee's support of the ReSTAR process and implementation plan. A phase 1 proposal has been submitted to the NSF to obtain funding for optical and near infrared spectrographs for the NOAO 4m's, infrastructure renewal, public access to the Palomar 5m and DCT 4m, and design studies for new 2m telescopes to further develop the LCOGT robotic telescope system.

Recommendation 2.2
At least in Phases II and III of ReSTAR implementation, we encourage NOAO to pursue as transparent and open an instrument selection process as possible, including broad discussion with the users community and careful review of competing options.

Follow on implementation of ReSTAR phases 2 and 3 will include open calls for proposals.

Recommendation 2.3
We believe that trading nights on the Blanco 4m in exchange for increased access to the Goodman spectrograph on SOAR is worth pursuing as long as it is consistent with continued oversubscription rates.

We will pursue all time trades that enhance the ability of the US community to gain access to the capabilities they need.

Recommendation 2.4
The committee emphasizes the need for high-resolution optical spectroscopy in the south, and suggests that NOAO pursue temporary availability of the 4m echelle spectrograph at the Blanco telescope.

The echelle does not currently fit within our current resources and operations plan for the 4m. NOAO is assisting the LNA (the national observatory) in Brazil with the STELES echelle spectrograph for SOAR, by facilitating LNA's hiring of outside (US-based) mechanical engineering resources. Through this assistance, LNA is significantly accelerating development of STELES. In the long run, STELES will provide a much more modern and efficient route to this important scientific capability.

Recommendation 2.5
In order for NOAO facilities to remain competitive, the observatory should continue to support, develop and provide mature, user-friendly data reduction and analysis software and documentation for all instruments. New instrumentation should have a full data pipeline; the minimum requirement for existing instruments is to provide simple, step-by-step cookbooks.

We agree that effective pipelines are needed for modern instruments. NOAO will work to complete basic pipelines for optical and near infrared imagers (MOSAIC and NEWFIRM). We are currently studying the needs for an ODI pipeline and what can be provided by NOAO and the WIYN consortium in a tightly constrained budget outlook. The Dark Energy Survey will provide a pipeline and archive (for storage and retrieval of raw and reduced images), and NOAO is involved in this effort.

NOAO is currently capturing all data coming off NOAO telescopes in a permanent archive (storage and raw data retrieval).

All ReSTAR instruments will be deployed with effective tools to reduce the data which they produce. The first order requirement is for data reduction manuals and step-by-step guides which will utilize IRAF tasks.

NOAO's new Software Data Management (SDM) program is working on a number of these aspects. The current scope of work for SDM includes the following:

0. The movement of NOAO facility-generated FITS files from the telescope acquisition computer systems to SDM safe storage, and in the case of DECam DES data, additionally to the NCSA DES data management facility.
0. The archiving of NOAO facility-generated FITS image metadata into a system that enables PIs and public users to query and retrieve their raw data electronically.
0. The pipeline processing of raw data from NOAO's workhorse instruments: MOSAIC, NEWFIRM, and in the future DECam.
. The archiving of pipeline processed reduced data products, so that PIs and public users can query and retrieve their reduced data electronically.
0. The creation and/or distribution of software and scripts enabling NOAO PIs and public users to reduce raw data from NOAO's workhorse instruments: MOSAIC, NEWFIRM, and in the future DECam.
. Legacy IRAF support
. Management of a Help Desk in support of the above activities.

3-ALTAIR and Gemini

Recommendation 3.1
NOAO should ensure that the red CCD upgrade to GMOS actually happens.

NOAO is committed to making sure that this upgrade remains a top priority for Gemini. US SAC and board members see this as a high priority as does NGSC director Verne Smith. However, NOAO has no direct line of responsibility or control over Gemini instrument decisions. We are working with the US Gemini SAC and board members and also through the ALTAIR process to make US community interests known to Gemini.

Our understanding is that the GMOS-N instrument will receive new devices in 2009.

Recommendation 3.2
We urge NOAO to ensure that various upcoming instruments come on-line as planned (e.g NICI, FLAMINGOS2, GNIRS etc.). Providing a suite of upcoming instruments (especially in the South) will go a long way to addressing the user community's concerns about the system's large telescopes in general and about Gemini in particular.

We agree that these near term instruments are key to improving Gemini's capabilities for the US community and international partners. But again, NOAO has no direct control over the deployment process for specific instruments at Gemini. We expect the ALTAIR committee which reports to NOAO to make the near term deployments a high priority.

NOAO is helping with GNIRS through technical consulting and we are currently set up and ready to test the replacement Aladdin 3 arrays for Gemini (a Monsoon controller and Dewar have already been tested with an engineering device). Two potential science grade arrays were delivered to NOAO, but have had to be returned for re-packaging to allow them to be installed in the GNIRS detector mount. The arrays should be returned in several weeks for testing at NOAO. The test results will be used by Gemini to choose the replacement device.

NICI is currently on Gemini South and taking campaign science data. The data appear to be of excellent quality.

NOAO oversees the Flamingos 2 contract for Gemini and has been involved in the recent acceptance testing at the University of Florida. The testing has produced good progress toward a ship decision, but Florida still has several outstanding issues to resolve. It is expected that final pre-ship acceptance will be achieved in Q1 2009.

Recommendation 3.3
We encourage NOAO to investigate some form of remote observing or "eavesdropping" on large telescopes in the system.

NOAO will continue to work with Gemini to improve PI access to the telescopes. We are set up in Tucson to do remote observing and this remains an important option for US Gemini users. NOAO, through the NGSC, is independently moving forward with plans to increase the number of classical observers that visit Gemini. We will support roughly 10% of US time scheduled via classical observing, including paying for two observers for each successful proposal scheduled. NOAO arranged with individual PIs in 2009A to make trips to both sites. The number of classical runs for 2009A is approximately 30% of the US time for that semester.

Recommendation 3.4
We recommend that NOAO investigate ways to alleviate the perception that the time spent on observation preparation is not commensurate with the actual amount/quality of

data acquired for users proposing on Gemini. We commend the attitude of learning to manage users' expectations. The data quality aspect may be ameliorated by Recommendation 3.3, in that an eavesdropping mode will fix both operational problems and perceptions.

We believe NOAO is a model of support for the US community interface to Gemini. Our NGSC staff will continue to work with PIs in the phase 2 process to enable timely and efficient preparation of phase 2 programs. NGSC has participated in recent long range planning meetings with Gemini staff in an effort to improve the completion rates of all accepted programs. Incomplete programs are the source of the bulk of unhappiness with phase 2. NGSC continues to work at ensuring the highest quality data are produced for programs that are observed. Poor data are also cause for frustration after investing significant time in phase 2.

Recommendation 3.5
We recommend giving observers guidance on how to optimize their chances in getting Band 3 observations done; since short programs are much more successful, perhaps even give an upper limit to the time allowed in Band 3.

Band 3 strategies are a regular part of the NGSC dialog with US PIs. Our NGSC staff are experienced Gemini observers and know how to maximize the chances for Band 3 success. NGSC has written a number of newsletter articles on this topic and will continue to educate observers.

Recommendation 3.6
We suggest that NOAO simplify the requirements in Phase II. One possible tactic would be to provide more useful templates for doing simple observations in Phase II.

Our NGSC staff has contributed significant template observations which are now in use as parts of the Gemini standard XML libraries. We recognize that proper templates ease the burden on PIs as well as NGSC (and Gemini) staff. Occasionally, Gemini has revised the libraries to remove templates and revert to using phase 2 "components" in lieu of full observations. We have argued strenuously with Gemini that this is counter-productive.

4-LSST

Recommendation 4.1
NOAO's contributions to LSST design and development bene_t the user community by helping guarantee LSST's success; those contributions should continue. But the level of contributions may need to be revised to avoid jeopardizing other high-priority needs at KPNO, CTIO, and Gemini.

We agree that care is needed in balancing the NOAO portfolio in these difficult budget times. Our current plan which re-scoped the NOAO FY09 budget plan paid particular care at balancing the present (KPNO-CTIO) and future (LSST). We feel the current plan preserves recent gains at KPNO and CTIO while protecting our (near term) future, principally as a major partner in the LSST. We expect to learn more about the FY09 budget and FY10 plans from the NSF in the coming months. We are presently looking at options for either an increased (for which we are hopeful) or decreased (for which we will be prepared) budget.

Recommendation 4.2
The level of community engagement should be increased. Toward this end, NOAO should help LSST advertise for the next call for community participation in science

collaborations and continue to provide informational assistance to prospective applicants.

We agree that community engagement in LSST is crucial. Following our successful proposal cycle for participation in the LSST science groups, we will look forward to future cycles.

Recommendation 4.3
Availability of the LSST simulator to test cadence options and new survey designs is important for the user community; anyone planning a new science project or science collaboration is likely to need this. We urge NOAO to lobby for completion of and access to the simulator as soon as possible.

The simulator is an important tool for realizing effective use of the LSST and planning for science. NOAO had an initial role in its development, and we plan on re-engaging in the simulator when more scientist support can be added to our LSST program.

Recommendation 4.4
It is important for the users community that complete LSST data products be easily available and understandable to all potential users in the US and international communities, not just to science collaborations, and we urge NOAO to continue advocating for this.

We agree. In the run up to science operations, this will be a key goal/activity for NOAO.

Recommendation 4.5
Las Cumbres and the ReSTAR spectrographs are a start towards providing LSST follow-up for bright objects including transients; faint object spectroscopic follow-up requires wide-field multi-object capability on large aperture telescopes -currently a glaring need in the NOAO system, as discussed elsewhere in this report.

We are aware of this "hole" and are working on plans to begin to fill it. The need for wide-field spectroscopy is evident even without LSST. NOAO is working with various stakeholders in wide-field spectroscopy to see what can be done. A first step is a Notice of Intent to present options to the Astro2010 Decadal Survey Committee. Arjun Dey of NOAO is leading this effort on the NOAO side.

5-Data Products Program (DPP)

As mentioned in section 2, above, DPP is now reorganized into the Science Data Management program (SDM)

Recommendation 5.1
The observatory should support at a significant and continuing level the development of a data pipeline for each new instrument. A bare minimum, preferably to be reserved for existing instruments only, is a clear, user-friendly data reduction cookbook.

We agree. See section 2 for details.

Recommendation 5.2
Practical software tools such as IRAF should be available to all NOAO users for all common data reduction and analysis needs.

We agree. IRAF support will remain an important aspect of SDM for the foreseeable future.

Recommendation 5.3
NOAO should complete development of the NEWFIRM and MOSAIC pipelines.

We agree. The MOSAIC pipeline development is complete and it will soon begin serving reduced data to PIs through the NOAO portal. See also section 2.

Recommendation 5.4
The observatory should provide a mature scientific data pipeline for ODI, calling if necessary on the WIYN partners to help support its development.

We agree. ODI will be completed with a quick look capability and basic instrumental signature removal software. A follow on project to produce fully reduced images and account for long term archiving of the ODI data is being developed by the WIYN partners.

Recommendation 5.5
NOAO should provide appropriate data acquisition, reduction, analysis, and archiving support for new (e.g., ReSTAR) instruments.

We agree. See section 2 for details.

6-GSMT

Recommendation 6.1
Within the boundaries of the currently restricted financial landscape, NOAO should continue to seek ways to participate as actively as possible in the development of GSMT and to advocate for 30-meter access for the entire US user community.

NOAO is fully committed to supporting the US community public access to GSMT. We are currently working with both US projects (TMT and GMT) to complete project status reviews to inform the Astro2010 Decadal Survey. NOAO held a community workshop in June 2008 to help engage US astronomers in the science case for GSMT. A report of this conference is being produced and will be made available to the community. We plan to continue to work with the US community by building support for the GSMT science case and to ensure that each project will address community needs when the NSF commits to a community share. We plan to involve more NOAO scientists in this activity as our budget improves.

In the mean time, the NOAO director is working with the GSMT Science Working Group (SWG) to re-organize their activity around the near term development of a Community Science Requirements Document.

Finally, NOAO scientists have presented talks in recent science related meetings for both TMT (Knut Olsen, Joan Najita, Verne Smith, June, 2008) and GMT (Katia Cunha, Ken Hinkle, Verne Smith, January, 2009).

Recommendation 6.2
NOAO should seek a clearer governance structure and more direct line of communication and decision-making in future GSMT institutional agreements than those currently in place at Gemini.

NOAO is aware of this issue and will work to ensure effective input for the US community.

7-Overall Balance

Recommendation 7.1
We reiterate that to address questions of overall balance of NOAO's efforts, it would be very helpful for the Users Committee in future meetings to be shown a rough NOAO budget breakdown so we don't need to seek it out independently. Our goal here is not to micromanage, but to be effective in advising priorities.

We acknowledge the need for the Committee to have basic budget information and will provide a suitable summary in advance of future meetings.

Recommendation 7.2
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. However, we suggest that NOAO consider revisiting or at least more explicitly justifying the currently large commitment of resources to LSST.

We believe the current plan appropriately balances the present and future needs of the Observatory, but we will be mindful of how that balance evolves as our budget outlook evolves (and in the context of NSF funding decisions for major new initiatives like LSST). We believe that the community's needs and interests in LSST can be best secured when NOAO is an active participant in project development; furthermore, the resources contributed to the effort represent skills and experience that are critical to LSST's success. We hear the Committee's concern and will strive to justify our position in future meetings and discussions with the Committee.

Recommendation 7.3
We believe the observatory's efforts to provide workhorse spectroscopy and O/IR wide-field imaging in both the north and the south are appropriately prioritized, and we recommend continuing those efforts at a high priority, including perhaps a temporarily de-scoped ODI if budget overruns prohibit initial completion of the fully specified instrument.

We appreciate the Committee's current positive view of our instrumentation development/implementation plans. We are working with WIYN and the ODI team for a successful outcome for ODI (see also Recommendation 1.7).

Recommendation 7.4
We recommend continuation and possible expansion of the graduate student travel support program.

We recognize that the National Observatory has a special commitment to training new astronomers and we will continue to support graduate study at our telescopes. As of 2009A, we are supporting travel for two observers for each classical run at Gemini, including graduate students and their advisors (we have supported graduate student travel to Gemini in the past as with other NOAO facilities).

Recommendation 7.5
We urge NOAO to cooperate with the NSF/AST working group that is exploring possibilities for a User's Grants program for all NSF-supported ground-based observatories.

NOAO will be happy to work with NSF in implementing such a program, but emphasize that it will need to be funded in addition to our current base level of support. We believe support for User's Grants would have a strong, positive impact on our program and telescope subscription rates.