



## ReSTAR—An Exercise in Defining Community Needs

Todd Boroson

The NSF Senior Review report urged NOAO to ensure that community access to observing facilities remains scientifically balanced over all apertures, both in the present and in the future—into the era of Pan-STARRS, LSST, JWST, ALMA, GSUMT, and the NVO. In response, NOAO formed the Renewing Small Telescopes for Astronomical Research (ReSTAR) committee and charged it with developing a prioritized, quantitative, science-justified list of capabilities appropriate to telescopes with apertures less than 6.5 meters, together with estimates of the number of observing nights needed. NOAO asked the committee to solicit input from the broad community to address the current needs and uses of such telescopes, and to attempt to predict how these needs will evolve over the next ten years. The ReSTAR committee concluded its work in December 2007 and issued its recommendations. The full report can be found on the NOAO Web site.

The committee was chaired by Caty Pilachowski (Indiana University), and it included members from a diverse set of institutions. However, the charge to the members was not to be representatives, but to use their contacts and experience to solicit input from as large a segment of the community as possible. The committee composed a Web-based survey and, through a variety of means, was able to elicit quite a large number of responses. Over 160 individuals wrote in, some adding input from other members of the group in which they worked. From this input, the committee was able to synthesize a blueprint of a system of facilities that they felt confident would satisfy most of those who considered themselves users (or potential users) of the ground-based optical/infrared (O/IR) system.

The report includes a fairly comprehensive overview of the kinds of science that can be done on small (<2 meters) and mid-size (2–6 meters) telescopes, categorized by discipline. Each set of problems includes a discussion of needed instrumental capabilities and needed operational capabilities. It is interesting to note that the uses of telescopes in this aperture range are not limited to the capabilities that we traditionally think of as being their strengths: wide-field imaging and multi-object spectroscopy, which are used

for surveys to find samples for more detailed study later with larger telescopes. Instead, there is a broad set of interesting astronomical problems that can be solved through traditional types of observations on telescopes of this size, so long as they are equipped with modern, high-performance instruments. In addition, a significant fraction of the community sees the opening of the time domain as motivating the development of a global network of small and mid-size telescopes, operated to allow an array of follow-up observations at various cadences.



Of course, the findings of the ReSTAR study lead to a number of recommendations for various attributes of the system of facilities. A few of these that are particularly important for guiding NOAO's next steps follow (in my own paraphrasing):

- The number of nights needed on 2–4-meter telescopes for the broad community (no access restrictions) is the equivalent of about eight telescopes. Current availability is a bit less than half this number.
- The priority for improvements or enhancements should start with strengthening the infrastructure of the existing federal telescopes. Next, these telescopes should be equipped with modern, high-performance instruments. Then, new telescopes should be added to the system, either by incorporating non-federal telescopes by buying time or forming partnerships or building new telescopes.
- The instrumental capabilities that are the most highly desired are standard, “work-horse” capabilities, optical and near-IR imaging and spectroscopy at both medium and high resolution. These should be available on the telescopes to which the community has the most access.

- The non-federal telescopes can provide important complementary capabilities and can supply some of the additional access that is needed. These facilities should meet standards of usability that will guarantee successful community use.
- A new component of the system that will be needed in the future is a network of facilities able to carry out time-domain observations and follow-up on discoveries that come from LSST and other investigations that will open up the time domain.

If the ReSTAR report can be thought of as providing a blueprint, we now have to begin putting a program together to build this system (and we have to start by getting construction permits). NOAO will begin by submitting a white paper to the NSF that lays out the steps we would like to take over the next five years to begin to address the needs of the community that responded to ReSTAR. The infrastructure improvements are already in progress, but the program will include new instruments, new partnerships, and new telescopes. We think of this as a supplement to our core program (described in our proposal to renew our cooperative agreement). We will post this white paper for community discussion and comment as soon as we submit it to the NSF.

A final point to remember is that the ReSTAR discussion was limited to telescopes of less than 6.5 meters. The system needs to broaden its consideration—in terms of choices, such as what aperture telescope is best for certain capabilities, and in terms of how facilities of all sizes can work in complementary ways to answer scientific questions.

Therefore, NOAO will form a new committee—a large telescope version of ReSTAR—to solicit community input aimed at devising a similar blueprint for the large telescope piece of the system. Although this effort is in its early days, watch for announcements of chances to provide your ideas. Especially given the new opportunities within the Gemini partnership, I expect that this large telescope activity will have as much, if not more, influence as ReSTAR is having.

# NOAO's New Program: The Process

Todd Boroson

The term of AURA's cooperative agreement to manage and operate NOAO is five years, and so every five years, we write a proposal to extend this agreement for the next term. The last time that there was a need for a new cooperative agreement, the NSF held a competition. This time, it was recommended by a management review, and accepted by the NSF, that this be a non-competed proposal. This decision turned out to be particularly fortuitous, because it came at a time when we were restructuring our program to be aligned with the recommendations of the Senior Review. Thus, we were able to discuss many of the ideas for the changing program with the NSF astronomy division (AST) staff, whose interpretation of the Senior Review report we are working to address.

Our cooperative agreement renewal proposal was submitted to the NSF 1 December 2007. With their permission, the NOAO section

of the proposal is available through a link on our home page, or you can access it directly at [www.noao.edu/dir/ca/noao-coop-agreement.pdf](http://www.noao.edu/dir/ca/noao-coop-agreement.pdf). I say "the NOAO section" because this is an AURA proposal to operate NOAO and NSO, and so we are only making public the part that describes the NOAO program in this new cooperative agreement period. If you read it, you will see many of the ideas that have been presented in the *NOAO/NSO Newsletter* over the last year, particularly the December 2007 edition, in which we tried to present a comprehensive overview of the NOAO section.

NSF/AST is now carrying out a review of the proposal. A committee has been formed, and they will be making site visits, starting with one to Tucson in late February. The new agreement is scheduled to start 1 April 2009 and run through 31 March 2014.

## The New NOAO e-Newsletter: *Currents*

Joan Najita



NOAO now distributes an e-newsletter, *Currents*, which is intended as a sparkplug for communication between NOAO and our community. *Currents* provides updates—and solicits community input—on NOAO observing opportunities, and NOAO programs and policies, on a more rapid timescale than is possible with the quarterly *NOAO/NSO Newsletter*. The incentive for *Currents* comes from the NOAO cooperative agreement renewal proposal to the NSF, which describes the new five-year program for NOAO. The proposal, now available via a link on the NOAO home page (or directly at [www.noao.edu/dir/ca/noao-coop-agreement.pdf](http://www.noao.edu/dir/ca/noao-coop-agreement.pdf)), elaborates on the description of the new NOAO program that was given in the December 2007 *Newsletter* ([www.noao.edu/noao/noaonews/dec07/pdf/](http://www.noao.edu/noao/noaonews/dec07/pdf/)).

In a nutshell, the renewal proposal reaffirms our mission of providing broad community access, based on peer review, to a complete and balanced System of state-of-the-art facili-

ties, including telescopes of all apertures, and the data from these facilities. The proposal describes how NOAO is altering its program in order to better accomplish this mission. The proposal also describes the principles by which the System will evolve and the importance of maintaining an active dialogue with the community in setting the appropriate balance of capabilities. *Currents* is one of the mechanisms by which we aim to maintain that dialogue.

### The First Issue

In the first issue of *Currents* (which was distributed in mid-February and is available at [www.noao.edu/currents](http://www.noao.edu/currents)), the *Program Update* ("ReSTAR and Beyond"), describes the recommendations of the Renewing Small Telescopes for Astronomical Research (ReSTAR) committee, which created a blueprint for developing a system of telescopes with apertures of 2–6 meters. A similar study focused on larger-aperture telescopes is on the horizon.

The *Gemini Update* ("The Gemini Opportunity") summarizes the recent news fluctuations regarding the Gemini partnership. It also raises the issue of how the Gemini partnership might evolve over the long term for the benefit of the US community.

The *Science Spotlight* ("Constraining the Cosmic Evolution of Type Ia Supernovae") illustrates how spectroscopy on a range of telescope apertures, from 1.5–10 meters, can be used to address an important problem at the frontier of astrophysics. In developing the System described in the cooperative agreement proposal, NOAO aims to make a similarly broad range of capabilities accessible to all astronomers in the community.

### Contact Us

Is there a topic that you would like to see covered in a future *Currents*? If you are planning a regional astronomy meeting or department internal symposium, would you like someone from NOAO to give a presentation on our new program?

Please contact us at [currents@noao.edu](mailto:currents@noao.edu). We look forward to hearing from you! If you did not receive the first issue of *Currents* and would like to receive future issues, please send an email to [currents-list-on@noao.edu](mailto:currents-list-on@noao.edu) to add yourself to the distribution list.