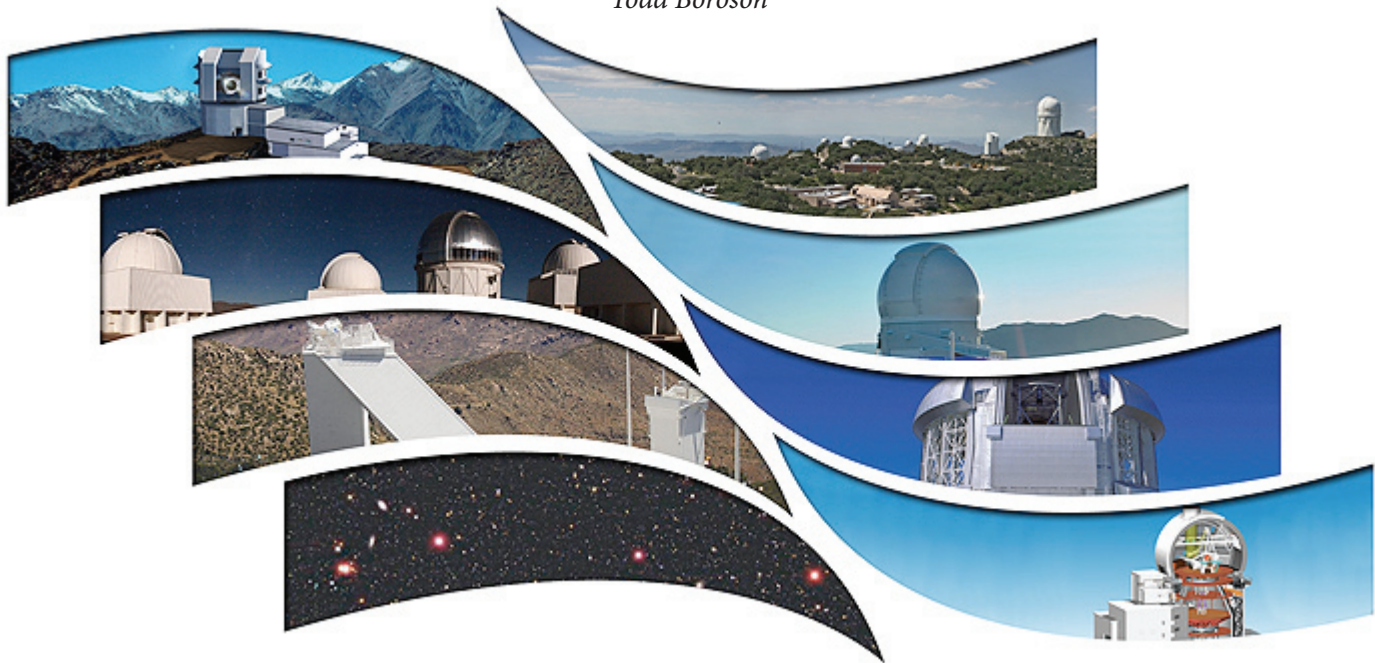


The New NOAO Program: A Synopsis of Our Cooperative Agreement Renewal Proposal

Todd Boroson



By the release date of this *NOAO/NSO Newsletter*, AURA will have submitted its proposal to the NSF to renew our agreement to operate NOAO, running until March 2013. This proposal will not be competed, so we are eager to share its contents with the community now. The development of the new five-year program has been an effort in which the entire staff participated, and so I have asked the *Newsletter* section editors to provide individual reports on the plans for each part of the program. In this article, I will give an overview.

The new NOAO program is guided to a great degree by the recommendations of the NSF Senior Review and subsequent discussions with NSF astronomy division staff. Stripped to its essentials, the program can be summarized in two overarching goals:

1. provide access to an optimized suite of high-performance telescopes of all apertures
2. engage the community to ensure that everyone knows what NOAO is doing and NOAO knows what the community wants.

Each of these goals will be implemented through multiple activities.

The phrase “optimized suite of high-performance telescopes” requires that we make sure that the telescopes we are operating are, in fact, efficient and well-instrumented. Therefore, we are renewing the infrastructure at our Kitt Peak and Cerro Tololo observatories by improving and updating the mountaintops (e.g., roads, utilities), by modernizing the operation of the telescopes (new control systems for telescopes and instruments), and by installing the support facilities (clean rooms, sky monitoring instruments) that will allow us to develop and deploy new, modern instrumentation.

The other 90 percent of the job is to build a complete, robust system of capabilities that are aligned with the community’s aspirations. This is a multi-part process that has started already with the Renewing Small Telescopes for Astronomical Research (ReSTAR) committee, which has gathered a great deal of community input and is formulating

recommendations that will determine what we need to build and how much of it. That optimized suite—including, potentially, new instruments for NOAO telescopes, new access to existing telescopes, and partnerships to develop new telescopes—will begin to become more obvious when ReSTAR completes its work. I expect to begin informing you about the details at the winter AAS meeting in Austin, Texas, this coming January.

This ground-based optical/infrared system is not limited to the small and mid-sized telescopes that ReSTAR is examining. It includes the Gemini Observatory and other large telescopes, and ultimately, the telescope initiatives of the last decadal survey: the Large Synoptic Survey Telescope (LSST) and the Giant Segmented Mirror Telescope (GSMT). Therefore, the NOAO Gemini Science Center (NGSC) and our LSST and GSMT programs will all be working to fit better into this new context. For NGSC, this will mean a renewed effort to translate community desires into more observing nights, better support, and new instrumental capabilities.

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The New NOAO Program continued

The second goal, “engage the community,” is less of a recommendation from the Senior Review and more of an observation of what we must do to be successful. It is clear that relegating the breadth of researchers and educators who use our facilities to a single word, “community,” is a gross simplification, and this is actually part of the problem.

There are some astronomers who are driven to solve the next big problem; some who want to bring their students along on their observing runs so that they can learn how far to trust the data; others who have found a fascinating object or phenomenon and want to continue to study it to understand it better; and still others who want to remain active researchers because it makes them more effective teachers. There

are many people for whom several of these motivations apply. What we have learned is that our program cannot choose one of these above the others. The national observatory must serve the national community.

So, what you will see in the future is a *balanced* program. It will attempt to provide those capabilities needed to carry out the best science, but it will recognize that astronomy is a rich subject in terms of interests and in terms of techniques. As a result, the job of engaging the community is twofold: first, in order to be seen as successful, we must explain what we are doing in a way that leads to trust; second, in order to evolve, we must understand what our constituents and potential constituents want now, and what they will want in the future.

The first will involve the renewal of some traditional media, and the use of some new ones. We will work to keep our current activities in public view, and we will do it in ways that will force people to stop thinking of us as the same old NOAO. The second will involve developing new ways to solicit public input. I think that the 150 surveys submitted to the ReSTAR committee are a good start, but what I envision in the longer term is more of a dialogue.

The articles spread throughout this *Newsletter* will give you some idea of the priorities of the new program. Come to the NOAO town meeting at the Austin AAS meeting (Thursday, January 10, at 12:30 pm) for a more complete and detailed description, and the start of this new discussion. ■

Instrumentation for the System

David Sprayberry

Viewing the NOAO instrumentation program in the context of its role as steward of the entire system of ground-based optical/infrared (O/IR) capabilities motivates a new outlook for those efforts. Under AURA's previous cooperative agreement with the NSF, instrument development work at NOAO was directed primarily at building instruments for Gemini. As the flagship publicly available facility, Gemini remains at the core of the US System, and so NOAO will continue whenever appropriate to support the construction of new instruments for it.

However, just as the whole “System” is much broader than Gemini alone, the NOAO instrument program should look to address the broader instrumentation needs of the rich range of telescopes that make up the System. Future NOAO instrumentation projects will address this broader goal of ensuring that the US community has access to a state-of-the-art suite of properly instrumented telescopes of all apertures.

In keeping with this broader role, the instrumentation program will become part of a new System Division at NOAO. Inclusion within the System Division will help ensure that the scientists, engineers and technicians working on instrument projects are aware of and able to support all System-related activities that involve or may affect instruments and their applications. It will also allow the instrumentation program to draw on the strengths of other parts of the System Division when needed to serve an instrument project. In connection with this organizational change, the instrumentation program will also change its name from “Major Instrumentation” to “System Instrumentation.”

In the short run, very little will change in terms of the day-to-day work going on within the System Instrumentation Program. As the current AURA cooperative agreement comes to a close, we have just completed

the NEWFIRM wide-field infrared imager for the NOAO 4-meter telescopes. We are hard at work on the SOAR Adaptive Module (SAM) and on new development work for applications of the MONSOON controller to support large focal plane imagers (the WIYN-One Degree Imager and the Dark Energy Camera for the Blanco), and we are supporting the infrastructure improvements on existing KPNO and CTIO instruments. Those efforts will continue into the term of the new cooperative agreement and through to completion.

The primary change with the start of the new cooperative agreement will be a refocusing of our scientific and engineering leadership on planning new developments in service of the entire System. We have supported the efforts of the Renewing Small Telescopes for Astronomical Research (ReSTAR) committee to identify the scientific capabilities most urgently needed on mid-sized telescopes throughout the System, and we will continue to apply the conclusions of ReSTAR in proposing for supplemental funding to carry out its recommendations. In addition, we will be working as appropriate with the operating divisions—CTIO, KPNO, and NGSC—and with the other parts of the System Division such as the Telescope System Instrumentation Program and the Giant Segmented Mirror Telescope Project Office to support and promote the aspects of their work that require expertise in instrument development and maintenance.

As we progress through the term of the new cooperative agreement, we anticipate that there will be exciting opportunities to develop one or more new instruments. These developments may be built for a telescope that NOAO operates, such as the Blanco or Mayall, or in which NOAO is a direct partner, such as SOAR or WIYN. Or these developments could be built for other telescopes whose owners/operators have agreed to participate in the national System.

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Instrumentation for the System continued

The ReSTAR committee will very shortly release its recommendations for improvements that the System needs, and immediately following that report NOAO will begin seeking funding for such improvements and negotiating arrangements with other interested parties to realize these enlargements and enhancements of the System. The System Instrumentation Program will be a vital part of the whole process of funding, negotiating, and implementing the ReSTAR recommendations.

One thing that will not change is that NOAO's instrument projects will be carried out via partnerships with other institutions, such as university instrument programs. A partnership approach to instrument building makes sense, both as a matter of good policy and as a matter of programmatic necessity. It is good policy because it encourages broader community involvement in the System by engaging the community's

talents and providing resources to support those talents. It is necessary for the success of the program because NOAO does not have the in-house resources to complete an entire instrument project of any scale and must supplement its own strengths with those of complementary partners to get a significant project done. By partnering with university groups and other observatories, we are able to take on larger projects and in doing so, we are able to ensure that the goals, designs and executions of the project are connected to the community's needs and strengths.

The new cooperative agreement will be a period of significant and continuing evolution for the System Instrumentation Program. We are confident it will provide a number of exciting opportunities to enhance the capabilities of the US ground-based O/IR system.

The GSMT Program Office – The Next Five Years and Beyond

Jay Elias

The most recent decadal survey recommended national participation in an extremely large telescope (ELT) as its highest priority for ground-based astronomy. The AURA New Initiatives Office was formed in response to this recommendation to pursue a "Giant Segmented Mirror Telescope" (GSMT) with a 20-meter aperture or greater, and began laying the groundwork for such community participation. This effort evolved into a partnership with the Thirty Meter Telescope (TMT) project, as well as provision of some NSF funding for the design and development of the Giant Magellan Telescope (GMT) project, both of which intend to develop and construct an ELT, with first light occurring around 2016. This date is critical because it provides overlap between full science operations of the ground-based ELT and the operational period of the James Webb Space Telescope.

The NSF Senior Review, held last year, recommended that federal participation in TMT and GMT be scaled back, in recognition of the lack of availability of construction funding on the timescale desired by both projects. The NSF followed this recommendation, and directed AURA to withdraw from direct participation from TMT and GMT, although some design and development funding for both will continue through FY 2009. However, eventual community access to a telescope (or telescopes) of this size remains a goal, and the AURA New Initiative Offices morphed into the GSMT Program Office (GSMTPO), with the continued mission of the pursuit of this goal, as outlined below.

Significant federal funding for participation in an ELT project will not be potentially available until after 2010, so the NSF has indicated that the upcoming decadal survey should re-examine the priority for such participation. GSMTPO's first task, therefore, is to revisit the science case for GSMT community access. This effort is being led by the GSMT Science Working Group, which has also been restructured to include a larger proportion of representatives from outside the two US ELT projects.

The revised science case will examine not only large "key project" science efforts, but also the prospects for small "principal investiga-

tor-class" programs. It will do so under the assumption that federal participation in an ELT will be as part of a robust system of optical/infrared telescopes including the full range of apertures now supported. The NSF has designated NOAO as its GSMT Program Manager, so GSMTPO is also "observing" the progress of both GMT and TMT by attending major design reviews and scientific working group meetings, in much the same way as other potential partners for the projects. This role may expand to include the European ELT effort as well.

In addition, GSMTPO is in the final phases of a site survey carried out in cooperation with TMT. The work is expected to result in the selection of a specific site for TMT around the middle of next year, and the publication of the survey data for all the sites under study. NOAO may elect to continue work at a site (or sites) not selected by TMT if there is a strong community interest in further characterization of that site.

GSMTPO efforts after the next decadal survey will depend on the survey committee's recommendations, on the prospects for NSF financial support of community ELT access, and—of course—on the status of the two US-based projects. Both projects are currently figuring out how to proceed in the absence of secure NSF funding. If the NSF budget permits it, funding support eventually could come in the late phases of construction, for example for additional instruments (with opportunities for community participation), and in support for operations after construction. GSMTPO would then shift from an observer role to that of a partner, representing the interests of the US community.

Clearly there is much uncertainty involved, but if plans to double the NSF budget over the next decade materialize, and if this increased budget is reflected in funding for astronomy facilities, there is a real and exciting prospect for community GSMT access and the science opportunities it would provide. In the meantime, GSMTPO will be working to ensure that NOAO and the community are ready to take advantage of the opportunity when it arises.