

Renewing Small Telescopes for Astronomical Research (ReSTAR)

Final solicitation for proposals to partner with NOAO in Phase 2

December 1, 2010

Executive Summary

NOAO is engaged in a ten-year, three-phase program to address the ReSTAR committee recommendations to revitalize the suite of U.S. telescopes with apertures up to 5 meters. The process described in this document is aimed at identifying institutional partners for a proposal to NSF/AST to fund the second phase (FY 2012-14) of this program. Potential partners may propose to build or improve instrumentation, provide open-access telescope time, or, in some other way, strengthen and improve the part of the U.S. ground-based OIR System in this aperture range. An open meeting was held in Tucson on November 15, 2010 for potential proposers to discuss this draft solicitation and understand how they might participate. Clarifications and modifications resulting from that discussion are incorporated into this final revision.

1. Background

Following the 2000 Decadal Survey, a substantial part of NOAO's program has had the goal of advancement of the System – the ensemble of all astronomical facilities and capabilities to which U.S. astronomers have access, whether public or private. This effort was brought into sharper focus by the NSF Senior Review, which advised that NOAO “should deliver community access to an optimized suite of high performance telescopes of all apertures...”. NOAO convened two committees, ReSTAR and ALTAIR, to examine community needs and prioritize the development of new capabilities or increased access or performance in two telescope aperture ranges: up to 5 meters for ReSTAR, and 6-10 meters for ALTAIR. The ReSTAR report, and a description of that study, can be found at <http://www.noao.edu/system/restar/>.

The ReSTAR report was widely disseminated in 2008, and NOAO proposed for community discussion a ten-year program, divided into three multi-year phases, to address the recommendations of that report. For the initial phase, which was intended to run during the period FY 2009-2011, NOAO identified a set of (a) infrastructure improvements, (b) instruments representing new or improved capabilities, (c) desired telescope partnerships to provide additional open access, and (d) studies to explore areas in advance of activities anticipated for future phases of the program. For the instruments and telescope partnerships, NOAO identified

and approached a small number of potential partners in the community, who then participated in the proposal to the NSF for funding.

The proposal was reviewed by the NSF and has been funded on a year-by-year basis. Funding in the first year (FY09) is being used to improve the detectors and controllers of two heavily-used NOAO instruments (Mosaic-N and Hydra-S), build a new multi-object optical spectrograph (KOSMOS) for the Mayall telescope in partnership with the Ohio State University, and buy a 1/16 share of the Hale 5m telescope at Palomar for community access for a period of three years. Funding in the second year will be used for building two new instruments for the Blanco telescope, a duplicate of the new Mayall spectrograph (COSMOS), again in partnership with OSU, and a copy of the TripleSpec infrared spectrograph, in partnership with Cornell University.

Earlier this year, NOAO reconvened the ReSTAR committee, and asked them to review progress on addressing their original recommendations and to prioritize activities for a phase 2 proposal (which we refer to as ReSTAR-2), to be submitted to the NSF early in FY 2012. They were also asked to recommend a process for community engagement in carrying out the ReSTAR activities. As described in the 2008 white paper that laid out NOAO's view of the ten-year program, it was seen as desirable to draw as broadly as possible from the community in finding partners for ReSTAR development. This was not done through an open selection process for phase 1 only because of the delay that would have resulted. The report of the ReSTAR update effort can be found on the ReSTAR web page mentioned above.

The ReSTAR committee proposed an open solicitation and selection process, which NOAO intends to follow. This is a solicitation for proposals to partner with NOAO in a ReSTAR-2 proposal to the NSF. NOAO desires to have the same four elements of advancing the system as components of this phase: infrastructure improvement, new instrumental capabilities, increased access, and studies for future activities. The exact nature of each of these items is to be determined, in part through a review of proposals from external groups. Our expectation is that this program will be funded at a level of \$3-4 million per year.

An additional part of the process was an informational meeting with prospective proposers to discuss the details of this solicitation, the process of selecting the partners, and collaborating on the proposal to the NSF and the subsequent activities. This meeting took place on November 15, 2010.

2. Eligibility

Participation in this program is open to all U.S. institutions and to foreign institutions under certain circumstances. For U.S. institutions, we regard any benefit to the research infrastructure as a desirable outcome of this program, including strengthening the ability of U.S. institutions to serve their communities with improved capabilities. For foreign institutions, we must look in a more limited

way at the benefit to the U.S. community, either through capabilities that would be otherwise absent or through increased telescope access. However, in all cases we are open to ideas about arrangements that would result in a stronger (U.S.) System.

We also note here that, while the ReSTAR committee considered telescopes down to 1m in aperture, we believe that our interest in telescopes with “workhorse” capabilities is limited primarily to apertures of 3m and greater. We are also interested in smaller telescopes that deliver unique capabilities that are still of broad interest – networks or arrays that deliver time-domain or multi-wavelength coverage are examples.

3. Criteria for selection

This section presents our current ideas about what will be important in reviewing and ranking proposals. We have tried to make these descriptions specific enough that potential proposers can understand our rationale, but still flexible enough to encourage creative proposals.

Proposals will be reviewed and ranked according to the following criteria:

a. Relevance to ReSTAR priorities

The ReSTAR reports (the original report and the 2010 update) provide an overview of the current state of the System for 1-5m aperture telescopes. They also list the desired capabilities (see Section 4), with varying degrees of detail and give estimates of the amount of access that would support a healthy community of researchers. While we are not compelled to strictly adhere to the details of these reports, we believe that, over the long term, success will be judged by how well we have delivered the capabilities that the community has said that they want. Thus, all proposals for new capabilities, etc., must provide justification in terms of the ReSTAR recommendations.

b. Balance of overall System

One of the strongest arguments for the System perspective is the ability to make the overall suite of capabilities more efficient by eliminating unnecessary duplication in favor of broader access. Thus, we are looking for an ultimate set of capabilities across NOAO and non-NOAO facilities that is balanced with respect to community demand. The set of proposals selected for participation in the subsequent proposal to NSF will demonstrate that balance.

c. Model for participation

We can imagine a variety of different types of proposals for both instrumentation and telescope time. Our preference is for those that help to produce a more integrated and stronger overall system. Thus, telescope time should be granted through the NOAO TAC. Instruments based on existing and demonstrated technology will be stronger proposals because there will already be community experience and expertise. While proposals for instruments could define efforts independent of NOAO, our preference would be for partnerships in the work. Additionally, we believe that telescope access partnerships do not have to be limited to organizations buying and selling nights; access trades and consortia such as SMARTS may be a more effective way to strengthen the system.

d. Value

We are looking for proposals that provide good value to the System, and, in particular, to the open-access community, as compared with their cost. However, we do not see this selection as a marketplace where it is simple to compare offers based on dollars/night. Instead, we see this effort as having the goal of a stronger system for everyone. It is our hope that this perspective will pervade the discussion and find its way into the proposals. For example, all other things being equal, a proposal that would use funds received for telescope time to improve observatory infrastructure rather than just offset costs of operation would receive preference. That said, it will be necessary to give significant weight to the value that the proposed deliverables add to the System relative to their cost. Also, for proposals that relate to specific telescopes, additional weight will be given based on the aperture.

4. Process/schedule for this solicitation and selection review

This document is a solicitation for proposals to partner with NOAO on the ReSTAR-2 proposal. This final solicitation is publicly available as of its release date, December 1, 2010. Public comments and questions should be submitted to restar@noao.edu; such input and our responses will be documented on the ReSTAR website.

An open meeting that included potential proposers, interested members of the broad community, and NOAO staff was held on November 15, 2010. The purpose of this meeting was to discuss the solicitation and its terms, to clarify any aspect of it or the selection process that is unclear, and to explore ideas about how this approach can be used to create a stronger System.

Following the meeting, the solicitation has been revised based on comments received and the discussion at the meeting. All material concerning the solicitation and the selection process will be available continuously through a link on the ReSTAR website: <http://www.noao.edu/system/restar>

Proposals will be due by February 1, 2011. A review panel that includes both external and internal (NOAO) membership will meet to review the proposals.

Given the review panel results, NOAO will select partners and open negotiations with them. Upon agreement with the partners, the NSF proposal will be developed. The goal of the process is to complete the proposal in time to be submitted to the NSF in October, 2011 for funding in FY2012.

5. Items needed to further address ReSTAR recommendations

Based on a reading of the ReSTAR reports and additional information, the following represents our view of the most important potential activities for phase 2:

Instruments

Wide-field imaging in both hemispheres

High-dispersion optical spectroscopy

High-dispersion IR spectroscopy – particularly with broad wavelength coverage

Wide-field optical multi-object spectroscopy

Access

Additional nights on telescopes for open access. Especially desirable are (a) nights on telescopes in the 3-5m aperture range, and (b) nights on telescopes in the southern hemisphere.

Infrastructure

Improved infrastructure at 2-5m telescopes that are components of the U.S. System.

Studies

Studies of adaptive optics for telescopes in this aperture range, from assessment of gains and losses expected with various types of systems to preliminary designs for reproducible hardware.

Studies of optical interferometry, starting from scientific justification, and including plans for community access to existing facilities as well as ideas about development of future facilities.

Studies of the time-domain follow-up problem, including (a) the challenge of making useful the static and dynamic information that will be published by future time-domain surveys, (b) the capabilities that will be required to follow-up the survey observations effectively, and (c) ideas for developing or providing access to those capabilities. These could lead to development or implementation of needed capabilities as they become better understood.

Added following open meeting: We recognize that both optical interferometry and adaptive optics are mature enough technologies and techniques that we welcome proposals that would construct, enhance, or provide access to such capabilities.

6. Required content of proposals

Proposals will have two sections, a text section and a budget. The text section will be limited to 10 pages in length. It will be subdivided into:

- a. Nature of proposed activity – A description of what is being proposed, e.g., a specific instrument for a specific telescope, open access to a specific facility, etc.
- b. Relevance to ReSTAR recommendations – The proposal will describe how this activity would address deficiencies in the U.S. System in the context of the science case presented in the ReSTAR report. This section should include reference to the ReSTAR recommendations, but may go beyond them in arguing (with scientific justification) for specific details or may include additional information about community needs.
- c. Detailed description of proposed execution – This section will include as much detail as possible about how the proposed activity would be carried out. It will include information that would allow the review panel to evaluate the capability of the proposer to execute the tasks proposed. It will also include a specifically designated subsection outlining the broader impacts of the proposed activity.

The budget section will start with a description of the items that the budget covers. It should address any cost sharing or other resources needed or contributed outside the formal budget. It will then include 4 tables, one for each year (FY2012,2013,2014) and one for the total. These tables should contain lists of the budget items itemized sufficiently that the review panel can assess their viability and the value that they represent. Finally, proposers should include CVs of key personnel, including current/pending support and commitments.

Proposals should be converted to pdf format and submitted via email to restar@noao.edu. Receipt of proposals will be acknowledged by email.

It is our intention to convene the review panel before the end of February, and inform proposers of the outcome soon after the panel meeting.

7. Questions concerning this solicitation

Questions about any aspect of this solicitation should be sent by email to restar@noao.edu. Questions received and responses to them will be posted on the ReSTAR website.