



November 2012 • Issue 24

Currents

In this Issue

[SRC Statement](#)

[Contact Us](#)

System Roadmap Committee Statement on the NSF/AST Portfolio Review: Your Endorsement Sought

The [Ground-based OIR System Roadmap Committee](#) (SRC) has issued a statement on the [NSF/AST Portfolio Review Committee](#) (PRC) report. The statement, based on the [2011 SRC Survey](#) of the US OIR community, describes the profound adverse impact on ground-based astronomy and the OIR System if the PRC recommendations are implemented as described in their report. As the PRC report is advisory to NSF/AST, the next critical step is the development of the NSF plan to implement the PRC report. [The SRC statement](#) (see below) makes [several recommendations](#) regarding the implementation that are based on the SRC survey and are intended to reflect the views of the broad community.

If you support the statement, **you may endorse it** at the [SRC petition website](#) by adding your name, affiliation, and checking the "I endorse the statement" box. You may also endorse the statement by sending an email to system.roadmap@gmail.com. **The demonstrated weight of community opinion is important in determining the outcome of the Portfolio Review process.**

Comments and questions on the SRC statement are welcome at an [online community forum](#) or at system.roadmap@gmail.com.

Relevant links:

- Endorse the SRC statement and recommendations at this website: <https://docs.google.com/spreadsheet/viewform?formkey=dC1ISENxMEJOLWVJXy1ldVdPR0RCQnc6MQ>
- Contribute comments and questions on the SRC statement and petition at the [online community forum](#) or via email to system.roadmap@gmail.com.
- The SRC survey results have been described in [previous issues of Currents](#) and were [provided as input to the PRC](#).
- The PRC recommendations and their potential impact are described in the [August 2012 issue of Currents](#).
- [AURA Response to the NSF Portfolio Review](#)
- [Expressions of Interest Invited for Participation in the Operation of Kitt Peak Facilities](#)

System Roadmap Committee Statement on the NSF Portfolio Review Committee Report and the NSF Response

The ground-based OIR System is a critical element in the continued US scientific leadership in astronomy and the pursuit of the science objectives of the decadal surveys (*New Worlds New Horizons* [NWNH]; *Visions and Voyages*).¹ The [Ground-based OIR System Roadmap Committee](#) (SRC) is concerned, based on our [2011 survey](#) of more than 1000 astronomers, that wholesale implementation of the recommendations of the [NSF/AST Portfolio Review Committee](#) (PRC) would lead to major reductions in new instrumentation for and open access to critical elements of the OIR system.² In the long term this would cripple US ground-based OIR astronomy, with profound adverse implications for achieving the science objectives of NWNH. Careful planning is essential to ensure the health of US astronomy in the current heavily constrained budgetary environment. We call on NSF/AST to fully engage the community in implementing the PRC recommendations.

Astronomical Discovery and the OIR System

Ground-based OIR has a track record of phenomenal success in advancing astronomical knowledge and in making major astronomical discoveries. The three most important astronomical discoveries of the last several decades, dark energy, dark matter, and exoplanets, have profoundly altered our view of the universe. These developments were made by highly motivated people with creative ideas who had access to vital OIR facilities and instruments. The discovery of dark energy, in particular, is a vivid illustration of how the OIR System of resources enables discovery.³ Sustaining this “OIR discovery model” requires continued *investment in resources* (e.g., instrumentation development) and the *preservation of observing opportunities* (not just data access) for the broad community.

NSF funding plays a critical role in the OIR System. Observing time on NSF-supported facilities (via NOAO and TSIP) is in high demand by the entire community (both those with and without institutional access to observing facilities)⁴ for progress toward NWNH goals, both now and in the era of LSST and GSMTs. The Mayall, Gemini N, Keck I/II, and MMT in the north, and the Blanco, Gemini S, and Magellan (Baade) in the south are the foundation of the ground-based OIR System,⁵ and NSF support provides open access to this entire suite of facilities. TSIP provides observing opportunities for the broad community on non-federal facilities and plays a pivotal role in funding the advancement of instrumentation in the OIR System.⁶

Implications of the PRC Report and the NSF Response to the Report

While the value ascribed by the PRC to individual OIR facilities regarding their potential contribution to *NWNH* science⁷ is broadly in accord with results from the 2011 SRC survey,⁸ the *funding priorities* recommended by the PRC conflict with these science rankings in important ways. In particular, the Mayall is as highly ranked as Gemini N, but divestment is recommended for it over the substantially lower ranked SOAR.⁹

Impact on Opportunity: Open-access time on 2-m to 6-m telescopes is decimated in the PRC recommendations, with the loss of 700+ nights per year (**more than half** of the open access nights), entirely from the Northern hemisphere.¹⁰ This severely limits the ability of a very large fraction of the astronomical community to compete for grants and observing time on ground- and space-based facilities¹¹ and to position itself to take advantage of future facilities. The imbalance hampers the broad participation that is a goal of NSF funding.¹² The loss of medium-aperture facilities in the north would reduce the effectiveness of the larger-aperture facilities (Keck I/II, Gemini N, MMT) that rely on preparatory work using the survey capabilities of the at-risk facilities.

Impact on Instrumentation: While instrumentation development is critical to the health of the OIR system,¹³ in the PRC recommendations, neither Gemini nor NOAO would have significant instrumentation budgets¹⁴ and the TSIP and ReSTAR programs, currently unfunded, do not have a clear future. These instrumentation programs would be subsumed into a new MSIP program that is asked to address a wide array of other needs and, thus, appears substantially underfunded to sustain significant OIR instrumentation and open access capabilities programs.¹⁵

Recommendations in Developing the NSF Implementation Plan

Maintaining US scientific leadership in the coming decade requires built-in flexibility to possibly changing budget constraints. In implementing the PRC report, NSF should avoid prematurely closing paths that may provide significant value to the community. It should fully utilize all opportunities to leverage NSF investment for the benefit of the entire astronomical community.

Maintain the Health of the OIR System. We call on NSF/AST to work with the community and NOAO on a balanced implementation plan that addresses the priorities of the PRC and supports the needs of the broad community, i.e., preserves open access capabilities as much as possible and funds OIR System instrumentation development at a level that maintains its health. These investments maintain the “bridge to the future” that allows the community to carry out forefront research today and to position itself to take advantage of future facilities such as LSST and GSMT.

Be Flexible. We urge NSF/AST not to prescribe how a reduced budget for NOAO should be managed, but instead to empower NOAO and the community to find creative ways to leverage

NSF funding to maximize the scientific return from NSF investment in facilities.¹⁶ We further call on NSF to remove non-scientific restrictions that may prevent the preservation of open access facilities. For example, the NSF requirement that divested facilities would be divorced in the future from current parent observatory (NOAO and NRAO) portfolios¹⁷ is not required financially and is harmful scientifically.

Preserve Opportunity. The network of Kitt Peak facilities (both tenant and NSF-funded) offers *NWNH* science capabilities and is vital to the health of the broad OIR community. We urge NSF to work with the community and NOAO to develop a feasible transition plan for Kitt Peak in which the reduction in NSF funding for Kitt Peak occurs gradually enough to (1) enable the uninterrupted operation of tenant facilities and (2) allow NSF-funded facilities to transition smoothly to a new funding model in which a larger fraction of their costs are borne by non-NSF sources. To achieve the latter, we call on NOAO and NSF to explore and encourage new funding arrangements for the NSF facilities (e.g., the formation of new consortia and the broadening of existing consortia).

As a highly ranked facility that is at risk, we urge NSF, NOAO, and the community to look for ways to preserve open access to the Mayall, fully or partially. As the PRC stated, “the Mayall... provides one of the most powerful open-access visible and NIR survey capabilities in the North.”¹⁸ It is also heavily used, equally valuable as larger aperture facilities,¹⁹ and plays a critical role in supporting research programs involving other facilities in the US System.²⁰ As one possible path to explore, identifying a new SOAR partner or selling SOAR nights may free up partial funding for the Mayall and lead to better hemisphere balance.

BigBOSS on the Mayall is an example of an opportunity to share Mayall costs with other partners while carrying out highly compelling *NWNH* science.²¹ A more gradual ramp down in NSF funding for the Mayall would enable a smooth transition to BigBOSS and community use of the instrument during (and possibly after) the BigBOSS Survey as well as access to the BigBOSS Survey data. Modest NSF funding for Mayall operations before and during the survey would enable this tremendous resource for the community, a highly leveraged approach. We urge the exploration of this and other opportunities to share costs for and maximize the science return from the Mayall.

Preserve and Coordinate Investment in Instrumentation. Because the renewal and development of OIR instrumentation is critical to achieving the highest priority objectives of the decadal surveys, it is imperative that NSF maintain their investment in instrumentation for the OIR System.²² We further urge NSF to create a funding process that promotes a coherent strategy for instrumentation development across the OIR System.

Engage AURA. *NWNH* asked NSF to “consider consolidating NOAO and Gemini under a single operational structure, both to *maximize cost-effectiveness* and to be more responsive to the needs of the US astronomical community.”²³ The need for cost efficiency is extremely urgent today given the dire budget situation. Because AURA manages NOAO, LSST, and

Gemini, it must be authorized (by AST and the NSB) to respond flexibly to the recommendations of the PRC and maximize the scientific efficiency of NSF funds, while preserving options for more optimistic budget scenarios for as long as possible. This flexibility should include cross-facility (Gemini, NOAO, LSST) optimization of supporting infrastructure(s).

Notes:

¹ The OIR community not only provides the foundational science to address the vital questions of astronomy, but it is also by far the largest element of the astronomical community. Among AAS members in 2009, 54.6% identify themselves as OIR astronomers, compared with 8.9% for Radio, and 4.6% Solar (*NWNH*, Table 4.1). NSF funding for OIR is highly leveraged. OIR is only 35% of the AST facilities budget for 2010-2012, whereas the facilities budget for the much smaller Radio community is 57%. The PRC budget for 2017 would reduce the OIR fraction of the facilities budget to 26% and raise Solar to 17%, with Radio unchanged.

² The Ground-based OIR System Roadmap Committee (SRC) was chartered in 2011 by the NOAO Director to monitor and report to the Director on the state of the OIR system, its health and directions. Also in 2011, NSF/AST established a Portfolio Review Committee (PRC). The SRC provided input to the PRC based on a survey of the astronomical community. Of the 1,178 responses received, 962 were from the US community. The SRC survey and results are described in the [white paper](#) “Ground-based O/IR System Roadmap Committee Community Survey Summary of Results from U.S. Based/Sponsored Respondents” (Jannuzi, Valenti, et al. 2011) and in the SRC [submission to the PRC](#).

³ The OIR System played a prominent role in the discovery of dark energy (<http://www.noao.edu/news/2011/pr1104.php>), employing multiple telescopes and capabilities, both federal (Blanco, Mayall, 2.1m, WIYN) and non-federal facilities. This discovery has been hailed by the PRC as an example of US research leadership in astronomy (PRC report, p. 13).

⁴ The vast majority of US observational astronomers use both federal and non-federal facilities for their research. More than 80% of SRC Survey respondents view open access time as “critical” or “important” to their research (SRC Survey Q10). 83% of respondents to the 2011 SRC survey (see note 1 above) viewed the facilities supported fully or partially by NSF (e.g., KPNO, CTIO, WIYN, SOAR, Gemini, and facilities accessed through TSIP) as “critical” or “important” to their research (SRC Survey Q8).

⁵ The Mayall, Blanco, Gemini N/S, Keck I/II, MMT, and Magellan (Baade) are the most heavily used telescopes in the OIR System (2011 SRC Survey Q6 and Figure 1 of the SRC Survey report) that also offer a significant amount of open access observing time. As shown in the SRC Survey (Q6), more than 20% of survey respondents report usage of these facilities in

the recent past. SDSS is also heavily used by the OIR community, but it does not offer open access time.

⁶ TSIP is “a vital component of the OIR system” (*NWNH*, p. 236).

⁷ PRC report, sec 9.1.1

⁸ SRC survey Q6; e.g., Mayall, Blanco, Gemini N/S are highly valued in the PRC report and the SRC survey.

⁹ In the PRC report, the Mayall is found to be comparable to Gemini N (pp. 99-100), but SOAR is lower ranked (p. 101). In Crabtree’s recent “Observatory Publications July 2012 Update”, which is based on publications from 2006 to 2010, the Mayall is more highly ranked than Gemini on a per telescope basis. Compared to Gemini, the Mayall has a larger number of papers per telescope, a larger average number of citations per paper, and a higher ratio of highly cited to poorly cited papers.

¹⁰ From the recommended closure or divestment of the Mayall, WIYN, and the KPNO 2.1m (PRC report, p. 121).

¹¹ More than 70% of the respondents to the SRC survey (Q19) reported that ground-based OIR data would be “critical” or “important” to research projects they would pursue that relied primarily on observations made with space-based or non-OIR facilities.

¹² Broad participation is a “core value” of the NSF and a priority for all NSF grant programs (<http://nsf.gov/od/odi/broadpar.jsp>). The NSF aims to “advance promising ideas wherever and whenever they arise” (NSF Strategic Plan 2012-2016, *Empowering the Nation through Discovery and Innovation*, p. 2).

¹³ “Without healthy funding to renew instrumentation...we face...a stagnating facility base” (PRC Report, p. 24). Instrumentation development and TSIP in particular is “a vital component of the OIR System” (*NWNH*, p. 236).

¹⁴ PRC Report, p. 87.

¹⁵ See [2012 August NOAO Currents](#).

¹⁶ The PRC supports this approach: “NSF funding is more beneficial to U.S. astronomical leadership when it leverages investments...[from other federal agencies or by private and international organizations] to improve the capabilities available to U.S. astronomers” (PRC report, p. 12).

¹⁷ [NSF MPS/AST Response](#) to the Portfolio Review Report, section 4: “It is anticipated that, if AST determines to divest from an individual telescope, this telescope would be separated from the AST-supported parent observatory in any future management competitions.”

¹⁸ The PRC report notes that “The Mayall and Blanco are excellent platforms for optical imaging and spectroscopic surveys [and are] ...uniquely well-suited among all the world’s 4m-class telescopes to providing high-multiplex wide-field optical spectroscopy (p. 94). The Mayall “serves the critical needs for workhorse OIR instrumentation and for health of the profession as the largest Northern OIR facility offering full-time U.S. open access” (p. 99). “The Mayall provides one of the most powerful open-access visible and NIR survey capabilities in the North” (p. 95) and its “Mosaic camera is currently the most sensitive implementation of ...wide-field optical imaging that is publicly available to U.S. astronomers in the Northern Hemisphere” (p. 94). Of the facilities recommended for divestiture, the PRC recommended “a prioritization with the Mayall highest and most important to preserve” (PRC report, p. 122).

¹⁹ The Mayall is one of the most heavily used facilities: 25% of respondents to the 2011 SRC survey use the Mayall for their research; only Keck I/II, SDSS, and Gemini N had a higher rate of reported use (SRC Survey Q6). Pages 99-100 of the PRC report describe the relative ranking of the 4-m Mayall and the 8-m Gemini N.

²⁰ Figure 1 of the 2011 SRC survey report shows how usage of the Mayall is connected to the use of other facilities in the OIR System, notably Keck I/II, Gemini N/S, Blanco, WIYN, and SDSS. This connection results because a diverse combination of capabilities is needed to pursue Decadal Survey science. The importance of facilities such as the Mayall is expected to continue throughout the decade: 75% of respondents to Q13 in the SRC survey said their research requires a small-medium aperture facility in next 10 years.

²¹ BigBOSS is recommended very highly by the *NWNH* Program Prioritization Panel (see *NWNH*, Appendix D). BigBOSS would provide a critical technical capability for high-multiplex wide-field optical spectroscopy that is needed to address *NWNH* science objectives (PRC report, p. 94).

²² Historically, Gemini instrumentation and the TSIP and ReSTAR programs have together been funded at a very modest level of \$7-8M/yr.

²³ *NWNH*, p. 1-17, 1-18.

• • •

Contact Us

We welcome your input on this issue of *Currents*. Please contact us at currents@noao.edu. We look forward to hearing from you!

NOAO is the national center for ground-based nighttime astronomy in the United States and is operated by the Association of Universities for Research in Astronomy (AURA), Inc. under cooperative agreement with the National Science Foundation.

[subscribe](#) • [unsubscribe](#)