

**Response of the Division of Astronomical Sciences  
to the Committee of Visitors 2002 Report Recommendations  
January 2005**

The report of the 2002 Committee of Visitors for the Division of Astronomical Sciences provided a thorough, careful, and insightful assessment of the state of the Division as of April 2002. The report addressed many issues that were of concern to the Division at the time, and its recommendations have been very helpful in focusing our attention on critical areas. We feel that we have made significant progress in addressing many of the Committee's recommendations, and found ways to take action on some of the recommendations that were outside the control of the Division to address directly.

The specific recommendations, our initial response in 2002, and our assessment of progress since then follow:

- **Our first and most urgent recommendation is to increase the staff in the AST Division.**

*AST agrees that the Division staff is stretched very thin, particularly given the number of present and upcoming vacancies. AST is currently working to fill three vacant positions (one administrative, two scientific), and is facing two more scientific staff vacancies within several months. The Division has done a staffing study to define our needs for additional personnel and has identified the urgent need for a senior administrative management position and additional scientific staff.*

*A number of our positions are filled by Visiting Scientists who come to NSF for two to three years and then return to their home institutions. The Division has had difficulty getting members of the astronomical community to step forward to fill the positions. AST thanks the Committee for its endorsement of the Senior Fellowship concept, and is well along in drafting the solicitation to begin internal NSF clearance of its release. The Division hopes these Fellowships will make the idea of spending several years at NSF more attractive to our community. AST will also continue efforts to work with the American Astronomical Society in encouraging members of the community to fill these positions.*

*AST also agrees with the Committee's recommendation that an adequate travel budget be provided for Program Directors. Within the constrained travel budget, the Division's priorities have been to provide travel for essential oversight and program management of facilities and large projects, which has resulted in very limited funds being available for outreach to the community and professional development and staff training.*

There has been a significant turnover in AST staff since the 2002 COV, not only in filling vacant positions with highly qualified, outstanding managers, but in

converting existing positions upon vacancy to positions that better meet the Division's need. NOAO/NSO and NRAO program management positions are now staffed with permanent NSF employees. Two program officer positions staffed by rotators have been filled with scientist on temporary positions.

However, the number of FTE's assigned to the Division has not increased, and to make progress in addressing the most urgent personnel needs we have converted several vacant positions into those that better meet the evolving needs of the Division:

- Most critical of these was to convert a vacant program assistant position to that of administrative manager/project administrator for the Division. This position was filled in November 2003.
- The vacant program officer position that had been dedicated to Gemini Observatory management was converted to an Assistant Program Officer position with responsibility for grants programs (e.g. the postdoctoral fellowship program) and interagency coordination (e.g. the NSF/NASA Astronomy and Astrophysics Advisory Committee). Gemini Observatory management is shared between the Division Director and Executive Officer

The creation of these two positions has partially relieved the burden on the Division Director and Executive Officer.

- Upon retirement of the incumbent, the technical support position for Electromagnetic Spectrum Management (ESM) has been revised to incorporate high-level and policy-related ESM activities and will be staffed at the PhD level. This position will also help to manage radio wavelength projects and proposals.
- The Division plans to convert a current administrative staff vacancy to a program officer position over the next few months.

Unfortunately, we have had no success in establishing the Senior Policy Fellowship following internal resistance to the program by upper NSF management. In spite of this, we have been able to attract outstanding candidates for all of our scientific positions and are staffed with persons of exceptional quality and dedication.

The Division continues to optimize use of its limited travel funds for the primary purposes of oversight of facilities and large projects and attendance at meetings. While funds do exist for some outreach and professional development, lack of time limits the staff's ability to carry out active outreach programs. Instead, the program staff, and particularly the DD and EO, attempt to combine outreach activities with trips to meetings and have become much more active in utilizing existing advisory committees to exchange ideas and get feedback from the community.

- **The COV recommends that the AST Division develop an implementation plan with funding requirements to the end of the decade to support the various initiatives that have been identified and prioritized by the community in the NRC Decadal Survey. The Division needs to actively engage the community on a continuing basis in the planning effort.**

*The Division is pleased with the Committee's reaction to the strategic planning activity that has been initiated. As reported to the Committee, it is the Division's intention to press forward and complete the implementation plan, the start of which was outlined, and to maintain the flexibility to incorporate new recommendations and community initiatives that will arise as the decade proceeds. AST will actively engage the community through the MPS Advisory Committee, the proposed new, joint NSF-NASA advisory committee, the Committee on Astronomy and Astrophysics, and other bodies as appropriate. This implementation plan will serve as input to the developing NSF-wide planning mechanisms. It will be maintained as a transparent and accessible indication of the Division's understanding of community priorities and how they can be handled within the evolving funding climate.*

As more detailed planning and proposals have been developed in the community, AST has continued its dialogue with the Committee on Astronomy and Astrophysics, both on our plans for implementation and our overall approach to timing and funding. The formation of the Astronomy and Astrophysics Advisory Committee (AAAC) to advise NSF, NASA and DOE on programs involving cooperation or coordination among the three agencies provides another community body that we now consult for implementation planning. AST was an active participant in the OSTP convened inter-agency planning body that produced the report "The Physics of the Universe", a coordinated Federal plan for the implementation of the recommendations in the NRC report "Connecting Quarks with the Cosmos." All of these discussions involve the flexibility to incorporate new ideas and approaches that have developed since the publication of the latest Astronomy and Astrophysics Decade Survey.

In part because of the growth of new areas of research, and in part because of the necessity to coordinate three agencies' actions, the Astronomy Division has taken the lead in forming and charging two community-based interagency task forces. The first has been charged with the provision of a strategy (ground- and space-based) to address questions concerning the cosmic microwave background, leading to an eventual space mission to measure its polarization. The second is performing a similar study to set out a scientific context for near- and intermediate-term efforts that have been, or may be, proposed in advance of projects like LSST and JDEM.

In the time since the last COV, the Brinkman report made a number of recommendations on the management of planning, prioritization, construction, and operation of large research facilities at NSF. These recommendations bear

directly on several of the Decade Survey and other recommendations that the Astronomy division is pursuing, as well as our overall planning and prioritization process. The reaction of the NSF to the recommendations can be found on the NSB web page at (Attachment 1 in [http://www.nsf.gov/nsb/meetings/2004/1004/summary\\_report\\_1004\\_updt.pdf](http://www.nsf.gov/nsb/meetings/2004/1004/summary_report_1004_updt.pdf) ). Largely because of our long tradition of decade surveys and carefully prioritized programs and facilities to address key scientific questions, the astronomical community is being used as a model as NSF sharpens its practices and policies in this regard. The Division has been deeply involved in shaping the NSF approach to responding to the Brinkman recommendations.

Since the time of the last COV, the overall outlook for the growth of the NSF budget has changed from one that might hope for doubling on a reasonably short timescale to one that is perhaps optimistic in looking for flat or only slightly declining budgets for the next five years. In light of this, the ambitions of the community, and the realization that, in fact, the Division has ~\$60M more to spend annually than it did in FY2000, AST has decided that a “Senior Review” of our entire portfolio is called for. We note that such a senior review of AST facilities was also one of the recommendations of the latest Decade Survey.

This review is designed to identify sources of flexibility in our budget amounting to perhaps 10% per year (\$20M) that would be available to invest in the development of new capability, whether technology development (LSST, GSMT, SKA, e.g.), moderate-scale construction (VERITAS, e.g.), limited-term experiments (deep surveys, e.g.) and operations of ALMA. Planning for the senior review is underway, but it will take place with boundary conditions that include no new funds, no impact on the core grant activity, ample opportunity for community input and careful consideration of the impact of any actions on the health of the field.

- **The COV recommends that the AST Division explore new ways to enhance the AST community’s response to the ‘broader impact criterion’ in the review process by emphasizing its importance, clarifying its meaning and usefulness, and illustrating its application. Review panels should also be encouraged to pay closer attention to this criterion and to give credit to investigators who fulfill it well.**

*AST shares the Committee's conviction that the astronomical community contributes substantially to the goals of Criterion 2 and that there is increasing awareness in the community of its importance. The Division will continue efforts to enhance the community response in this regard, not just as something that must be addressed in the proposal and review process, but as an organic part of how the astronomical community regards its research and teaching activity.*

*The Division feels that the review panels are already very effective at providing advice to the Program Directors on the weight given to borderline proposals with regard to issues of diversity, gender equity, new investigators, etc.*

In addition to the intrinsic importance of addressing the goals of Criterion 2, the COV will be aware that NSF policy now requires that every project summary address these goals directly in a separate section or the proposal is returned without review. We have had to return about six to ten proposals each year, providing great impetus to communicate the letter, as well as the intent, of NSF policy to the community. We have set aside time at our AAS Town meetings to feature this; we have written repeatedly about it in the AAS newsletter. In opening remarks to every review panel we now call this out as a vital part of proposal review and spend time with panels discussing it. Our overall impression is that the community is responding more actively and positively in this regard.

In an even more proactive stance, we have established the Program for Research and Education with Small Telescopes (PREST), which works to this goal directly (see updated response on 4-meter class telescopes below).

The Astronomy and Astrophysics Post-Doctoral Fellowship (AAPF) program, now in its fifth year, was designed to foster the integration of research and education early in the Fellows' careers. It has been very successful, is oversubscribed by 6:1, and the AAPF Symposia that we have sponsored in conjunction with AAS meetings have presented an exciting and varied approach to this integration by an enthusiastic cross section of the future leaders of the astronomical community

- **The COV recommends that a vital instrumentation program be maintained for the 4-m class telescopes to which the national community has access.**

*The Committee's endorsement of NOAO actions taken since the previous COV matches AST perception of positive management changes being undertaken at the national observatory. The concern about 4-meter class instrumentation joins the concern about access to telescopes smaller than 4-meters for research and training as challenges brought about by shrinking budgets and growing costs that should be addressed for the health of the field. AST will carefully consider this and the other related suggestions regarding the nature of optical/IR astronomy in the era of 8 meter class telescopes. The Division will work with the community of small-telescope users to seek a solution that provides access to telescopes of all apertures, particularly for those with no preferred access to observational facilities.*

*AST will also consider the establishment of a uniform policy for support of users of all the national facilities.*

*The concept of a program similar to the University Radio Observatories could have a positive effect, but the overall balance of long-term commitments to facilities vs. research grants must also be considered.*

Starting in FY04 a new program, The Program for Research and Education with Small Telescopes (PREST), was established to fund telescope, instrumentation and infrastructure improvements on private telescopes in the ~0.5-2.5 m class in return for access to the facilities by the astronomical research community at large. Funded at \$1.2M in FY04, the program was very popular: 47 proposals were submitted and four projects (one collaborative) were funded. These range from improvements to the Lowell 1.8 m telescope to installation of an array of six-0.4 m photometric and polarimetric telescopes on Cerro Tololo for rapid response observations of gamma ray bursters.

In response to a recommendation of the Decadal Survey, NOAO has begun the development of partnerships with university groups for the development of new capabilities for the Mayall and Blanco 4-m telescopes. The first of these is a collaboration with the University of Maryland on the NEWFIRM project, a wide field near-IR camera for the Mayall telescope. The second is the so-called Dark Energy Camera, an extremely large field, prime focus imager for the Blanco telescope that is currently being negotiated between NOAO and a consortium including Fermilab, the University of Chicago and the University of Illinois.

Other ongoing projects for 4-m telescope instrumentation include those for the SOAR telescope (SOAR Optical Imager, Goodman Spectrograph, and SOAR Adaptive Module) and the WIYN (One-Degree Imager). Time on both of these telescopes will be available to the community via competitive observing proposals.

The TSIP program was originally designed to support instrumentation programs for telescopes with aperture greater than 6 m. The program has been very successful in returning observing time to the community (on Keck, Magellan, HET, MMT, and LBT (when completed)) and the first TSIP instrument (OSIRIS on Keck) will be commissioned in early calendar 2005. In response to recommendations from the NOAO-led Observing System Committee in 2004, the TSIP rules have been modified to allow observatories with telescopes with aperture in the range 3-6 m to apply. Consideration will be given to the lower cost per night of these telescopes in determining the amount of time to be returned to the community. This modification closes the gap between TSIP and PREST with the result that instrumentation efforts on essentially all research-quality telescopes can now be funded with the expectation that observing time will be returned to the community.

At NSF's request, NOAO has begun an effort to assemble information on the telescope resources that are made available by these various programs and publicize this information on the web. A prototype web page for CATCH

(Community Access Telescope Clearing House) was demonstrated at the January 2005 AAS meeting.

NRAO continues to be able to provide more support to users because of the large budgetary increases they have seen through the appropriations process. A more general, uniform approach is under consideration, but is hampered by the lack of funds.

Also, as part of the preparation for the Senior Review described elsewhere, AST has begun considering a number of possible approaches that might help to assure long-term availability of 4-meter class telescopes. However, as mentioned above, these may have budgetary implications that, even though they may be short term, must be considered as part of the senior review process.

- **The COV recommends that the AST Division should help clarify the information disseminated to the astronomical community about various NSF-wide opportunities such as MRI, RUI and other similar programs, by providing simplified descriptions of goals and requirements for these programs. The Division should also encourage additional proposals for these programs from the community.**

*AST agrees that the astronomical community could take better advantage of NSF-wide funding opportunities, but that this requires more understanding of these opportunities. The Division has begun regular discussion at the American Astronomical Society meetings and regular contributions to the AAS newsletter, and will work with the Society to identify other vehicles to disseminate more detailed information. AST staff have begun to make visits to the university community to provide seminars on NSF and AST funding opportunities and intends to increase the number of these outreach visits as travel funds permit. One very useful venue would be an informal section in the AST Web page that could be updated easily and often.*

We have maintained a regular presence in the AAS newsletter, reminding people of these programs and introducing new programs to them. In many cases we have assigned a single program officer for Foundation-wide programs who has been very active in talking with the community and directing inquiries to the appropriate program. The Math Sciences Priority Area (MSPA) and the Information Technology Research (ITR) programs have illustrated a more effective reach into the community for new programs because of this approach. A newly restructured NSF web site will enable us to maintain our own community information pages as soon as the spring.

Additional recommendations taken from the COV report text:

- **Consideration should be given to establishing new UROs in the future as the closing of older facilities provides new funding opportunities, but without impacting the support for research grants to individuals.**

*The Division is carrying out a competitive review of all current and new proposed URO's in the summer of FY2002, and will continue this mechanism in the future to monitor and maintain balance among the URO facilities.*

The FY2002 competitive review took place, and resulted in the consideration of the renewal of existing programs as well as the establishment of new ones. The result of the competition was the continued funding of the CalTech Sub-millimeter Observatory (CSO), Five College Radio Astronomy Observatory (FCRAO), and the California Array for Research in Millimeter-wave Astronomy (CARMA). AST is planning another competition in May 2005 for FY2006 funding. The balance of programs such as the URO activity, national astronomy centers, and support for individual investigators will be examined by the senior review process.

- **The COV is concerned that these efforts require more than the one FTE position devoted to this issue. (ESM activities).**

*AST shares the Committee's concerns and agrees with the need to provide more than one FTE position to Electromagnetic Spectrum Management.*

With the retirement of the previous incumbent, this technical position has been recast as a program officer to provide a higher level of involvement and support for technical, scientific and policy issues in ESM and will be filled by a scientist highly experienced in this area.

Sincerely,

G. Wayne Van Citters  
Director, Division of Astronomical Sciences