

**Annual Report
on Actions in Response to February 2011 COV for the Astronomical Sciences**

Recommendations from the 2011 AST COV on which there have been actions in FY2011 are called out below. For those recommendations not called out, action has not been initiated or no action is contemplated as described in the AST response to the COV report, which follows this page in its entirety.

Recommendation-1: NSF should thoroughly review the staffing requirements of AST to determine the level required for AST to adequately support its base program while playing a leadership role in the complex, international development of the next generation of world-class observatories.

Action in FY2011: AST has hired one new permanent program officer who is being trained as Program Manager for one of our large facilities (Arecibo).

Recommendation-2: AST should conduct a thorough review of present and planned programs and activities across the division (a *portfolio review*) in order to establish a realistic fiscal baseline to accompany the community's scientific aspirations as enumerated in the Astro2010 decadal survey. MPS/AST management should seek community consultation prior to defining the makeup and charge of its portfolio review team.

Action in FY2011: The AST Portfolio Review was organized in the summer of 2011 and held its first face-to-face meeting in October.

Recommendation-6: ATST's ultimate "programmatic home" within NSF should be decided before AST conducts its portfolio review because the portfolio review team will need to know whether or not ATST's operations cost will be borne by the AST division.

Action in FY2011: The home for ATST has not been finally determined. However, ATST and solar astronomy are topics included in the AST Portfolio Review.

Recommendation-7: A decision regarding whether or not to invest in D&D costs for GSMT should await the results of the portfolio review.

Action in FY 2011: This action extends beyond the end of FY2011, but it has been decided to go ahead with the solicitation on GSMT before the results of the Portfolio Review are known.

Recommendation-9: Given the importance of ESM to the NSF and the growing external pressures that are being placed by international commerce on ESM, a decision needs to be made regarding the proper home for the ESM program. The home for ESM must be chosen to ensure that ESM retains a sufficiently high profile to protect scientifically significant parts of the electromagnetic spectrum for research purposes.

Action in FY2011: While ESM remains in AST, the EARS program and program manager have been moved to the MPS Front Office to ensure the visibility that the program requires.

**Reply to COV Report for MPS/AST
March 17, 2011
Jim Ulvestad
Division Director, AST**

Introduction

We thank the members for their willingness to serve on the Committee of Visitors for MPS/AST, particularly since some were invited with less advance notice than we would like to supply. The COV worked hard before, during, and after the February meeting, and we appreciated the chance to share with them our programs and the excitement of the research that is funded by the Division. We particularly thank the COV for the kind words expressed about the diligence, professionalism, and performance of our staff. This document is primarily a response to their nine itemized recommendations, described in the next section.

Recommendations and Responses

***Recommendation-1:* NSF should thoroughly review the staffing requirements of AST to determine the level required for AST to adequately support its base program while playing a leadership role in the complex, international development of the next generation of world-class observatories.**

AST agrees with the implication of this recommendation, that more staff are needed to ameliorate both workload and risk, particularly for the complex international observatories that are on the horizon. As discussed with the COV, we are actively identifying and training backup personnel as possible, but this is affected significantly by both workload and travel budget.

***Recommendation-2:* AST should conduct a thorough review of present and planned programs and activities across the division (a *portfolio review*) in order to establish a realistic fiscal baseline to accompany the community's scientific aspirations as enumerated in the Astro2010 decadal survey. MPS/AST management should seek community consultation prior to defining the makeup and charge of its portfolio review team.**

AST has a program-officer team meeting weekly in order to draft a charge and management plan for the portfolio review, with a goal of presenting these drafts to the MPS Advisory Committee in early April. The plans will be discussed in more detail with the astronomy-oriented members of the MPSAC during their breakout session, and responses tabulated. Before embarking on the review, it also will be described at the NSF Town Hall at the Boston AAS meeting. Because the current budget scenarios, carrying out the review is rather urgent, so we believe it would be counterproductive to have a substantial public comment period on the review mechanism.

Recommendation-3: As it prepares for a portfolio review, AST should consider establishing a set of metrics to measure success – that is, to measure the relative return on investment – of various segments of its portfolio, such as the individual investigator program and major facilities.

This is an interesting recommendation, but we frankly don't know how to implement it. Metrics for individual investigator grants would necessarily be so different from metrics for a national facility that it doesn't make sense to compare them. For example, a national facility may have 1000 users in a year, whereas a grant directly supports no more than a couple people. So in scientists supported per dollar, one might view a national facility as being more effective, somehow. On the other hand, it may be that the number of papers published per dollar is higher for the grants program. Then, if someone publishes papers based on data from a national facility, is this a success of their grant or of the facility funding? It is perhaps slightly easier to compare facilities to each other, but even that is fraught with peril. For example, the VLA will always have more papers per year than the VLBA, because one can make an image in minutes with 27 antennas, but an array with only 10 antennas requires a much longer observing time in order to produce a useful synthesized aperture and a scientific result. If the members of the portfolio review team can develop useful metrics for a cross-comparison, we will be happy to consider adopting them in the future.

Recommendation-4: The Foundation should aggressively explore the innovative use of new technologies to facilitate effective and timely communication with the research community.

The COV made a number of interesting recommendations for ways to make information available. We believe that this must start with developing a way to provide a more timely web presence, which implies (1) navigating our way around various NSF restrictions, and (2) finding someone who has time to take charge of the web communications. A simple practice of posting recent NSF presentations on the web may be useful, but it is often the case that such presentations are more useful for hearing what the presenter says than for reading their content. Developing the varied mailing lists suggested by the COV is an interesting idea, though it will be somewhat difficult to maintain since the half-life of e-mail addresses can be rather short in many cases. AST will form a group to discuss the suggestions by the COV, determine which provide the most return, and propose an implementation plan for trying the additional communication methods.

Recommendation-5: AST should consider options to significantly expand the pool of potential panelists, such as: (a) establishing the expectation that past recipients of grants *should* participate in the review process; (b) communicating the benefits of participation to new investigators or those who have been previously unsuccessful; (c) gathering data on the pool of potential panelists earlier than the present practice; and (d) assembling review panels earlier and, perhaps, using a staggered distribution approach.

Unfortunately, most of the suggestions in the recommendation and in the text surrounding the recommendation have been considered previously, and either met with little success or could not be executed because of the workload required. Our response to this recommendation may

seem rather negative, but this is likely because there is little in the recommendation or the connected discussion that has not already been thought of.

The first two suggestions about community responsibility have been attempted with varying success, and we try hard to bring in new investigators when possible. Anecdotal evidence tells us that one of the biggest problems we face may be our low success rate compared to the workload involved in reviewing a proposal. People find it difficult to devote a week of their professional lives to a panel from which only four proposals may be funded. With respect to panel operations, the suggestion that we have a more uniform “panel-training” methodology is a good one, and one that we will try to implement after we name a new coordinator for Individual Investigator Programs.

In response to the un-numbered reiteration of a 2008 COV recommendation that proposers be told what quartile their proposals fall in, the response is under active discussion within AST. The program officers like the idea of providing more information so that the proposers know whether they need minor changes or wholesale revisions to their proposals. However, providing specific ranking information to every proposer without a summary of the results for the entire research area may create more angst among the proposers, because proposals are sometimes funded out of rank order for a large number of reasons (e.g., Research at an Undergraduate Institution, co-funding for an EPSCOR state, programmatic balance). Such reasoning cannot appear in a panel summary, because it depends on program officer negotiations that may take place months after a panel meets. We expect that we will provide the additional quartile information on a trial basis for a few panels this year and see how well it works.

Gathering data sooner and assembling panels earlier are ideas that we have tried to implement every year, but the efforts always run afoul of the inadequate staffing in AST. The “staggered distribution approach” of generating a large pool of panelists and then distributing them among panels has been tried to a limited degree, but cannot work very broadly. For example, a broad pool of extragalactic astronomers does little good when there is one AGN panel, one clusters panel, one high-redshift panel, and one or two cosmology panels (for example). Mixing astronomers from these different fields would, in our opinion, make for less effective panels, since each panel would have less background in the specific fields being addressed by the proposers. In some sense, this experiment is tried every year with the panels for the Astronomy & Astrophysics Postdoctoral Fellowship proposals, where the panels are much broader because proposals over all of astrophysics are spread among only three panels. Perhaps the greatest difficulty with AAPF evaluation is making sure that reviews are not biased because only one person on the panel knows the field of a proposal very well, and we would not like to repeat this situation with the majority of our grant proposals.

There were suggestions in the text about gathering information in advance via letters of intent or other means of acquiring data about proposer research areas, institutions, etc. Unfortunately, the required workload will not permit us to extract meaningful information from letters of intent, and the other information is part of standard proposal forms dictated by Fast Lane; AST would have no means of acquiring this information by some other process.

Recommendation-6: ATST's ultimate "programmatic home" within NSF should be decided before AST conducts its portfolio review because the portfolio review team will need to know whether or not ATST's operations cost will be borne by the AST division.

MPS and AST continue to press GEO for a concluding set of discussions on the programmatic home of ATST and other solar research. We will not defer the beginning of the portfolio review for this issue, but we expect the answer to become clear during the course of the review, and to be taken into consideration by the panel.

Recommendation-7: A decision regarding whether or not to invest in D&D costs for GSMT should await the results of the portfolio review.

This recommendation may be moot, because it is possible that eventual funding for GSMT construction and operations is not feasible under any budget scenario. However, the potential impact of not investing could be huge on the public/private partnerships in play for each GSMT candidate, and could result in their being no telescope larger than 8-10m available to the U.S. community until after 2025. It is possible that waiting until after the portfolio review for a decision will severely damage one or both GSMT candidates, so deferring a decision for a year could in fact be a decision to never invest. Because of this possibility, we continue to consider our options very carefully, and may not be able to support this recommendation.

Recommendation-8: AST and, more broadly, MPS must develop a realistic plan for decommissioning instruments and phasing out the M&O costs of its current and planned facilities. In particular, AST/MPS should establish and implement finite lifetimes for major research facilities built with NSF funds.

AST has been striving for the past year to develop this realistic plan. Unfortunately, the problems with decommissioning and phasing out facilities seem to be dominated by observatories that were built many years ago and will be very costly to decommission. In fact, the problem is not the lack of planning, it is the unavailability of funding from within the AST Division to execute any feasible plan except to continue a facility funding line for as long as it takes to decommission a site. This is a problem that must be addressed at a broader NSF level if the aforementioned portfolio review is to be truly successful at creating room for future projects.

Recommendation-9: Given the importance of ESM to the NSF and the growing external pressures that are being placed by international commerce on ESM, a decision needs to be made regarding the proper home for the ESM program. The home for ESM must be chosen to ensure that ESM retains a sufficiently high profile to protect scientifically significant parts of the electromagnetic spectrum for research purposes.

The home of ESM is still under active discussion. To a certain extent, it will remain hostage to the implementation (or not) of the National Broadband Plan and the Wireless Innovation Fund,

as well as the beginning of the EARS (Enhancing Access to the Radio Spectrum) program. We note that ESM also is difficult to support in that it has not been a desirable career path for young Ph.D. astronomers; the “graying” of the ESM community leads to significant concerns that there will be almost no astronomers left to support ESM work in a decade. This is particularly true when the many new radio telescopes being developed around the world appear to be absorbing all young astronomers who are being trained in radio astronomy instrumentation.