

Responses to some frequently asked questions about the Senior Review

Questions regarding the process:

1. Was the Senior Review exercise conducted solely to find money to operate ALMA?

Answer: No, the coincidence of the dollar figure set as a target and the current estimate of the U.S. share of ALMA operations is just that, a coincidence. The projected annual need for operations and development from the AST base budget is much larger than either figure.

2. My field was not adequately represented by the Senior Review committee. Why didn't the committee include staff from the facilities, since they are most affected by the outcome.

Answer: The membership of the committee was not designed to cover all possible sub-fields of astronomy, all wavelength regions, techniques, or any other of the many cross-sections through the field. It was designed to have respected, broadly experienced researchers and administrators who could examine the needs of the field from a scientific perspective.

The committee did not include any staff members from the facilities or those associated with any of the managing organizations of the facilities because that would violate NSF policies on conflict of interest. No one can serve on a committee that reviews or evaluates their own organization. The committee did, however, include users of all of the facilities. In addition, the facilities themselves provided a great deal of information to the committee, and had opportunity to respond to questions from the committee and from NSF to provide clarifying information.

3. What is the benefit to the astronomy community of the cuts recommended by the Senior Review?

Answer: As we enter an era of new facilities with ever-expanding budgets, AST is confronted with ever-larger potential operating costs for projects in the conceptual and planning phases. The ambitions of the community, as expressed in the Decadal Survey and similar documents, will vastly outstrip AST's ability to fund facility operation as well as the design and development of the conceptual projects which are already among the community's expectations. Identifying potential cost savings in our current portfolio of projects and devising an acceptable implementation plan for realizing these savings will allow progress to be made on the next generation of astronomical instruments and better position AST for future budget augmentation. Put another way, without pruning our existing facilities, we can expect only very limited growth in the future.

4. Why can't AST ask for more money (from NSF, from Congress, etc.) to cover the increased costs of operating our current and future world-class facilities?

Answer: AST routinely submits requests for budget growth. We will continue to do so in the future. The careful scrubbing of our operations budget facilitated by the Senior Review and the subsequent implementation plan are necessary prerequisites for budget growth and will hopefully position us favorably for future requests.

Questions on specific recommendations:

5. Will the VLBA be shut down? When will the VLBA be shut down?

Answer: The VLBA will be closed only as a last resort, and then only after every effort has been made to identify supplemental support from other stakeholders including the international astronomical community and, perhaps, other federal agencies. The Senior Review recognizes the scientific contributions of the facility and its potential for important discoveries well into the next decade as well as the importance of the VLBA to the success of the GLAST mission. If no supplemental funding is identified, the recommendation is to close the VLBA in 2011, thereby allowing for a three-year overlap with GLAST.

6. Will Arecibo be closed? When will Arecibo be closed?

Answer: Arecibo will be closed only as a last resort, and then only after every effort has been made to craft a sustainable scientific program (albeit with a different operations model than present) utilizing support from all of the shareholders including AST, ATM, NASA and the international astronomical community that presently use the facility. The Senior Review recognizes the scientific contributions of the facility and its potential for important discoveries well into the next decade. What the review recommends is that we seek a different operations model that can accomplish a substantial fraction of that future scientific program at a reduced cost to AST. Cornell management has already provided us such a model; to be sure it does not provide the customary level of visitor support and it changes the model for development of future instrumentation. Such changes are necessary if we are going to have the resources to move into the future. However, it preserves the core scientific capability with support at about 80% of the current level. The review recommends that, once this model is established, AST only provide \$4M per year of this level, the balance being assumed by others.

7. A public letter from the Chair of the Division of Planetary Science of the AAS states that funding for the Arecibo S-band planetary radar program will end in 2007. Why is this unique program being terminated?

Answer: The senior review report makes no recommendation on the future of the S-band radar system. The recommended funding level for Arecibo was judged by the committee, and by AST, to be sufficient to provide basic operational support for Arecibo astronomy programs, under the assumption that survey work would take up a larger fraction of observing time. However, NSF does not determine the programmatic balance among NAIC operations. NAIC management establishes the relative scientific priority of the

Arecibo programs, and could decide to continue the S-band radar operations within the funding envelope provided them by NSF funding even at the reduced \$8 annual budget. Concerns about the termination of the planetary radar program should be directed to NAIC's management at Cornell University.

8. If AST reduces its funding to Arecibo substantially, how will this affect the ionospheric use of the facility? What is ATM's plan to deal with this?

Answer: ATM remains completely committed to maintaining the Space and Atmospheric Sciences group at Arecibo, as well as the 430 MHz incoherent scatter radar. Over the next several years, ATM will work closely with AST, Cornell, and Arecibo staff to ensure that space and atmospheric science research continues to thrive at the observatory.

9. Is NSF in discussion with other institutions (US or foreign) as partners or as operators of the facilities to be closed?

Answer: Yes, the AST has briefed both NASA and DOE on the recommendations of the Senior Review and our plans for implementation. We will welcome discussion with any and all potential operations partners for the impacted facilities following the report's release.

10. With the early shutdown of NSO facilities on Kitt Peak and Sac Peak and the closure of GONG, the ground based public solar facilities will be reduced to only SOLIS prior to the commissioning of ATST. Given that telescope projects always seem to take longer than planned, what is the US Solar physics community to do in the interim? This plan seems to guarantee that the field will wilt just prior to the construction and commissioning of the most ambitious solar telescope ever.

Answer: The shutdown of the NSO facilities on Kitt Peak and Sacramento Peak are part of the long-range plan put forward by NSO as they transition into the era of the ATST. The divestment of the facilities and the establishment of a new home for NSO will be a complex process entailing possible demolition, environmental mitigation, and negotiation with potential new 'landlords' for the NSO headquarters. The Senior Review recommendation reflects their understanding of these complexities and encourages an early start for the preparations. The details of the transition from the existing facilities to the new one will be part of the AST implementation plan. The recommendation for GONG is similar to that for Arecibo and the VLBA. The Senior Review recognized the superb science that GONG has produced and proposed an orderly shutdown for the facility that would allow a transition to a new helioseismology experiment (Solar Dynamics Observer – SDO) as well as the establishment of a GONG legacy database. Specifically, GONG should be closed only if a majority of its operations cost cannot be found from external agencies or partner countries. The recommendation allows for one year of overlap of GONG and SDO operation in order to perform cross-calibration of the instruments.

11. The Senior Review report recommends reduction of scientific staff at NOAO and NRAO. How can the observatories provide leadership for the community if they are not staffed with a first rate scientific staff who have active research careers?

Answer: The intent of this recommendation appears to have been misunderstood. The committee was not stating that a first rate scientific staff is not an integral part of a world-class national facility. The Committee was tasked with setting priorities among many worthwhile activities and programs, and so their statements should be seen as relative, not absolute. Even the activities that are recommended for large reductions in NSF support are not 'redundant to the scientific enterprise.' In this light, we see the recommendation concerning scientific staff as a call for all of us to examine the balance of the size and roles of that staff, taking careful account of the new or changing missions and activity at individual facilities. We are also urged to protect the vital, core function of the scientific staff while looking critically at other activities and roles that may have accrued over times when budget growth was better matched to community ambitions.

Questions about the future:

12. The Senior Review process was conceived and initiated prior to the announcement of the American Competitiveness Initiative. Surely the doubling of NSF's budget included in the latter obviates the need for such draconian cuts. Doesn't the ACI render the Senior Review null and void?

Answer: As part of the American Competitiveness Initiative (ACI) the Administration has announced its determination to double the investment in the physical sciences at NSF, NIST, and DOE's Office of Science. We in AST certainly applaud this stance. It is important, however, to temper this enthusiasm with some budget realities:

- The FY2007 Request, which includes an increase of 7% for AST, is just that, a request, with no money yet appropriated. In fact, current indications are that the NSF (and AST) budgets will remain at FY2006 levels for FY2007 under a continuing resolution.*
- The doubling would take 10 years of sustained fiscal and scientific priority, spanning at least two administrations.*
- A careful reading of the ACI reveals that the total investment in NSF, NIST, and DOE Office of Science is targeted to double; there is no set distribution among them.*

The senior review is as important a planning and budgeting tool in a time of increasing budgets as it is when they are flat or declining. The AST share of the NSF appropriation is not an entitlement; we must support it with carefully determined priorities and defend it by showing the ability to make difficult choices for the good of the field.

13. Do you expect to implement all of the recommendations? What will be the timescale for the implementation plan?

Answer: AST is considering all of the recommendations and has not ruled out any of them. However, there are many costs associated with implementing some of the recommendations for termination of support and relocation or closure of facilities that need to be well understood before an implementation plan is developed. The cost reviews recommended in the report will be carried out in the first half of 2007 and are necessary input to the development of a plan. The national community is being asked to comment on the recommendations, which may lead to modifications to them. AST will consider input from the community gleaned, for example, at the town meetings, as the implementation plan is formulated. The timescale for full implementation of the Senior Review recommendations is five years. Some recommendations may be implemented more quickly than others. AST will keep the community informed as we develop the plan.

14. What if the situation changes before 2011? For example, if SDO is not successful will you still close GONG? Will you revisit the recommendations?

Answer: We will continue to evaluate the recommendations and the need to implement them in the light of future changes in the AST budget, developing partnerships and availability of other sources of support for facilities, the evolving scientific context of our discipline, and your input. Remember the report is advisory to NSF, and although we take all of these recommendations seriously and intend to implement as many of them as realistically possible, we will not follow them blindly or without thorough consultation with the facilities themselves and with the community.

15. Will the recommendations of the Senior Review be considered by the next Decadal Survey Committee? Will the Senior Review be repeated periodically? If so, on what timescale?

Answer: The Senior Review has recommended that consideration of the balance amongst facilities, including their closure to enable more powerful replacements, should be an integral part of the next Decadal Survey and future Surveys. The NSF intends to implement this recommendation. An activity like the Senior Review will be carried out at periodic intervals, as judged necessary. We have not established a timescale for further reviews, although mid-way between decadal surveys may be appropriate.

16. How much money will be saved if these recommendations are followed? Where will the savings go? How do you decide where it goes?

Answer: The amount of money freed up by following these recommendations depends on a number of issues still to be resolved. Obviously, the amount of savings for Arecibo, VLBA and GONG depend on the ability to identify other funding sources. At a minimum they are likely to total approximately \$12M. In the event that these facilities are closed, the savings is likely to be closer to \$20M. Additional savings by altering operations models will have to await the outcome of the cost reviews of each of the observatories we will be carrying out over the next months. In following any of these recommendations, however, there will be significant additional one-time costs associated with the closure or

program termination. Funds released will be reinvested in projects and new facilities of high priority, following the recommendations of community reports, such as the Decadal Survey and in response to proposals judged through our normal merit-review process. We will be proactive in instituting a more strategic framework to guide these new investments, as urged by the Senior Review Findings. In this we will be informed through active consultation with our advisory groups and the community at large.

17. I wish to meet with NSF to discuss the Senior Review findings. How do I set up a meeting?

Answer: *Input from the community is welcome and will be considered as AST formulates its implementation plan for the Senior Review recommendations. We will be conducting a number of town meetings to discuss the report and its implications. Your attendance would be welcome as would email comments. The town meeting schedule will be announced on the AST Senior Review page:*

http://www.nsf.gov/mps/ast/ast_senior_review.jsp – and on the AAS Informational Email Exploder.