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From: Garth D. Illingworth [mailto:gdi@ucolick.org]
Sent: Thursday, June 02, 2005 10:55 AM
To: Martha P. Haynes; Caty Pilachowski
Cc: Van Citters, Wayne; Friel, Eileen D.; Lehr, Dana
Subject: Long Range Planning

Dear Martha and Caty:

Thank you very much for your presentations to the AAAC on the RMS and OIR Long-Range Planning (LRP) group's deliberations and reports. Your committees have put together an excellent summary of the science capabilities and interrelationships between the components of a strong and diverse program in astronomy - and coupled these very nicely with the recommendations of the Decadal survey.

The Decadal Survey recommendations (as well as those arising from Quarks with the Cosmos) provide the framework within which the agencies implement the new projects. However, as we all are becoming aware, the scope of the Decadal Survey recommendations has clearly exceeded the agencies' ability to fund the full range of projects in the current budget climate. A substantial challenge is faced by all communities who are recipients of NSF funding.

None of the 2000 Decadal Survey major projects will be completed this decade. The only major project that will be largely funded this decade is ALMA (from the 1990 Decadal Survey) - and this will not be completed until early in the next Decade. The solar facility, ATST, may be initiated in the next couple of years, but it too is unlikely to be completed in this decade. As has been noted often by the AST and MPS leadership, new starts for GSMT, LST and EVLA II are well into the future (into the next decade, in all likelihood). Even substantial increments in funding later in the decade, if there is an improved fiscal environment, are unlikely to change this scenario by much. Our projects are technically challenging and expensive.

We appear to have moved beyond the point where we can replace old facilities with updated, more powerful versions having similar capabilities. Some tough choices will have to be made based on scientific priorities.

A crucial near-term activity for the astronomy and astrophysics community is the Senior Review that AST plans to carry out this Fall. The Senior Review will need to make recommendations that will help the Astronomy Division reduce its support later in the decade of some current facilities so as to allow the ramp-up to operations of those currently under development (like ALMA). An additional aspect, as AST has indicated, is the need to provide funding to enable technology development for highly ranked Decadal survey projects, since such technology development is a key precursor step to initiating any such projects.

AST has indicated that it needs to free up \$30M per year by 2011. While substantial, this funding wedge can be put into perspective by the ~\$25M needed yearly to fund ALMA operations, the requests for GSMT, LSST and SKA technology development that together total ~\$20M per year for many years, the need for Adaptive Optics funding of several \$M per year, and the ~\$11M additional funding needed for ATST operation in an era when NSO has consolidated sites and closed its older facilities. In addition, the AAAC expects that both the CMB Task Force and the Dark Energy Task Force (DETF) recommendations will lead to increased demand for resources. The AAAC is concerned that even \$30M per year will not enable all the high priority activities - even larger changes may be needed early in the next decade.

MREFC funding for major projects is, of course, a substantial budget increment that benefits astronomy and astrophysics by providing construction costs. However, the non-construction components (technology development, commissioning and operations) of the lifecycle cost of a major project are an NSF/MPS/AST responsibility, as required by the MREFC legislation - and it will be a challenge to increase AST's budget in the current climate. While there will be opportunities to increase funding for AST when the budget situation improves sometime in the future, the support within the NSF, OMB and Congress to utilize those opportunities for astronomy will depend on the community's willingness to transition from current facilities to the new major projects. In essence, we must give before we can receive.

Moving ahead on our Decadal Survey recommendations means that some hard choices await us. Clearly the Senior Review will have to deal with prioritizing current astronomy and astrophysics activities.

In the AAAC discussions after your presentations, the committee noted a few items for your consideration to help give your reports greater impact with the Senior Review (some of these items may be addressed in part in your current reports, but are emphasized here because of their importance):

- 1) development of a prioritized summary (sort of like a roadmap) which would help the Senior Review and the NSF Astronomy Program gain some insight into the community's thinking on the timescales and priorities among the elements of your program. Clearly, the recommendations will carry the most weight if science goals are the overall guide to the priorities. Obviously, it will be of great value to the Senior Review and the NSF AST if the Long Range Planning committees' provided some guidance for the ramp-down of current facility support. The AAAC recognizes the great challenges that this poses for a diverse community, but the Senior Review and AST will have to make choices, and assistance from the affected communities would greatly help.

- 2) the range of the facilities available to the community is large, and, in certain areas, includes facilities that are totally, or in large part, privately-operated (partial operation from non-federal resources also occurs). It would be of value to the Senior Review to have available to them a full summary of such facilities. While this can be provided to

the Senior Review committee by AST, it would be useful if the LRP reports also recognized and discussed the role of such facilities in their overall deliberations/recommendations.

3) it would be useful to have as part of your reports suggestions for further private and international support for operating current facilities - particularly where current facilities enjoy significant involvement by groups that might be responsive to overtures for partnerships for operations. Bringing this to the attention of AST and the Senior Review could help in discussions with potential partners, both private and international.

The AAAC also felt that it would be useful for the LRPs to target a number of reviewers to provide feedback on the draft report. While public comment periods provide some feedback, identification of a few reviewers, as the NRC does for its reports, might provide a more thorough review.

The AAAC recognizes the challenges that this long-range planning effort entails, and greatly appreciates your efforts on behalf of the community. In tough fiscal times, strong emphasis on the science provides both guidance and justification for selecting among the options. The effort that you and your long-range planning teams are investing will be of great value to the Senior Review, to AST and the community as we all face some tough choices in the coming years.

with best wishes

Garth Illingworth

Chair, Astronomy and Astrophysics Advisory Committee