Minutes of the Meeting of the National Astronomy and Astrophysics Advisory Committee

8-9 April 2003

Members attending: Dr. Robert Gehrz (Chair)
Dr. Alan Dressler
Dr. Barry LaBonte
Dr. Bradley Peterson
Dr. Catherine A. Pilachowski
Dr. Abhijit Saha

MEETING CONVENED 8:30 AM, 8 April 2003

The Chair welcomed committee members and introduced all in attendance. The Committee approved the minutes from the October 2002 meeting with no revisions.

Dr. Van Citters summarized the circumstances leading to the formation of the NAAAC and highlighted recent developments in the nature and composition of the committee as defined in the recent NSF Authorization Bill, now public law Pub. L. 92-463. The NAAAC will now have 13 members, 5 appointed by NSF, 5 by NASA, and 3 by the Office of Science and Technology Policy (OSTP). OSTP has not announced their appointments, and when they are known, the balance and expertise of membership will be examined before appointing the remaining 3 members. The legislation also calls for 4 meetings/yr, although 2 can be by telecon. The law does not define term limits, and the committee will need to set these as appropriate. Pub. L. 92-463 also states that the committee chair must be elected from the membership. This action was postponed while the committee waited for an additional member to arrive to establish a quorum.

While waiting, the Committee heard presentations from NSF and NASA staff on the NStars program. NStars arose from SIM preparatory science needs and a basic research perspective with two primary parts: an NStars Database, which was funded by NASA and based at Ames, and a jointly funded research grants program. The grants program was described and some recent research resulting from it was reviewed. NASA staff outlined their programmatic interest in the previous program and presented a new mission critical need for the planned Terrestrial Planet Finder (TPF) that could form the basis of a new joint activity. The TPF Foundation Science Program will include both general science goals and target star related efforts. The committee and agency representatives discussed the benefits of coordinated if not actually joint activities in these areas of science.

With the arrival of Barry LaBonte, the committee had a quorum and turned to the election of the Chair. The Committee, with Bob Gehrz abstaining, elected Bob Gehrz as chair, for a term of one year.

The Committee discussed some of the broad issues they planned to bring up in the later discussion with the NSF Director and Deputy Director.

Dr. Pat Looney, from OSTP, joined the meeting. He presented an introduction to OSTP, describing its organization, staff, role in implementing policies, and stewardship activities. He

reviewed the primary policy topics currently being considered by OSTP, and the Office's work with interagency committees, advisory panels and committees. He described many issues related to the stewardship of facilities, such as priority setting, the impact of mega-facilities, the path for mature facilities (shutdown, upgrade paths, stewardship, transfer), best practices for long-range planning, program business models, etc.

He reviewed HR 4664 (later Pub. L. 92-463), which, in Section 23, details the formation of the NAAAC, and sets out requirements for membership, selection process, chair, coordination, meetings, quorum, and duties.

He described the plans for the Interagency Working Group on the Physics of the Universe formed by the National Science and Technology Council, and their activities leading to an agency response to the NRC report "Connecting Quarks with the Cosmos." In discussion with the Committee, he clarified OSTP's role in these and future activities to arise from the NRC recommendations and the agencies' response.

Wayne Van Citters & Anne Kinney outlined the agency response to the recommendations arising from the October 2002 meeting of the NAAAC. Discussion focused on several areas: the archiving of large datasets and the development of the National Virtual Observatory, the gravitational wave modeling in support of LIGO and LISA, and work to phase the completion of ATST and Solar Dynamics Observatory. The agency representatives described their efforts to meet the NAAAC's recommendations in these areas.

The Committee again urged the agencies to relax the traditional separation of space and ground, and to undertake a greater degree of joint strategic planning. There was some discussion about the role of the NAAAC in facilitating these activities.

Wendy Freedman, co-Chair of the NRC Committee on Astronomy and Astrophysics (CAA), joined the committee by telecon. Discussion focused on defining the respective roles of the CAA and the NAAAC in providing advice to the agencies, particularly in light of the publication of multiple NRC reports and their many recommendations. The role of the CAA is to monitor progress on meeting the recommendations of the NRC Decadal Survey. Dr. Freedman urged the NAAAC to keep these recommendations in mind even with the appearance of new recommendations from other studies, such as Connecting Quarks with the Cosmos, and to be cognizant of the priorities established in the Decadal Survey. It was recognized that the NAAAC is in a position to respond more quickly than the CAA can to requests for advice. The Committee agreed that the CAA plays primarily a strategic advisory role, while the NAAAC is more concerned about specific implementation tactics leading to better agency cooperation and coordination. It was agreed that the CAA would be kept informed of NAAAC activities.

MEETING ADJOURNED AT 12:00 PM – RECONVENED AT 12:30 PM

There followed a series of brief presentations of NSF and NASA program activities in areas of astronomy and astrophysics managed outside the primary programs reviewed in the October 2002 meeting.

Dennis Peacock, Head of the Antarctic Sciences Section, NSF Office of Polar Programs described the organization and responsibilities of the Office of Polar Programs (OPP). In particular he listed the astronomy and astrophysics projects in Antarctica that are now supported by OPP or are planned for the near future.

W. Vernon Jones, NASA, gave a status report on the Antarctic ballooning program that is jointly supported by NASA and NSF/OPP. Dr. Jones' presentation of flight statistics evoked a controversial discussion about NSF support for balloon payloads. From the discussion, Committee members noted that there were still many misconceptions within each agency about the other agency's policies and positions on support for ballooning. Committee members suggested that NSF and NASA must better exchange information and work together to resolve outstanding issues.

Joe Dehmer, Division Director, presented an overview of the NSF Physics Division (PHY) activities. He highlighted astrophysics areas and interagency issues in which PHY is participating.

Michael Salamon, NASA, provided a detailed overview of LISA, the space-based, gravitational wave detector. He highlighted the fact that LIGO and LISA have theoretical and computational problems in common, which a joint NSF--NASA sponsored program might address. The need for a gravity theory program has been identified by a community task group, and NASA and NSF are discussing how resources and needs should be shared between the two agencies. Salamon also presented a potential opportunity for NASA and NSF to cooperate in plasma physics theory.

Thomas Bogdan of NSF Division of Atmospheric Sciences in the Geosciences Directorate presented a review of cooperative NASA/NSF efforts in Space and Atmospheric Sciences. These include: the National Space Weather Program, NSF participation in the Living with a Star planning activities, the Community Coordinated Modeling Center (also a DoD partnership), satellite programs (CEDAR/TIMED, GEM, and SHINE), Peru Rocket Campaign, and NSF Ground-Based Facility support for NASA Space Missions (ISTP, Polar, etc.) Bogdan stressed the informal cooperation of NSF and NASA staff in a number of ways such as joint funding of proposals, serving on each other's review panels, information exchange, informal meetings. He noted the asymmetry in funding levels between NASA and NSF.

The Committee returned to a discussion the perceived dispossession of plasma astrophysics in the context of the space science collaborations, principally in response to a statement in the Lanzerotti report (the first decadal survey in space science). This report expressed a concern that space science 'has no home' and proposed bridged faculty positions. E. Friel noted that the grants program in AST accepts proposals in all areas of astronomy and astrophysics and that theory proposals are generally as successful as those to support observational work. Proposals are reviewed in panels organized by the physical processes that are to be studied and the scientific questions addressed, not pigeonholed into a pre-existing framework. B. Peterson asked whether NAAAC could facilitate understanding of the issues between agencies and awardees. The subject was noted as a topic for further discussion.

Charles Holmes of NASA Office of Space Science gave a brief review of one example of a joint cooperative grants program that could be considered a case study. The CEDAR/TIMED project

involved both agencies with NASA providing the satellite to measure properties at the ionosphere/mesosphere interface and NSF funding ground-based instruments and modeling. This collaborative investigator program was initially funded at $1.5M/yr for two years. Proposals were jointly received but independently selected; there was no co-funding. The program was judged a "resounding success" but a few challenges were noted. These arose from differences in the funding agencies' governing acquisition regulations, evaluation criteria and processes, and selection criteria. Holmes noted that it would perhaps be better to coordinate separate programs with a common goal.

William Smith of the Association of Universities for Research in Astronomy, Inc. (AURA) spoke on his view of the future from AURA's perspective. He noted that it was the committee's responsibility to track and assess their impact on the problems put to them. He expressed his view that the community should proceed with a "community based scientific plan" that identified the desirable scientific outcomes and was consistent with the Decadal Survey. Success of such a plan should be judged by evidence in the integrated President's budget request.

Smith then highlighted what is being done in achieving community scientific priorities in GSMT, LSST, JWST, ATST and NVO. He specifically noted a need for a presence from the SNAP community in the LSST Science Working Group and for better planning in how NASA and NSF should link in the development of NVO. The latter prompted a brief discussion introduced by A. Kinney questioning whether NSF would fund an effort to archive ground-based data. Further discussion was deferred. Smith then accentuated the need for linkage between GSMT and JWST, noting that this must be more than just a link based on their temporal overlap. He noted the need for community-based workshops to understand the scientific and technical links – which telescope would lead in a given scientific endeavor; what instrumental capabilities are needed; what special operational processes would result from such linkages, etc. His proposal was to make the joint community responsible for identifying the complementarities with the agencies jointly developing, coordinating and funding any so-identified synergies.

Smith closed by noting that a clear mechanism should be identified to track the handling of the NAAAC's recommendations through NSF and NASA. This prompted a question from C. Pilachowski as to how the NAAAC reports and responses are currently being handled. It was suggested that this could be a good question for R. Colwell and J. Bordogna.

R. Colwell and J. Bordogna joined the meeting. Colwell praised the Committee on their thoughtful report from their first meeting and AST for their straightforward response to the report. She noted her opinion that a strong collaboration between AST and NASA was long overdue. Bordogna echoed these sentiments and noted that it was very important for NAAAC to be informed well by the agencies in order to establish strong credibility for the Committee. The session was opened for questions.

B. LaBonte asked Colwell for her opinion as to what discipline is doing multi-agency cooperation right. Colwell's response was "astronomy." She also noted medical science (NIH).

Dressler and Peterson discussed the escalating cost of ground-based facilities while noting that they still are considerably cheaper than space facilities. Colwell responded with her impression that the FY04 budget request begins to address some standing problems: (1) cost of facility

operation, and (2) a big request for new tools. She believes that the need for large facilities is beginning to be understood by OMB and they are reacting positively. She stressed the importance of the Committee and the astronomical community at large to argue for increases in the entire NSF budget. She would like to see a budget with 1/3 going to tools.

A brief discussion of the MREFC account ensued with Bordogna noting that a doubled budget would really allow the clearing out of the MREFC backlog. He noted that he liked the astronomy community's shared equipment.

Bordogna stated that it was very important to be well informed on developments of the cyberinfrastructure and to begin to plan on its exploitation. This was seconded by Colwell, who suggested that the Committee should invite someone from CISE to a future meeting. She also suggested that the Committee become informed about advances in nanotechnology, particularly with an eye to how it could bear on future detector development.

B. Gehrz asked how the astronomy community can take advantage of non-traditional sources of funding. Colwell suggested interagency workshops; Bordogna noted that all directorates were open to proposals from all disciplines.

C. Pilachowski asked how NAAAC could help NSF. Colwell responded that it can provide external verification of the authenticity of the research within the agencies (NASA/NSF) and the fact that there is not large duplication of effort at the agencies. The Committee can spotlight the NSF/NASA symbioses. Bordogna urged the Committee to think beyond the specific, to consider the philosophical aspects of integration.

The Committee thanked Colwell and Bordogna for their time.

Jill Tarter (SETI) gave a detailed and informative review of SETI research, strategic planning and the progress on the design and prototyping of the Allen Telescope Array, a collection of 350 6.1-meter dishes with inexpensive electronics and broad frequency range (0.5-11.2 GHz). She argued that the Committee should adopt SETI and ATA as a "poster child" for mid-priced projects ($10-25M/year). She noted that there is a closed window between MRI appropriate projects and MRE level projects in which there is no obvious program for funding. Van Citters agreed on the existence of such gap. A lively discussion ensued. The need for NRC approval was brought up by Dressler who noted that this really was a fairly large project in comparison to others that were being planned. The Committee suggested that Tarter deliver her presentation to CAA and that this might be a subject for subsequent meetings and discussion.

MEETING ADJOURNED AT 5:50 PM, 8 APRIL 2003

MEETING RECONVENED AT 8:30 AM, 9 APRIL 2003

The Committee engaged in a discussion of the steps necessary toward a coordination of astronomy and astrophysics programs of NSF and NASA. The committee identified the major areas to focus on in their report. They emphasized the need to develop the driving scientific ideas and questions behind planned activities and to move from these to specific project implementation.

The Committee discussed with agency representatives the Committee reporting responsibilities and how the timing of their reports would phase with agency budget preparations. The Committee is charged with providing an annual report by March 15th, and to conduct at least 4 meetings per year. The interim report from this meeting will provide input to the planning for the FY2005 budget cycle. In future years, the March 15th report will be in time to provide formal input into NSF and NASA budget preparation.

NRAO VLA director Dr. Jim Ulvestad joined the meeting via videoconference. He provided a brief presentation on past NSF/NASA activities, such as Space Very Long Baseline Interferometry, the Voyager Neptune encounter, and the development of WMAP amplifiers. He then reviewed several present and future NASA/NSF activities, such as joint observing programs, spacecraft telemetry and tracking, and space VLBI. He suggested ways in which the NAAAC could facilitate these kinds of interactions. Could NSF and NASA, for example, set up a cooperative agreement or general framework for agreements that would streamline coordination between the agencies? Agency representatives assured him that interagency MOU's could provide this framework.

W. Van Citters made a brief presentation, addressing questions remaining from yesterday with respect to "mid-scale" instrumentation projects, i.e., large projects too small to meet the MREFC threshold. A funding profile sufficient to support the intermediate scale projects of the Decadal survey would require approximately $30M per year through 2012. In addition, although the larger projects could be done through MREFC, they would require substantial preliminary D&D programs which would have to be absorbed within the Astronomy Division budgets.

The Committee delayed setting a date for the next meeting until the full committee membership is established. A meeting as soon as possible after the membership is determined would be desirable.

The Committee spent the remainder of the meeting drafting their report.

MEETING ADJOURNED AT 3:00 PM, 9 APRIL 2003