

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

19 December 2006

National Science Foundation, Arlington, VA, via teleconference

Members attending:	Garth Illingworth (Chair) Neta Bahcall Bruce Carney Wendy Freedman Katherine Freese Dan Lester	Rene Ong Sterl Phinney Marcia Rieke Keivan Stassun Alycia Weinberger
Agency personnel:	Wayne Van Citters, NSF-AST Eileen Friel, NSF-AST Dana Lehr, NSF-AST	Nigel Sharp, NSF-AST Eric Smith, NASA-HQ Kathy Turner, DOE-HEP
Other participants:	Dennis Ebbetts, Ball Aerospace	

MEETING CONVENED AT 4:00 PM EST, 19 DECEMBER 2006

The Chair thanked members and participants for attending. He reiterated the importance and challenges of both the undertaking and implementation of NSF Division of Astronomical Sciences (AST) Senior Review (SR) activity. He stated that he anticipates a continuing dialogue for how AST will move ahead on the implementation of the SR Report¹ recommendations. He then opened the meeting for questions from the Committee.

Dr. Phinney asked if the SR Report responded to NSF needs. Dr. Wayne Van Citters, AST Director, responded that AST worked very closely with the SR committee to ensure a useful report that did not address issues that the SR committee was ill-equipped to address. He added that AST desired a science-based prioritization of its programs regardless of the anticipated budget situation. Dr. Lester asked if Dr. Van Citters would assess the reaction thus far from the astronomical community during the meeting. Dr. Van Citters responded affirmatively.

Dr. Van Citters stated that, because members have already read the SR report, he will forgo formal presentation of his distributed PowerPoint document, which provides a comprehensive but high-level overview of the SR motivation, charge, recommendations, findings and implementation development thus far. He noted that the presentation has been used for briefings on the Hill, at the Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB), at AST facilities and with the Resident Commissioner of Puerto Rico. The Chair asked if the SR committee chair joined the briefings. Dr. Van Citters said that the SR Chair briefed the National Science Board (NSB), the House Science Committee and OSTP. He added that the reception has been extremely positive towards the SR committee, the process, the report, and the astronomical community's willingness to undertake the effort.

¹ *From the Ground Up: Balancing the NSF Astronomy Program, October 2006,*
http://www.nsf.gov/mps/ast/seniorreview/sr_report_mpsac_updated_12-1-06.pdf

The Chair solicited additional questions from the Committee. Dr. Rieke asked if the implementation of the SR recommendations would depend strongly on the planned cost reviews of AST facilities. Dr. Van Citters stated that the implementation of the SR recommendations regarding the level of administrative costs and efficiencies at the facilities would depend on the cost reviews, but that the remainder of the recommendations would not. He noted that the issues do have interagency import and should be considered by the Committee during the coming months and folded into the AAAC annual report for how the agencies should proceed. He also noted that the total amount of money to be saved by the implementation of the SR report's recommendations remains to be determined.

Dr. Carney noted that, despite the charge to assess current programs, the SR committee did not resist the temptation to call for investment in some specific new programs. He asked if the recommended investments are consistent with the Decadal Survey². Dr. Van Citters replied that the recommended investments may come from reorganization of the current investments in the national observatories themselves; thus, the recommendations won't necessarily compete with other future investments. Dr. Carney added that the SR report's recommendation to invest in more small telescopes "seems like such a contrast" to the aggressive European program for an Extremely Large Telescope (ELT). Dr. Van Citters replied, "Many quarters have reported that the timescale for that level of effort needs to be more realistic." He added, "We have to have a system for [optical and infrared] astronomy—for all of astronomy—that we don't yet have."

Dr. Phinney asked about the SR recommendation regarding major instrumentation programs. Dr. Van Citters clarified that the recommendation refers to a major instrumentation program at the National Optical Astronomy Observatory (NOAO) that was sized to take on a \$15-20M instrument for an 8-m or larger telescope. He stated that, given the timescale for such instruments coming into fruition and given the talent out in the university community, "we can't afford that sort of standing army at the national observatories." He added, "We need to be able to manage that sort of effort but not do it ourselves." Dr. Eileen Friel, AST Executive Officer, noted that the SR committee recommended increased support for the Telescope System Instrumentation Program (TSIP)³.

The Chair asked if the presentation purposefully singles out only two-thirds of the sentences from Finding 1 in the report. Dr. Van Citters said yes, but only because the first two sentences are the most important conclusions. Dr. Friel added that the NSF Director and Deputy Director identified the two sentences from Finding 1 that are reproduced in the presentation as the core message of the SR report. Dr. Van Citters added that he does make certain to point out the statement regarding the AST budget when giving the presentation.

Dr. Bahcall asked if any discussions have been undertaken on soliciting private funding. Dr. Van Citters answered yes: that is clearly reflected in the hope coming from Global Oscillation Network Group (GONG), the Very Long Baseline Array (VLBA) and Arecibo Observatory for raising non-Federal funds to continue operations. He noted that the report comments on building the ability to manage private-public partnerships and that NSF plans to be proactive in that regard. He stated that NSF has been talking to the Thirty Meter Telescope (TMT) and Giant

² *Astronomy and Astrophysics in the New Millennium*, 2001; <http://www.nap.edu/books/0309070317/html/>

³ The Telescope System Instrumentation Program (TSIP) supports new instrumentation, instrument upgrades, and operations/facilities improvements for the telescopes operated by the private (non-federally-funded) U.S. observatories. In return, observing time proportionate to the funding awarded is made available to the public community through the NOAO time allocation (TAC) process.

Magellan Telescope (GMT) projects and restructuring how NSF relates to those programs. He added that NSF has also been active in talking to potential supporters of the VLBA and Arecibo.

Dr. Phinney asked if the SR committee considered privatizing or replacing the telescopes of Kitt Peak National Observatory (KPNO) with a private system. Dr. Van Citters replied that all possibilities were discussed at great length in the committee. He noted that NOAO occupied a far larger fraction of the committee's debate time than the other facilities put together, so "no stone went unturned."

Dr. Lester asked if Dr. Van Citters could comment about future reviews: How frequently will future reviews be done? Is this the right time in the decade to undertake this in phase with the Decadal Surveys? Dr. Van Citters responded that the Senior Review process must "become a usual part of how we do business." He noted that the Decadal Survey recommended that an SR process be undertaken every five years, but "we'll just be seeing some of the results of this one in five years." He continued, "The approach of intercomparing the past and the future needs to become part of our usual thinking, particularly within the Decadal Survey process. Especially as cost estimates develop more fully, we need to have a process to reconsider within the context of ongoing and other new facilities." Dr. Freese asked if Dr. Van Citters meant that this should be a part of the Decadal Survey process. He replied that the community has to be looking at a new process for the Decadal Survey that: extends over a longer period of time; does not assume that existing facilities will be there to support the new facilities; and builds in evolution as part of the planning. He reiterated, "As you develop better cost estimates for the new program, one must look at the existing program and adjust as necessary." Dr. Freedman agreed and noted that one cannot build in assumptions about budget growth into the Decadal Survey process.

The Chair commented that it is difficult to understand how NOAO will move forward from this report since it is not clear that the recommendations for NOAO are even consistent. He asked if there will be feedback from NOAO. Dr. Van Citters stated that NSF began to solicit feedback from NOAO in September and that they have started working on an implementation plan. He added, "We will continue to have many interactions. NSF must describe to NOAO what our vision of its mission is and keep that constant for some time to allow them respond." Dr. Bahcall asked how the discussions with NOAO were going so far. Dr. Van Citters responded that so far they've been "productive, frank and open but not without disagreement." He stated that NSF and NOAO are converging fairly rapidly on a path into the future and that they will keep close track over the coming months. He continued, "We have to be careful about some personnel issues right now, but we will open up communications on this with the community at an appropriate time. We hope to have a clean, transparent, well understood path to the development of any large telescopes in the future. This guidance allows us to emerge six months from now with a much better understood system."

The Chair asked if discussions about the Giant Segmented Mirror Telescope (GSMT) were firm enough to discuss. Dr. Van Citters said that he would like to defer that discussion until at least after the American Astronomical Society (AAS) meeting in January 2007.

The Chair commented that he is unsure how the program for small and large telescopes comes together from a budgetary standpoint. Dr. Van Citters replied that NOAO presented to the SR a path forward that devoted 90% of its future resources to the GSMT. He stated, "We, the community—through town meetings—and the Senior Review committee found that to be unsustainable both scientifically and sociologically; a substantial fraction of the community voiced their perceived disenfranchisement from that sort of effort." He noted that the SR report identifies a significant fraction of exciting science from the past few years coming from

telescopes with apertures of less than 4 meters. He said, “The GSMT-only model does not work,” and added, “The Europeans are facing exactly the same problem.” He said that the astronomical community were fortunate in the 8- to 10-m telescope era to be able to keep as much access to 2- to 4-m telescopes as they did, but that it remains unclear how to keep that going in the 30-m era when the access also has to support 8- to 10-m telescopes. Dr. Freedman stated that the SR report characterizes this as a focus on science rather than just an argument about sizes. She said, “They made a very strong case for their recommended approach.”

The Chair asked about interagency concerns that may emerge from the SR report. Dr. Van Citters noted a key recommendation in the radio-millimeter-submillimeter (RMS) program: the need to raise a substantial fraction of VLBA costs from non-AST funds. He noted a similar recommendation for GONG++ and said that NSF has noted responses from the solar community on the merits of sustaining GONG++ through another solar cycle as well as overlapping operations with the NASA Solar Dynamics Observatory (SDO). He identified support for the Arecibo radar program and noted that the management organization chose to close the radar program in October 2007. Dr. Van Citters described that the SR report provides several recommendations that are independent of the actual cost of running the facilities while others are related to reducing administrative costs that will need input from the anticipated cost reviews. He stated, “We have to be prepared to hear that the cost reviews will show that funding must be increased to keep the same level of service.” He also said that, while NSF regards the primary responsibility for identifying alternate sources of support to lie with the managing organizations, the agency is providing assistance in that effort where possible and is in active discussion with possible partners.

Dr. Van Citters reviewed the ongoing development of the NSF response and implementation plan. He noted that AST has scheduled a number of town meetings starting with the AAS meeting in Seattle and is also accepting email input⁴. He said, “We are urging people to talk to us.”

Dr. Van Citters stated that the astronomical community must examine our 50-year tradition of operations to determine if the current level of service can be provided for less. He noted that a recent comparison between operations of the (private) MacDonald Observatory and KPNO showed that operations were very close in cost. He said, “The community may have to look at different service models.” He added that the SR report provides the scientific priorities that informs and allows AST to tailor their program to fit their future budget development. He concluded, “This process has resulted in a stronger community to go forward into the next decade.”

The Chair noted that the goal provided to the SR committee was to find \$30M to invest in new programs but that the report seems to identify only about \$15M. He asked, “Do you see that as a problem?” Dr. Van Citters replied, “Not at all.” He added that the SR committee was very careful to mention only supportable costs in the final report. He explained, “We were very afraid that realistic reviews of the savings would deem the report a failure, so we included only those costs that we knew well.” He stated that the cuts identified by the report are those that the SR committee found to be possible without doing irreparable harm. He added that the \$30M was a “finger-to-the-wind” goal, and only a goal.

The Chair asked about the implications of a potential ongoing Continuing Resolution (CR) through the remainder of the current fiscal year. Dr. Van Citters replied that the \$15M increase requested for AST in the President’s FY07 Budget Request would be “out the window.” He

⁴ astsenior-review@nsf.gov

added that AST would not be able to put out the anticipated Virtual Observatory (VO) program solicitation because no new program starts are permitted under CR legislation. Dr. Eric Smith added that the primary impact at NASA would be the lack of the substantial impact for Exploration in the FY07 Budget Request. He noted that the NASA Administrator would have the authority to parse out the FY06 budget number among programs. The Chair asked if the CR would likely have a significant impact on the Gamma-ray Large Area Space Telescope (GLAST). Dr. Smith said no. Dr. Kathy Turner stated that the major impact at the DOE Office of High Energy Physics would be on starting new programs such as the International Linear Collider (ILC) and the expansion of some research and development (R&D) projects. She added that the university program would be hurt because the program was expecting increases in FY07. She identified little impact on the Very Energetic Radiation Imaging Telescope Array System (VERITAS), GLAST and other astrophysics programs. She noted that the \$5M “set aside” for dark-energy R&D probably would not be there but was uncertain about that outcome.

Dr. Weinberger asked if the CR would stall the implementation of the SR recommendations. Dr. Van Citters said no. The Chair asked if the personnel layoffs at Arecibo were in response to the SR recommendations or because of previous budget issues. Dr. Van Citters stated that the layoffs were definitely in response to the SR report.

Dr. Stassun noted the SR committee’s articulation of six principles that guided the discussion and brought attention to the second principle of “Optimizing the Workforce.” He said that, based on email chatter from the Committee on the Status of Women in Astronomy (CSWA) and the Committee on the Status of Minorities in Astronomy (CSMA), concern has been raised that the “endangered species” in the population may be the most vulnerable as a result of major divestitures. Dr. Stassun noted that this concern may require deliberate thinking to protect the current status of women and minorities and ongoing efforts at broadening participation in astronomy and added that implementation of the SR recommendations also presents a valuable opportunity for the same. He asked if there were deliberate thinking on the part of the SR on the issue. Dr. Van Citters stated that all six principles were considered at each stage of the SR process and that the closing of facilities were considered in the context of ensuring openings elsewhere for workforce transfer. He stated that AST understands that other workforce and training issues would be critical during implementation process. Dr. Lehr added that consolidation of that input from the community to the SR email address would be very useful.

Dr. Friel added that the town meeting schedule would be posted within days to the SR website⁵ and that they would also distribute the schedule through the AAS email exploder.

Dr. Van Citters added that under the terms of the CR, the account that covers NSF staff and AAAC members’ travel would be extremely limited; thus, NSF may have to consider holding the February AAAC meeting as a teleconference. The Chair noted that the February meeting is the single most important meeting of the year; as a result, he could not imagine lacking a useful face-to-face meeting to produce the annual report. He asked if another meeting could be held as a teleconference instead. Dr. Van Citters replied that NSF may not be able to hold any other face-to-face meetings at all. The Chair asked what timeframe would be needed to make the decision. Dr. Van Citters replied that the timeframe was unknown. He explained that current CR extends to February 15 and that more information may not be available prior to the scheduled February meeting. He noted that the Directorate may have a budget discussion the following day and agreed to contact the Chair at the end of the week regarding the status of the February meeting.

⁵ www.nsf.gov/mps/ast/ast_senior_review.jsp

The Chair thanked Dr. Van Citters and others for their work and time. Dr. Van Citters thanked the Committee for their support.

MEETING ADJOURNED AT 5:30 PM EST, 19 DECEMBER 2006