

**APPROVED MINUTES¹
OPEN SESSION
402ND MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
February 6-7, 2008

Members Present:

Steven C. Beering, Chairman
Mark R. Abbott
Dan E. Arvizu
Barry C. Barish
Camilla P. Benbow
Ray M. Bowen
John T. Bruer
G. Wayne Clough
Kelvin K. Droegemeier
Patricia D. Galloway
José-Marie Griffiths
Daniel Hastings
Louis J. Lanzerotti
Alan I. Leshner
Douglas D. Randall
Arthur K. Reilly
Jon C. Strauss
Thomas N. Taylor
Jo Anne Vasquez

Arden L. Bement, Jr., *ex officio*

Members Absent:

Kathryn D. Sullivan, Vice Chairman
Kenneth M. Ford
Karl Hess
Elizabeth Hoffman
Richard F. Thompson

¹ The minutes of the 402nd meeting were approved by the Board at the March 2008 meeting.

The National Science Board (Board) convened in Open Session at 11:20 a.m. on Thursday, February 7, 2007 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-08-6, Board Book Tab 11). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 5: Approval of Open Session Minutes, December 2007

The Board unanimously APPROVED the Open Session minutes of the December 2007 Board meeting (NSB-07-139, Board Book Tab 11C).

AGENDA ITEM 6: Closed Session Items for February 2008

The Board unanimously APPROVED the Closed Session items for the February 6-7, 2008 meeting (NSB-08-8, Board Book Tab 11D).

AGENDA ITEM 7: Chairman's Report

Dr. Beering reported on several issues:

a. Introduction of Board Acting Executive Officer and Board Office Director

Dr. Beering formally welcomed and introduced Dr. Craig Robinson, the recently appointed Board Acting Executive Officer and Board Office Director. Dr. Robinson had served the National Science Foundation (NSF) in a variety of capacities since joining NSF in 1998. Over the past few years, Dr. Robinson led NSF's performance assessment and chaired the group that drafted the recent NSF Strategic Plan. Most recently, Dr. Robinson served for a year as a Brookings Legislative Fellow on the personal staff of Senator Joe Lieberman where he worked on various issues, including the America COMPETES Act. (COMPETES: America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science.) He received his Ph.D. in Astronomy and Astrophysics from Pennsylvania State University under the direction of France Cordova.

b. Introduction of Board Office Senior Associate for Operations

Ms. Pamela McKinley, Board Office Senior Associate for Operations, is one of the newest members of the Board Office staff. A long-time Government employee, Ms. McKinley was employed by the U.S. Agency for International Development before her new assignment. Ms. McKinley is responsible for all the administrative and operational functions in the Board Office. She received her M.A. Degree in Adult Education and Human Resources Development from the University of Rhode Island.

c. Approval of Honorary Awards

In the Executive Closed Session, the Board approved honorary awards for the Vannevar Bush Award and the NSB Public Service Awards. The awards will be presented at the annual awards dinner on May 6, 2008.

d. 2009 Board Meeting Dates

After the February meeting, the Board Office will begin working on the 2009 calendar for Board meeting dates. All Board Members will be polled to ensure attendance by the highest number of voting Members possible. The poll will include those Board Members who could continue as Board Consultants.

e. Task Force Announcement

The Task Force on International Science was discharged with thanks and recognition to Dr. Strauss, chairman, and task force members Drs. Dan Arvizu, Ray Bowen, Patricia Galloway, Karl Hess, Alan Leshner, Thomas Taylor and Mr. Arthur Reilly. Special thanks went to Misses Clara Englert, Amanda Slocum, and Tami Tamashiro of the Board Office staff, who served as Executive Secretaries.

f. NSF Budget Request Released

The FY 2009 NSF budget request was released on Monday, February 4, 2008. Information on this budget request was provided to all Board Members, and the NSF Director presented an overview of the budget request to the Committee on Strategy and Budget.

AGENDA ITEM 8: Director's Report

Dr. Arden Bement, Jr., NSF Director, reported on the following items:

a. NSF Staff Announcement

Dr. Bement introduced Dr. Lance Haworth, the new Director of the Office of Integrative Activities (OIA), and replacing Dr. Nathaniel Pitts who retired in January 2008. Dr. Haworth joined NSF from Wayne State University in 1984 as the first Program Director for the Materials Research Group. He also served as Executive Officer for the Division of Materials Research, 1996-2006, and as Acting Division Director 2006-2007. Immediately prior to this appointment, Dr. Haworth led the Office of Multidisciplinary Activities in the Directorate for Mathematical and Physical Sciences (MPS). He received his degrees from Liverpool University, University of Alberta, and Yale University. His research activities focused on fatigue damage mechanisms, structure-property relationships in materials and nondestructive evaluation.

b. Association for Computing Machinery (ACM) Turing Award

Dr. Bement drew attention to the announcement of the ACM Turing Award, widely considered the most prestigious award in computing, named Dr. Edmund Clarke, Carnegie Mellon University; Dr. E. Allen Emerson, University of Texas, Austin; and Dr. Joseph Sifakis, University of Grenoble, as the 2007 award recipients for their work in Model Checking. Through the Directorate for Computer and Information Science and Engineering (CISE), NSF has supported research in Model Checking since its inception in the early 1980s, through its breakthrough research in the 1990s transforming how hardware companies like Intel change the way they verify chip and protocol designs, and more recently in the 2000s transforming how software companies like Microsoft are debugging their code. NSF is proud of this research and the enormous impact it has had and will continue to have, especially as computing and information systems becoming increasingly complex and as our society relies more on those complex systems for our daily lives.

c. Congressional Update

Appropriations

The President signed the Omnibus appropriations bill on December 26, 2007. NSF was funded at \$6.065 billion for FY 2008 (October 1, 2007 - September 30, 2008). This represented an increase of 2.5 percent.

FY 2009 Budget Request

The President sent his FY 2009 budget request to Congress on February 4, 2008. The NSF FY 2009 budget request reflects the commitment of the President and Congress to sustain competitive advantages by a total request of \$6.85 billion, which is an increase of 13.6 percent over 2008. NSF also hosted its budget rollout on February 4, 2008, and had well attended exhibits in the NSF atrium and overflow room showcasing NSF-sponsored research and education projects. Attendance included 4 congressional staff members, 10 members of the media, more than 150 colleagues from the normal constituency who attended the presentation, more than 500 local elementary and middle school students – a significant increase from last year.

Upcoming Hearings

Tentative dates for upcoming hearings were as follows:

House Science and Technology Committee, Subcommittee on Research and Science Education
February 26, 2008 (both the Board Chairman and NSF Director will participate)

House Appropriations: Commerce, Justice, Science Subcommittee
February 27, 2008 (both the Board Chairman and NSF Director will participate)

Senate Appropriations: Commerce, Justice, Science Subcommittee
March 13, 2008

Senate Commerce: Science, Technology, and Innovation Subcommittee
February 28, 2008 or March 12, 2008 (likely dates)

House Science and Technology Committee, Subcommittee on Research and Science Education
April 2, 2008

AGENDA ITEM 9: Open Committee Reports

Note: The Education and Human Resources (EHR) Committee did not meet in February 2008.

a. Audit and Oversight (A&O) Committee

Dr. Dan Arvizu, A&O chairman, stated that he briefed the committee on NSF's progress in addressing recommendations made in the Office of Inspector General's (OIG's) audit of NSF's management of research center programs. NSF has undertaken a number of activities, which appear to be on track and responsive.

Mr. Thomas Cooley, NSF Chief Financial Officer, updated the committee on progress to resolve the 2007 audit findings. Mr. Cooley was optimistic that the contract monitoring "significant deficiency" can, with hard work, be resolved this fiscal year. Activities also began on the new property plant and equipment accounting and reporting "significant deficiency," and NSF was negotiating a corrective action plan with the audit team.

Dr. Christine Boesz, NSF Inspector General, reported that pending questions associated with the previous audit report on a major NSF contractor had been settled. The NSF could proceed with resolution. Dr. Arvizu thanked the NSF team for their significant efforts in addressing a number of difficult issues. Dr. Boesz also noted that there were ongoing audits on university efforts reporting that will be presented to the Board at a future meeting. Dr. Boesz also indicated that the OIG offered its consultative services to assist staff during the planning and execution of the Request for Proposal for the Antarctic services contract.

b. Committee on Programs and Plans (CPP)

Dr. Barry Barish reported for Dr. Kenneth Ford, CPP chairman. Dr. Barish stated the committee reviewed the FY 2008 Schedule of NSF Action and Information Items for the Board, dated December 11, 2007 (Board Book Tab 6D). This list of critical action information items reflects the August 2007 revision to the process, whereby "No Director's Review Board action will be brought to the Board without NSF having presented background information on such action item to the Board, a maximum of 6 months prior."

Dr. Barish reported that Drs. Louis Lanzerotti and José-Marie Griffiths volunteered to lead a working group on the report to Congress, on the effectiveness of NSF in supporting interdisciplinary research. Dr. Douglas Randall will join Drs. Griffith and Lanzerotti for this effort. This report is due to Congress by August 9, 2008.

Dr. Mark Abbott reported to CPP on the required “Report to Congress on Pre-construction Funding and Maintenance and Operations (M&O) Costs Associated with Major Research Equipment and Facilities at NSF” (NSB/CPP-08-1, Board Book Tab 6E), which was revised and provided to Board Members. The report gives an overview of NSF’s current Major Research Equipment and Facilities Construction (MREFC) process and recommends two changes: (1) the Board should become formally engaged in reviewing and approving priority ordering and actual funding of all post initial proposal stages for MREFC projects; (2) MREFC funds should be used for pre-construction planning and design activities, construction, and for facility decommissioning; research and related activities funds should be used for preparation of the initial proposal and M&O.

Two changes were recommended to the draft report prior to sending the report to Congress: (1) the removal of two case studies in the previous documents, which were provided for background information and a change to the text that reflects their removal; (2) a change to the text that would allow the Board more time to finalize this important issue from "May" to "later in 2008." After some discussion, the committee approved the report with minor changes and recommended approval by the full Board.

The Board unanimously APPROVED the “Report to Congress on Pre-construction Funding and Maintenance and Operations (M&O) Costs Associated with Major Research Equipment and Facilities at NSF” (NSB-08-15), subject to minor edits and the proposed revisions.

Dr. Lanzerotti led the continued CPP discussion of the Board Statement on Competition, Recompetition, and Renewal of NSF Awards. Dr. Lanzerotti reported to the Board that CPP discussed this Board Statement (NSB/CPP-08-4, Board Book Tab 6F), which was revised and provided to Board Members. Dr. Lanzerotti recommended to the Board the following changes to the Statement for section “2. Large Group Awards:” (1) addition of “NSF should continue to pay attention to these issues” at the end of the first paragraph, (2) the omission of the paragraph on the review procedure because some of the actions that are noted were accomplished by NSF, and (3) addition of footnote, “The Final Design Review will include the review and approval of an Operating and Maintenance Plans that will define the most likely period required for sustainable operation.”

The committee recommended approval of the revised Statement by the full Board.

The Board unanimously APPROVED the Board Statement on Competition, Recompetition, and Renewal of NSF Awards (NSB-08-16).

The committee also recommended approval of the Resolution on Competition and Recompetition of NSF Awards (NSB/CPP-08-5, also Board Book Tab 6F). [*The word “such” was deleted from the last sentence of the approved resolution.*]

The Board unanimously APPROVED the Resolution on Competition and Recompetition of NSF Awards (NSB-08-12) (Appendix A).

Dr. Barish reported on the status of CPP subcommittee and task forces. He stated that Dr. Strauss, INT chairman, informed the committee that the published report, *International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and Our Nation's Innovation Enterprise* (NSB-08-4), would be released in March 2008.

Subcommittee on Polar Issues (SOPI)

Dr. Barry Barish, SOPI chairman, reported that the subcommittee heard two brief reports: (1) European Science Foundation-led effort to establish a multi-national polar infrastructure network of stations to support research, including climate and environmental observations at both poles, which will be complementary to the NSF-funded work; and (2) an NSF-funded effort underway to investigate changing fresh water cycles in the Arctic. The subcommittee also viewed a short film on the dedication ceremony of the new South Pole Station, which was held January 12, 2008. Lastly, NSF presented an information item on the upcoming rebid for polar services, which will come before the Board at a future meeting.

Task Force on Sustainable Energy (SE)

Drs. Dan Arvizu and Jon Strauss, SE co-chairmen, reported that the task force outlined plans for Roundtable Discussions later in 2008. The first SE Roundtable Discussion would be held on February 8, 2008, the day after the Board meeting. The task force reviewed the Roundtable agenda, participant list, and background paper provided to Board Members (Board Book Tabs 4B-4C, Supplemental Board Book Tabs 1-2).

c. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chairman, reported on the requirement, under the America COMPETES Act, for the Board to consider NSF's policies on limiting proposals from single institutions. This report was due to Congress by August 9, 2008. At the December 2007 meeting, NSF reported to CSB that a small number of NSF solicitations have institutional limitations. At the February 2008 meeting, CSB discussed the timetable in order to comply with this congressional request, and agreed to attempt to have a draft report for consideration at the May 2008 meeting.

CSB also discussed the NSF FY 2008 appropriations and the 2009 budget request. Shortly after the December 2007 meeting, the FY 2008 budget was approved by Congress and signed by the President. Dr. Bement briefed CSB on the details of the 2008 budget and described its expected impact (Supplemental Board Book Tab 5). As he indicated in his Director's Report, the FY 2008 budget represented a 2.5 percent increase over the FY 2007 budget. Dr. Bement also briefed the committee on details of the FY 2009 budget request to Congress, and reported that this request

represents a 13 percent increase over the approved FY 2008 budget. Dr. Bement answered questions relating to the management of the MREFC Program, given the FY 2008 constraints as well as the limited funds anticipated to be available for FY 2009.

Lastly, the committee discussed the Guidance for NSF Award Size and Duration and Proposal Success Rate (NSB-08-14, Board Book Tab 7B, Board Book Supplement Tab 6). Dr. Bowen stated that the Board had a series of discussions on this topic, which involved CSB, A&O, and especially those with the Impact of Proposal and Award Management Mechanisms (IPAMM) study. Dr. Bowen further stated that there were too many people to thank individually for their efforts, but noted the significant contribution of Dr. Strauss. CSB approved the Guidance and recommended approval by the full Board.

The Board unanimously APPROVED the Guidance for NSF Award Size and Duration and Proposal Success Rate (NSB-08-14).

Task Force on Cost Sharing (CS)

Dr. Bowen called upon Dr. Kelvin Droegemeier, Task Force on Cost Sharing (CS), who reported that CS completed the first phase of its activities, the “Report to Congress on Cost Sharing Policies at the National Science Foundation” (NSB/CS-08-4, Board Book Tab 3C). CS was tasked to prepare a response to a congressional request, which originated with the America COMPETES Act, to evaluate the impact of the 2004 policy to eliminate cost sharing from programs that were developed around industrial partnerships and programs that historically require cost sharing.

Dr. Droegemeier, presented background information on the task force’s efforts. He reported that CS had four information-gathering meetings in late 2007 and early 2008: Experimental Program to Stimulate Competitive Research (EPSCoR) directors; Engineering Research Center (ERC) directors and industrial liaison officers; and Industry/University Cooperative Research Centers (I/UCRC) directors and evaluators; and a public Roundtable Discussion at NSF on December 7, 2007, which was attended by several of the authors from the Special Research Management Review issue on cost sharing, published in 2000, as well as several other stakeholders. Support for the preparation of this report was provided by the following: the Board Office; the Directorate for Engineering’s Advisory Committee; the Directorate for Budget, Finance, and Award Management (BFA); as well as input from Capitol Hill and the Office of Management and Budget (OMB).

Dr. Droegemeier summarized the recommendations of the report: (1) NSF should define and communicate a set of overarching principles to guide the application of mandatory cost sharing; (2) NSF should continue to employ OMB Circular A-110 to define cost sharing and communicate all changes to NSF cost sharing policy to its stakeholders; (3) NSF should enhance its training of program officers to avoid unintended implicit or explicit requests for voluntary cost sharing/institutional commitment during the budget negotiation process; (4) NSF should reinstate mandatory cost sharing for specific programs for which cost sharing is foundational to strategic programmatic goals namely, ERCs, EPSCoR, I/UCRC; also NSF should retain the successful industrial participation features that it has adopted in its implementation of the

interagency Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR), which are statutory; (5) NSF should continue to communicate the requirements of tracking and reporting mandatory cost sharing to all institutions to which it provides funding; and (6) NSF should periodically and systematically review its cost sharing policies and report its findings to the Board.

A second Board report on cost sharing will look at difficult issues such as voluntary cost sharing, use of cost sharing, broadening participation of traditionally under-represented groups, and auditing and compliance.

CSB recommended approval of the report by the full Board, which was due to Congress by February 9, 2008.

The Board unanimously APPROVED the report to Congress, “Report to Congress on Cost Sharing Policies at the National Science Foundation” (NSB-08-17), subject to minor edits.

Dr. Droegemeier and Dr. Bowen thanked CSB and CS members as well as NSF colleagues who worked on the report, with special thanks to Ms. Jennifer Richards, CS Executive Secretary, as well as Drs. Craig Robinson and Michael Crosby, Board Executive Officers.

Whereupon the Open Session recessed at 11:50 a.m. and reconvened at 1:00 p.m.

AGENDA Item 10: Science Presentation

Dr. Beering introduced Dr. Anne Simon, Professor in the Department Cell Biology and Molecular Genetics at the University of Maryland, College Park. He stated that she is an extraordinary researcher in virus replication and virus host interactions, and partially funded by NSF. Dr. Simon is the recipient of many distinguished awards and is also the founder and director of University of Maryland Virology Program and a senior editor of the Journal of Virology. The title of her presentation was, “Uncovering New Paradigms in the Biology of Viruses.” She provided an overview of her research into replication and translation in RNA viruses using the simple model system of *Turnip crinkle virus* (TCV). She called attention to the importance of NSF’s funding basic research using the best model system for studying a biological process and pointed out that other Federal agencies must balance the choice of model system with other concerns. Dr. Simon described in detail how her work led to the finding that a small, untranslated RNA from TCV can form more than one biologically active structural conformation and that this may have broad implications for the regulation of DNA translation.

Dr. Beering adjourned the Open Session at 1:55 p.m.

[signed]
Ann A. Ferrante
Writer-Editor
National Science Board Office

Attachment

Appendix A: NSB-08-12, Resolution on Competition and Recompensation of NSF Awards

RESOLUTION

NATIONAL SCIENCE BOARD

COMPETITION AND RECOMPETITION OF NSF AWARDS

WHEREAS, the Committee on Programs and Plans has reassessed, at its meeting of February 6-7, 2008, the major principles and key issues in a statement “Competition, Recompetition and Renewal of NSF Awards” (NSB/CPP-08-4) in the context of the various types of NSF awards.

Therefore, be it RESOLVED that the National Science Board (the Board) endorsed strongly the principle that all expiring awards are to be recompeted, because rarely will it be in the best interest of U.S. science and engineering research and education not to do so. Furthermore, the Board endorsed a recompetition policy for major facility awards which is transparent to the research community such that after construction of major facilities is completed, followed by an appropriate time period to bring the facility to sustainable operations, full and open competition of the operations award will be required.

This position was based on the conviction that peer-reviewed competition and recompetition is the process most likely to assure the best use of NSF funds for supporting research and education.

The Board requested that the Director, NSF, take steps necessary to ensure that all NSF practices embody this principle.

[signed]
Steven C. Beering
Chairman