

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the December 5-6, 2007 Meeting

The major actions of the National Science Board (Board) at its 401st meeting on December 5-6, 2007 and a preliminary summary of the proceedings are provided. This memorandum will be publicly available for review. A more comprehensive set of Board meeting minutes will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval at the February 2008 meeting.

1. Major Actions of the Board (not in priority order):

- a. The Board approved the minutes of the Plenary Open Session (NSB-07-120) for the October 2007 meeting (<http://www.nsf.gov/nsb/meetings/2007/1002/minutes.pdf>.) Minutes for the Plenary Executive Closed and Closed Sessions for the October 2007 meeting of the Board were also approved.
- b. The Board approved a resolution to close portions of the upcoming February 6-7, 2007 Board meeting dealing with staff appointments; future budgets; grants and contracts; specific Office of the Inspector General investigations and enforcement actions; and National Science Foundation (NSF) participation in a civil or administrative action, proceeding, or arbitration (<http://www.nsf.gov/nsb/meetings/2008/0206/closing.pdf>).
- c. The Board authorized the Director, at his discretion, to make an award to Associated Universities, Inc., for operation of the Atacama Large Millimeter Array (ALMA).
- d. The Board authorized the Deputy Director, at her discretion, to make an award to the University of Arizona for "The iPlant Collaborative: A Cyberinfrastructure-Centered Community for a New Plant Biology."
- e. The Board authorized the Director, at his discretion, to make an award to the National Ecological Observatory, Inc. for "Organizational and Project Management Support to Complete the NEON Construction-Ready Design and Project Execution Plan."
- f. The Board approved the draft report, *International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and Our Nation's Innovative Enterprise* (NSB-07-10), subject to minor edits approved by the Chairman of the Board and the chairman of the Task Force on International Science http://www.nsf.gov/nsb/publications/2007/nsb0710_int_eng.pdf.

- g. The Board approved a report, *Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy, A Companion to Science and Engineering Indicators 2008*, which will be released in early 2008.
- h. The Board Chairman appointed the Committee on Programs and Plans, Task Force on Sustainable Energy members: Drs. Mark Abbott, John Bruer, Camilla Benbow, Patricia Galloway, José-Marie Griffiths, Daniel Hastings, Elizabeth Hoffman, Douglas Randall, and Mr. Arthur Reilly. Co-chairmen of the task force are Drs. Dan Arvizu and Jon Strauss.
- i. The Board Chairman appointed the Committee on Strategy and Budget, Task Force on Cost Sharing chairman, Dr. Kelvin Droegemeier, and members, Drs. Mark Abbott, Camilla Benbow, Daniel Hastings, Jon Strauss, Thomas Taylor, Richard Thompson, and Jo Anne Vasquez.
- j. The Board Chairman discharged the Committee on Programs and Plans, Task Force on Transformative Research with thanks to Dr. Douglas Randall, chairman, as well as Dr. Nina Fedoroff, former chairman, and Drs. Mark Abbott, John Bruer, Kelvin Droegemeier, Kenneth Ford, Daniel Hastings, Karl Hess, Louis Lanzerotti, and Alan Leshner.
- k. The Board Chairman announced that the Board approved the transmittal letter and management response for the NSF Office of Inspector General's *Semiannual Report to Congress, September 2007* by notational vote during November 2007.

2. Board Chairman's Report

Dr. Steven Beering, Board Chairman, reported that during November 2007, a notational vote was conducted by e-mail, and the Board approved the transmittal memo and NSF management response for the *Office of Inspector General Semiannual Report to Congress, September 2007*. The OIG Semiannual Report package - which included a memo, the NSF management response, and the printed report - was sent to Congress before the December 1, 2007 due date. Because of timing issues, it was not possible for the Board to conduct this business at the October or December 2007 Board meetings. (See 1.k.)

Dr. Beering thanked the NSF Office of Legislative and Public Affairs (OLPA) for providing Board Members with the National Geographic Society DVD on the construction of the South Pole Station, which will be officially dedicated in January 2008.

The appointments of chairmen and members to the Board's newest task forces, the Task Force on Sustainable Energy and the Task Force on Cost Sharing, both established at the October 2007 Board meeting, were announced. (See 1.h. – 1.i.) The Task Force on Transformative Research was discharged with special thanks to the chairmen and task force members over the past 3 years. (See 1.j.)

Dr. Beering recognized the following Board Members: Dr. Richard Thompson received the 2007 Karl Spencer Lashley Award from the American Philosophical Society on November 9, 2007 in Philadelphia. The Lashley Award is one of the most prestigious prizes in behavioral neuroscience. Dr. Arden Bement was awarded the 2007 Award for Outstanding Achievement in Support of Science by the Council of Scientific Society Presidents on December 2, 2007. The award was for his lifetime leadership of scientific endeavors into excellence and eminence, for stimulation of outstanding progress on the frontiers of science, and for strategic vision and motivation of NSF into new directions addressing 21st century challenges.

Finally, Dr. Beering announced his approval of a temporary Intergovernmental Personnel Act (IPA) request from Dr. Michael Crosby, Executive Officer and Board Office Director, to serve as the Interim Vice Chancellor for Research at the University of Hawaii - Hilo (UHH). The IPA assignment will not exceed 24 months. During this assignment, Dr. Crosby will attend one or two Board meetings each year and provide advice to Board Members and the Board Office. Dr. Beering noted that Dr. Crosby had performed at an exceptional level in his responsibilities throughout his tenure as Executive Officer and Board Office Director, and that he provided excellent leadership and direction for a broad range of policy-level issues.

3. NSF Director's Report

Dr. Arden Bement, NSF Director, introduced the following new NSF staff:

- Dr. Zakya Kafafi, Director, Division of Materials Research (DMR) (as of October 14, 2007).
- Dr. Clifford Gabriel, Senior Advisor, Office of Integrative Activities (OIA), as an NSF employee (as of December 30, 2007).

Dr. Bement announced the following NSF staff departure:

- Dr. Nathaniel G. Pitts, Director of OIA, after 30 years service with NSF.

Dr. Bement also announced the following award to NSF staff:

- Dr. Mihail C. Roco, Senior Advisor for Nanotechnology, Directorate for Engineering (ENG), received the National Materials Advancement Award from the Federation of Materials Societies on December 5, 2007.

For the congressional update, Dr. Bement reported that the Government was operating under a continuing resolution at FY 2007 spending levels through December 14, 2007. Since the October 2007 Board meeting, NSF participated in two hearings before the House Science and Technology Subcommittee on Research and Science Education. The first hearing was on Nanotechnology education, with Dr. David Ucko, Deputy Division Director, Division of Research on Learning in Formal and Informal Settings, Directorate of Education and Human Resources (EHR) providing testimony. The second hearing was on Women in Academic Science and Engineering, with Dr. Kathie Olsen, NSF Deputy Director, as the NSF witness. Dr. Bement and Congressman Alan Mollohan, Chairman of the House Appropriations Subcommittee on Commerce, Justice, and Science, toured West Virginia University (WVU) and met with various state and local representatives to discuss West Virginia's 2015 strategic plan. They also visited with numerous WVU faculty and students to look at nanotechnology and biometrics research funded by NSF.

4. Board Committee Reports

(Note: The Executive Committee did not meet in December 2007.)

a. Audit and Oversight (A&O) Committee

A&O Open Session

Mr. Salvatore Ercolano, partner-in-charge with Clifton Gunderson LLP, presented the results of the two reviews. In the review of the financial statements, the auditors gave an unqualified opinion on the agency's financial statements, and found no material weaknesses. However, the auditors cited the agency for two significant deficiencies: (1) contract monitoring, which is a continuation from last year's audit; and (2) property, plant, and equipment (PP&E) accounting and reporting related to the U.S. Antarctic Program. Mr. Ercolano also spoke about the recommendations in the report for addressing these deficiencies. The agency's information technology (IT) security program review or "FISMA" report contained six findings, including four new ones, none of which are considered a significant deficiency.

Mr. Thomas Cooley, Chief Financial Officer, reported on steps that the agency is taking to address the two significant deficiencies Mr. Ercolano noted. The contract monitoring finding, which was an expected continuation from the FY 2006 audit, will be aggressively addressed this year. The PP&E accounting and reporting issue was still under discussion, and further system testing was planned.

Dr. Gloria Rogers, Chairman of the Advisory Committee for GPRA Performance Assessment (AC/GPA), reported on the committee's meeting of June 14-15, 2007. She outlined the 2007 charge to the committee, which included assessment of three strategic outcome goals identified in the *2006-2011 Strategic Plan: Discovery, Learning, and Research Infrastructure*, as well as a request for comments and recommendations regarding Transformative Research at NSF. She noted that the fourth strategic outcome goal, Stewardship, was being assessed internally by NSF. The AC/GPA report is available at <http://www.nsf.gov/pubs/2007/nsf07207/nsf07207.pdf>.

Dr. Olsen provided an update on NSF's human capital activities. She presented the human capital challenges facing NSF, provided a snapshot of NSF's workforce, and reported on current human capital efforts. As a result of the Succession Plan Working Group's efforts, a draft human capital plan which incorporates both workforce and succession plans for NSF, will be made available for NSF staff and stakeholder comment. Dr. Olsen outlined the plan's goals and underlying principles, including the aspiration that NSF be a strong learning organization.

Ms. Jill Schamberger, Office of Inspector General (OIG) audit manager, briefed the committee about an audit of NSF's oversight and management of its research center programs. The audit found that implementation of guidance about center programs, given by both the agency and the Board, is not consistently implemented among the centers, and not well communicated. The audit report recommends that a written policy would facilitate full implementation, and that establishing a "forum" would promote the sharing of experience and best practices.

A&O Closed Session

The NSF Inspector General and her staff presented information about several ongoing investigations.

b. Education and Human Resources (EHR) Committee

The committee noted the Board's latest printed publications:

- *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System* (Action Plan on STEM Education) (NSB-07-114) <http://www.nsf.gov/pubs/2007/nsb07114/nsb07114.pdf>.
- *Moving Forward to Improve Engineering Education* (NSB-07-122) <http://www.nsf.gov/pubs/2007/nsb07122/nsb07122.pdf>.

Dr. Cora Marrett, Assistant Director for NSF EHR, highlighted several suggestions for the EHR Committee to consider regarding Congressman Rush Holt's continued interest in receiving a followup to the Board's preliminary response to his September 2006 letter. Dr. Marrett introduced Dr. Linda Slakey, Division Director, Division of Undergraduate Education, who spoke about NSF's implementation of the recommendations of the Board Action Plan on STEM Education. Dr. Crosby noted that he contacted Congressman Holt and his staff, and they are interested in receiving a report from the Board on NSF's roadmap for achieving needed reform in STEM education. Committee members were encouraged to send comments to Dr. Crosby for a draft response that will be discussed at the February 2008 meeting.

The committee heard an update from Dr. Camilla Benbow on "Preparing STEM Innovators." Dr. Benbow noted that a charge will be developed for consideration at the February 2008 meeting.

c. EHR Subcommittee on Science and Engineering Indicators (SEI)

The subcommittee approved the final draft Companion Piece to *Science and Engineering Indicators 2008, Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy* (NSB-08-3), subject to final edits. The Companion Piece will be released in early 2008. [The EHR Committee and the full Board subsequently approved the Companion Piece, subject to minor edited approved by the Board Chairman and the Subcommittee on Science and Engineering Indicators chairman.] (See 1.g.)

d. Committee on Programs and Plans (CPP)

CPP Open Session

Dr. Louis Lanzerotti presented an update on the Board Policy on Recompensation of NSF Awards discussion item, during which he provided six policy options for the Board to consider. In consultation with Dr. Olsen and the Board Office, a seventh policy option was proposed for the committee's consideration. This topic will be discussed further at the February 2008 meeting.

Dr. Mark Abbott presented an update on the Facilities Management and Operations discussion item and provided background information and recommendations for the committee to consider in February 2008. Dr. Abbott will work with the Board Office to prepare an initial draft response to Congress regarding the appropriateness of using research and related activities (R&RA) as the source of funding for maintenance and operations and preconstruction costs of NSF's major research equipment and facilities construction (MREFC), as required by the America COMPETES Act. (COMPETES: American Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science.) This draft will be circulated to CPP for comments. The committee also agreed to schedule a teleconference in mid-January 2008 to continue this discussion.

Dr. Olsen provided the committee with a detailed presentation and update on MREFC and large facilities. The update included information on large facilities in construction or getting ready to be constructed. Dr. Olsen also reported that NSF had established an MREFC working group that shared the charge with the committee. This topic will also be discussed further at the February 2008 meeting.

Dr. Olsen also provided information on two Board reporting actions: (1) the Board's requirement to evaluate and report on the role and effectiveness of NSF in supporting interdisciplinary research, and (2) the Board's requirement to conduct a review and assessment of the NSF Pilot Program of Grants for New Investigators. Dr. Olsen reported that a new NSF working group on interdisciplinary research has been merged with the former NSF group on transformative research. The groups will report regularly to NSF and the Board on deliberations and recommendations over the next year.

Finally, NSF presented three information items to the committee: (1) NSF Review of the Management of the National Radio Astronomy Observatory (NRAO) by the Associated Universities, Inc., by Dr. Tony Chan, Assistant Director, Directorate for Mathematical and Physical Sciences (MPS); (2) National Ecological Observatory Network (NEON) by Dr. James Collins, Assistant Director, Directorate for Biological Sciences (BIO); and (3) Experimental Infrastructure for Network Science by Dr. Jeannette Wing, Assistant Director, Directorate for Computer Information Sciences and Engineering (CISE).

CPP Closed Session

The committee considered and approved the three action items.

- The Operation of the Atacama Large Millimeter Array (ALMA); Associated Universities, Inc. (AUI) (NSB-07-131)
- The iPlant Collaborative: A Cyberinfrastructure-Centered Community for a New Plant Biology, University of Arizona (NSB-07-132)
- Organization and Project Management Support to Complete the NEON Construction-Ready Design and Project Execution Plan, National Ecological Observatory Network (NEON), Inc. (NSB-07-133)

[The full Board subsequently approved the above resolutions.] (See 1.c – 1.e.)

e. CPP Subcommittee on Polar Issues (SOPI)

Dr. Karl Erb, Director, Office of Polar Programs (OPP), provided an extensive report on recent events in Antarctica, including the sinking of a Canadian commercial tourist ship in the Antarctic Ocean, the *M/S Explorer*. Drs. Mark Abbott, Dan Arvizu, Patricia Galloway, and Tom Taylor reported on their recent trip to the Antarctic, and noted the IT and energy infrastructure there.

f. CPP Task Force on International Science (INT)

The task force and CPP approved the final draft report, *International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and Our Nation's Innovative Enterprise (NSB-07-10)*. The final draft report incorporates revisions based on public comments from persons in academia, industry, U.S. Government, and other stakeholder groups. [*The Board subsequently approved the final report, subject to minor edits approved by the Board Chairman and the chairman of the Task Force on International Science.*] (See 1.f.)

g. CPP Task Force on Transformative Research (TR)

Dr. Randall, TR chairman, presented his last report to CPP and summarized the accomplishments of the task force and its predecessor task group over the past 3 ½ years, which culminated with the TR report, *Enhancing Support of Transformative Research at the National Science Foundation (NSB-07-32)* and developments of NSF's transformative research initiative strategy in response to that report.

h. CPP Task Force on Sustainable Energy (SE)

The task force held its first meeting and discussed the importance and urgency of this area, and outlined plans to have a coordinated and concerted multi-agency effort to address the charge to this task force. The first SE roundtable would be held on February 8, 2008, the day after the next Board meeting.

i. Committee on Strategy and Budget (CSB)

CSB Open Session

The committee noted that the America COMPETES Act, reauthorizing NSF, charged the Board with examining NSF policies for limitations on the number of proposal submissions by a single institution and reporting its findings and recommendations to Congress in August 2008.

Dr. Jacqueline Meszaros, Program Director, Division of Social and Economic Sciences, Directorate for Social, Behavioral, and Economic Sciences (SBE) presented information on NSF's practice for limiting proposal submissions by a single institution or principal investigator.

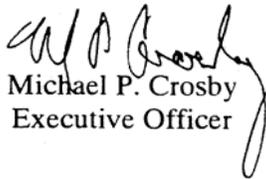
The committee discussed the revised draft Board guidance on average award size, duration, and success rate. Committee members were encouraged to provide comments and suggested wording for further consideration at the February 2008 meeting.

CSB Closed Session

Dr. Bement reported on the status of NSF's FY 2009 budget request.

j. CSB Task Force on Cost-Sharing (CS)

The task force held its first meeting and reviewed the impetus behind the creation of this task force: Board interest and a Congressional mandate in the America COMPETES Act for the Board to examine the impacts of its 2004 revision to NSF cost sharing policy that eliminated cost sharing for NSF programs. Dr. Droegemeier, CS chairman, reported on key findings from informal discussions held with key stakeholders in cost sharing at the 2007 National NSF Experimental Program to Stimulate Competitive Research (EPSCoR) Meeting, the NSF Engineering Research Center (ERC) 2007 Annual Meeting, and the NSF Engineering Advisory Subcommittee on University-Industry Partnerships. The task force discussed two additional means of gathering input on cost sharing: a December 7, 2007 Roundtable Discussion on Cost Sharing held on the day after the Board meeting, and a Web-based cost sharing survey.



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