

MEMORANDUM TO MEMBERS AND CONSULTANTS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the May 3-4, 2012 Meeting

The major actions and approvals of the National Science Board (Board, NSB) and a preliminary summary of the proceedings at the Board's May 2012 meeting are provided. This memorandum is also made available for public review. The minutes of the Plenary Open Session for the May 2012 meeting will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval.

1. Major Actions and Approvals at the 425th NSB Meeting (not in priority order):

- a. Dr. Dan Arvizu was elected to a 2-year term as Chairman of the Board, and Dr. Kelvin Droegemeier was elected to a 2-year term as Vice Chairman. Drs. Arvizu and Droegemeier were also elected by acclamation to 2-year terms (May 2012 – May 2014) as members of the Executive Committee.
- b. Dr. Carl Lineberger was elected to the Executive Committee to fill the remainder of Dr. Droegemeier's term (May 2011 – May 2013).
- c. The Board accepted the 2011 Annual Report of the Executive Committee (NSB/EC-12-3) as presented by Dr. Cora Marrett, NSF Deputy Director, on behalf of the committee chairman, Dr. Subra Suresh, NSF Director.
- d. The Board approved the *Report on the NSF Support of Unsolicited Mid-Scale Research* (NSB-12-22), subject to final edits by the chairman of the Task Force on Unsolicited Mid-Scale Research and the Board Chairman.
- e. The Board Chairman discharged the Committee on Strategy and Budget, Task Force on Data Policies with thanks to Dr. José-Marie Griffiths, chairman, and Drs. Mark Abbott, Camilla Benbow, John Bruer, Bud Peterson, Thomas Taylor, and Mr. Arthur Reilly, members.
- f. The Board Chairman discharged the *ad hoc* Committee on Honorary Awards with thanks to Dr. Bud Peterson, chairman, and Drs. Camilla Benbow and Arnold Stancell, members.
- g. The Board Chairman discharged the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee), with thanks to Dr. John Bruer, chairman, and Drs. Patricia Galloway and José-Marie Griffiths, and Mr. Arthur Reilly, members.

- h. The Board approved the minutes of the Plenary Open Session (NSB-12-15) for the February 2012 meeting (<http://www.nsf.gov/nsb/meetings/2012/0202/minutes.pdf>). Minutes for the Plenary Executive Closed (NSB-12-13) and Plenary Closed Sessions (NSB-12-14) for the February 2012 meeting of the Board were also approved.

2. Board Chairman's Introduction and Report

Dr. Ray Bowen, NSB Chairman, recognized and thanked Board Members of the Class of 2012 who completed their service with the May 2012 Board meeting: Drs. Mark Abbott, Camilla Benbow, John Bruer, Patricia Galloway, José-Marie Griffiths, Thomas Taylor, Richard Thompson, and Mr. Arthur Reilly.

Dr. Bowen announced that, in Plenary Executive Closed Session, the Board elected Dr. Arvizu as Chairman and Dr. Droegemeier as Vice Chairman for the 2012 - 2014 terms. They will also serve as members of the Executive Committee from 2012 to 2014. Dr. Lineberger was also elected to the Executive Committee to fill the 2011-2013 term vacated by Dr. Droegemeier. (See 1. a-b.)

The Chairman welcomed Dr. Arthur Bienenstock, who was nominated by the President on March 12, 2012 for the Class of 2016. He also announced that Dr. Bonnie Bassler, Class of 2016, was confirmed by the Senate on April 25, 2012.

Dr. Bowen reported on the annual Awards Ceremony and Dinner at the Department of State's Diplomatic Reception Rooms on May 3, 2012. The following honorary award recipients were recognized for their distinguished contributions:

- Dr. Leon Lederman, Director Emeritus, Fermilab, received the Vannevar Bush Award.
- Dr. Scott Aaronson, Associate Professor of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology, received the Alan T. Waterman Award.
- Dr. Robert Wood, Associate Professor of Electrical Engineering at Harvard University, also received the Alan T. Waterman Award.
- Dr. Lawrence Krauss, Professor in the School of Earth and Space Exploration and Physics Department and Director of the Origins Project at Arizona State University, received the individual Public Service Award.
- NPR Science Desk received the group Public Service Award.

On the subject of outreach, Dr. Bowen reported that on February 28, 2012, he and Dr. Suresh testified before the House Committee on Science and Technology, Subcommittee on Research and Science Education on the NSF FY 2013 Budget Request. Additionally, on March 8, 2012, Dr. Griffiths testified before the same committee regarding NSF's Major Research Equipment and Facilities Construction (MREFC) management.

The Chairman discharged three committees: CSB Task Force on Data Policies, the *ad hoc* Committee on Honorary Awards, and *ad hoc* Committee on Nominating for NSB Elections. (See 1.e.-g.)

Dr. Bowen announced recent recognition of Dr. Suresh, who was elected to the National Academy of Sciences, and Dr. Peterson, who was selected as an Outstanding Alumni of the Look College at Texas A&M University.

Lastly, Dr. Bowen made the following Board Office staff announcements:

- Dr. Jacqueline Meszaros, Science Policy Analyst, joined the Board Office on March 12, and will support several committees. “Jack” came to NSB from the Directorate for Social, Behavioral, and Economic Sciences (SBE), where she was a Program Director.
- Mr. Blane Dahl, Science Policy Analyst, will leave on May 11, 2012 to relocate to Wiesbaden, Germany, after serving with the Board Office for 2 years and supporting several committees.
- Ms. Beverly Sherman, Program Coordinator, retired on March 30 from the Federal Government after almost 24 years of service. She joined the Board Office in 2008.

3. NSF Director’s Report

In the absence of Dr. Suresh, Dr. Marrett introduced the following NSF staff:

- Dr. Alan Townsend, Division Director, Division of Environmental Biology (DEB), Directorate for Biological Sciences (BIO) (as of March 19, 2012).
- Dr. Jinliu (Grace) Wang, Division Director, Division of Industrial Innovation and Partnerships (IIP), Directorate for Engineering (ENG) (as of February 12, 2012).

Dr. Marrett also announced that Ms. Mary Santonastasso, Division Director, Division of Institution and Award Support (DIAS), Office of Budget, Finance, and Award Management (BFA), was selected to receive the 2012 National Council of University Research Administrators’ Joseph F. Carrabino Award.

For the congressional update, Dr. Marrett reported that the NSF Director testified at five congressional hearings since the Board Meeting in February 2012. The topics ranged from NSF’s Budget to advanced manufacturing to forensic science. Dr. Suresh also had the distinct pleasure of testifying twice in the same day, on two different occasions. Additionally, Dr. Marrett also testified before the House Science Committee on the NSF’s MREFC process.

On April 25, 2012, Dr. Marrett spoke at the congressional luncheon, “Re-engineering Water for Power.” The event was hosted by ENG in conjunction with Senator Majority Leader Harry Reid (NV). All of the NSF Assistant Directors as well as the Head of Office of Polar Programs (OPP) recently met with congressional staff to brief them on their respective areas of the FY 2013 Budget Request.

The Coalition for National Science Funding will sponsor its 18th annual exhibition. This year’s theme is “STEM Research and Education: Underpinning American Innovation,” and the event will be held on May 15, 2012 on the Capitol Hill.

The House and Senate Appropriations Committees passed their versions of the Commerce, Justice, Science and Related Agencies Bill for FY 2013. The House provided NSF \$7.333 billion, an increase of \$299.4 million, or 4.3 percent over the FY 2012 appropriated level. The Senate provided the NSF \$7.273 billion, an increase of \$240 million, or 3.4 percent above last year’s appropriated level. Reductions from the request in both the House and Senate are taken

solely from the Research and Related Accounts, and all other accounts are held level with the requested amount. The House expects to take up the Appropriations Bill on the floor when it returns from recess on May 8, 2012.

On behalf of Dr. Suresh, Executive Committee chairman, Dr. Marrett submitted the 2011 Annual Report of the Executive Committee, which was accepted by the Board. (See 1.c.)

4. Board Committee Reports

[Note: The Executive Committee (EC) did not meet in May 2012.]

a. Committee on Audit and Oversight (A&O)

In A&O Open Session, Ms. Allison Lerner, Inspector General (IG), briefed the committee on the Office of Inspector General's recent personnel appointments and audit activities. She and Ms. Martha Rubenstein, NSF Chief Financial Officer (CFO), jointly reported their progress on resolving remaining issues for the use of contingency funds in cooperative agreements. Two specific working groups are focused on two issues: (1) arriving at a mutual understanding of the definition of "contingency," and how it applies across the proposal and award lifecycle for these large facilities construction projects and (2) the sufficiency of awardee documentation in this area, with the goal of understanding how the proposal contingency budget line item is developed. Mr. Sal Ercolano, CliftonLarsonAllen, partner-in-charge of NSF's financial statement audit, presented an overview of the audit plan for FY 2012.

Ms. Rubenstein updated the committee on the considerable work NSF has undertaken to be responsive to the Administration and congressional interest in spending on conferences and an update on how NSF was proceeding on the Administration's mandate to accelerate the responsible spending of the American Recovery and Reinvestment Act (ARRA) funds. Mr. Eugene Hubbard, Chief Human Capital Officer, gave an update on a variety of issues in these challenging times for Federal employees. Dr. Pamela O'Neil, Staff Associate for the Office of Integrated Activities (OIA), and her colleagues presented the 2011 edition of the annual Merit Review Report.

In A&O Closed Session, Ms. Rubenstein gave an update on two procurement matters.

b. Committee on Education and Human Resources (CEH)

The committee discussed the topic of scaling-up educational practices and programs that have been shown through research to be effective in improving STEM learning and/or effective in increasing recruitment and retention of students in STEM disciplines. Dr. Michael Tanner, Vice President and Chief Academic Officer for the Association of Public and Land-grant Universities, discussed the potential of using Adaptive Learning Systems to provide rich, personalized learning pathways for students. Dr. Hunter Rawlings, President of the American Association of Universities, described its 5-year initiative to influence the way that STEM courses are being taught at their member universities. The goal is to foster a change at the department level from using more passive, lecture-style approaches to using more interactive pedagogies.

The committee discussed the question of incentives that might encourage faculty and departments to make changes to their undergraduate teaching that reflect research-based best

practices. Dr. Carl Wieman, Associate Director for Science with the Office of Science and Technology Policy (OSTP), and Dr. Joan Ferrini-Mundy, Assistant Director for the Directorate for Education and Human Resources (EHR), participated in this discussion. These incentives or motivators included departmental leadership in setting expectations, peer pressure, institutional competitiveness, and pride in effective teaching.

c. Committee on Science and Engineering Indicators (SEI)

To begin planning for *Science and Engineering Indicators 2014*, the SEI chairman urged Board Members to contact Mr. Rolf Lehming and Dr. Robert Bell, SEI Executive Secretaries, and Dr. Matthew Wilson, Board Office Liaison, preferably by June 1, 2012, with any suggestions they may have for changes in 2014. Plans are under way for the publication of the first *Indicators* Companion Piece in mid-June 2012. Board Members were asked to provide feedback on a preliminary draft of the second *Indicators* Companion Piece, which focuses on trends in public research universities, to Dr. Lisa Nichols and Dr. Matthew Wilson, Board Office staff, by May 18, 2012.

The meeting closed with tributes to two people who have made important contributions to the continued success of *Indicators*. Dr. José-Marie Griffiths, the outgoing SEI committee chairman, was praised for her outstanding leadership and a strong commitment to encouraging wider use of the *Indicators* data. Mr. Rolf Lehming, retiring Director of NSF's Science and Engineering Indicators Program and SEI Executive Secretary, was honored in recognition of his achievements in managing production of the last six editions of *Indicators* and contributing to eleven editions since 1991.

d. Committee on Programs and Plans (CPP)

In CPP Open Session, the committee heard presentations on five information items.

Dr. James Ulvestad, Division Director, Division of Astronomical Sciences (AST), Directorate for Mathematical and Physical Sciences (MPS), presented an update on the Large Synoptic Survey Telescope (LSST). LSST, a collaboration with the Department of Energy, is a potential future MREFC project for NSF. Although NSF's MREFC panel unanimously approved the project, additional requirements and reviews were stipulated prior to final consideration of a proposal. Dependent on the outcome, NSF may bring an action item to the Board as early as July 2012.

Dr. Ian Robertson, Division Director, MPS Division of Materials Research (DMR), presented an update on the National High Magnetic Field Laboratory (NHMFL). Dr. Robertson highlighted several NHMFL projects with great scientific promise, including the potential for new types of computer and information storage. NSF has developed a long-range plan for recompetition of the facility and anticipates bringing an action item to the Board in July 2012.

Dr. Ulvestad also updated CPP on the recent competition held for management of Arecibo, formerly known as the National Astronomy and Ionosphere Center. SRI International was selected as the new managing organization; the formal transition occurred in October 2011. Dr. Ulvestad explained that because of the full cooperation and engagement of the previous managing organization, scientific activities transitioned without interruption. He noted that

recompetition was a complex undertaking, and described a number of lessons learned in the areas of NSF workload, property ownership, personnel, and long-term project management.

CPP also heard an update on the National Center for Atmospheric Research (NCAR) from Dr. Michael Morgan, Division Director, Division of Atmospheric and Geospace Sciences (AGS), Directorate for Geosciences (GEO). Dr. Morgan told the committee about an extensive 2011 review of both NCAR and the University Corporation for Atmospheric Research (UCAR), the managing body. He noted that both reviews were extremely positive, and NSF anticipates an action item for renewal of NCAR at the spring 2013 Board meeting.

Dr. David Conover, Division Director, GEO Division of Ocean Sciences (OCE), presented an update on the *JOIDES Resolution* scientific drillship, which is the U.S. contribution to the Integrated Ocean Drilling Program (IODP), an international program made up of 25 member countries. The current program is authorized through FY 2013. NSF plans to bring an action item for a 1-year extension of operations and maintenance to the Board at the July 2012 meeting. Longer range plans anticipate an action item in December 2013 for support of ship operations beyond 2014.

CPP then turned to its first Program Portfolio Planning process on Cognitive Science and Neuroscience. Dr. John Wingfield, BIO Assistant Director (AD), gave a short overview of cognitive science/neuroscience efforts at NSF. Several other ADs also came to the table for the discussion, including: Dr. Myron Gutmann (SBE); Dr. Farnam Jahanian, Directorate for Computer and Information Science and Engineering (CISE); Dr. Thomas Peterson (ENG); and Dr. Joan Ferrini-Mundy (EHR). CPP and NSF had a successful discussion about NSF's role in the larger Federal Government cognitive science and neuroscience portfolio, as well as ways NSF might create a focal point for this research. Dr. Mark Abbott, CPP chairman, suggested a joint CPP-NSF white paper summarizing recommendations and providing feedback on the planning process. Drs. Alan Leshner and Myron Gutmann agreed to coordinate this document, which will be discussed at the July 2012 meeting. A second Program Portfolio Planning process, on a topic to be determined, is also scheduled for July 2012.

The committee approved the report from the CPP Task Force on Unsolicited Mid-Scale Research, *Report on the NSF Support of Unsolicited Mid-Scale Research (NSB-12-22)*, which was subsequently approved by the Board subject to final edits by the chairman of the Task Force on Unsolicited Mid-Scale Research and the Board Chairman. (See 1.d.)

In CPP Closed Session, the committee heard one information item and had one update.

CPP Subcommittee on Polar Issues (SOPI)

Dr. Karl Erb, the long time-head of NSF's Office of Polar Programs (OPP), retired at the end of March 2012. Dr. Taylor, SOPI chairman, recognized Dr. Erb for his service to NSF and the Nation. Dr. Kelly Falkner was introduced as the OPP Acting Director. It was also announced that Dr. Fae Korsmo will serve as OPP Acting Deputy Director.

Dr. Falkner provided updates on several topics:

- The protest of the award of the contract to provide logistical support to the US Antarctic Program (USAP) was denied. The public version of the decision is available on the Government Accountability Office's Web site.
- The Blue Ribbon Panel, which is tasked with reviewing the USAP to ensure a sustainable long-term strategy for logistics in support of research in Antarctica, is currently developing a report summarizing the results of their review. The report will be delivered summer 2012.
- OPP recently released a solicitation for Science, Engineering, and Education for Sustainability in the Arctic. Proposals are expected fall 2012.
- The National Academy of Sciences/National Research Council recently released a report, *Lessons and Legacies of the International Polar Year*, which highlights outcomes and achievements of the International Polar Year (IPY). NSF played a significant role in the IPY.

Dr. Julie Brigham-Grette, Geoscience Professor from the University of Massachusetts-Amherst and U.S. Chief Scientist of the Lake El'gygytgyn Drilling Project, presented early results from the climate record compiled from the Lake El'gygytgyn drilling samples.

Mr. Brian Stone, Division Director, OPP Division of Antarctic Infrastructure and Logistics (AIL), presented several updates on Antarctic logistics support. The resupply of the McMurdo and South Pole Stations was successfully completed. Additionally, the USAP logistical support contract was successfully transitioned from Raytheon to Lockheed Martin. In the near-term, the focus for logistical support in the Antarctic will be on supporting ongoing research activities, supporting the Blue Ribbon Panel Report, and on making information technology upgrades, such as improvements to supply chain management tools.

e. Committee on Strategy and Budget (CSB)

In CSB Open Session, Dr. Suresh provided a brief update on the NSF FY 2012 and FY 2013 budget processes. He noted that the agency received nearly a 3 percent increase over the FY 2011 enacted level for the agency in FY 2012. He reported that the FY 2013 mark-ups by the House and Senate were favorable, approximately 4 and 3 percent above the FY 2012 level, respectively. Dr. Wingfield, BIO AD, presented changes in solicitation and merit review processes currently being implemented within that directorate. Dr. Griffiths provided updates on the Subcommittee on Facilities (SCF) and the Task Force on Data Policies (DP), which, having successfully implemented its responsibilities, was subsequently discharged by the Board Chairman. Dr. Diane Souvaine, CSB Chairman, also led a discussion on NSB committee organization.

In CSB Closed Session, Dr. Suresh presented information to CSB on the AD Retreat held in April 2012. CSB also discussed with NSF management policies and planning for budget processes for FY 2013, 2014, and outyears.

CSB Subcommittee on Facilities (SCF)

The subcommittee met to conduct the Annual Portfolio Review (APR). Dr. Griffiths, SCF chairman, reviewed the background, context, and inputs for the review. This was followed by a presentation by the SCF Executive Secretaries that defined the NSF portfolio, showed budgetary

information on the portfolio, discussed management and oversight of the facilities, and identified risks and attributes. At the end of this presentation, Dr. Griffiths opened the meeting for discussion and questions by the subcommittee members. After discussions, Dr. Griffiths requested that comments and suggestions be used to develop recommendations for incorporation into the APR report to be sent to SCF members for further review prior to the July 2012 meeting.

[signed]
Michael L. Van Woert
Executive Officer