

**APPROVED MINUTES¹
OPEN SESSION
393RD MEETING
NATIONAL SCIENCE BOARD**

The National Science Foundation
Arlington, Virginia
August 9-10, 2006

Members Present:

Steven C. Beering, Chairman
Kathryn D. Sullivan, Vice Chairman
Dan E. Arvizu
Barry C. Barish
Ray M. Bowen
G. Wayne Clough
Kelvin K. Droegemeier
Kenneth M. Ford
Louis J. Lanzerotti
Douglas D. Randall
Jon C. Strauss
Jo Anne Vasquez

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

Members Absent:

Daniel E. Hastings
Elizabeth Hoffman
Alan I. Leshner

Consultants* Present

Mark R. Abbott
Camilla P. Benbow
John T. Bruer
Patricia D. Galloway
José-Marie Griffiths
Karl Hess
Thomas N. Taylor
Richard F. Thompson

Consultant** Absent

Arthur K. Reilly

¹ The minutes of the 393rd meeting were approved by the Board at the September 2006 meeting.

* Consultants pending delivery of Presidential commission.

** Consultant pending Senate confirmation.

The National Science Board (Board) convened in Open Session at 1:30 p.m. on Thursday, August 10, 2006 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-06-73, Board Book Tab 13). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

Dr. Beering welcomed and introduced the new Presidential Nominees for the National Science Board, Class of 2008 and 2012. Eight Nominees were confirmed by the Senate on August 3, 2006 with a ninth Nominee to be confirmed by the Senate in the upcoming weeks. Final paper work was pending with the White House for the eight new Members. He thanked Dr. Michael Crosby and the Board Office staff for their efforts to help the process proceed as quickly as possible. Eight Nominees attending the August meeting were:

- Dr. Mark Abbott of Oregon. Dean and Professor, College of Oceanic and Atmospheric Sciences, Oregon State University.
- Dr. Camilla Benbow of Tennessee. Patricia and Rodes Hart Dean of Education and Human Development, Vanderbilt University's Peabody College.
- Dr. John Bruer of Missouri. President, The James S. McDonnell Foundation.
- Dr. Patricia Galloway of Washington (state). Chief Executive Officer, Nielsen-Wurster Group, Inc.
- Dr. José-Marie Griffiths of Pennsylvania. Dean and Professor, School of Information and Library Science, University of North Carolina, Chapel Hill.
- Dr. Karl Hess of Illinois, replacing Dr. Delores Etter, Class of 2008. Swanlund Professor, Center for Advanced Study, Professor of Electrical and Computer Engineering and Physics, Faculty of the Beckman Institute, University of Illinois, Urbana.
- Dr. Thomas Taylor of Kansas. Roy A. Roberts Distinguished Professor, Department of Ecology and Evolutionary Biology, Curator of Paleobotany for the Natural History Museum and Biodiversity Research Center, University of Kansas.
- Dr. Richard Thompson of California. Keck Professor of Psychology and Biological Sciences, Psychology Department and Biological Sciences Department, University of Southern California.

The most recent Nominee could not attend the meeting:

- Mr. Arthur Reilly of New Jersey. Senior Director, Strategic Technology Policy, Cisco Systems, Inc.

Dr. Beering encouraged the Nominees to participate in all discussions, and reminded them that they could not vote at this time.

AGENDA ITEM 5: Approval of Open Session Minutes, May 2006

The Board unanimously APPROVED the Open Session minutes of the May 2006 Board meeting (NSB-06-64, Board Book Tab 13H).

AGENDA ITEM 6: Closed Session Items for September 2006

The Board unanimously APPROVED the Closed Session items for the September 2006 meeting (NSB-06-74, Board Book Tab 13I).

AGENDA ITEM 7: Chairman's Report

Dr. Beering, Board Chairman, reported on several issues.

a. NSF Authorization Act of 2002, Section 14 Report

Dr. Beering reported that he reminded both the Executive Committee and the chairman of the Committee on Programs and Plans that, as required by Congress under Section 14 of the NSF Authorization Act of 2002, he would report to Congress any delegations of authority related to the use of Major Research Equipment and Facilities Construction (MREFC) account. He would report to Congress that there had been no delegation of authority related to MREFC during the past year. That report would be made by September 15, 2006.

b. Annual Board Retreat, Visit, and Meeting

At the May meeting, Dr. Beering asked Dr. Michael Crosby, Board Executive Officer, to develop a list of proposed sites for the 2007 annual retreat, visit, and meeting. The Executive Committee reached a consensus recommendation that the Board's retreat, visit, and meeting for February 2007 should take place at Corvallis, Oregon. Dr. Beering concurred with this recommendation, and asked Dr. Crosby to develop the logistics and agenda, and provide updates to the Board at the September 2006 meeting.

c. *ad hoc* Committee on Nominations for NSB Class of 2008 – 2014

Dr. Beering announced the appointment of Members to serve on the *ad hoc* Committee on NSB Nominations for the Class of 2008 – 2014, with Dr. G. Wayne Clough as chairman, and committee members Drs. Daniel Hastings, Elizabeth Hoffman, Alan Leshner, and Douglas Randall. Drs. Beering, Kathryn Sullivan, and Arden Bement will serve as *ex officio* members.

d. Board Commission on 21st Century Education in STEM

Dr. Beering invited Dr. Jo Anne Vasquez, a Board Member and Commission Vice Chairman, to report on the Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics (STEM), which held its first meeting on August 3-4, 2006 at the National Science Foundation.

Dr. Vasquez reported that since the May 2006 Board meeting, Dr. Beering appointed the final two members of the Commission: Nobel Laureate, Dr. Dudley Herschbach from Harvard University and former United States Senator Nancy Kassebaum Baker. In addition, Dr. Shirley Malcom was named as the Co-Chairman, along with Dr. Leon Lederman, also a Nobel Laureate. Dr. Vasquez thanked Board Members who attended the Commission meeting: Drs. Dan Arvizu, Beering, Elizabeth Hoffman, Jon Strauss, and new Board Nominee, José-Marie Griffiths.

During its first meeting, the Commission was addressed by Mr. Robert Shea, Office of Management and Budget, who spoke about the efforts of the inter-agency Academic Competitiveness Council that is reviewing STEM education programs across the Federal Government; Dr. Donald Thompson, Directorate for Education and Human Resources gave an update on the STEM education programs in that directorate; and Mr. Norman Augustine, Retired Chairman and Chief Executive Office for Lockheed Martin, who chaired the committee that produced the influential report released in 2005, *Rising Above the Gathering Storm*, from the National Academies. The Commission formed a series of working groups that will meet over the coming months and report back to the full Commission at its next meeting, which is tentatively scheduled for mid-November. The Commission plans to have a draft action plan ready to circulate in early 2007, and will update the Board of its progress. Dr. Vasquez thanked Dr. Beering for his leadership, and the Board for helping to move the Commission forward.

AGENDA ITEM 8: Director's Report

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

a. NSF Staff Announcements

Mr. Jeffrey Nesbit joined NSF as Director, Office of Legislative and Public Affairs (OLPA), Office of the Director on June 11, 2006. Prior to forming his own communications consulting business in 1992, Mr. Nesbit was the Director of Communications to former Vice President Dan Quayle at the White House; Associate Commissioner for Public Affairs at the Food and Drug Administration for David Kessler, M.D.; a U.S. Senate press secretary and a national journalist with media organizations such as Knight-Ridder Newspapers.

Dr. Edward J. Hackett joined NSF as Director, Division of Social and Economic Sciences, Directorate for Social, Behavioral, and Economic Sciences (SBE) on July 14, 2006 under an Intergovernmental Personnel Act (IPA) assignment between NSF and Arizona State University, where he serves as professor for the School of Human Evolution and Social Change and School of Life Sciences, and the Consortium for Science, Policy, and Outcomes. He received his Ph.D. in Sociology in 1979 from Cornell University.

Mr. David Elizalde joined NSF as Director, Division of Acquisition and Cooperative Agreement Support, Office of Budget, Finance, and Award Management (BFA) on July 23, 2006. Prior to his appointment, Mr. Elizalde served as the Special Assistant to the Director, Office of Commissioned Corps Operations, and Office of the Surgeon General.

Dr. Sandra L. Schneider began serving as Director, Division of Behavioral and Cognitive Sciences, SBE on July 26, 2006 under an IPA assignment between NSF and the University of South Florida where she serves as both Associate Dean for the College of Arts and Sciences and Professor of Cognitive and Neural Sciences. She received her Ph.D. in Experimental Psychology in 1989 from the University of Wisconsin, Madison.

Dr. Rae Silver, endowed Professor at Columbia University joined the Office of Integrative Activities in June. She will assist in activities related to the relationship between physical sciences and the brain.

Dr. Richard O. Buckius agreed to serve as Assistant Director for Engineering, Directorate for Engineering (ENG) for the next 2 years. Dr. Buckius joined NSF in September 2004 as Director, Division of Chemical and Transport Systems. He is from the University of Illinois, Urbana-Champaign, and received his Ph.D. in Mechanical Engineering in 1975 from the University of California, Berkeley.

Dr. Bement stated that Dr. Donald Thompson would complete his 4-year assignment at NSF on August 11, 2006. Dr. Bement commented that Dr. Thompson had done an outstanding job leading the Directorate for Education and Human Resources (EHR).

b. Congressional Update

Dr. Bement reported that although there were no hearings involving NSF witnesses since the May 2006 Board meeting, NSF is included in six House bills and four Senate bills. He submitted a congressional update for the record (Board Book Tab 13J) (Appendix).

c. NSF Web Site Outreach Activities for Middle School Students

Dr. Kathie Olsen, NSF Deputy Director, reported on an NSF effort to further initiate and support science and engineering education programs at all levels and in all fields of science and engineering; and to foster the interchange of scientific and engineering information nationally and internationally. She stated that the NSF Web site, which was recently awarded the *Webby*, will have a children's Web site that includes scientific information and quizzes to earn 14 patches that correlate to NSF scientific disciplines. It was developed with OLPA staff Ms. Susan Mason, Mr. Patrick Olmert, and Mr. Jeffrey Nesbit. Dr. Sullivan, Board Vice Chairman, commented on a similar successful program in Singapore, which worked through schools and science museums.

AGENDA ITEM 9: Committee Reports

(Note: The Education and Human Resources Committee did not meet in August 2006.)

a. Executive Committee (EC)

Dr. Bement, EC chairman, reported that Dr. Beering discussed the delegation of authority letter to Congress as indicated in the Chairman's Report. Dr. Crosby provided an update on the subject of a Board Member proposal and the development of a system with NSF to record proposals in progress. At the EC meeting, Dr. Bement also reported on NSF personnel issues.

b. Audit and Oversight (A&O) Committee

Dr. Dan Arvizu, A&O chairman, reported that Dr. Bement introduced Dr. Gloria Rogers, chairman of the Advisory Committee for Government Performance and Results Act (GPRA) Assessment. Dr. Rogers presented a brief background of the committee and its FY 2006 charge. She also noted that the Advisory Committee was asked to report on issues related to the NSF's strategic outcome goals and associated indicators as defined in the *NSF Strategic Plan for FY 2003 - 2008*. The committee concluded that NSF demonstrated significant achievement in all performance indicators related to the strategic outcome goals in FY 2006. Twelve recommendations were included in the final report, which was submitted to the NSF Director and posted publicly. A&O committee members agreed that there appeared to be duplication of efforts related to oversight, reporting, and responsibilities. Dr. Rogers referred to this in her report as "inspection of inspections" and noted that her committee would address this issue at future meetings. Dr. Arvizu commented that the report was exhaustive, comprehensive, and thoughtful. On behalf of the A&O, he thanked the Advisory Committee for all its work.

Mr. Salvatore Ercolano, with the accounting firm Clifton Gunderson LLP, presented information about the audit process and various audit reports that his firm will issue. He also discussed the concept of "auditor judgment," and emphasized that the conclusions reached during an audit are based on facts, figures, and analysis, and are subject to a quality review process. Mr. Ercolano stated that the audit is proceeding on schedule. He is engaged in the detail of testing internal controls, including compliance with laws and regulations. He assured the committee that the management's views are well considered before reaching final conclusions.

Mr. Thomas Cooley, NSF Chief Financial Officer, provided updates on a variety of topics. The FY 2006 financial audit is going well, and considerable progress has been made in addressing the FY 2005 reportable conditions regarding post-award monitoring and contract monitoring to include staff site visits and a review of high risk grantees, contractor support for desk reviews for institutions not visited, and the Defense Contract Audit Agency (DCAA) support for contractor cost oversights. NSF is also successfully addressing the new internal control analysis and reporting requirements.

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

Dr. Louis Lanzerotti, SEI chairman, reported that Dr. Beering and Dr. Alan Rapoport, SEI Executive Secretary, provided an overview answering the question, “What is Science and Engineering Indicators?” Dr. Lanzerotti reported that he explained the role of both the subcommittee and the full Board in the production of *Science and Engineering Indicators*. He emphasized that the Board involvement in *Indicators* is not limited to the SEI Subcommittee, but is the responsibility of each Board Member in terms of the review and discussion process.

An initial discussion of *Indicators* chapters was led by Mr. Rolf Lehming, Director for the Science and Engineering Indicators Program, Division of Science Resource Statistics (SRS), SBE. Mr. Lehming also presented the evolution of some of the current indicator chapter structure, the logic behind the structure, and how the structure evolved over time.

Dr. Lanzerotti introduced a parallel process to plan for *Science and Engineering Indicators 2010* at the same time that the current edition for 2008 is being developed. Ms. Jean Pomeroy, Board Office staff, briefly discussed the new condensed version of *Indicators* and the Companion Piece. Dr. Lanzerotti commented on potential use of the condensed version to emphasize selected issues.

Dr. Rapoport provided the key dates associated with the preparation of *Indicators* (Board Book Tab 9B). At the September 2006 meeting, SEI will discuss the narrative outlines, which will be provided to all Board Members for comment, and possible additional chapters and the parallel process. Dr. Lanzerotti noted that chapter outlines must be approved by the November 2006 Board meeting and hopefully most will be approved at the September 2006 Board meeting. He also noted that an additional subcommittee meeting on chapter outlines might be necessary between the September and November meetings.

d. ad hoc Engineering Education Group

Dr. Lanzerotti reported for Dr. Daniel Hastings, group lead. He called attention to the recent edition of the National Academy of Engineering (NAE) publication, *The Bridge*, which consists of informative articles on engineering education.

The *ad hoc* group consisting of Drs. G. Wayne Clough, Daniel Hastings, and Louis Lanzerotti, continues to make plans to hold a second workshop on engineering education to follow-up on the Board-sponsored workshop during October 2005 at the Massachusetts Institute of Technology (MIT), “Engineering Workforce Issues and Engineering Education: What are the Linkages?”

The second workshop will examine issues that arose from the first workshop; in particular, the retention of engineering undergraduate students and the role of NSF in understanding the issues associated with retention of those students. The upcoming workshop will also consider ways that NSF may enhance the educational experience of engineering students and how NSF may contribute to an understanding of the societal trends and industrial practices that may influence student’s choice to pursue engineering education and careers.

To prepare for this second workshop, the group met with Dr. William Wulf, NAE President, and discussed NAE's ideas from the Engineer 2020 activity, which was chaired by Dr. Clough and resulted in two reports. The group also met with NSF staff from ENG and EHR Directorates to discuss NSF's current and potential role in engineering issues and engineering education, and to consider possible issues for discussion at the upcoming workshop. Dr. Lanzerotti thanked the ENG and EHR staff for their thorough briefings and discussions on NSF programs and activities related to engineering education over the past 20 years.

With the support of the Board's EHR Committee, the group will continue to move forward with plans for a one-day workshop scheduled for November 7, 2006 at the Georgia Institute of Technology with deans of engineering universities to discuss how NSF programs and activities can specifically address major issues raised during the October 2005 workshop at MIT.

After this second workshop, the group plans to submit a draft report of both workshops, which could potentially be submitted to the full Board to consider, with recommendations to guide engineering education reform.

e. Committee on Programs and Plans (CPP)

Dr. Kenneth Ford, CPP chairman, reported on the status of several task forces and a subcommittee.

Dr. Douglas Randall, chairman of the Task Force on Transformative Research (TR), assumed the lead on this task force. The task force is absorbing the results of the various workshops and plans on presenting a working draft report to the committee at the September 2006 Board meeting.

Dr. Kelvin Droegemeier, co-chairman of the Task Force on Hurricane Science and Engineering (HSE) with Dr. Ford, reported that a draft of a report was provided to the Board (Board Book Tab 4B). The task force plans to present a final draft report at the September 2006 meeting. Once the final draft is approved, it will be released for public comment.

Dr. Barry Barish, chairman of the Subcommittee on Polar Issues (SOPI), assumed the lead for the subcommittee. He reported that Dr. Karl Erb, Director of the Office of Polar Programs (OPP), described the difficult and competing pressures for resources such as cargo delivery, population, power, and other highly constrained resources at the South Pole Station and the challenges for the coming operational season. SOPI also heard reports on three projects being conducted by OPP.

Dr. Jon Strauss, chairman of the Task Force on International Science (INT), reported that the task force drafted preliminary recommendations following the May 11, 2006 hearing and a second roundtable discussion is planned for Monday, September 25, 2006. Additionally, possible international locations for other roundtable discussions were considered.

Continuing from the May 2006 meeting with the discussion item on Board policy on recompetition of NSF awards, CPP discussed the creation of a task group to develop criteria for recompetition, but deferred action. Dr. Lanzerotti had volunteered to review the history and past documents, and reported on his progress at this meeting and outlined a plan for next steps. Dr. Lanzerotti and the Board Office staff will also continue to collect information on recompetition policies at other agencies, and provide further information and specific recommendations at the meeting in November 2006.

For the first information item presented to the committee, CPP heard an update on a new version of *NSF's Cyberinfrastructure Vision for 21st Century Discovery* draft (Board Book Tab 7B). Dr. Daniel Atkins, Director for the Office of Cyberinfrastructure, outlined the status of the document. Dr. Atkins also provided a presentation on NSF's high performance computing (HPC) strategy, and described a series of four two-track competitions. The results of one of those competitions was brought forward as an action item in closed session. He also discussed a one-track competition for a future petascale acquisition.

The second information item was on the EarthScope facility construction project. Dr. Margaret Leinen, Assistant Director, Directorate for Geosciences, made the presentation and informed the committee of the results of a baseline review conducted in September 2005. The most salient results of the review were that the facility is doing well, and work is 6 percent under budget for work completed to date. The project remains slightly behind schedule. Dr. Leinen also outlined several success stories of the project.

Dr. Olsen presented an annual update on NSF's major research facilities. She outlined the science objectives for each project and briefed the committee on the current status. Dr. Olsen emphasized the concern that operation costs for the new starts and the horizon projects will have a large impact on NSF's budget. She suggested that this would be a worthy topic for more analysis and discussion by CPP.

Dr. Olsen also presented the current draft of the *NSF Facility Plan, July 2006*, and reviewed the history and current status of the Facility Plan. The committee accepted the plan and forwarded it to the full Board.

The Board ACCEPTED the draft *NSF Facility Plan, July 2006*, subject to final edits to be approved by the Board Chairman and the CPP chairman.

f. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chairman, reported that the committee heard an information item on the status of the NSF FY 2007 budget by Dr. Bement.

Dr. Olsen summarized the draft *NSF Strategic Plan FY 2006 – 2011*, which is renewed on a 3-year cycle. Upon approval by the Board, the Strategic Plan will go to the Office of Management and Budget and subsequently to Congress. Dr. Olsen addressed the evolution of the plan over the past months involving the broad public community in addition to those specialized communities close to NSF, as well as the Board's input. The committee recommended the plan to the Board for approval.

The Board APPROVED the draft *NSF Strategic Plan FY 2006 – 2011*, subject to final editorial changes resulting from Board discussion and recommended changes by the NSF Director, which are to be approved by the Board Chairman and CSB chairman prior to transmittal by NSF to the Office of Management and Budget.

Dr. Beering adjourned the Open Session at 2:10 p.m.



Ann A. Ferrante
Writer-Editor
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Attachment

Appendix: NSF Director's Congressional Update

**NSF Director's Congressional Update
August 2006**

Appropriations:

On June 29 the House passed the Science, State, Justice, Commerce and Related Agencies Appropriations bill for the coming fiscal year. Included in the bill was funding for NSF at the President's requested level of \$6.02 billion, a 7.9 per cent increase over the FY 2006 level.

On July 13 the Senate Appropriations Committee marked up their version of the Commerce, Justice and Science Appropriation, which would provide NSF with \$5.99 billion. This is \$410 million over the FY 2006 level, an increase of 7.4 percent. The Senate is not expected to vote on the measure before Congress adjourns, after which it is most likely to become part of an omnibus appropriations bill.

Congress is currently in recess until September 5th, and both the House and Senate are expected to adjourn on September 29.

Hearings:

There have been no hearings involving NSF witnesses since the last NSB meeting.

Legislation:

The following bills that mention the National Science Foundation have been introduced or have been subject to Congressional action since the last NSB meeting:

H.R.27; Rep. Howard P. (Buck) McKeon [CA-25] (introduced 1/4/2005)

Workforce Investment Act Amendments of 2005

6/29/2006: Passed Senate with an amendment by Unanimous Consent.

To enhance the workforce investment system of the Nation by strengthening one-stop career centers, providing for more effective governance arrangements, promoting access to a more comprehensive array of employment, training, and related services, establishing a targeted approach to serving youth, and improving performance accountability, and for other purposes. Requires consultation and Interagency Committee participation by the NSF Director.

H.R.5356; Rep. Michael T. McCaul [TX-10] (introduced 5/11/2006)

Research for Competitiveness Act

6/22/2006: Placed on Union Calendar No. 294.

Requires the NSF Director to allocate at least 3.5 percent of funds appropriated to NSF for Research and Related Activities for FYs 2007 through 2011 for grants to early-career researchers to establish innovative research programs and integrate education and research. Permits the existing Faculty Early Career Development (CAREER) Program to be designated as the mechanism for awarding such grants. Requires reports describing the: (1) distribution of the

institutions of the awardees of such program since FY 2001 among specified categories of institutions of higher education; and (2) impact of such program on the ability of young faculty to compete for NSF research grants.

H.R.5358; Rep. John J. H. "Joe" Schwarz [MI-7] (introduced 5/11/2006)

Science and Mathematics Education for Competitiveness Act

6/22/2006: Placed on the Union Calendar No. 293.

- Authorizes \$50 M for FY 2007; \$70 M for FY 2008; \$90 M for FYs 2009 and FY 2010 to NSF for the Robert Noyce "Teacher" Scholarship Program and related capacity-building activities.
- Authorizes \$50 M from FY 2007 to 2011 to NSF to award grants to establish science and mathematics teacher training partnership programs to improve elementary and secondary science and math instruction.
- Authorizes \$40 M for FY 2007, \$45 M for FY 2008, \$50 M for FY 2009, \$50 M for FY 2010, and \$50 M for FY 2011 to NSF for the STEM Talent Expansion Program.
- Calls for the NSF Director to allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship program for FYs 2007 through 2011.
- Authorizes \$4 M for FY 2007 and \$10 M for FYs 2008 through 2011 to NSF for a program to award grants to STEM departments at institutions of higher education to establish Centers for Undergraduate Education in Science, Mathematics, and Engineering.
- Requires the NSF to assess the impact of the Professional Science Master's (PSM) degree at a variety of institutions.
- Requires the NSF to submit a report to Congress on the impact of the broader impacts grant criterion.

H.R.5605; Rep. David Wu [OR-1]; introduced 6/14/2006

10,000 Trained by 2010 Act

6/14/2006: Referred to House Committee on Science.

- Authorizes NSF from \$3.5 M (FY 2007) increasing incrementally to \$3.8 M (FY 2010) to award grants for basic research on innovative approaches to improve information systems, including research on information studies; population informatics; translational informatics; and data security, integrity, and confidentiality.
- Authorizes NSF from \$4.5 M (FY 2007) increasing incrementally to \$4.8 M (FY 2010) to award multi-year grants for Informatics Research Centers.
- Authorizes NSF from \$9 M (FY 2007) increasing to \$9.6 M (FY 2010) for capacity building grants to establish or improve undergraduate and master's degree information programs.
- Authorizes from \$7 M (FY 2007) increasing incrementally to \$7.6 M (FY 2010) to award grants under the Scientific and Advanced Technology Act of 1992 for the purposes of section 3(a) and (b) of that Act (which authorize grants to: 3(a) associate-degree-granting colleges to assist them in providing education in advanced-technology fields, including manufacturing, and 3(b) to improve the quality of their core education courses in science and mathematics and to support National Centers of Scientific and Technical Education).

H.R.5644; Rep. Michael T. McCaul [TX-10] (introduced 6/20/2006)

Green Energy Education Act of 2006

6/20/2006: Referred to House Committee on Science.

Authorizes the Secretary of Energy to contribute energy research and development funds to NSF for the Integrative Graduate Education and Research Traineeship program to support graduate education related to such energy projects. Authorizes the Secretary to contribute funds for advanced energy technology research and development for high performance buildings to the NSF for curriculum development to improve undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of such buildings.

H.R.5656; Rep. Judy Biggert [IL-13] (introduced 6/21/2006)

Energy Research, Development, Demonstration, and Commercial Application Act of 2006

6/27/2006: Ordered to be reported out of committee by voice vote.

To provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes. Section 14 contains same provisions as H.R.5644. Authorizes the Secretary of Energy to contribute energy research and development funds to NSF for the Integrative Graduate Education and Research Traineeship program to support graduate education related to such energy projects. Authorizes the Secretary to contribute funds for advanced energy technology research and development for high performance buildings to the NSF for curriculum development to improve undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of such buildings.

S.2802; Sen. John Ensign [NV] (introduced 5/15/2006)

A bill to improve American innovation and competitiveness in the global economy.

7/19/2006: Reported out of Committee on Commerce, Science, and Transportation Committee with and placed on Senate Legislative Calendar No. 524.

Addresses the competitiveness of the United States in science, mathematics, and technology. Authorizes appropriations for NSF for fiscal years 2007 through 2011 of between \$6.4 billion and \$11.4 billion a year. The bill would earmark a portion of the authorized amounts to increase graduate research fellowships, expand the graduate education and research trainee program, and create pilot programs to stimulate competitive research. Also directs the President to convene a national summit on United States science and technology enterprises and establish a council on innovation and competitiveness.

S.3483; Sen. John Ensign [NV]; introduced 6/8/2006

National Innovation Education Act - College Pathway Act of 2006

6/8/2006: Referred to Senate Committee on Health, Education, Labor, and Pensions.

- Authorizes NSF to award competitive grants to local educational agencies (LEAs) for the development or improvement of magnet school programs which focus on science, mathematics, and technology education. Authorizes \$10 M for FY 2007 and \$20 M for FYs 2008 and 2009 to NSF to award grants to LEAs to enable implementation of innovation-based experiential learning.

- Requires NSF to: (1) expand the Graduate Research Fellowship Program by an additional 250 fellowships annually for five years (1,250 total) and the Integrative Graduate Education and Research Traineeship Program (1,250 additional trainees over five years); (2) establish a clearinghouse for sharing program elements used in successful professional science master's degree programs; (3) award grants for pilot programs to four-year institutions of higher education to facilitate the creation or improvement of such programs; (4) submit a multi-year plan that describes how the funds authorized by this Act for doubling research funding shall be used; and (5) study how the federal government should support the new discipline of service science.
- Authorizes appropriations for the NSF Mathematics, Engineering, and Technology Talent Expansion Program as follows: \$35 M (FY 2007); \$50 M (FY 2008); \$100 M (FY 2009); and \$150 M (FY 2010).
- Authorizes the doubling of NSF research funding as follows: \$6,440 M (FY 2007); \$7,280 M (FY 2008); \$8,120 M (FY 2009); \$8,960 M (FY 2010), and \$9,800 M (FY 2011).

S.3502; Sen. Edward Kennedy [MA]; introduced 6/13/2006

New National Defense Education Act of 2006

6/13/2006: Referred to Senate Committee on Health, Education, Labor, and Pensions.

- Authorizes to NSF \$400 M for the NSF Math and Science Partnerships for FY 2007, and increases funding by 10 percent annually for each of the FYs 2008 through 2011. These funds should be in addition to any other amounts authorized or appropriated.
- Directs funding of the Teacher institutes for the 21st Century program as follows: \$50 M (FY 2007); \$60 M (FY 2008); \$70 M (FY 2009); \$80 M (FY 2010), and \$90 M (FY 2011).
- Authorizes funds to double NSF's Education and Human Resources programs as follows: \$887 M (FY 2007); \$1,040 M (FY 2008); \$1,193 M (FY 2009); \$1,346 M (FY 2010); and \$1,500 M (FY 2011).

S.3510; Sen. Robert Menendez [NJ]; introduced 6/14/2006

Amends the NSF Authorization Act of 2002 to authorize grants for Partnerships for Access to Laboratory Science (PALS).

6/14/2006: Referred to Senate Committee on Health, Education, Labor, and Pensions.

- Authorizes \$9,839,262,000 to NSF for FY 2007, and of that amount, calls for \$50 M to be specifically allocated for a Partnerships for Access to Laboratory Sciences program, which awards grants to high-need local educational agencies to establish partnerships for access to laboratory science to improve laboratories and provide instrumentation as part of a comprehensive program to enhance the quality of STEM instruction at the secondary school level.
- Calls for the program to be evaluated, and for the NSF Director to provide technical assistance, including providing advice from experts on how to develop: (1) a quality application for a grant and (2) quality activities from funds received from a grant.