

**APPROVED MINUTES<sup>1</sup>  
OPEN SESSION  
398TH MEETING  
NATIONAL SCIENCE BOARD**

National Science Foundation  
Arlington, Virginia  
May 14-15, 2007

Members Present:

Steven C. Beering, Chairman  
Kathryn D. Sullivan, Vice Chairman  
Mark R. Abbott  
Dan E. Arvizu  
Ray M. Bowen  
John T. Bruer  
Kelvin K. Droegemeier  
Kenneth M. Ford  
Patricia D. Galloway  
José-Marie Griffiths  
Daniel E. Hastings  
Elizabeth Hoffman  
Louis J. Lanzerotti  
Douglas D. Randall  
Arthur K. Reilly  
Jon C. Strauss  
Thomas N. Taylor  
Richard F. Thompson  
Jo Anne Vasquez

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

Members Absent:

Barry C. Barish  
Camilla P. Benbow  
G. Wayne Clough  
Karl Hess  
Alan I. Leshner

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<sup>1</sup> The minutes of the 398<sup>th</sup> meeting were approved by the Board at the August 2007 meeting.

The National Science Board (Board) convened in Open Session at 2:00 p.m. on Tuesday, May 15, 2007 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-07-45, 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, March 2007

The Board unanimously APPROVED the Open Session minutes of the March 2007 Board meeting (NSB-07-42, Board Book Tab 11D).

AGENDA ITEM 6: Closed Session Items for August 2007

The Board unanimously APPROVED the Closed Session items for the August 7-8, 2007 meeting (NSB-07-44, Board Book Tab 11E).

AGENDA ITEM 7: Chairman's Report

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

**a. Election of Executive Committee Members**

In Plenary Executive Closed Session, the Board elected Drs. Mark Abbott and Patricia Galloway to serve as members of the Executive Committee.

**b. Board Meeting Calendar for 2008**

As part of the annual business conducted each May, the Board reviewed the draft meeting schedule for the next calendar year. The draft 2008 calendar for Board meeting dates and the resolution for approval were provided to Board Members with supplemental materials (NSB-07-48, Board Book Tab 11F.)

Dr. Michael Crosby, Executive Officer and Board Office Director, reported on the final schedule for approval. The Board Office made every effort to avoid as many conflicts as possible with Board Member schedules and various constraints during the year, such as holidays, professional meetings, and date-specific Board actions.

Dr. Crosby stated that in April 2007, after the initial polling for Board Member conflicts and availability, he sent an e-mail to all Members with some suggested meeting dates for calendar year 2008. In response to that note, additional information was received that caused the Board Office to suggest convening the February meeting one day earlier than reflected in the first draft schedule. The February 6-7, 2008 (instead of February 7-8) meeting date immediately follows the release of the NSF's budget rollout and is typically held in conjunction with the Retreat and a site visit. All other dates remained the same in the draft schedule.

According to the Board Member poll for meeting dates in 2008, one Board Member will miss both days and one Member will miss one day of the February meeting. All Board Members can attend the March meeting. The May Board meeting is required by statute, and on May 10, 2008 one-third of the current Board Members' terms will end. By holding the meeting before May 10, all Members will be able to vote on action items including the elections of the Board's new or reelected Chairman and Vice Chairman. Although two Board Members will miss the May meeting, they could call-in for the elections. All Members whose terms do not end in 2008 will be able to attend the remaining meetings in August, October, and December. Based on the recommended Board meeting dates for 2008:

The Board unanimously APPROVED the Board meeting calendar for 2008.  
(NSB-07-60) (Appendix A).

Dr. Beering asked Dr. Crosby to develop a short list of candidate locations for the February 2008 meeting, retreat, and visit. He asked Board Members to provide location suggestions to Dr. Crosby, who will be presenting a list of candidate sites at the August 2007 meeting.

Dr. Douglas Randall reminded the Chairman about a discussion from the February 2007 meeting on possibly changing the retreat meeting from February to October. Dr. Kathryn Sullivan, Board Vice Chairman, noted that it had been about 10 years since the review of this issue, which was done last by her predecessor, Dr. Diana Natalicio. Dr. Sullivan asked that two or three Board Members join her in reviewing Board meeting cycles, milestones, and schedules. Dr. Sullivan will provide the Board with their findings, recommendations, and insights over the next several months.

### **c. Board Visit to Hawaii**

The Chairman announced that a Board visitation team will visit Hawaii, June 3-9, 2007. Dr. Beering, along the rest of the visitation team - Drs. Dan Arvizu, Ray Bowen, Kelvin Droegemeier, Karl Hess, Elizabeth Hoffman, and Kathryn Sullivan - will meet with various directors, researchers, and representatives from the University of Hawaii, the broader science and engineering research and education community, and the State Government of Hawaii. The visitation team had an ambitious schedule to meet with 70 people in 5 days on 3 different islands to learn more about education initiatives that can promote greater participation of Native Hawaiians and Pacific Islanders as well as NSF-funded research in science and engineering on the islands.

Dr. Crosby thanked NSF staff who provided advice on various NSF-sponsored programs in Hawaii. He noted that Hawaii had been perennially one of the top finalist candidates for off-site Board meetings held in February. He stated that he met with University of Hawaii leadership to include the President, vice presidents, chancellors of several campuses, as well as the Governor's office, science and technology industry leaders, and local Hawaiian representatives who are engaged in weaving Native Hawaiian and Pacific Islander culture with science and technology, much of which is sponsored through NSF awards. The visit was timely in terms of the development of the Board's National Action Plan for science, technology, engineering, and mathematics (STEM) education. Dr. Crosby reported that the

Governor of Hawaii is supportive of the recommendations that the Board is considering as part of its National Action Plan, as well as a state Innovation Initiative to transition Hawaii from a tourism economy to a science and technology economy.

#### **d. STEM Education Caucus**

On April 26, 2007, Dr. Beering along with Drs. Elizabeth Hoffman and Jo Anne Vasquez, gave a briefing to the STEM Education Caucus on the Board's forthcoming National Action Plan on STEM education. Also participating in this event was a representative of the National Governors Association who discussed its initiatives in this area. After the formal presentation, the floor was open for questions and answers from about 30 congressional staff and representatives of STEM organizations present. Dr. Beering noted that the event was covered by the media, which included an article in *Science* magazine.

#### **e. NSF Reauthorization Bills**

Dr. Beering asked Dr. Crosby to give an overview on the NSF reauthorization bills for FY 2008-2010 currently in Congress as pertaining specifically to Board responsibilities and/or actions, if enacted into law.

Dr. Crosby reported that on April 25, 2007 the Senate passed the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act (or America COMPETES Act, S. 761). The NSF Director, in consultation with the Board, will submit a comprehensive, multi-year plan describing how the authorized funds would be used if appropriated to Congress no later than 180 days after enactment of the act.

On May 2, 2007 the House passed the NSF Authorization Act of 2007 (H.R. 1867) and tasked the Board with the following duties, if this pending legislation becomes law:

- (1) **Limit on Proposals:** The Board will review and assess the effects of NSF policies on institutions of higher education regarding the limitations on the number of proposal submissions by a single institution. The Board will determine whether current policies are well justified and appropriate for the types of programs that limit the number of proposal submissions. The Board will summarize its findings and any recommendations regarding changes to the current policy on the restriction of proposal submissions in a report to Congress no later than 1 year from the enactment of that act.
  
- (2) **Interdisciplinary Research:** The Board will evaluate the role of NSF in supporting interdisciplinary research, including through the Major Research Instrumentation program, the effectiveness of NSF's efforts in providing information to the scientific community about opportunities for funding and process of selection of interdisciplinary research proposals. The Board will also evaluate the effectiveness of NSF's efforts to engage undergraduate students in research experiences in interdisciplinary settings, including through the Research in Undergraduate Institutions program and the Research Experiences for Undergraduate program. The Board will provide the results of its evaluation including a recommendation for the proportion of NSF's research and

related activities funding that should be allocated for interdisciplinary research to Congress no later than 1 year from the enactment of this act.

- (3) Pilot Program of Grants for New Investigators: The Board will conduct a review and assessment of the NSF pilot program of grants for new investigators, including the number of new investigators funded, the distribution of awards by type of institution of higher education, and the success rate upon re-submittal of proposals by new investigators funded through this pilot program. The Board will summarize its findings and any recommendations regarding changes to, or the continuation of, the pilot program in a report to Congress no later than 3 years after the enactment of this act.
- (4) Cost-Sharing: The Board will evaluate the impact of its policy to eliminate cost-sharing for existing programs that were developed around industry partnerships and that historically require industry cost-sharing, such as the Engineering Research Centers and Industry/University Cooperative Research Centers. The Board will also consider the impact of a cost-sharing policy on initiating new programs while industry interests and participation are sought. The Board will report to Congress no later than 6 months after the enactment of this act.
- (5) Preconstruction Funding and Maintenance and Operations Costs: The Board will evaluate preconstruction funding and maintenance and operation costs, and on any recommendations for modifying the current policies related to allocation of funding for major research equipment and facilities. In particular, the Board will evaluate the appropriateness of the requirement that funding for pre-construction activities, including detailed design work that comes exclusively from the sponsoring research division rather than being available, at least in part, from the Major Research Equipment and Facilities Construction (MREFC) account. Additionally the Board will evaluate the appropriateness of NSF policies for allocation of costs for, and oversight of maintenance of, operations of major research equipment and facilities. The Board will submit a report to Congress no later than 6 months after the enactment of this act.

Referring to Dr. Crosby's item (1) regarding a limit on proposals from institutions, the NSF Director, Dr. Arden Bement, clarified that although NSF has no current policy for restriction on current research grants, it has a practice that is determined on a case-by-case basis, which is based on the type of solicitation.

#### **f. Annual Awards Dinner**

The Board held its annual Awards Dinner at the Department of State's Reception Rooms on Monday, May 14, 2007. Dr. Beering stated that the Awards Dinner is one of the few opportunities the Board has to recognize the distinguished contributions of individuals and organizations to the advancement of science. The Board was honored to receive a message from President George W. Bush.

The following honorary award recipients were recognized for their distinguished contributions:

- Dr. Shirley Ann Jackson, President, Rensselaer Polytechnic Institute, received the Vannevar Bush Award.
- Dr. Peidong Yang, Associate Professor of Chemistry, University of California, Berkeley, received the Alan T. Waterman Award.
- Dr. Bassam Shakhashiri, Professor of Chemistry, University of Wisconsin-Madison, received the individual NSB Public Service Award.
- NUMB3RS, a television series, co-creators Ms. Cheryl Heuton and Mr. Nicolas Falacci, received the group NSB Public Service Award.

Dr. Beering thanked the Board Office staff, in particular Ms. Ann Noonan and Ms. Annette Douglas, for the planning of the event.

#### **g. Committee Announcements**

Dr. Beering discharged the *ad hoc* Committee for the Vannevar Bush Award with thanks to Drs. Sullivan, chairman, and Kelvin Droegemeier, Patricia Galloway, José-Marie Griffiths, and Thomas Taylor.

He also discharged the *ad hoc* Committee on Nominating for NSB Elections, informally known as the Elections Committee, with special thanks to Drs. Sullivan, chairman, and Hoffman, Randall, and Vasquez.

#### **h. Staff Recognition**

The Chairman recognized Dr. Christine Boesz, NSF Inspector General, who was recently asked to be the new Vice Chairman of the Executive Council on Integrity and Efficiency. This council is the body of inspectors general hired by agency heads, and this appointment constitutes a positive recognition for the credibility of the NSF Office of Inspector General (OIG).

He also recognized Ms. Clara Englert, who worked in the Board Office as a Science Assistant since December 2004. She served as Executive Secretary to the Task Force on International Science, and assisted with the Education and Human Resources Committee as well as all the Board's many congressional activities. Ms. Englert will be leaving her position with the Board Office to pursue advanced science degrees at North Carolina State University.

#### **AGENDA ITEM 8: Director's Report**

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

### **a. NSF Staff Announcements**

Dr. Allen Soyster began serving as Director, Division of Engineering Education and Centers (EEC) on November 1, 2006. Dr. Soyster came to NSF from Northeastern University, where he served as Professor and Dean of the College of Engineering. He earned his Ph.D. in Operations Research in 1973 from Carnegie Mellon University.

Dr. Judy Raper joined NSF as Director, Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET) on January 9, 2007. Dr. Raper came to NSF from the University of Missouri, Rolla, where she served as Chairman of the Department of Chemical Engineering. She earned her Ph.D. in Chemical Engineering in 1980 from the University of New South Wales.

Dr. Joan Ferrini-Mundy joined NSF as Director, Division for Research on Learning and Informal Setting (DRL) on January 22, 2007. Dr. Ferrini-Mundy came from Michigan State University where she served as Associate Dean for Science and Mathematics Education. She earned her Ph.D. in Mathematics Education in 1980 from the University of New Hampshire.

Dr. Machi F. Dilworth was selected to head the NSF Tokyo Office. Dr. Dilworth served as Division Director, Division of Biological Infrastructure, Directorate for Biological Sciences (BIO). Dr. Dilworth began her career in science administration as an assistant program director at NSF in 1979, worked for U.S. Department of Agriculture 1981-1990, and returned to NSF in 1990. She earned her Ph.D. in plant biochemistry and physiology from the University of California, Los Angeles.

Dr. David Stonner was selected to head the NSF Europe Office as of August 2007. Dr. Stonner previously served as Head, Congressional Affairs Section, Office of Legislative Affairs (OLPA) where he had worked since 1991. He earned his Ph.D. in psychology from the University of Missouri.

### **b. Succession Plan Activities**

Dr. Bement reported that Dr. Kathie Olsen, NSF Deputy Director, gave a presentation to Board Members at the March 2007 meeting of the Audit and Oversight (A&O) Committee on NSF's Framework for Human Capital Management, which encompassed succession planning at NSF. During her presentation, she noted the establishment of an agency-wide group made up of deputy assistant directors and deputy office directors to address workforce strategy and succession planning issues.

NSF's Ms. Kathryn Sullivan, Deputy Director, Office of International Science and Engineering (OISE), Office of the Director, was selected to work full-time to bring focused energy to the NSF succession planning efforts over the next 9 months. The group plans to report on the substantive framework for NSF succession planning and implementation activities at the October 2007 A&O meeting.

### c. Congressional Update

Dr. Bement reported that he testified on April 19, 2007, with Dr. John Marburger, Senior Advisor to the President and Director, Office of Science and Technology Policy (OSTP); the White House; and Dr. William Jeffrey, Director, National Institute of Standards and Technology (NIST); before the Senate Commerce Subcommittee on Technology, Innovation, and Competitiveness. The hearing was on the role of basic research sustaining America's competitiveness in the global economy.

Since the March 2007 Board meeting, four major pieces of legislation affecting NSF were passed. During one week, the House passed two bills that were key parts of the congressional "Innovation Agenda," and the Senate passed a reauthorization bill that encompassed three separate committees of jurisdiction.

- On April 24, 2007 the House passed H.R. 362, "10,000 Teachers, 10 Million Minds Math and Science Scholarship Act," and H.R. 363, "Sowing the Seeds Science and Engineering Research Act," both authored by the House Science and Technology Committee Chairman Bart Gordon. Both bills implement many of the science education recommendations of the National Academies report, *Rising Above the Gathering Storm*.
- Also on April 24, 2007 the Senate passed S. 761, "America COMPETES Act" that provides for a doubling of NSF's budget over 4 years by providing \$11.2 billion in budget authority in FY 2011. The bill also provides authorization for NIST, National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Energy (DOE), and U.S. Department of Education.
- On May 2, the House passed H.R. 1867, the NSF Authorization Act of 2007. The bill would provide budget authority for NSF for the next 3 fiscal years, ending with \$7.5 billion in FY 2010.

Dr. Bement further reported that the House plans to pass all of its separate bills under one bill number in order to conference these pieces of legislation, and get a bill to the President's desk for signature. Regardless of whether the bills become public law or not, all of the bills that passed were a tremendous affirmation by Congress of the good work being done at NSF.

The Director noted that during the NSF authorization bill debate on the House floor, amendments to cut funding for specific SBE awards at NSF were successfully deflected. He stated that SBE provided excellent information needed to make a credible case on the specific awards on the House floor. Additionally, Chairman Brian Baird and Ranking Member Vernon Ehlers of the Subcommittee on Research and Science Education were helpful in their vigorous defense of NSF during these amendments. He also thanked Dr. Alan Leshner and the American Association for the Advancement of Science (AAAS) who managed a write-in campaign challenging these amendments.

## AGENDA ITEM 9: Open Committee Reports

### **a. Executive Committee (EC)**

Dr. Bement, EC chairman, reported that the committee endorsed the Annual Report of the Executive Committee, which summarizes the activities of the committee from May 2006 through April 2007 (Board Book Tab 7B). Based upon the committee's recommendation:

The Board unanimously ACCEPTED the 2006 Annual Report of the Executive Committee (NSB/EC-07-2) (Appendix B).

### **b. Audit and Oversight (A&O) Committee**

Dr. Dan Arvizu, A&O chairman, noted that A&O will be following the work of the Committee on Strategy and Budget (CSB) on cost-sharing, and both committees will coordinate the outcome of discussion on this subject.

As a follow up to NSF's Merit Review Process discussed in March 2007, Drs. James Lightbourne and Joanne Tornow, both with the Office of Integrative Activities (OIA), Office of the Director, provided additional information in response to questions raised on this subject (Board Book Tab 6C).

Dr. Christine Boesz, NSF Inspector General, discussed the *Semiannual Report to the Congress, March 2007, Office of the Inspector General*. Dr. Joan Frye, NSF Director's Office, relayed the management response with data tables. The committee approved the draft transmittal letter and management response for the report (Board Book Tab 6B), and recommended full Board approval.

The Board unanimously APPROVED the transmittal letter and management response to the *Semiannual Report to the Congress, March 2006, Office of the Inspector General*.

Mr. Salvadore Ercolano, Partner-in-Charge with Clifton Gunderson LLP, reported that the auditors were reviewing the NSF Corrective Action Plan for the two reportable conditions cited in last year's plan, and that final resolution of the findings would depend on the adequacy of implementation activities. Further, Mr. Ercolano stated that the finding on contract monitoring was not likely to be resolved this year. He also informed the committee that audit standards changed, lowering the threshold for what is considered a material weakness or significant deficiency, and making it more likely that weaknesses will be reported as deficiencies.

Mr. Ercolano reported that NSF had thus far declined permission to conduct penetration testing on its systems, and indicated that his interpretation of NIST guidelines, referenced in the Federal Information Securities Management Act (FISMA) of 2002, requires penetration testing. If an agency does not allow penetration testing, a scope restriction will be reflected in the FISMA report submitted to Office of Management and Budget (OMB) in September 2007, and final audit procedures will have to be increased to avoid a qualified opinion on financial statements. Mr. George Strawn, NSF Chief Information Officer, explained the agency's concern about the

risk of penetration testing, and expressed an opinion that penetration testing is not required under NIST guidelines or Federal law. Nonetheless, NSF submitted a control penetration test proposal to the OIG in early May 2007, and Clifton Gunderson was reviewing that proposal. As the dialogue continues, A&O anticipates that NSF and auditors will work together on a viable approach to assess and ensure that NSF and the IT security is secure in the near future.

Mr. Thomas Cooley, NSF Chief Financial Officer, discussed the ramp-up for the FY2007 audit and stated that considerable progress was made on addressing reportable conditions from the FY 2006 audit. He also noted that developing a revitalized contract monitoring function will be a multi-year process.

### **c. Education and Human Resources (EHR) Committee**

Dr. Elizabeth Hoffman, EHR chairman, reported that the Department of Education "Report of the Academic Competitiveness Council" was released, and asked NSF for a brief discussion on the report at the August 2007 meeting.

The committee heard a presentation by Dr. Maria Zuber, Massachusetts Institute of Technology, on the report of the National Academies, *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*. Dr. Zuber provided background on the report and recommendations and significant findings, which included a finding that more women are earning science and engineering doctorates but are leaving academic careers. The report recommendations include providing clear leadership practices, taking responsibility for positive environments, recognizing accomplishments of women, and minimizing gender bias. The committee discussed several key points and the report's findings. Dr. Hoffman encouraged Board Members to review the book that the National Academies provided to them.

As of March 2007, EHR was given the responsibility to present to the Board a draft National Action Plan for STEM education based on the work of the Board's Commission on 21<sup>st</sup> Century Education in STEM. Dr. Hoffman reviewed the progress made since March 2007 on the draft, and the committee agreed that critical central issues were addressed in the draft plan. The committee will continue with the current direction of the document, with the intent to have a discussion in August 2007 that could allow for release of a draft for public comment at that time. Dr. Hoffman will coordinate the revisions and asked Board Members for comments on the current draft by Tuesday the following week.

The committee heard from Board Member, Dr. Camille Benbow, on a new topic, "NSF's Role in Supporting the Next Generation of High Ability Students." She provided background on math education, and the growing need for qualified math teachers, and current programs that had recently been enacted including No Child Left Behind and the American Competitiveness Initiative. It was noted that there is a compelling need to raise the average performance of all students to provide workforce capabilities and to raise the ceiling for exceptional students. Several ideas were presented for discussion including reviving the NSF Young Scholars Program, creating portable fellowships for talented youth, and creating research/internship

opportunities. Dr. Hoffman invited Dr. Benbow to continue a discussion on this topic at the August 2007 meeting, and to explore the possibility of creating an *ad hoc* task group to develop this idea further.

Dr. Crosby noted that in the interest of time, he would send a memo to Board Members summarizing his comments on recent congressional legislation regarding STEM education programs at NSF.

#### **d. EHR Subcommittee on Science and Engineering Indicators (SEI)**

Dr. Louis Lanzerotti, SEI chairman, reported that SEI discussed three major items on the agenda, which consisted of a discussion of the reviewer comments and author responses to comments for the six draft chapters that SEI was not able to address at the March 2007 meeting; an examination of key findings for all eight chapters to determine which ones might be included in the new condensed version, the *Indicators* “Digest;” and a brief discussion of possible topics for the Board's Companion Piece.

Dr. Lanzerotti stated that Board Members participated vigorously and creatively in the six chapter reviews. All of the chapters went back to the authors for final revision in preparation for the “Orange Book” – the full draft that would be circulated to Board Members for comment. There were a few minor comments related to Chapter 7, Public Attitudes and the Understanding Chapter, and Dr. John Bruer, the lead reviewer for that chapter, will work with Dr. Robert Bell, the author of that chapter, to resolve minor issues. Board Members will receive copies of the “Orange Book” in mid-July 2007. SEI planned to finalize the chapters at the August 2007 meeting.

The subcommittee also discussed key findings that might go into the “Digest.” SEI members agreed to organize the “Digest” around a few themes rather than around the individual chapters. A draft of the “Digest” organization and template of some of the themes will be made between the May and August 2007 meetings.

For the Companion Piece, Board Office staff compiled discussion points based upon *Indicators* draft chapters, primarily Chapters 4 and 6, dealing with the status of Government industrial research and development in the U.S. today and industrial high technology activity. SEI discussion on these points will be continued over the course of the next couple of months as well as at the August 2007 meeting. In order to facilitate that discussion and outline further ideas, SEI formed an *ad hoc* group consisting of Drs. Bruer, Galloway, Lanzerotti, and Arthur Reilly.

#### **e. Committee on Programs and Plans (CPP)**

Dr. Kenneth Ford, CPP chairman, reported that the Board Office will be polling CPP members regarding availability for an additional meeting day on Monday, August 6 - one day ahead of the regularly scheduled Board meeting on Tuesday and Wednesday, August 7-8, 2007. If this can be organized, it should help CPP accommodate the larger number of action items and allow time for the attention the topics deserve. Dr. Ford stated that at a future CPP meeting, it would

be worth discussing the pros and cons of modifying guidelines so that numerous actions are not brought to the Board for approval close to the end of the fiscal year, essentially in one meeting.

The committee also continued its discussions of recompetition and the operations and management costs for NSF funded activities. At the March 2007 meeting, the committee was briefed by Drs. Abbott and Lanzerotti on information provided by NSF on this subject. After identification of requested information, the discussion continued at the meeting, and Dr. Lanzerotti noted that CPP approved a request for information on this topic in November 2006. NSF provided information at several points in the interim, and in April 2007 the Board Office organized a meeting with Mr. Cooley and other NSF staff to clarify the request. As a result, NSF agreed to provide additional information in several installments from May through July 2007. Dr. Lanzerotti noted that the Board recognizes that these are large and sometimes difficult requests requiring a large amount of effort. The committee will continue this discussion at meetings in August and October 2007 after more data is delivered and analyzed. Clarification of NSF's recompetition decision-making and approval process will also be discussed at a future meeting.

The committee also discussed the possibility of inviting advisory committee chairmen to future Board meetings for the committees to brief the Board on emerging issues for the directorates. CPP will work with Dr. Crosby and the Board Office to explore this idea more fully.

Dr. Ford reported on the status of a subcommittee, two task forces, and *ad hoc* task group:

#### Subcommittee on Polar Issues (SOPI)

Dr. Barry Barish, SOPI chairman, stated that Dr. Karl Erb, Director, Office of Polar Programs (OPP), reported that NSF recently reached an agreement in principle with several Swedish organizations that will permit shared use of the *Oden* in both polar regions for the next several years for icebreaking, joint research, and international outreach and education purposes. Dr. Erb also reported on the Antarctic Treaty meeting held in New Delhi in which a resolution was passed encouraging parties to form an Antarctic Observing System to investigate climate change. Attendees also passed a resolution limiting tourist ships to 500 passengers and landing parties to 100 persons.

The subcommittee heard a report by Dr. Thomas Wagner, Antarctic Sciences Program Director, OPP, who reported on Polenet, an NSF-funded project to establish a polar system of GPS sensors working in concert with NASA to weigh ice sheets and characterize their geological setting in Greenland and Antarctica. Additionally, Dr. Martin Jeffries, Director, Arctic Sciences Program, OPP, reported on the Arctic Observing Network (AON) awards that were funded as part of the FY 2006 International Polar Year (IPY) competition.

Dr. John Lightbody, Senior Facilities Officer, Physics Division, Directorate for Mathematical and Physical Sciences (MPS), provided an update on the IceCube High-Energy Neutrino Detector. IceCube is a neutrino observatory for astrophysics currently being installed at the South Pole during Austral summers over approximately a 6-year period. Construction of IceCube is 69 percent complete with 30 percent of the detector strings already deployed. Construction is scheduled to be completed in FY 2011, with initial operation in spring 2008

and full operation in spring of 2010. IceCube was the initial stages of transition to operations, and operation costs are about \$1 million over the estimate. NSF understands these costs better as the project nears completion.

#### Task Force on International Science (INT)

Dr. Jon Strauss, INT Chairman, reported that the task force heard two presentations. The first presentation was by Dr. Boesz who provided an overview of OIG efforts to support international accountability activities. The second presentation was by Dr. Thomas Weber, Director of the NSF Office of International Science and Engineering (OISE), who presented a summary of the OISE activities. Dr. Strauss also informed the committee of his plans to travel to the Middle East in July 2007 to hold informal meetings and discussions. A draft INT report and recommendations will be submitted to CPP and the Board at the August 2007 meetings.

#### Task Force on Transformative Research (TR)

Although TR did not hold a meeting in May 2007, Dr. Randall, TR chairman, informed the committee that the report, *Enhancing Support of Transformative Research at the National Science Foundation* (NSB-07-32) was in production and printed copies would be available in June 2007. NSF will provide a response to the report recommendation at the August 2007 meeting. The approved TR report cover design was also presented at the CPP meeting.

#### ad hoc Task Group on Sustainable Energy

Dr. Strauss reported for the *ad hoc* Task Group on Sustainable Energy, which was formed at the March 2007 meeting to prepare options for the Board to consider on this topic. The committee agreed to develop a formal charge for a Task Force on Sustainable Energy. Dr. Strauss, with Dr. Dan Arvizu and other committee members, will work to develop this charge to be brought before CPP at a future meeting for action.

#### **f. Committee on Strategy and Budget (CSB)**

Dr. Ray Bowen, CSB chairman, reported that the committee established an informal *ad hoc* Task Group on Cost-Sharing at the March 2007 meeting. Dr. Kelvin Droegemeier reported on initial activities and findings. Dr. Bowen noted that in recent years, in reaction to Board policy decisions, NSF stopped requiring cost-sharing from its grantees. Because this change had just been implemented, one purpose of this task group will be to examine the implications of this change and try to estimate some long-term issues. The Board Office has worked closely with the Director's Office to identify and obtain appropriate material to inform CSB on this issue. The committee anticipates receiving material from NSF to aid in continuing discussions on this topic at the August and October 2007 meetings. CSB welcomed participation by A&O on this issue.

The committee also discussed the NSF Long-Range Plan. Board Members received a notebook with background materials, which contained a vast amount of information about NSF strategic goals and funding activities, as well as an examination of the broad context in which these

activities take place. The committee heard a presentation by Mr. Cooley, whose office developed this important document. A similar document has been prepared annually for about 20 years.

The final item was a reminder to the committee of its role in the development of the FY 2009 budget. The committee will have teleconferences in June and July 2007. The Board Office will poll Members for dates and times for these teleconferences to take place. At the August 2007 meeting, the Board will review the proposed budget and, if appropriate, approve the budget for submission to the OMB.

Dr. Beering adjourned the Open Session at 2:52 p.m.



Ann A. Ferrante  
Writer-Editor  
National Science Board Office

#### Attachments

Appendix A: NSB-07-60, National Science Board, Calendar of Meetings 2008

Appendix B: NSB/EC-07-2, National Science Board, 2006 Annual Report of the Executive Committee

**NATIONAL SCIENCE BOARD**

**CALENDAR OF MEETINGS\***

**2008**

February 6 – 7  
(Wednesday – Thursday)  
[Annual Retreat and Visit]

March 26 – 27  
(Wednesday – Thursday)

May 6 – 7  
(Tuesday – Wednesday)  
[Annual Meeting and Awards Dinner]

August 12 – 13  
(Tuesday – Wednesday)

October 1 – 2  
(Wednesday – Thursday)

December 9 – 10  
(Tuesday – Wednesday)

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\* Approved at the May 15, 2007 meeting of the National Science Board.

**National Science Board**  
**2006 Annual Report of the Executive Committee**

In accordance with the requirements of 42 U.S.C. § 1865 (d), I hereby submit this annual report of the National Science Board (Board) Executive Committee, as approved at the Executive Committee meeting on May 15, 2006. This report covers the period from May 2006 through April 2007. I served as Director of the National Science Foundation and the Board's Executive Committee chairman during the above time period.

The elected Board membership of the Executive Committee during the past year was as follows.

From May 1, 2006 to May 10, 2006:

Dr. Barry C. Barish  
Dr. Steven C. Beering  
Dr. Diana S. Natalicio  
Dr. Warren M. Washington

From May 11, 2006 to April 30, 2007:

Dr. Barry C. Barish  
Dr. Steven C. Beering  
Dr. Ray M. Bowen  
Dr. Kathryn D. Sullivan

Dr. Michael P. Crosby, the Board's Executive Officer and Board Office Director, served as Executive Secretary for the entire period.

The Executive Committee met four times during this period at the National Science Foundation in Arlington, Virginia. Oral reports of its activities were made at meetings of the full Board and are reflected in the minutes of those meetings.

The Executive Committee's powers and functions are based on a delegation of authority to it by the Board according to 42 U.S.C. § 1865(a). The Board's current delegation to the Executive Committee (Attachment B to NSB-99-158) authorizes the Executive Committee to approve awards on behalf of the Board when an immediate decision is required between Board meetings and when the necessary action is not within the authority of the Director of the National Science Foundation. There were no occurrences of this condition or Executive Committee actions on behalf of the Board during the above time period.

/s/

Arden L. Bement, Jr.  
Chairman  
Executive Committee