

**APPROVED MINUTES¹
OPEN SESSION
412TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
December 9-10, 2009

Members Present:

Steven C. Beering, Chairman
Patricia D. Galloway, Vice Chairman
Mark R. Abbott
Dan E. Arvizu
Barry C. Barish*
Camilla P. Benbow
Ray M. Bowen
José-Marie Griffiths
Esin Gulari
Louis J. Lanzerotti
Alan I. Leshner
Douglas D. Randall
Arthur K. Reilly
Diane L. Souvaine
Jon C. Strauss
Kathryn D. Sullivan
Thomas N. Taylor
Richard F. Thompson

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

Members Absent:

John T. Bruer
G. Wayne Clough
France A. Córdova
Kelvin K. Droegemeier
Elizabeth Hoffman*
G. P. “Bud” Peterson

¹ The minutes of the 412th meeting were approved by the Board at the February 2010 meeting.

* Consultant

The National Science Board (Board, NSB) convened in Open Session at 1:05 p.m. on Thursday, December 10, 2009 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-09-91, Board Book page 189). In accordance with the Government in the Sunshine Act, this portion of the meeting was closed to the public.

AGENDA ITEM 6: Approval of Open Session Minutes, September 2009

The Board unanimously APPROVED the Open Session minutes of the September 2009 Board meeting (NSB-09-90, Board Book page 203).

AGENDA ITEM 7: Closed Session Items for February 2010 Meeting

The Board unanimously APPROVED the Closed Session items for the February 3-4, 2010 meeting (NSB-09-94, Board Book page 213).

AGENDA ITEM 8: Chairman's Introduction and Report

In the Chairman's Introduction on Wednesday, December 9, 2009 and during the Chairman's Report in the Plenary Open Session on Thursday, December 10, 2009, Dr. Beering announced and reported on several items:

a. *Office of Inspector General, Semiannual Report to Congress*

Dr. Beering announced that the *Office of Inspector General, Semiannual Report to Congress, September 2009*, which was due to Congress by December 1, 2009, was sent with the NSB transmittal letter and the management response prior to the deadline after approval of the letter and response by the Executive Committee.

b. Meeting with Office of Science and Technology Policy (OSTP)

Dr. Beering reported that he and Dr. Craig Robinson, Acting Executive Officer, had a productive meeting with Dr. John Holdren, OSTP Director and the President's Science Advisor, on December 8, 2009. They discussed the continuation of their strong working relationship. Dr. Beering invited Dr. Holdren to address the Board in the future, and Dr. Holdren agreed to do so at a mutually convenient time. Dr. Beering invited OSTP to be part of the rollout for Science and Engineering Indicators 2010. They also discussed the major priorities under consideration by the Board for future reports.

c. Board Recommended Actions Related to STEM

In January of 2009, then President-elect Obama's transition team received a letter from the Board recommending a set of actions relating to STEM (science, technology, engineering and mathematics) education. Among the recommendations was that “the President and his Administration should emphasize to the general public, early and often, the importance of a solid education, especially in STEM, for all of our students.” Dr. Beering, on behalf of the Board, congratulated President Obama for the launch of the “Educate to Innovate” campaign in November 2009 at an event attended by Dr. Arden Bement, NSF Director. This campaign to improve the participation and performance of America's students in STEM disciplines will include efforts from the Federal Government as well as leading companies, foundations, nonprofits, and science and engineering societies.

d. Retreat, Meeting, and Research Site-Visit Location for September 2010

Dr. Beering referred to Board Book page 215, which included a table on several locations for consideration, and asked Dr. Robinson to report on the candidate sites for the retreat, meeting, and site-visit for September 2010.

Dr. Robinson reported that since 1996, the Board has held 10 off-site meetings: 3 in California, 1 in the South, 2 in Texas, 1 in a mountain state, 2 in the northwest, and 1 in the Midwest. He presented information on the six candidate locations for the September 2010. After discussion, the Board acted as follows:

The Board AGREED, with 17 in favor and 2 opposed, to hold the retreat, meeting, and research site-visit at the Deep Underground Science and Engineering Laboratory (DUSEL) in Lead, South Dakota in September 2010.

e. Board Member Recognition

Dr. Camilla Benbow was presented with the National Association for Gifted Children's 2009 Presidential Award at the group's annual convention in St. Louis, held on November 5-8, 2009. This award reflects a body of work for significant impact by an individual on behalf of gifted education. Dr. Benbow was selected for her record of accomplishments in the field of gifted education and her contributions to the national landscape.

f. NSB Office Staff Introductions

Dr. Beering welcomed Ms. Lee Arslan to the Board Office as the lead for the NSB electronic records management project. She is on detail to the Board Office for 1 year from the Division of Information Systems where she served as the Branch Chief for Customer Support.

The Chairman also welcomed Ms. Elke Lower, Executive Assistant, who is on detail for 4 months from the Office of Legislative and Public Affairs (OLPA). She served in OLPA as assistant to Mr. Jeffrey Nesbit, the OLPA Director.

AGENDA ITEM 9: Director's Report

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

a. NSF Staff Introductions

Dr. Myron P. Gutmann joined NSF as Assistant Director, Directorate of Social, Behavioral and Economic Sciences (SBE), on November 1, 2009. Dr. Gutmann came to NSF from the University of Michigan where he served as the Director of the Inter-University Consortium for Political and Social Research and Professor of History. He received his Ph.D. from Princeton University in 1976.

Dr. Stephen H. McKnight joined NSF as Division Director, Civil Mechanical and Manufacturing Innovation (CMMI), Directorate for Engineering (ENG), on August 16, 2009. Dr. McKnight came to NSF from the Weapons and Materials Research Directorate of the U.S. Army Research Laboratory. He also serves as the Co-Chairman for the U.S. Army Research, Development, and Engineering Command (RDECOM) Nanotechnology Knowledge Center. Dr. McKnight received his Ph.D. in Materials Science and Engineering from the University of Delaware in 1996.

Dr. Stephen H. Howell joined NSF as Division Director, Molecular and Cellular Biosciences (MCB), Directorate for Biological Sciences (BIO), on September 14, 2009. Dr. Howell came to NSF from Iowa State University where he served as the Director for the Plant Sciences Institute and Professor of Genetics, Development and Cell Biology. He received his Ph.D. in Biology in 1967 from Johns Hopkins University.

Mr. William T. Colston joined NSF as Director, Division of Antarctic Infrastructure and Logistics (AIL), Office of Polar Programs (OPP) on November 8, 2009. Mr. Colston came to NSF from the Department of State, Bureau of Overseas Buildings Operations, where he served as Director, Office of Project Development and Coordination. He received his Masters Degree in Environmental Engineering from Manhattan College in 1996.

b. NSF Staff Departure

Mr. Thomas Cooley, NSF Chief Financial Officer (CFO), will leave NSF in January 2010 to accept a position as Director of Grants Management for Deloitte and Touche LLP in Washington, D.C. Dr. Bement stated that Mr. Cooley had been at NSF since 1977 when he joined the Directorate for Geosciences (GEO) and served as a program manager in both the Division of Earth Sciences (EAR) and the Division of Ocean Sciences (OCE) for 9 years, working on the Deep Sea Drilling Project and Ship Operations. In 1986, he became the Branch Chief for Program Analysis in the Budget Division (BD), Office of Budget, Finance, and Award Management (BFA). Mr. Cooley later held positions of Senior Staff Associate and Executive Officer for the Division of Grants and Agreements (DGA) BFA and became the NSF CFO in 2000. During his career at NSF, Mr. Cooley also served as a Special Assistant to the Director and spent a year on Capitol Hill working with the Senate Subcommittee on Science, Technology, and Space of the Committee on Commerce, Science and Transportation.

Dr. Bement stated that Mr. Cooley's performance had been exemplary throughout his career with NSF, and that NSF owes him a debt of gratitude for his exceptional leadership especially within the CFO community. Of all his fine attributes, Dr. Bement stated that his wisdom and well-conceived advice on the complex issues faced each day would be missed most.

c. Congressional Update

On November 5, 2009, the Senate passed its version of the Commerce, Justice, Science Appropriations bill for FY 2010 by a vote of 71 to 28. The bill provides NSF with \$6.917 billion, a 6.6 percent increase over FY 2009 enacted levels. On December 9, 2009, the House-Senate conference agreement was passed by the committee providing NSF with \$6.926 billion, an increase of \$436 million, or 6.7 percent, over the FY 2009 enacted level.

On October 8, 2009, Dr. James Collins, former BIO Assistant Director, testified for NSF before the House Science Committee's Research and Education Subcommittee on "Investing in High Risk, High Reward Research." This was the subcommittee's first hearing aimed at learning more about future issues in relation to the NSF reauthorization next year.

On October 22, 2009, Dr. Thomas Peterson, ENG Assistant Director, testified for NSF before the House Science Committee's Research and Education Subcommittee on "Engineering in K-12 Education." The hearing examined the potential benefits of, and challenges to, the current models for incorporating engineering education at the K-12 level.

AGENDA ITEM 10: Open Committee Reports

a. Executive Committee (EC)

Dr. Arden Bement, EC chairman, reported that the committee discussed possible priority topics for FY 2010. This discussion drew from previous discussions held in past Board meetings, discussion with NSF senior management, and recent input from Dr. Holdren. The committee recommended the following three priorities: NSF Data Policy, Merit Review Criteria, and Support for Multi-investigator and Large-Scale Research.

The Board unanimously APPROVED the following priorities for FY 2010:
NSF Data Policy, Merit Review Criteria, and Support for Multi-investigator
and Large-Scale Research.

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

Dr. Dan Arvizu, A&O chairman, noted that work continued with the international science community to harmonize differing approaches among nations toward accountability in general and the responsible conduct of research in particular.

Dr. Arvizu reported that the Organization for Economic Cooperation and Development (OECD), Global Science Forum Coordinating Committee for Facilitating International

Research Misconduct Investigations issued a report in April 2009. NSF's Office of International Science and Engineering (OISE) studied the report and continued to work on a white paper in response to its recommendations while it consults with the Office of Inspector General (OIG). The committee will receive more information at the February 2010 meeting.

Dr. David Spencer, Chairman, Advisory Committee for GPRA Performance Assessment (AC/GPA), reported on the committee's meeting of June 18-19, 2009. He outlined the charge to the committee, which included assessment of outcomes under the three strategic outcome goals of discovery, learning, and infrastructure; and a discussion of alternative performance evaluation methods. After review of program accomplishments from NSF, the committee determined that NSF had demonstrated "significant achievement" for the three strategic outcome goals. Dr. Spencer also noted that NSF fully and satisfactorily responded to each recommendation made in the 2008 report. Dr. Sharon Dawes, AC/GPA Vice Chairman, spoke about the committee's recommendations on how NSF might conduct performance evaluation in the future, as a value added part of the NSF's infrastructure.

Mr. Sal Ercolano, Clifton Gunderson LLP and Partner-in-Charge of NSF financial statement audit, summarized the results of his final report. The auditors gave NSF an "unqualified" (clean) opinion, the 12th in a row, and found no material weaknesses. They identified one significant deficiency related to the administration of cost reimbursement contracts. The report recommended improved procedures to ensure that the costs submitted for reimbursement are reasonable and accurate, and that audits of contractor costs are timely. They further recommended that a review of the staffing and work priorities of NSF's acquisition division. Mr. Ercolano stated that the management letter covering the less critical findings of the audit would be issued in January 2010. Given the importance and high profile accorded the American Recovery and Reinvestment Act (ARRA) funds, he cautioned that both the management letter and next year's audit would likely focus on grant processing and oversight. Finally, Mr. Ercolano stated that the Federal Information Security Management Act (FISMA) report on IT security, which included an enhanced focus this year on polar programs, contained no significant deficiencies.

Dr. Arvizu recognized the great working relationship that A&O has had with Mr. Cooley and wished him well in his next endeavor. Mr. Cooley described NSF's plans to address the significant deficiency in the contract monitoring for cost reimbursable contracts and reported that a draft corrective plan action was issued. Steps included completion of a workforce analysis for the procurement function and NSF contracting for audits and cost reimbursable contracts. Mr. Cooley also reviewed NSF's annual internal control process, high success ratio (98 percent) on grantee reporting for ARRA, implementation of the Responsible Conduct of Research provision of the America COMPETES Act, plans to respond to Senate concerns about grants management, and intention to implement a new financial/property system to replace an aging system that is more than a generation old.

Ms. Allison Lerner, NSF Inspector General, discussed the OIG's recent ARRA reports issued since September 2009. The first was a review of proposals funded by ARRA that were already in-house at the time of the legislation. The report recommends that NSF: (1) do a better job of documenting how the proposals meet the goals of ARRA; and (2) clarify staff's responsibilities

for monitoring how quickly the funds are spent; and (3) provide a risk mitigation for high risk awardees. The other two reports that OIG completed were performed as a part of a larger OIG community effort including a survey of the qualifications and capabilities of grant and contract staff to handle ARRA funds, and an evaluation of NSF's plans to review the quality of data submitted by ARRA recipients. Regarding the latter report, OIG found that NSF has an adequate plan to evaluate data quality but made several suggested improvements for the agency to consider.

Dr. Emily Woodruff, OIG, presented the OIG's FY 2010 Audit Plan. Over a third of the OIG's audit work is determined by law, regulation, and congressional and NSF requests. Two-thirds of the remainder of OIG's discretionary audit efforts will be related to ARRA. The audit plan includes an in-depth review of the quality of data submitted by recipients; multiple reviews of the financial systems and capabilities of ARRA recipients; and audits of several large Major Research Equipment and Facilities Construction (MREFC) projects such as the Alaska Regional Research Vessel (ARRV), the Ocean Observatories Initiative (OOI), and the Advanced Technology Solar Telescope (ATST). Due to the increased audit workload triggered by ARRA, OIG will not be able to perform any of the new audits requested by NSF management in 2010.

Dr. Cora Marrett, NSF Deputy Director, discussed the NSF priority for human resource management. Dr. Marrett noted NSF's efforts for specific areas of hiring, review of human resource policies, contractor/federal employee multi-sector analysis, and executive development programs. Dr. Mark Suskin, OISE Acting Deputy Director, informed A&O of the work completed by NSF's SWAT Team on Employee Satisfaction and Wellness and its plans for next steps. Ms. Mignon Anthony, "Future NSF" Project Director, presented an update on the plans underway for the next generation NSF environment as the current lease expires.

c. Committee on Education and Human Resources (CEH)

Dr. Camilla Benbow reported on behalf of Dr. John Bruer, CEH chairman. She stated that, unfortunately, the time available for the CEH meeting was reduced considerably due to an overrun of a previous meeting. In spite of the brief meeting time, the committee had an engaged discussion about important issues concerning NSF's education research investments and the Broader Impacts Criterion. By agreement of the attending committee members, discussion on Preparing the Next Generation of Next STEM Innovators was not addressed at this meeting. The main goal of that agenda item was to discuss a draft outline for a white paper that summarizes key results from the Expert Panel held in August 2009 and consider next steps. Between the December 2009 and February 2010 meetings, CEH will continue to work on a draft of the white paper with committee input.

Dr. Kathy Sullivan updated the committee on exploratory efforts that might support a future Decadal Survey of NSF's Education Investments. Dr. Sullivan reported that she and Dr. Bruer had independently examined a subset of nearly 11,000 awards made since 2000 using different data visualization tools - the Open Source Network Toolbox and Battelle's Starlight - to look for trends that might identify clustered investment areas or significant gaps. Awards included

projects funded by the NSF Directorate for Education and Human Research (EHR) and other NSF directorates, as well as other non-NSF education research funding organizations. The goal of this preliminary analysis was to explore the “landscape” of education research, and Drs. Sullivan and Bruer noted that there were some trends emerging from the preliminary analyses. Dr. Alan Leshner noted that these types of decadal surveys can be laborious. The committee agreed that continuing with this exploration of the award portfolio, which was done at no cost to the Board, was worth pursuing and could help to identify specific hypotheses if it was determined that a more formal analysis was warranted.

The committee spent the remaining time examining the Broader Impacts Criterion. Drs. Douglas Randall and Thomas Taylor highlighted issues raised in the article “Implementation of the NSF Broader Impacts: Efficiency Considerations and Alternative Approaches,” in *Social Epistemology* by Warren Burggren. Three main concerns were raised: (1) confusion and inconsistency regarding how the Broader Impacts Criterion is interpreted by NSF’s principal investigators (PIs), reviewers, and program staff; (2) most PIs do not have the relevant expertise to undertake many of the broader impacts activities proposed, which raises questions about the impacts of those activities and whether implementation mechanisms other than placing the burden on individual PIs should be explored; and (3) the financial costs associated with broader impacts activities are not easily separated from the costs of the discovery research activities, making it difficult to account for them or know whether they are cost effective.

The committee discussion was followed by presentations from Dr. Paul (Wyn) Jennings, EHR Program Director, and Ms. Heather Pacheco and Mr. John Moore, GEO Einstein Fellows. Dr. Jennings reported on a recent analysis of 40 Division of Chemistry (CHE), Directorate for Mathematical and Physical Sciences (MPS), awards to see how broader impacts activities were described in the proposal, the written reviews, the program officer review analysis, and the annual and final reports for the same proposal. The bulk of the proposals emphasized teaching and learning as the main broader impacts efforts. Some interesting differences between PIs, reviewers, and program staff were noted in how the broader impacts activities were described. Ms. Pacheco reported on two GEO surveys on broader impacts activities that were conducted for proposals submitted to the Division of Ocean Sciences (OCE) in 2004 and awards made by the Division of Earth Sciences (EAR) in 2008. These data reveal that, contrary to expectation, less than 20 percent of the proposals and awards involved broad impacts activities focused at the K-12 level. Finally, Mr. Moore demonstrated a prototype geo-spatial referencing tool being developed by GEO with a goal of helping PIs identify nearby NSF-funded education, outreach, and broadening participation programs that could be leveraged through their individual broader impacts activities.

Noting that the current merit review criteria had been in effect for more than a decade with ongoing confusion and inconsistency in their application and impact, the committee felt that it was time for the Board to establish a formal task force to evaluate the current review criteria and recommend changes in their definitions and application as appropriate. CEH was working on a draft charge for such a task force that might be presented at the next committee meeting.

d. Committee on Science and Engineering Indicators (SEI)

Dr. Louis Lanzerotti, SEI chairman, reported that the committee convened directly after the luncheon presentation of the Web version of the *Science and Engineering Indicators 2010 (Indicators)* Digest, which was built upon the initial Digest of 2008. Mr. Rolf Lehming, Science Resources Statistics (SRS), Director for the Science and Engineering Indicators Program, informed the committee that *Indicators* was on schedule for delivery to Congress and the White House on January 15, 2010, which is the statutory date by which time the print version, the online appendix tables, online *pdf* of the full volume, and the Digest itself would be ready for release. Other products including the Board's Companion Piece with the policy discussions and recommendations, presentation slides from the Overview, the state data tool that allows users to examine state-level indicators of S&E performance, the Info-cards, the *Indicators* CD, and the fully functional Web version of *Indicators*, were expected to be released for the American Association for the Advancement of Science (AAAS) Annual Meeting in mid-February 2010 held in San Diego, California.

Rollout activities for *Indicators 2010* will occur in Washington, D.C. on January 15, 2010, and in San Diego at AAAS on February 19, 2010. Ms. Lisa Joy Zgorski, OLPA, and Ms. Jean Pomeroy, Board Office, briefed the committee on rollout plans in Washington, which will be a morning event in collaboration with OSTP possibly followed by a second rollout event on Capitol Hill. In San Diego, the Companion Piece and the state tool will be released to the press and the public at a press conference, which will have interactive activities with the state data tool, and the *Indicators'* Digest. After the press conference, it will be possible for people to use the interactive features of *Indicators* at the NSF booth using computer hookup to the Web.

Dr. Lanzerotti reported that the Board is continuing to expand the audience for *Indicators* and other Board reports. Following on the Digest of *Indicators*, Dr. Pamela Flattau and her staff from Science and Technology Policy Institute (STPI) were working with Board Office staff to develop a Web-based tool targeted at K-12 and undergraduate education based upon *Indicators* data. The framework of this is a chronological pathway spanning pre-K education through entry into the workforce, including data on financial issues affecting students wishing to pursue S&E education. The targeted audience includes students, teachers, parents, and guidance counselors. The SEI committee is looking forward to reviewing this prototype Web tool. A parallel effort to identify Web sites that the education audience members were likely to access for outreach was part of this effort. An additional audience - industry - will be targeted for *Indicators 2012* at which time the new survey data from the Business R&D and Innovation Survey will be published. Several Board Members made suggestions for education, industry, academe, and state groups that might welcome *Indicators* outreach activities after its release.

Dr. Lanzerotti stated that he and the Board Office staff will be contacting Board Members regarding availability for one or both of the rollout events.

e. Committee on Programs and Plans (CPP)

Dr. Mark Abbott reported on behalf of Dr. Droegemeier, CPP chairman. He stated that the committee considered a proposed revision to the guidelines on transmitting action items to the Board, “Transmitting Director’s Review Board (DRB) Packages to the National Science Board” (NSB/CPP-09-54, Board Book page 37). The revision proposed that NSF provide information items one Board meeting in advance of an action and that the start of an action must have at least one Board meeting after the action was presented to the Board. This would allow deferral of a final action to the next Board meeting if the Board chooses to extend deliberation. CPP approved this revision subject to a few minor edits, and will proceed to implement it. (Appendix)

The “CY 2010 Schedule of Action and Information Items for NSB Review” (NSB/CPP-09-53, Board Book page 35) was addressed. Given the complex schedule, especially in February and May 2010, the committee will reconsider in February the threshold for bringing action items to the Board. As the future workload for CPP is considered, in addition to the threshold issue, the committee would like to think creatively about other options for managing the CPP workload.

The committee discussed proposed revisions to the “Annual Timeline for Integration of Board MREFC Process with NSF Budget Process” (NSB/CPP-09-55, Board Book page 41) and proposed modification to *Setting Priorities for Large Research Facility Projects Supported by the NSF*. CPP also discussed proposed revisions to two policy and report documents related to the Board’s review of large research facilities. Mr. Arthur Reilly, Committee on Strategy and Budget (CSB) chairman, co-led this discussion. Current policy and process documents were approved prior to the establishment of the Subcommittee on Facilities (SCF) under CSB and before the Board’s involvement in portfolio review and Post-Conceptual Design action on projects. The committee concurred with the revision of the timeline as proposed. It incorporates the joint CPP and CSB oversight authority and involvement in the large facilities process. As part of this process and timeline in February 2010, CPP and CSB will hold a joint meeting that will consider the NSF facilities plan. Additional conference calls may be scheduled as the two committees work through this complex oversight process. CPP agreed to discuss revisions to the NSB report, *Setting Priorities for Large Research Facilities Projects Supported by NSF* (NSB-05-77), at the February 2010 meeting that would reflect these changes.

CPP was then presented with an information item on the National Ecological Observatory Network (NEON). Dr. Joann Roskoski, BIO Acting Assistant Director, presented an update, and she informed CPP that an action item will be brought to the Board in February 2010 to provide bridge funding until construction can begin. Dr. Roskoski also reported on the successful completion of the final design review for NEON. During discussion, Dr. Randall asked about operations and maintenance costs of NEON and the expected lifetime. Dr. Roskoski answered that they expect a 30-year lifespan for the project and that the Operations and Maintenance (O&M) costs were not firm but will be reviewed in April 2010. Dr. Barish asked how technology would be kept up-to-date during this 30-year lifetime, and Dr. Roskoski and Dr. Elizabeth Blood, NEON Program Manager, answered that the costs of technology refresh were built into the O&M budget for the program and that the project will

start with the newest technology available. CPP continued discussion on a variety of other issues including data policy, cyberinfrastructure, and the linkage with numerical models. The discussion will be continued in February 2010 when an action comes forward to the Board.

Lastly, CPP addressed the second information item on Plans for Integration and Recompetition of the Division of Earth Sciences (EAR) Solid Earth Deformation Facilities ([NSB/CPP-09-49](#), Board Book page 51). Dr. Robert Detrick, EAR Division Director, gave an update on the plans for integration and recompetition of the solid earth deformation facilities. All four cooperative agreements for these facilities expire in the next 4 years. GEO is planning a phased integration and recompetition in the next few years that will allow the directorate to unify and streamline facility operations and management, as well as simplify NSF oversight by condensing the four cooperative agreements into two. Dr. Lanzerotti asked whether the competition will be open and whether it would be limited to the current management companies, UNAVCO and Incorporated Research Institutions for Seismology (IRIS). Dr. Detrick stated that the management reviews thus far were favorable, and assuming this continues, the intent was to invite proposals from the current management groups and hold a full and open competition 5 years later, in 2017.

CPP Subcommittee on Polar Issues (SOPI)

Dr. Jon Strauss, SOPI chairman, reported that Dr. Karl Erb, OPP Director, reported that a number of follow-up activities to International Polar Year (IPY) were planned in the next year beginning with a State of the Arctic International Workshop sponsored by OPP and others to be held in March 2010 in Miami. It will be followed by the 2010 IPY follow-up this summer in Oslo and conclude with an international wrap-up conference in Canada that he will co-chair in 2012. The Arctic Council was undertaking three assessments. One of these, the Greenland Ice Sheet Report, will be issued in December 2009. The U.S. and New Zealand have a joint project underway to install three wind turbines at McMurdo Station, which, when completed, will provide 10 percent of the electricity needs for McMurdo and nearly all of Scott Base's requirements. SOPI members agreed that it would be useful to discuss satellite connectivity to the Antarctic stations at a future meeting with respect to improved Internet bandwidth and availability. In response to a question, Dr. Erb noted that OPP was discussing a sequel to the 1996 review of future program needs.

Ms. Dana Topousis, OLPA Group Leader for Media and Public Information, reported on the Climate Change Conference underway in Copenhagen, noting that OPP was selected by the State Department to open the event. In addition, Ms. Renee Crain, OPP Arctic Research Support Manager, led or participated in three public media events, and OPP staff provided Web links to relevant climate change material. Dr. Esin Gulari presented an overview of the Board Members' recent trip to Antarctic research facilities, including a video of the first ever views of the underside of the McMurdo ice shelf in an oceanographic experiment. She specifically thanked Mr. Brian Stone, OPP Division Director, for his support as host.

Dr. Scott Borg, OPP Division Director, presented an information item to the Board on the IceCube O&M renewal proposal in anticipation of an NSB action item in February 2010. NSF was reviewing the renewal proposal. Dr. Borg noted the strong international participation in

the proposal from Belgium, Germany, and Sweden; the strong performance to date of the construction project; and contingency plans to increase the total number of strings to 86 and to install six deep-core strings that will significantly extend the range of IceCube to lower energies.

Lastly, Dr. Martin Jeffries provided a status update on the Arctic sea ice. In September 2007, the sea ice decreased to record levels. As a result, the northern route of the Northwest Passage was open, an almost unprecedented event. There are significant commercial and environmental implications due to increased access in the region. Dr. Jeffries presented a video showing changes in sea ice thickness from 1979 through 2009 that clearly indicate a significant loss of the older thicker ice beginning in 2004. There was evidence that a resulting increase in air temperature and thawing of the permafrost was already impacting vegetation in the Arctic. Computer models indicate that in as early as 25 years a significant portion of the permafrost active layer will no longer refreeze in the winter.

f. Committee on Strategy and Budget (CSB)

Mr. Arthur Reilly, CSB chairman, reported that the committee heard an update on the FY 2010 appropriation by Dr. Bement, and he reported that the Senate-House conference report was filed December 9, 2009, and that there were hopes that the appropriation will be passed by the end of the week. The NSF budget was still slated to double over the next 10 years. The FY 2010 conference report contains a 6.7 percent increase over FY 2009, not including the ARRA funding. Highlights include an increase in EHR-related to educational research activities, the MREFC account would be funded at the request level, and the NSB Budget would increase.

Dr. Clifford Gabriel reported on efforts to develop the 2010-2015 NSF Strategic Plan under new guidance received from the Administration. NSF will embark on an aggressive schedule to complete development of the new Strategic Plan by May 2010. NSF formed a working group to accomplish this task. CSB will have the opportunity to provide input to the working group. The NSF Working Group invited Mr. Reilly to participate in their meeting later that day. Mr. Reilly transmitted results of previous CSB work on this topic, and encouraged CSB members to provide additional comments to him to pass along for the working group efforts.

Dr. Marrett presented a report on the NSF ARRA funding. She highlighted specific examples of ARRA-funded projects. These projects demonstrated how NSF was able to capture the opportunity brought about by ARRA funding, by not only supporting scientists, graduate and undergraduate students, postdocs and technicians, and creating jobs, but also through new knowledge to address national challenges and to realize America's aspirations. NSF was able to fund excellent research and to do so expeditiously. The committee reiterated their appreciation to the NSF staff for their extraordinary work in obligating ARRA funding.

CSB Subcommittee on Facilities (SCF)

Dr. José-Marie Griffiths provided an update to CSB. The May 2009 review of the OCE served as a pilot and helped define next steps in the process for the full review of NSF facilities in

May 2010. The subcommittee worked with the NSF staff to develop a template for identifying key issues and best information to assess the NSF facilities portfolio. A template for the “data call” was sent to appropriate NSF directorates in early December 2009. In May 2010, the facilities review will include existing MREFC projects and those known to be in the preconstruction planning process. The following year, SCF plans to include multi-user facilities and other research infrastructure.

g. Task Force on the NSB 60th Anniversary (60ANN)

Dr. Patricia Galloway, 60ANN chairman, reported on the progress for the “Voices from the Future” lecture series. The guest speakers will be making presentations at the February, August, and December 2010 Board meetings. The speakers were chosen using the criteria established by the Board, identified by the NSF 60th Anniversary Working Group, and ranked by NSF directorates. Letters were sent to the nominated speakers requesting that they respond with their availability and preference for speaking date by December 18, 2009. Mr. Jeffrey Nesbit, OLPA Director, reported that his staff will arrange for Webcasting of the speakers and look for appropriate distribution vehicles for the videos. The other nominees will be considered as speakers for the NSF venues during 2010, which will be coordinated by the NSF working group.

Mr. Nesbit also provided an update of recent OLPA activities relating to the 60th Anniversary, which included a partnership with NBC that resulted in a series of 16 videos on the science of the Winter Olympics that featured NSF-supported researchers. He reported that the first of the videos aired on the *Today* show on December 8, 2009. The full series will air on NBC in February 2010 during the Winter Games. Mr. Nesbit stated that the video interviews with approximately 100 NSF-supported scientists associated with the NSF climate change report were available on the NSF Web site www.nsf.gov under “Special Reports.”

Mr. Nesbit also provided an update on the 60th Anniversary activities where his staff made contributions. For the AAAS Annual Meeting, Mr. Nesbit reported on the following: an article about the NSF Symposium of current and past NSF Directors is in the AAAS electronic newsletter sent to 80,000 AAAS members; an ad featuring the NSF Symposium in the AAAS program book that all meeting attendees will receive; a media event scheduled for Friday, February 19, 2010 at 3:00 p.m., that will feature the release of the Companion Piece to *Indicators*; and the 60th Anniversary branding artwork as well as the NSF 60th Anniversary logo will be included in the AAAS meeting signage, NSF and NSB Web sites, publications, and other NSF events during 2010.

Additionally, Mr. Nesbit reported that the NSF Historian, Dr. Marc Rothenberg, completed the first draft of the “Sensational 60” - a compilation of some of the most outstanding NSF-funded discoveries with wide-ranging impacts. The “Sensational 60,” as well as highlights of the NSB in the last 10 years, will undergo agency review after the winter holidays. Mr. Nesbit indicated that his staff will do their best to share the documents with the task force members as soon as they are available.

Mr. Nesbit also stated that OLPA will be working on several additional initiatives in the new year including: a joint congressional resolution honoring NSB and NSF; a proclamation from the President or OSTP congratulating NSB and NSF on 60 years of discovery and achievement; a letter from congressional supporters, which will be entered into the *Congressional Record* with copies for each Board Member; and a flag to be flown over the Capitol on May 10, 2010, NSF's 60th Anniversary.

Mr. John Tsapogas, Chairman of the NSF 60th Anniversary Working Group, provided an update on the group's efforts. He reported that they made 10 low-cost high-impact recommendations to Dr. Marrett and 7 were approved: adopting the celebratory theme "60 Years of Discovery," augmenting the Director's Award Ceremony in June 2010 to include recognition of the 60th Anniversary, exploring opportunities for science-focused television and radio programs related to the 60th Anniversary, incorporating comments about the 60th Anniversary in Dr. Bement and Dr. Marrett's speeches, using social networking sites such as Twitter and Facebook to engage the public and inviting them to celebrate the 60th Anniversary remotely, hanging a banner with the 60th Anniversary theme inside the NSF buildings, and placing an anniversary display in the Stafford I atrium showcase.

Mr. Tsapogas also noted that a Speakers Series and theme-based promotional items were still being considered. He said that although the working group had officially completed its mission to provide ideas and recommendations to NSB and NSF, he and Ms. Tracy Gorman, Co-chairman NSF Working Group, would continue to work with Dr. Marrett and NSB on the implementation of the 60th Anniversary recommendations. [The NSF 60th Anniversary Working Group officially disbanded on November 23, 2009.]

Finally, Mr. Tsapogas provided an update on the NSF Symposium at the AAAS Annual Meeting. The symposium is entitled "The Future of NSF on Its 60th Anniversary," and will be held at the San Diego Convention Center on Saturday, February 20, 2010 from 1:30 to 4:30 p.m. In July 2009, letters of invitation were sent to former NSF Directors: Mr. Erich Bloch, and Drs. Rita Colwell, Neal Lane, and Walter Massey to participate as speakers, along with Dr. Bement, the present NSF Director. All invitees accepted. This symposium will, for the first time, bring together the largest cohort of NSF Directors to discuss challenges facing the agency as it commemorates its 60th Anniversary. Dr. Galloway will be the Moderator, and Dr. Beering will be the Discussant. A teleconference is planned for January 2010 with the symposium participants to coordinate topics, presentations, and visuals.

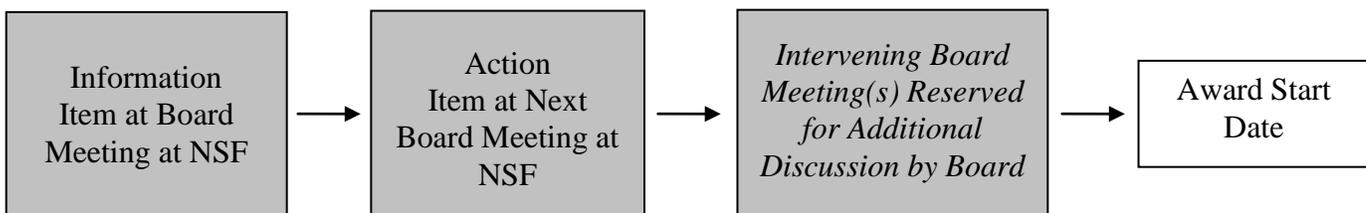
Dr. Galloway thanked Dr. Marrett, the NSF Working Group, task force members, and executive secretaries for all their efforts in conceiving and planning the 60th Anniversary commemorations.

Dr. Beering adjourned the Open Session at 2:20 p.m.

[signed]
Ann A. Ferrante
Executive Secretary
National Science Board

**Transmitting Director's Review Board (DRB) Packages
to the National Science Board²**

1. **Annual Timeline:**
 - A. The NSF Deputy Director will provide a proposed schedule of information and action items for the next 12 months to the Board Office Director for review and inclusion in the Board Book for the December Meeting (or the last meeting of the calendar year).
 - B. The proposed annual timeline, and any revisions during the year, will need to be reviewed by the NSB Chairman and the CPP Chairman prior to inclusion in the Board Book.
 - C. The Deputy Director should avoid proposing action items at off-site Board meetings.
2. **Information Items for Future Actions:** The Board expects information items for upcoming actions to be scheduled the meeting before an action item is presented, excluding off-site meetings. Information items will be short oral presentations with the option to provide written materials for Board consideration in the Board Book.
3. **Action Items:** To ensure that the Board is able to fully consider a decision on a proposed action item (new award, continuation of existing award, or renewal), the effective date of the proposed action item must be after the date of the next scheduled Board meeting.
4. **Board Member Packages:** The Office of the NSF Director will provide the Board Office with electronic versions of NSB packages for each Board Member, using the most appropriate medium. This material is needed at least 4 weeks prior to the Board meeting to allow for Board Member review.
5. **Conflicts of Interest:** The Office of General Counsel (OGC) will advise the Board on conflicts of interest for each action item and provide the Board Office with a draft conflicts analysis 4 weeks prior to the Board meeting.



² Approved by the National Science Board Committee on Programs and Plans at its meeting on December 9, 2009.