

**APPROVED MINUTES¹
OPEN SESSION
407TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
December 9-10, 2008

Members Present:

Steven C. Beering, Chairman
Patricia D. Galloway, Vice Chairman
Mark R. Abbott
Barry C. Barish*
Camilla P. Benbow
France A. Córdoba
Kelvin K. Droegemeier
José-Marie Griffiths
Esin Gulari
Louis J. Lanzerotti
Alan I. Leshner
George P. (Bud) Peterson
Douglas D. Randall
Arthur K. Reilly
Diane L. Souvaine
Jon C. Strauss
Thomas N. Taylor
Richard F. Thompson

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

Members Absent:

Dan E. Arvizu
Ray M. Bowen
John T. Bruer
G. Wayne Clough
Elizabeth Hoffman*
Kathryn D. Sullivan

¹ The minutes of the 407th meeting were approved by the Board at the February 2009 meeting.

* Consultant

The National Science Board (Board, NSB) convened in Open Session at 1:45 p.m. on Wednesday, December 10, 2008 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-08-103, Board Book page 213). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 6: Approval of Open Session Minutes, September 2008

The Board unanimously APPROVED the Open Session minutes of the September 2008 Board meeting (NSB-08-99, Board Book page 229).

AGENDA ITEM 7: Closed Session Items for February 2009

The Board unanimously APPROVED the Closed Session items for the February 23-24, 2009 meeting (NSB-08-102, Board Book page 239).

AGENDA ITEM 8: Presentation by Mr. Jeffrey Nesbit, OLPA Director

Mr. Jeffrey Nesbit, Director, Office of Legislative and Public Affairs (OLPA), presented an overview of NSF media and public affairs outreach activities during the past 2 years. He presented the partnerships that OLPA has formed with national magazines such as *U.S. News & World Report*, *Discover*, and *Popular Mechanics*; television networks such as The Research Channel; wire services such as LiveScience; and online news sources such as Windows to the Universe. The new public affairs initiatives are meant to counter the long decline in the coverage of science in print and broadcast media. Many of these initiatives take advantage of new media technologies to directly reach the American public, while others create partnerships with existing media to extend the reach of OLPA public affairs activities. Mr. Nesbit noted that an NSF-funded survey identified science news sources used by the public, which are led by television with the Internet in second place and growing, and print media a distant third.

Mr. Nesbit stated that OLPA has partnered with organizations such as the American Association for the Advancement of Science (AAAS) to do joint workshops in communicating science for researchers as well as public information officers. He also reported that NSF was the first to form a partnership with LiveScience, an online news service that covers science across the board and features stories that highlight the work of university scientists and engineers, provides an “image of the week” with longer captions, and profiles researchers.

Board Members noted the need to communicate science from all sources - not just NSF-funded research - because NSF is perceived as representing the scientific enterprise. They also noted the need to communicate to younger audiences via new media, such as Facebook, YouTube, and iTunes.

AGENDA ITEM 9: Chairman's Introduction and Report

Dr. Beering administered the Oath of Office to newly confirmed Board Members on Tuesday, December 9, 2008 during the Chairman's Introduction, and reported on several items during Chairman's Report of the Plenary Open Session on Wednesday, December 10, 2009:

a. Oath of Office to the Class of 2014

In the public Plenary Open Session, Dr. Beering administered the Oath of Office to the six recently confirmed Board Members of the Class of 2014: Drs. Ray Bowen, France Córdova, Esin Gulari, George (Bud) Peterson, Douglas Randall, and Diane Souvaine. [Drs. Barry Barish and Elizabeth Hoffman would continue to serve as Board Consultants.] Each newly confirmed Board Member would receive a Presidential Commission certificate signed by the President of the United States and the Secretary of State. A certificate was displayed for view by Board Members, NSF staff, guests, and members of the public.

Dr. Beering welcomed the Class of 2014 as new Board Members, and stated that membership on the Board was an honor he has cherished since he was took the Oath of Office 6 years ago. Dr. Beering commented that the new Board Members could be proud to be selected to this uniquely important body, whose Members are appointed by law "solely on the basis of established records of distinguished service." He was very pleased that the Senate acted on the nominations in a timely manner.

Dr. Beering added that the Board was created in 1950 and comprises, together with the NSF Director, the National Science Foundation. The Board has two main roles: establishing the policies for NSF, and providing reports to Congress and the President on policy matters related to science and engineering. The NSF's Board focuses on the policies guiding the Foundation in achieving its mission: nurturing science and engineering talent, and promoting the advancement of scientific knowledge through research. Dr. Beering stated that the Board continues to work to fulfill and balance both of its policy roles, and that the Board was pleased that the new Members chose to serve the Nation by joining in this endeavor.

b. Recognition of Dr. Christine Boesz, NSF Inspector General

On behalf of the Board, Dr. Beering recognized the retirement of Dr. Christine Boesz, NSF Inspector General, and thanked her for her service to NSF for the past 9 years as head of the Office of Inspector General (OIG). He stated that the Board was grateful for her contributions to NSF in such areas as workforce planning, contract administration, and research ethics, and that the Board appreciates her responsiveness in providing information and advice on many matters such as cost sharing and compliance with the Government in the Sunshine Act. Dr. Beering presented Dr. Boesz with a plaque for "achievements in promoting the progress of science and engineering." He announced that Mr. Thomas (Tim) Cross, current Deputy Inspector General, agreed to serve as Interim Inspector General.

c. Executive Committee Taskings

Dr. Beering requested from Dr. Arden Bement, Jr., Executive Committee chairman and Director of the National Science Foundation (NSF, Foundation), for the Executive Committee to take the responsibility for the approval of Closed Session items for future Board meetings, and Dr. Bement agreed.

Dr. Beering also asked that the Executive Committee prepare a prioritization process for future major activities of the Board for discussion at the February 2009 Board meeting and provide a report to the full Board at the May 2009 meeting. Dr. Bement also agreed that the committee would undertake these tasks.

d. Retreat, Meeting, and Research Site-Visit Location for September 2009

Dr. Beering reported that the Board had an invitation from The Ohio State University in Columbus, Ohio to be the site of the 2009 retreat, meeting, and research site-visit scheduled for September 23-24, 2009. Dr. E. Gordon Gee, President of The Ohio State University, offered to host the Board retreat, meeting, and research site-visit.

Dr. Beering added that a meeting in the Midwest was overdue and had the advantage of reducing travel time for Board Members located on either coast in comparison with a coastal location. He reported that since 1996, the Board held nine off-site visits: three in California at Davis, Los Angeles, and Irvine; one in the South in New Orleans, Louisiana; two in Texas at Houston and El Paso; one in a Mountain state at Boulder, Colorado; and two in the Northwest, at Corvallis, Oregon and recently at Fairbanks, Alaska. The Board holds most of its meetings on the East Coast, and has held retreats in Annapolis, Maryland and Warrenton, Virginia, as well as in the Washington, D.C. metropolitan area.

In addition to the location in the Midwest, The Ohio State University is an excellent representative institution in a major urban center. It is one of the largest undergraduate universities with almost 40,000 undergraduate students and 7,000 graduate students. It is a world-class public research institution of the Big Ten renown for its research and science, technology, engineering, and mathematics (STEM) education programs; and it has been ranked by NSF among the Top Ten public research universities based on total research expenditures and ranked 35th among institutions receiving NSF funding.

As there were no objections to holding the 2009 retreat, meeting, and research off-site visit at The Ohio State University, the Board acted as follows.

The Board unanimously AGREED to hold the retreat, meeting, and research site-visit in at The Ohio State University in Columbus, Ohio in September 2009.

e. Board Member Recognition

The National Academy of Engineering (NAE) recently presented Dr. G. Wayne Clough with the Arthur M. Bueche Award for leadership in science, technology, and engineering policy at its annual meeting. The award recognizes “outstanding accomplishments advancing civil engineering and higher education, and for leadership at the local, state, and national level in policy analysis and advisory roles.”

f. NSB Office Staff Introduction

Ms. Jennie Moehlmann joined the Board Office in November 2008 as Chief of the new Policy Branch. A long-time NSF employee, Ms. Moehlmann spent over 5 years on Capitol Hill working as a House staffer. She then served as the Public Policy Director for the American Institute for Biological Sciences before joining NSF in 1999. She has worked as a policy analyst and acting Branch Chief on the NSF budget justifications to the Office of Management and Budget (OMB) and Congress for the NSF Budget Division of the Office of Budget, Finance and Award Management (BFA).

The Policy Branch Chief is a new position with the Board Office that will coordinate, together with OLPA, the Board Office interactions with stakeholders, including the development of a strategic communication plan and connections with the science and engineering community, OMB, Office of Science and Technology Policy (OSTP), and Congress. The branch currently includes Ms. Ann Ferrante, Mr. Brandon Powell, Ms. Jennifer Richards, Ms. Kim Silverman, and Ms. Tami Tamashiro as well as Drs. Elizabeth Strickland, Robert Webber, and Matthew Wilson who also support the development of policy reports and policy documents for Board discussions.

AGENDA ITEM 10: Director’s Report and Presentation

Dr. Arden Bement, Jr., Director of the National Science Foundation (Foundation, NSF), reported on the following items:

a. NSF Staff Search

Dr. Beering reported on the search for the Assistant Director, Directorate for Social, Behavioral and Economic Sciences (SBE), a position currently held by Dr. David Lightfoot, who will be completing his term in mid-year of 2009. Dr. Bement stated that Dr. Jeremy Sabloff, the Christopher Brown Distinguished Professor of Anthropology at University of Pennsylvania, was the distinguished chairman of the search committee. Other members on the committee were Dr. Susan Goldman, University of Illinois; Dr. Michael Goodchild, Department of Geology, University of California, Santa Barbara; Dr. Simon Levin, Director of the Center for Biocomplexity at Princeton; Dr. Shirley Malcom, Head of Education and Human Resources at American Association for the Advancement of Science (AAAS); Dr. Gregory Price, Charles Merrill Professor of Economics, Morehouse College; and Dr. Teresa Sullivan, Provost and Executive Vice President for Academic Affairs at the University of Michigan. Dr. Bement announced that the search committee was still accepting nominations for this position, and that the committee members or NSF Director’s Office could be contacted regarding nominations.

b. NSF Staff Departure

Dr. Bement announced the retirement of Dr. John (Jack) Lightbody, Executive Officer, Directorate for Mathematical and Physical Sciences (MPS), who would leave NSF at the end of December 2008. Dr. Lightbody came to the NSF in 1987 from the National Institute of Standards and Technology (NIST) to serve as Program Director for the Division of Nuclear Physics. His accomplishments include serving as the primary NSF point of contact for construction of ICECUBE, working collaboratively between Physics and the Office of Polar Programs (OPP), serving as the NSF member of the NSF-Department of Energy Joint Oversight Group for the Large Hadron Collider, and working closely with Dr. Mark Coles and others in developing the Major Research Equipment and Facilities Construction (MREFC) and large facilities planning guidelines.

c. NSF Staff Introduction

Dr. John McGrath, Director, Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET), Directorate for Engineering (ENG) joined NSF on October 1, 2008. Dr. McGrath came to NSF from the University of Arizona where he served as Department Head and Professor of Aerospace and Mechanical Engineering. He received his Ph.D. in Mechanical Engineering in 1977 from the Massachusetts Institute of Technology.

Dr. Robert Detrick, Director, Division of Earth Sciences (EAR), Directorate for Geosciences (GEO), joined NSF on November 3, 2008. Dr. Detrick was previously with the Woods Hole Oceanographic Institute where he served as Vice President of Marine Facilities and Operations. He received his Ph.D. in Marine Geophysics in 1974 from the University of California, San Diego.

d. Presidential Rank Awards

The Office of Personnel Management (OPM) announced President Bush's selection for 2008 Presidential Rank Awards in October 2008. The Presidential Rank Awards program recognizes and celebrates career Senior Executive Service (SES) members who are strong leaders and who consistently demonstrate strength, integrity, industry and a relentless commitment to public service. The 2008 NSF recipients of the Presidential Meritorious Executive Rank Awards are Ms. Andrea Norris, Director, Division of Information Services (DIS), Office of Information Resource and Management (IRM); and Dr. Peggy Fischer, Associate Inspector General for Investigations, OIG.

e. Congressional Update

For a congressional update, Dr. Bement reported that Congress met the week of November 17, 2008 to hold internal elections for House and Senate leadership for the 111th Congress. Senator Daniel Inouye will replace Senator Robert Byrd as Chairman of the Senate Appropriations Committee, and Congressman Henry Waxman will replace Congressman John Dingell as Chairman of the House Energy and Commerce Committee.

AGENDA ITEM 11: Open Committee Reports

a. Executive Committee (EC)

Dr. Bement, EC chairman, reported that he presented brief biographies on the four transition team members to the committee and described their activities since mid-November 2008. He also gave an update on NSF searches for the Assistant Directors for SBE and the Directorate for Biological Science (BIO).

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

Dr. Jon Strauss reported on behalf of Dan Arvizu, A&O chairman. He stated that Dr. Arvizu indicated that the cover letter and management response that accompanies the OIG's *Semiannual Report to Congress, September 2008* was approved by the committee and the Board by e-mail and then transmitted to Congress. Copies of the *Semiannual Report* were delivered to each Member's mailbox. In addition, Board Members also received a copy of OIG's FY 2009 Audit Plan, which describes how OIG views the risk environment in which the agency operates, and summarizes the audits being planned to mitigate those risks. The chairman gave an update on the status of the search for the next Inspector General, and the vacancy announcement for that position opened on October 28 and closed December 9, 2008.

The chairman reported that the NSF and OIG staff met at the chairman's request to discuss the types of problems arising from differing approaches to accountability among international funding organizations and their impact on international research collaborations. OIG participated in discussions with foreign accountability officials, primarily as part of the Organization for Economic Cooperation and Development's (OECD's) Global Science Forum about whether and how to harmonize policies pertaining to research misconduct and financial reporting. As a follow-up, Dr. Olsen reported on NSF's intention to have the Office of International Science and Engineering (OISE) prepare a white paper in response to OECD's forthcoming recommendations, which are expected to be issued in February 2009. Dr. Olsen also indicated that BFA will be looking at best practices related to internal control considerations in funding actions that have an international component, and that NSF will provide an update at the February 2009 meeting.

Dr. Strauss stated that Dr. Arvizu also recognized two OIG managers, Mr. James Noeth and Ms. Marie Maguire, who received awards from the Federal IG community in October 2008 for their good work. Mr. Sal Ercolano of Clifton Gunderson, the partner-in-charge of NSF's financial statement audit, presented the results of the FY 2008 audit. That audit report was included in NSF's 2008 Annual Financial Report, provided to Board Members (Board Book back pocket). This year's audit resulted in a "clean" opinion and the determination that two prior significant deficiencies no longer met that threshold. However, Mr. Ercolano reported that improvements were still needed and would be reported in the upcoming management letter. The 2008 IT security, or Federal Information Security Management Act (FISMA) review, contained three findings including one new one.

Mr. Thomas Cooley, NSF Chief Financial Officer, noted that he was pleased with the audit outcome because there were no deficiencies to report. He anticipated that the upcoming management letter issued by OIG will suggest areas where more work can be done. The

design and implementation of a new financial system are critical to sustaining NSF's long-standing track record on clean opinions. He also reported on clarifications to NSF's faculty salary compensation policy, which offer more flexibility to universities than the old "summer salary" ruling. Both Mr. Ercolano and Mr. Cooley noted the importance of excellent communications during this audit cycle.

Ms. Kristen Cutforth, OIG auditor and attorney, presented findings contained in a report about NSF's Large Facilities Operations Agreements. The report made four recommendations aimed at ensuring that performance measurement and evaluation components are part of all future facility agreements. The agency generally agrees with all recommendations.

Lastly, Dr. Boesz provided information about the new IG Reform Act and how it will affect NSF.

c. Committee on Education and Human Resources (CEH)

Dr. José-Marie Griffiths reported on behalf of Dr. John Bruer, and stated that the committee reviewed two draft charges. The first draft charge was a revised charge of the full Committee on Education and Human Resources (CEH), which removed oversight responsibility of the Subcommittee on Science and Engineering Indicators (SEI), noted the committee's role to review the science and engineering U.S. workforce needs, and affirmed the committee's commitment to coordinate its work and resources with other Board committees. This charge also changed the committee acronym from EHR to CEH. (NSB/EHR-08-11, Board Book page 126)

The second charge was to establish a full standing Committee on Science and Engineering Indicators (also SEI), which acknowledges the Board's statutory responsibilities regarding its biennial and policy reporting and articulates the role of the committee. The charge also guides the development of the SEI biennial report and the *Digest*, informing the Board about timely and important national issues in order to incorporate them into the *Science and Engineering Indicators (Indicators)* as appropriate; oversees the development and publication of the *Indicators* "companion" document; and expands Government and public awareness of the important data and trends as captured in the *Indicators* to better inform science and engineering policy discussions. (NSB/EHR/SEI-08-10, Board Book page 130)

In separate motions, the committee recommended approval by the Board of the two charges, and the Board acted as follows.

The Board unanimously APPROVED a revised charge for the Committee on Education and Human Resources, which includes changing the committee's acronym from EHR to CEH. (NSB-08-124)

The Board unanimously APPROVED a new separate charge for the establishment of a full standing Committee on Science and Engineering Indicators (SEI). (NSB-08-125)

Dr. Benbow updated committee members about the ongoing work on Next Generation STEM Innovators. The group held an information gathering session on December 8, 2008 with NSF and Department of Education experts who provided the group with informative briefings.

Dr. Benbow outlined key findings and observations, which included: programs tailored for gifted students are rare, only one such program was identified that the Department of Education funds; while a patchwork of ongoing programs exists, there is no coherent Government-wide program to identify and develop future innovators; determining how to identify future innovators can be challenging; creating conditions to enable future STEM innovators to emerge consistent with the ecology of innovation; attention needs to be given to assessing the impact of programs; and to bring some focus to a very broad topic, consideration should be given to tying the group's efforts to a specific area such as sustainable energy.

Given the breadth of issues associated with this topic, the group indicated that more time would be needed for preparatory deliberations and planned to hold a teleconference in January 2009 as well as a second meeting with NSF staff to coincide with the February 2009 Board meeting. The group requested that the group's workplan be revised to accommodate the enhanced planning efforts. Several committee members offered positive suggestions regarding the planning of the workshop and possible communities to engage, such as the National Consortium for Specialized Secondary Schools for Mathematics, Science and Technology, as well as the national societies for Black and Hispanic engineers.

Dr. Griffiths reported that committee members noted the importance of both raising students' overall STEM literacy, which was the focus of the recently issued Board report on STEM education, as well as raising the ceiling for gifted STEM students. The recently reported findings of the Trends in International Math and Science Study (TIMSS) report again reinforced the need for greater efforts in both areas. The group was also encouraged to investigate the efforts of state-level STEM-focused schools such as those in Illinois, North Carolina, and Tennessee. Several members commented on the need for the Board to exert leadership in the light of the new incoming administration and its stated interest in innovation.

Dr. Beering added that, during the CEH meeting, Dr. Alan Leshner urged the Board to take advantage of the potential offered by this moment in history to identify five or six items to address the STEM education problem for the new Administration. Dr. Beering asked for volunteers for a group to be led by Dr. Leshner and include Dr. Griffiths and himself to follow through on this suggestion. Dr. Beering asked that interested Board Members contact Dr. Craig Robinson, Acting Executive Officer and NSB Office Director.

CEH approved a revised workplan for the Expert Panel Discussion on Preparing the Next Generation STEM Innovators, where the 2-day expert panel workshop would be rescheduled for early fall 2009 (NSB-08-82, Board Book page 131). The subsequent associated actions would also reflect a draft report to be released for public comment going to the Board for consideration at the December 2009 Board meeting; a final draft report to be presented to the Board for approval in February 2010; and dissemination of the final report in spring 2010. The committee recommended approval of the revised workplan by the Board.

The Board unanimously APPROVED a revised workplan for the CEH Expert Panel Discussion on Preparing the Next Generation of STEM Innovators. (NSB-08-82)

Dr. Griffiths thanked the Board for its support on the three motions. Additionally, she expressed thanks to Ms. Kathryn Sullivan, CEH Executive Secretary, Dr. Robert Bell, SEI Executive Secretary, and Ms. Jean Pomeroy and Dr. Matt Wilson, Board Office staff, for all their assistance.

d. Committee on Science and Engineering Indicators (SEI)

The committee discussed several important topics regarding *Indicators 2010*. Dr. Louis Lanzerotti, SEI chairman, thanked Dr. Bell and other members of the Division of Science Resources Statistics (SRS) staff for all their efforts.

Dr. Lanzerotti reported that SEI reviewed the revised chapter outlines prepared for *Indicators*. He stated that Board Members made comments and suggestions on the previous draft outlines, which were finalized at the meeting. Board Members made suggestions for exploring and incorporating suitable new data on a variety of important and emerging topics of which Dr. Bell kept a list and will make available. The chapter authors will include appropriate data either in the text or in sidebars that are responsive to both the concerns raised at the meeting as well as those incorporated in the revised outlines.

SEI also discussed reviewers for the *Indicators* chapters. Dr. Lanzerotti expressed his thanks to SEI and Board Members who volunteered to review the draft chapters of *Indicators*, but stated that lead reviewers were still needed for several chapters. Dr. Lanzerotti asked Board Members to send suggestions to him (with copies to Dr. Bell and Ms. Pomeroy) for experts to review the chapters by February 1, 2009. A list of potential outside reviewers was distributed at the meeting.

Dr. Lanzerotti reported that SEI had a discussion with Dr. Lynda Carlson, SRS Division Director, regarding Volume II of *Indicators*. SEI agreed with the proposal to publish the appendix tables primarily in electronic form as explained in the memorandum from Dr. Carlson provided to Board Members (NSB/EHR/SEI-08-11) (Board Book pages 187-188). This change will reduce errors, costs, and staff time while continuing to make the data conveniently available to users.

Finally, Dr. Lanzerotti reported on the 2010 *Digest of Key S&E Indicators (Digest)*, and reminded Board Members that the first *Digest* was published in 2008. SEI and SRS worked jointly on Digest plans during the past several months, and SRS presented its plans and ideas for the 2010 *Digest*. SEI was shown a prototype of a Web version of a section of the *Digest* and a print version showing the same content. Dr. Clough emphasized that the Board needs to present factual and balanced material that does not include policy or information susceptible to misinterpretation. It was agreed that selection of themes and messages was important and that Board Members should be involved in all stages of development for this new experimental version of the *Digest*. Drs. Bement, Clough, Esin Gulari, and Leshner agreed to work with Dr. Lanzerotti and staff to discuss and flesh-out ideas and formats, and will give a report on the progress at the February 2009 meeting. Dr. Lanzerotti thanked the four Board Members for volunteering to work on this project.

e. Committee on Programs and Plans (CPP)

Dr. Kelvin Droegemeier, CPP chairman, reported on a discussion of potential new programmatic areas for CPP. At the September 2008 meeting, he asked CPP members to think about new areas of interest for the committee and to bring these ideas forward. CPP members introduced several potential topics for discussion, including reviewing NSF's Merit Review Criterion II, the status of the National Ecological Observatory Network (NEON), the role of community colleges in broadening participation and the increasing administrative burden on grantees among others. CPP will discuss these topics further at the February 2009 meeting.

Dr. Vern Pankonin, Program Manager, Division of Astronomical Sciences (AST), Directorate for Mathematical and Physical Sciences (MPS), presented the information item on the Associated Universities Incorporated (AUI) proposal for the management and operations of National Radio Astronomy Observatory (NRAO). The proposal is for a 6-year cooperative agreement with AUI, a not-for-profit scientific management organization that also manages several other facilities in the AST portfolio. AST will bring an action item to the May 2009 Board meeting with a recommendation on the proposal from AUI to manage NRAO. In December 2007, NSB was informed that the award for management should not be competed (NSB/CPP-07-36). NSF expects to recompet the maintenance and operations for NRAO following the upcoming renewal of the cooperative agreement and noted that the process must start 3 years into the next 6-year cooperative agreement. ATS/MPS intends to bring an action item to the May 2009 Board meeting.

Dr. Timothy Killeen, GEO Assistant Director, gave an update on the information item on the Ocean Observatories Initiative (OOI), an MREFC project. He responded to questions from the Board on how the project has evolved, and identified areas of risk from the November 2008 Final Design Review (FDR). Dr. Killeen assured the Board that GEO was doing exhaustive tracking on all the costs associated with the project, and GEO expects to bring this item before the Board at the May 2009 meeting as an action item.

Also, Dr. Killeen presented an update on the information item on the status of the Alaska Regional Research Vessel (ARRV), another MREFC project that will be NSF's first new build as part of the academic fleet renewal. It will also be the first high latitude, high endurance general purpose research vessel in the U.S. academic fleet, and also will be a "green" ship in terms of energy and environmental capabilities. GEO expects to bring this item to the Board for approval to proceed with construction at the May 2009 Board meeting.

The last information item was on the subject of the Experimental Program to Stimulate Competitive Research (EPSCoR). Dr. Henry Blount, EPSCoR Office Head, provided the update. He highlighted recent changes to the program including the move of the EPSCoR Office to the Office of Integrative Activities (OIA) in the Office of the Director, as well as increased competitiveness through increasing co-funding participation in NSF initiatives, and alignment of the Research Infrastructure Improvement (RII) program with discovery frontiers in directorates and offices across NSF. EPSCoR currently has nine RII proposals under review. Each of those proposals is for up to \$20 million over 5 years, and the EPSCoR Office is likely to bring these award recommendations before the Board at the May 2009 meeting.

CPP addressed a discussion item for the review of the MREFC process. As a follow-up to the Board's *Report to Congress on Pre-construction Funding and Maintenance and Operations Costs Associated with Major Research Equipment and Facilities at the National Science Foundation (NSB-08-15)* in February 2008, CPP has considered various MREFC process modifications that would create a more enhanced role for the Board. Dr. Mark Abbott has led this effort, and most recently the working group was expanded to include Drs. Droegemeier, Griffiths, Lanzerotti, and Mr. Reilly, chairman of the Committee on Strategy and Budget (CSB). Mr. Cooley presented a white paper that proposed an implementation plan for the NSB enhancements to the MREFC process. Most importantly, the keystone component is an extensive portfolio review that would occur after the Conceptual Design Review (CDR) of projects and during the May Board meeting of every year. The focus of that review would be to place multiple projects within the broad context of the disciplinary support and include a review across the entire NSF portfolio of candidate projects.

It was proposed that a subcommittee of CSB be formed for this post-CDR portfolio review. These suggestions were referred to CSB and will be finalized at the February 2009 Board meeting. Dr. Abbott and the working group will continue to work with NSF to finalize the implementation plan and review structures with possible implementation of these proposals at the May 2009 Board meeting. The possibility was raised for a final output of this effort to be a reissue or supplement to the September 2005 report, *A Joint National Science Board – National Science Foundation Report: Setting Priorities for Large Research Facilities Projects Sponsored by the National Science Foundation (NSB-05-77)*.

Lastly, CPP brought forward two potential changes to the work structure of the committee: the incorporation of the changes proposed by the new MREFC process into the Board committee structure, which would include the establishment of a CSB subcommittee; and a potential change to the threshold of the delegation of award-approval authority for items requiring Board approval, noting that most award actions are now reviewed in CPP. The latter suggestion was intended to free time on the CPP agenda for review of other programs. Currently, as implemented, CPP would review almost 30 award actions in calendar year 2009, which would leave little time for more in-depth review of programs, including requirements for continued oversight of MREFC projects. These changes in award thresholds were referred to A&O, which has purview over this issue. CPP planned to discuss these issues during the upcoming months and bring final recommendations to the Board at the February 2009 meeting.

CPP Subcommittee on Polar Issues (SOPI), Dr. Strauss, chairman

Dr. Karl Erb, OPP Director, discussed the impact of the FY 2009 budget on the International Polar Year (IPY) activities, and noted that emphasis was placed on maintaining IPY commitments to grantees in light of current budget difficulties. He described the recent evacuation by the Air National Guard of a severely injured Australian from that country's Davis Station in Antarctica, and reported on the grounding in the Antarctic region of the cruise ship *MV Ushuaia*. Fortunately, there were no injuries and the environmental impact was modest.

Dr. Erb also compared the Arctic Sea ice coverage this summer to last summer, and although the coverage had not diminished in Summer 2008 as dramatically as in Summer 2007, the volume reached its lowest level in many years. The occurrence of thinner ice over a larger area

could have an impact on subsequent years. Also, Dr. Erb reported on the recently signed NSF-Department of Energy (DOE) Memorandum of Understanding (MOU) on renewable energy and energy efficiency.

Lastly, Mr. George Blaisdell and Mr. Patrick Haggerty, both with OPP, reported on tremendous savings achieved by efforts to increase energy efficiency and exploit renewable energy in the polar regions.

CPP Task Force on Sustainable Energy (SE) - Drs. Arvizu and Strauss, co-chairmen

Task force co-chairmen summarized their informal discussions in November 2008 with U.S. Government stakeholders. In these discussions, they reviewed task force activities, described potential report recommendations, and received informative guidance. The task force also discussed a draft report on sustainable energy, and Dr. Arvizu explained the major findings, recommendations to the U.S. Government, as well as guidance to the NSF included in the report. The draft report will be revised during the next few months, and Board Members were urged to provide comments and revisions in early January 2009.

f. Committee on Strategy and Budget (CSB)

Mr. Arthur Reilly, CSB chairman, reported on long-range planning. The committee had an information presentation by Mr. Cooley who provided an overview of the Long-Range Planning Background Material binder provided to Board Members in May 2008, and also available on the NSF Web site. The binder contains a wealth of information such as major funding trends for the agency, overall posture of the NSF in relation to other research and development agencies, and funding in relation to strategic goals. The background material is available on the NSF Web site. Mr. Cooley noted that a new version of this information will be provided to the Board approximately 4 weeks prior to the May 2009 Board meeting.

CSB also considered NSB input on investment priorities for the next NSF Strategic Plan, which is developed and published every 3 years and covers a 5-year period. The NSF Strategic Plan and the visions captured in this document provide a roadmap for NSF to implement cutting edge science, education, next generation facilities, and stewardship. The committee initiated discussion of issues and ideas for shaping that next Strategic Plan by reviewing the investment priorities associated with the four existing goals of NSF - discovery, learning, research infrastructure, and stewardship. CSB identified a number of items, such as sustainability and environmental issues, economic and energy issues, international dimension for science in the NSF work program, metrics and measures as indicated in the work of *Indicators*, and young innovators and innovators in general. CSB will continue to reflect on the Strategic Plan at the next meeting, and requested additional inputs from Board Members before the February 2009 meeting.

Following on the facilities discussion raised in CPP, CSB will work with CPP to develop a plan to identify the roles of NSB committees in the facility review process. Mr. Reilly stated that an *ad hoc* group, along with any other interested Board Members, will be working to develop a proposal for review at the February 2009 meeting that will outline a group to do the review of that portfolio at, or in conjunction with, the May 2009 meeting.

The committee recommended the release of the draft report, *Investing in the Future: NSF Cost Sharing Policies for Sustaining a Robust Federal Research Enterprise (NSB/CS-08-18)* for public comment subject to editorial modifications by the Chairman of the Board and the CS chairman. Based on this recommendation:

The Board unanimously APPROVED the draft report, *Investing in the Future: NSF Cost Sharing Policies for Sustaining a Robust Federal Research Enterprise (NSB/CS-08-18)* for public comment subject to editorial modifications by the Chairman of the Board and the CS chairman.

CSB Task Force on Cost Sharing (CS) – Dr. Droegemeier, chairman

Dr. Droegemeier, CS chairman, reported that a *Federal Register* request was released for public comments on cost sharing August to October 2008. The task force received and reviewed 88 comments, which were helpful input to the second report. The report was then modified, and the task force reviewed and approved the draft of the second report on cost sharing, including the nine recommendations, and recommended approval by CSB for release for public comment.

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

Dr. Patricia Galloway, 60ANN chairman, presented highlights on an interview that Dr. Marc Rothenberg, NSF Historian, conducted with Father Theodore M. Hesburgh, President Emeritus of the University of Notre Dame who served as a Board Member from 1954 to 1966. Father Hesburgh is considered one of the most influential figures in higher education in the 20th century. The interview reveals insights into his very early years with NSB as well as NSF. A copy of the interview was distributed to Board Members, and she thanked Dr. Rothenberg for his service in conducting the interview.

Dr. Galloway reported that the Dr. Kathie Olsen, NSF Deputy Director, agreed to establish a management implementation committee for the 60th Anniversary to work jointly with the NSB task force on the NSF-related 60th Anniversary activities.

The task force identified goals and potential activities that might be considered for the 60th Anniversary. The committee reached agreement that the goals to be accomplished for the 60th anniversary will include the following:

- ◆ A half-day workshop in May of 2010 that will highlight researchers of the past 10 years who will be identified by the NSF directorates through the selection criteria agreed by the task force and who will represent NSF areas of research;
- ◆ Identification of 60 great achievements that have arisen from NSF/NSB during the past 60 years through Internet outreach for idea collection and voting on those achievements;
- ◆ Posters and media coverage associated with the researchers and the 60 great achievements;
- ◆ Identification of state and national student competitions and selection from national winners to be recognized and to speak at the Anniversary Dinner in December of 2010;

- ♦ An Anniversary Dinner to be held in December 2010 that corresponds with the 60th Anniversary will recognize a student or students selected from the national competitions, and to which the task force will also invite President-Elect Obama to highlight his objectives in the areas of science and engineering.

Dr. Galloway recognized that there will be limited resources available and, therefore, the task force will be working with Dr. Robinson and the NSF directorates on plans for meeting these goals.

The task force also agreed with the schedule of recommended actions associated with the 60th Anniversary commemoration over the next 18 months. Dr. Galloway indicated that the workshop will feature the 10 early-career researchers, and the task force agreed to the criteria for selecting the researchers who will be the workshop speakers. This criteria will be given to the directorates and used to begin identifying the researchers. The task force also agreed to consider persons from successful small businesses enabled by NSF funding as possible speakers at the workshop.

Dr. Galloway thanked task force members as well as Dr. Robinson, Ms. Ann Ferrante and Ms. Karen Sandberg, 60thANN Co-Executive Secretaries, and the Board Office staff for their assistance, as well as the NSF management and the directorates for their help.

Dr. Beerling adjourned the Open Session at 3:25 p.m.

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