

**APPROVED MINUTES¹
OPEN SESSION
420TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
July 28-29, 2011

Members Present:

Ray M. Bowen, Chairman
Mark R. Abbott
Dan E. Arvizu*
Steven C. Beering*
Camilla P. Benbow
John T. Bruer
France A. Córdova**
Kelvin K. Droegemeier
Patricia D. Galloway
José-Marie Griffiths
Douglas D. Randall
Arthur K. Reilly
Diane L. Souvaine
Arnold F. Stancell*
Thomas N. Taylor
Richard F. Thompson

Members Absent:

Esin Gulari, Vice Chairman
G.P. “Bud” Peterson
Subra Suresh, *ex officio*

¹ The minutes of the 420th meeting were approved by the Board at the September 13, 2011 meeting.

* Consultant

**Participated by telephone

The National Science Board (Board, NSB) convened in Open Session at 1:40 p.m. on Friday, July 29, 2011, with Dr. Ray Bowen, Chairman, presiding (Agenda NSB-11-43, Board Book page 265). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 4: Approval of Open Session Minutes, May 2011

The Board unanimously APPROVED the Open Session minutes of the May 2011 Board meeting (NSB-11-40, Board Book page 275).

AGENDA ITEM 5: Chairman's Report

In the Chairman's Introduction on Thursday, July 28, 2011 and during the Chairman's Report in the Plenary Open Session on Friday, July 29, 2100, Dr. Bowen announced and reported on several items.

a. Webcast of Board Meeting and NSF Innovation Initiative Announcement

For the first time, the Board meeting held in Arlington, Virginia, was Webcast and simultaneously available to viewers over the Internet. The Webcast included all Open Sessions of the full Board as well as Open Sessions for committees, subcommittees, and task forces held in Room 1235. The Webcast link, <http://www.tvworldwide.com/events/nsf/110729/>, was available from the NSB and NSF Web sites.

On Wednesday, July 28, 2011, Dr. John Holdren, Director, Office of Science and Technology Policy (OSTP), came to NSF to announce the Innovation Corps (I-Corps) Program, a public-private program to help research make the leap into entrepreneurship. The objective of I-Corps is to place NSF-funded scientists together with mentors and entrepreneurs to turn their ideas into marketable ventures. The launch event was also Webcast live.

b. Board Meeting Calendar for 2012

Dr. Bowen presented the proposed 2012 calendar for Board meeting dates. In developing the meeting dates, the Board Office considered a variety of constraints during the year, including statutory requirements, and compiled a list of dates for the maximum attendance by Board Members. The 2012 calendar includes dates for meetings of the full Board during February, May, July, September, and December.

The Board unanimously APPROVED the Board meeting calendar for 2012. (NSB-11-46, Board Book page 297) (Appendix).

c. Candidate Sites for 2012 Board Retreat and Off-Site Meeting

The Board will soon be considering locations for next year's off-site meeting and retreat to take place September 19-20, 2012. Dr. Bowen asked Board Members to give suggestions to Dr. Michael Van Woert, Executive Officer and Board Office Director. The location of the

2012 off-site meeting and retreat will come before the Board for discussion and approval at the December 2011 meeting. This year's off-site meeting and retreat will take place on September 13-14, 2011 in Tucson, Arizona.

d. Board Member Nominations

Dr. Bowen made the following announcements regarding recent Board Member nomination activities.

- Dr. Arnold Stancell was nominated by the President, and replaced Dr. Barry Barish, for the Class of 2014. Dr. Stancell is Emeritus Professor and Turner Leadership Chairman at the Georgia Institute of Technology.
- Dr. Claude Steele was nominated by the President, and replaced Dr. Elizabeth Hoffman, also for the Class of 2014. Dr. Steele is currently the Provost of Columbia University and Professor of Psychology, and will begin to serve as the Dean of the School of Education at Stanford University in September 2011.
- [Dr. G. Wayne Clough, Class of 2010, officially resigned from the Board in June 2011.]

Dr. Bowen directed Board Members to the list of Board Members by Terms (NSB-11-45, Board Book page 295), and thanked Drs. Barish and Hoffman for their long-term service on the Board as Members and Consultants.

Additionally, Dr. Bowen announced that Dr. Cora Marrett was confirmed by the U.S. Senate to serve as the Deputy Director of the National Science Foundation.

e. Committee Announcement

The Chairman established the *ad hoc* Committee on Honorary Awards with Dr. Bud Peterson as chairman. Drs. Camilla Benbow and Arnold Stancell agreed to serve on the committee.

f. Board Member Recognition

Dr. France Córdova was awarded an honorary doctorate degree in June 2011 from the Ben-Gurion University of the Negev in Israel for her “leadership in fostering academic excellence, pluralism, equality, and social justice at Purdue University.”

Dr. Patricia Galloway was asked to give the commencement speech in December 2011 at the South Dakota School of Mines.

g. Board Office Staff Departure

Mr. Michael Town, an Albert Einstein Distinguished Educator Fellow, who joined the Board Office in September 2010, will be leaving at the end of the month. He will be returning to Redmond High School in the State of Washington to continue to teach Advanced Placement Environmental Science, and finish development of a high school course on Environmental Engineering and Sustainable Design, among other projects. Mr. Town supported the Committee on Education and Human Resources (CEH) and conducted extensive research on STEM education issues.

AGENDA ITEM 6: Director's Report

On behalf of Dr. Subra Suresh, NSF Director, Dr. Cora Marrett, NSF Deputy Director, reported on the following items:

a. NSF Staff Introductions

Dr. Kesh Narayanan was reassigned as the Deputy Assistant Director, Directorate for Engineering (ENG), on June 20, 2011. Previously, he served as the Director, ENG Division of Industrial Innovation and Partnerships. Dr. Narayanan joined NSF in 1994, having previously served as the Chief Scientist for the Building Materials Group at Certainteed Corporation and Director of Research and Development, Bonded Abrasives, at Norton Company. He is the recipient of several NSF Director's Awards and was awarded the Presidential Rank Award for Meritorious Service in 2010. Dr. Narayanan received his Ph.D. in Materials Science and Engineering from Carnegie Mellon University in 1976.

Dr. Celeste Rohlfsing was appointed Deputy Assistant Director, Directorate for Mathematical and Physical Sciences (MPS) on May 22, 2011. Dr. Rohlfsing joined NSF in 2000 from Sandia National Laboratories and has served most recently as Head, MPS Office of Multidisciplinary Activities. She served on a detail to OSTP from December 2010 to May 2011. Dr. Rohlfsing received her Ph.D. in Chemistry from Princeton University in 1983.

Dr. Joanne Tornow was appointed Deputy Assistant Director, Directorate for Social, Behavioral, and Economic Sciences (SBE) on June 19, 2011. Since September 1999, she has served at NSF in a variety of capacities including Staff Associate for the Office of the Assistant Director for Education and Human Resources (EHR), Senior Advisor for the Office of the Assistant Director of Biological Sciences (BIO), and Staff Associate within the Office of the Director, among other assignments. Prior to coming to NSF, Dr. Tornow served as an American Association for the Advancement of Science (AAAS) Fellow at the White House and for the U.S. Senate. Dr. Tornow received her Ph.D. in Genetics from Yale University in 1983.

b. Human Frontier Science Program

As NSF has done in previous years, it is anticipating making an award to the Human Frontier Science Program (HFSP) at the request of OSTP. HFSP is a multinational, nonprofit organization that promotes interdisciplinary research and cooperation on the complex mechanisms of living systems through peer-reviewed fellowships and research grants. The program is supported by annual funding from 13 countries and the European Union. U.S. support is provided by the National Institutes of Health (NIH) and NSF. The U.S. representation on the HFSP Board of Trustees will include Dr. Joann Roskoski, NSF BIO, and Dr. Sally Rockey of NIH.

NSF will contribute \$2.3 million and NIH will provide \$7.6 million via an interagency agreement to NSF, and NSF will then make the award to HFSP. This holds the U.S. contribution at \$9.9 million, level with the 2010 contribution. This is compared to almost \$30 million provided annually by Japan of the total HFSP budget of \$61 million. Dr. Marrett noted that the U.S. has been the primary beneficiary of the program. The bulk of the money for HFSP comes from Japan because the program was begun there.

c. NSF Congressional Update

Legislative Activity

Since the May 2011 NSB meeting, the House Committee on Appropriations approved the FY 2012 Commerce, Justice, Science Appropriations bill. NSF received \$6.86 billion, which is equal to the agency's FY 2011 enacted current plan and \$907 million less than President Obama's FY 2012 request.

Dr. Marrett shared comments from the Chairman of the Subcommittee on Commerce, Justice, Science, and Related Activities, Frank Wolf. At the time he presented the subcommittee's bill for mark-up, he noted that what had come to the committee was far less than requested. He reminded everyone that the subcommittee was working under severe constraints, but he went on to say despite a 6 percent lower allocation than in 2011, the bill increases funding for research accounts at NSF. Investments in scientific research are critical to long-term economic growth and job creation.

Additionally, Dr. Marrett reported that NSF has been in regular interaction with Members of Congress and their staff. There have been several meetings involving NSF senior managers to convey fundamental information about NSF and how it operates.

Hearings

Since the May 2011 NSB meeting, NSF provided witnesses for three hearings at the request of the House Committee on Science, Space, and Technology - Subcommittee on Research and Science Education.

On May 25, 2011, Dr. Farnam Jahanian, the Assistant Director, Directorate for Computer and Information Science and Engineering (CISE), appeared before joint House Science Committee Subcommittees. Dr. Jahanian spoke about the broader contributions that result from NSF's investments in cybersecurity research and education, and provided feedback on the CyberSecurity Research and Development Act of 2002.

On June 2, 2011, Dr. Myron Gutmann, SBE Assistant Director, testified on how NSF's investments in the social, behavioral, and economic sciences are necessary, innovative, and improve the daily lives of Americans.

On July 26, 2011, Dr. Marrett testified on NSF's merit review process. Among the outcomes, there was expression of interest by the subcommittee leadership in a Workshop on merit review for Members of the subcommittee and their staff.

AGENDA ITEM 7: Open Committee Reports

[Note: The Executive Committee (EC) did not meet in July 2011.]

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

Mr. Arthur Reilly, A&O chairman, reported that Ms. Allison Lerner, NSF Inspector General (IG), and Ms. Martha Rubenstein, NSF Chief Financial Officer (CFO), discussed the progress made

in addressing audit findings on the use of contingency budgeting to manage costs in NSF construction projects. They noted that they and their respective staffs have been communicating regularly and progress is being made on this issue. The Office of Inspector General (OIG) is engaged in an audit of a closed award, which will provide additional information. OIG has also been benchmarking with the Department of Energy (DoE) on their practices. NSF reviewed existing awards and is amending them to tighten controls. NSF is revamping its fund drawdown system for awardees, which will also help enhance oversight and accountability. Additionally, NSF is working with the Office of Management and Budget (OMB) and OSTP on clarifying policy language on this issue to avoid future misunderstandings.

Mr. Reilly reported that Ms. Lerner also briefed the committee on OIG's recent activities. She reported that her office organized a successful full-day conference in June 2011, "Combating Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) Fraud," which was attended by 130 members of the Federal law enforcement community. The initiative was supported by Senator John Rockefeller, Chairman of the Senate Committee on Commerce, Science and Transportation, and the subject of a press release by his office. Ms. Lerner announced that Dr. Peggy Fischer will be retiring after 12 years as the NSF Assistant IG for Investigations.

Mr. Reilly also noted that the President appointed Ms. Lerner to serve on the new Government Accountability and Transparency Board (GATB) with 10 other IGs and Government executives. The purpose of the Board is to advance transparency and find new methods of rooting out waste and fraud in Government.

In Ms. Rubenstein's update, she reported that this fiscal year is challenging, given late appropriations and congressional spending approvals. FY 2010 audit issues are being addressed and the FY 2011 audit is moving forward. Ms. Rubenstein then responded to questions related to grants management, reporting by researchers, and progress in questioned costs in external institutions as identified in the *Office of the Inspector General Semiannual Report to Congress, March 2011*.

Dr. Marrett gave an update on Human Capital issues. She discussed three key threads: (1) the Office of Personnel Management (OPM) has been pleased with NSF's progress on matters in their audit, and pointed to NSF as a model agency for other agencies seeking to improve their practices; (2) NSF's progress in meeting the Administration's goal in making the Federal Government a model employer of America's veterans; and (3) NSF's work to become a model Equal Employment Opportunity (EEO) agency is important to creating an overall environment for NSF success. Also, in response to Mr. Reilly's question, Dr. Marrett noted that NSF is poised to proceed on the Future NSF effort, working in partnership with the General Services Administration (GSA) and Congress.

Finally, in order to expedite action on the OIG's forthcoming budget request, the committee acknowledged and reaffirmed the EC's authority to act on behalf of the full Board to approve the A&O recommendation pertaining to the OIG budget for FY 2013. Based on this recommendation:

The Board unanimously REAFFIRMED the delegation of authority for the Executive Committee to act on behalf of the full Board to approve recommendations from the Committee on Audit and Oversight relating to the FY 2013 budget for the Office of the Inspector General.***

b. Committee on Education and Human Resources (CEH)

Dr. Camilla Benbow, CEH chairman, reported that the committee considered three Horizon Priority Action Items that had been identified during June 2011 teleconference (NSB/CEH-11-13, Board Book page 239). The identified horizon actions would implement strategies aimed at: engaging talented middle/high school students in STEM education experiences; expanding K-12 students' access to computing and internet-based STEM content with focus given to increasing technological and network capabilities in disadvantaged areas; and incorporating opportunities for K-12 students and teachers in new Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) and Science, Engineering, and Education for Sustainability (SEES) solicitations. The committee passed a motion to bring this list of Horizon Priority Actions Items to the full Board, with a request that the Board forward the list to the NSF Director for consideration. Based on this recommendation:

The Board unanimously APPROVED the STEM education High Priority Action Items recommended by CEH to forward to the NSF Director for consideration.

The committee also had an exchange on strategic directions for NSF's education portfolio with Dr. Joan Ferrini-Mundy, EHR Assistant Director; Dr. Timothy Killeen, Assistant Director, Directorate for Geosciences (GEO); and Dr. Lee Todd, Chairman of EHR's Advisory Committee. The committee learned about NSF's efforts to develop an agency-wide, education strategic vision. The three speakers addressed the following issues: education grand challenges within the national and NSF context; the NSF education goals; activities designed to engage, empower, and energize; and the impact of cyber technologies on learning, including the evolving role between student and mentor.

The initial presentation stimulated the following questions from CEH members: Who is ultimately the targeted audience of the strategic vision – STEM workforce or a broader cross-section including educators and students? How do standards factor into the vision? How is this emerging vision for education at NSF aligned with the agency's recently announced I-Corps initiative?

CEH members felt that the vision effectively addressed the question of "why NSF?" and could help to fill a void felt nationally with the end of the space shuttle era. Additional comments noted the importance of pursuing both internal partnerships between EHR and the research directorates and external partnerships with other agencies and the private sector, as well as the critical importance of including evaluation and assessment to increase understanding of what does and does not work in STEM education.

Lastly, the committee recognized the hard work and contributions of Mr. Michael Town, who served as an Einstein Fellow in the Board Office. Mr. Town supported CEH during the past year and will return to teaching in the State of Washington.

c. Committee on Science and Engineering Indicators (SEI)

Dr. José-Marie Griffiths, SEI chairman, reported that Ms. Jeri Mulrow, National Center for Science and Engineering Statistics (NCSES), presented a demonstration of new Web-based functionality in the *Science and Engineering Indicators (Indicators)* state data tool. Dr. Bowen reiterated his suggestion that *Indicators* include data on the declining percentage of State university budgets supported by state appropriations, and NCSES said it will try to include the requested data. Dr. Bowen also suggested that *Indicators* data be accessible via an I-Phone application, and the staff responded that this was already in the early stages of work.

Mr. Rolf Lehming, Director, NCSES Science and Engineering Indicators Program, summarized the major themes of the Overview and the Digest, which are being developed. Both the Overview and the Digest will continue the emphases of past years with particular attention to developments related to the recent worldwide recession. The working group on the Companion Piece plans to address innovation, including how research and development fosters innovation and implications for the workforce. It plans to have a teleconference soon to further develop ideas.

The committee heard a summary of the Federal agency reviews of the “Orange Book,” the penultimate draft of *Indicators 2012*. The reviews made numerous constructive suggestions and did not raise any major concerns. The committee approved the “Orange Book” draft for *Indicators 2012*, subject to final edits approved by the Board Chairman and the SEI Chairman, and recommended full Board approval. Based on this recommendation:

The Board unanimously APPROVED the “Orange Book” draft of *Science and Engineering Indicators 2012*, subject to final edits approved by the Board Chairman and the SEI Chairman.

d. Committee on Programs and Plans (CPP)

Dr. Mark Abbott, CPP chairman, reported that in an effort to save time on the agenda, NSF provided several written information items in advance to the committee in lieu of oral presentations at the meeting:

- ◆ The Joint Institute for Computational Science, Status of Track 2B award to the University of Tennessee (NSB/CPP-11-29, Board Book page 21). This information item was an annual update on an NSB approved action.
- ◆ Update on the NSF Business and Operations Advisory Committee’s (BOAC’s) formation of a subcommittee regarding implementation of the NSB Recompensation Policy (NSB/CPP-11-38, Board Book page 23). CPP is looking forward to seeing an implementation plan from NSF.
- ◆ Two summary reports (1) on the Deep Underground Science and Engineering Laboratory (DUSEL), including a prepublication summary of the National Research Council (NRC) report (Board Book Page 34 - full NRC report available on the NRC Web site), and (2) a DoE report titled, *Office of Science - Review of Options for Underground Science* (Board Book page 37).

Dr. Abbott noted that Dr. Marrett's report on behalf of the Director relating to the FY 2012 budget for NSF stated that the Major Research Equipment and Facilities Construction (MREFC) account will present potentially severe near-term challenges. Dr. Abbott stated that it may be necessary for CPP to engage a teleconference with NSF leadership to clarify this issue as FY 2012 begins.

Dr. Abbott stated that for data intensive science, an issue that came up in part of a larger discussion on a specific action item, he recommended to Board Office staff that Dr. Alex Szalay from Johns Hopkins University be invited to give a broad science presentation of his work on the Nature of Data Intensive Science in the 21st Century at the December 2011 meeting.

Discussion Item: CPP Program Portfolio Planning
(NSB/CPP-11-39, Board Book page 53)

The committee continued a discussion of the proposed CPP Program Portfolio Planning. The goal of this activity is to provide stewardship to NSF on a broader portfolio of programs, intended to complement the strong involvement of the committee in reviewing NSF's largest awards. The CPP working group met earlier this month with an NSF team to discuss a draft outline of the process.

At the CPP meeting, the NSF team and committee members had a thorough discussion about what both sides are looking for in terms of projects. Two cross-cutting programs were proposed, and Dr. Abbott would like to have a third project that is science-grounded. Dr. Suresh agreed to continue the discussion with CPP during the next few days so that NSF and the committee can come to a mutual agreement on what is most appropriate and how to accomplish this. CPP will continue this discussion with NSF and have a final proposal for CY 2012 at the December 2011 meeting. The committee intends to schedule at least one program discussion in each of the CPP meetings during 2012, and some discussions may need to be held in Closed Session due to the pre-decisional budget planning involved.

NSB Information Item: iPlant Annual Report on Award Progress

Dr. Karen Cone, BIO Program Officer, presented the Annual Report on iPlant's current activities and future plans. iPlant is a collaborative that enables transformative plant science research through the use of a unified cyberinfrastructure. Dr. Cone told CPP about the new science deliverables that have been rolled out over the past year, and provided an update on plans for iPlant years 4 and 5. Dr. Griffiths was the lead reviewer on the original award, and noted the committee's initial concerns on its unconventional approach. However, the project has progressed well and the community has had positive reactions to iPlant.

NSB Information Item: NEON Update

Dr. Joann Roskoski, Acting BIO Assistant Director, and Dr. Elizabeth Blood, BIO Program Officer, presented an update on the status of the National Ecological Observatory Network (NEON). Dr. Blood updated the committee on NEON design and development activities. She noted that National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) testing and calibration of the spectrometer is ahead of schedule, and they anticipate delivery 4-6 weeks ahead of schedule. NSF expects to bring an action item to the Board for additional

funding at the December 2011 meeting. The committee requested that the December 2011 update include information about budgetary trade-offs between NEON and other BIO programs. Dr. Abbott brought to the attention of the Board an NSF press release issued on July 28, 2011, entitled “NSF Awards Construction Funding to National Ecological Observatory Network,” which was available on the NSF Web site.

NSB Information Item: Network for Earthquake Engineering Simulation (NEES) Update

Dr. Thomas Peterson, ENG Assistant Director, and Dr. Joy Pauschke, ENG Program Director, presented an update on the Network for Earthquake Engineering Simulation (NEES). Dr. Pauschke provided a mid-stage update on the status of NEES, and told CPP about two important independent studies being conducted: the NRC workshop report, which was just released on July 27, 2011; and a Science and Technology Policy Institute (STPI) report expected in early 2012. NSF will use both reports to help plan for 2014 and beyond. NSF plans to brief the Board about outyear plans for NEES in summer 2012.

NSB Information Item: LIGO – Data Management Plan
(NSB/CPP-11-31, Board book page 55)

Dr. Marrett provided an overview of data management plans for Laser Interferometer Gravitational-Wave Observatory (LIGO) and IceCube. After careful review, NSF supports the plans as presented to the Board.

Dr. Edward Seidel, MPS Assistant Director, gave an update on the Data Management Plan for LIGO, which was agreed upon by both NSF and LIGO. It is a two-phase framework with varying levels of data access based on stability of instruments and data analysis. The committee expressed concerns regarding the two-phase approach to release of data, and NSF welcomed the NSB advice on this complex issue. The committee recommended an evaluation on the determination of the transition to “mature” data, to provide an independent analysis and support for the best approach to data management.

NSB Information Item: IceCube Data Management Plan
(NSB/CPP-11-30, Board Book page 127)

Dr. James Whitmore, MPS Program Director, gave an update on the Data Management Plan for IceCube. Dr. Whitmore provided details about the data management plan, which includes a year-long data collection period, followed by extensive quality control checks before the data is released on the Web with open source access tools. He also noted that data will be made available in compliance with both NSF data policy and Antarctic Treaty requirements.

NSB Information Item: Gemini Cooperative Agreement

Dr. Gary Schmidt, MPS Program Director, gave an update on the Gemini Cooperative Agreement. Dr. Schmidt updated the committee on the restructuring due to the United Kingdom’s (UK’s) withdrawal from the Gemini Partnership in 2012. He noted that the UK departure will result in an estimated 25 percent cut in the Gemini budget, which will not be replaced by other partners. He also noted that an Interim Director for Gemini is in place, and a search for a new Director is

underway. Gemini plans to synchronize its Cooperative Agreement and International Agreement so that the observatory can be recomputed in 2015. NSF plans to bring an action item before the board in December 2011 regarding renewal of the Cooperative Agreement through 2015. Mr. Reilly requested that this future presentation also highlight budgetary trade-offs, and Dr. Schmidt agreed.

CPP Subcommittee on Polar Issues (SOPI)

Dr. Thomas Taylor, SOPI chairman, reported for the subcommittee. He stated that Dr. Karl Erb, Director for the Office of Polar Programs (OPP), reported that the competition for the U.S. Antarctic Program support contract is ongoing. Final proposals are due in September 2011, and the contract is expected to be awarded in November 2011. Proposals for *Nathaniel B. Palmer* type services are presently under review by the prime contractor. Overall, IceCube is doing well. The full complement of 86 detector strings is installed and the detector is working with 98.5 percent uptime. Dr. Kelly Falkner, OPP Deputy Director, represented OPP as part of U.S. delegations at two biannual joint committee meetings recently. Networking the Swedish Abisko Station with U.S. and other observatories in the high Arctic was an important science focus of the Stockholm meeting. The meeting in Oslo included a focus on connecting research facilities and activities in Svalbard, with those of U.S. stations including Summit, which Dr. Suresh recently visited.

Dr. Erb also mentioned that December 14, 2011 will mark the 100th Anniversary of Roald Amundsen reaching the South Pole, and OPP was alerted by tourist companies that as many as 300 people are making arrangements to go to the South Pole in the coming season. Dr. Erb expressed concerns that search and rescue operations may be needed. A senior delegation from Norway is planning commemorative activities, part of which will be hosted by OPP. In his concluding remarks, Dr. Erb noted that Dr. Norman Augustine was selected to chair the Blue Ribbon Panel charged with reviewing U.S. science support operations in Antarctica and the Southern Ocean.

Dr. Simon Stephenson, OPP Division Director, reported on the Interagency Arctic Research Policy Committee (IARPC). Although there has been an interagency policy since 1984, implementation was spotty, and there were a number of achievements at each agency but true interagency actions have been limited. It is anticipated that the recent move of IARPC to the National Science and Technology Council, together with the NSF Director continuing to chair the committee and the hiring of a deputy director in the OPP Arctic Sciences Division to provide staff support to Dr. Suresh and coordinate with OSTP, will provide further interagency coordination. The first principal's meeting held in several years took place in April 2011 and focused on the next 5-year plan and identified priority areas for interagency action. Dr. Suresh also asked IARPC members to consider whether the current approach is still appropriate or needs modification. The next meeting will be held in September 2011. In response to questions from the Board about interagency coordination, including the newly re-established Office of Naval Research (ONR) Arctic research program and the National Ocean Council, it was suggested that this subject be discussed at the December 2011 SOPI meeting.

Lastly, SOPI discussed the McMurdo Station resupply. Normally, an icebreaker is employed annually in January to break in a channel in the sea ice and escort a fuel tanker and cargo ship

to the station. The Swedish icebreaker *Oden* will not be available this year and if no other alternatives are available, contingency plans to reduce and conserve fuel will have to be implemented by the middle of August 2011. Such plans once implemented, cover an 18-month period and cannot be reversed. OPP, in collaboration with the U.S. State Department and others, is exploring a number of alternatives, including the use of the *Healy* alone or paired with another ship, Russian conventional ice breakers such as the *Krasin*, or one of the Russian shallow draft nuclear ice breakers. McMurdo and South Pole Stations would not be completely closed as reopening them would be prohibitively expensive, and NSF is required to maintain these stations year-round in accord with U.S. Antarctic policy. The issue of longer-term arrangements for ice breakers and reduced fuel reliance were discussed, and SOPI requested an update from OPP at its December 2011 meeting.

CPP Task Force on Unsolicited Mid-Scale Research (MS)

Dr. Abbott reported that Drs. Diane Souvaine and Kelvin Droegemeier, MS co-chairmen, provided an update on a successful Workshop held on June 6-7, 2011, that brought together Board Members, NSF management and staff, members of the research community, university administrators, and representatives of other Federal funding agencies. (Workshop Summary Notes, Board Book page 258)

The task force discussed several potential actionable themes, including improving internal and external communication, developing best practices, encouraging universities to foster mid-scale research, and evaluating current and possible new mechanisms at NSF to support these projects. The task force agreed to examine how facility costs can push smaller awards into the mid-scale category and beyond, which highlights a natural link between the task force and the Mid-Scale Instrumentation project led by the Subcommittee on Facilities (SCF). Dr. Suresh reiterated concerns about budgetary constraints and recommended that the task force determine the appetite of the community for mid-scale research with the understanding that NSF's budget is a zero-sum game.

MS also gave an update on its ongoing and future plans, including an update on the STPI-led data gathering activities and the development of a Web-based feedback portal. Board Members suggested that they add a question to gauge the research community's desire for mid-scale research. The task force informed the Board that it plans to have a draft report by the September 2011 meeting, and a final report for full Board review at the December 2011 meeting.

e. Committee on Strategy and Budget (CSB)

Dr. Diane Souvaine, CSB chairman, reported that the committee discussed the NSF FY 2011 and 2012 budgets. Mr. Michael Sieverts, Director, Budget Division, Directorate for Budget, Finance, and Award Management (BFA), provided an update on NSF budget activities to the committee. He highlighted key issues associated with the FY 2011 budget. One notable area of concern, due to the decreased funding level, was for the projects funded through the MREFC account. Adjustments were made to these project funding profiles to accommodate the funding decrease. Overall, priority alignments were also made to reflect the FY 2011 request and Administration priorities.

Mr. Sieverts also provided the latest information on the FY 2012 Appropriation, noting the recent House mark. When compared to the FY 2011 Current Plan, the House mark is close to level funding, with only a slight decrease of -0.1 percent (or -\$7 million). Compared with the FY 2012 request however, the House mark is a significant decrease, -11.8 percent (or -\$914 million). Although there is a mechanism to transfer some funds among accounts, even with this capability, the MREFC account will again be of serious concern to NSF. Obtaining the FY 2012 request level in the current economic climate will be quite a challenge. Although NSF still hopes to achieve that level, NSF is encouraged to see that there is support to maintain the nearly current level of funding for the agency from the House.

Finally, Mr. Sieverts provided some information on potential issues related to the current 'debt ceiling' issue. He stated that, barring new developments, the country would reach its' borrowing authority limit on August 2, 2011, and described the events following as a cash flow management problem, which will be mainly managed by the Department of Treasury. NSF is currently awaiting guidance from the OMB on any potential impacts to NSF operations.

CSB also discussed the process and logistics related to the FY 2013 budget submission to OMB. The committee will have a teleconference in August 2011 to review the FY 2013 budget and make a recommendation regarding the budget submission to OMB. In order to expedite action on the NSF's budget request, the committee acknowledged and reaffirmed the authority of EC to act on behalf of the full Board to approve the CSB recommendation pertaining to the NSF budget for FY 2013. Based on this recommendation

The Board unanimously REAFFIRMED the delegation of authority for the Executive Committee to act on behalf of the full Board to approve recommendations from the Committee on Strategy and Budget relating to the FY 2013 budget for the National Science Foundation.***

Dr. Bowen stated that as several of the reports indicated, the Board learned about the FY 2012 budget approval by the House Subcommittee on Appropriations. The Board understands the difficult budget environment currently confronting the Nation and it is grateful for the continued strong bipartisan support of NSF and its mission. The Board is also concerned about the impacts of this difficult environment in FY 2012 and subsequent years both on research and on major investments in science infrastructure necessary to support that research. For this reason, the Board strongly encourages NSF management to perform a careful assessment of long-term large facility commitments being contemplated during this challenging period. The Board is confident that NSF can navigate the next several years and it remains mindful of the importance of protecting the Nation's scientific, engineering, and education research enterprise.

CSB Subcommittee on Facilities (SCF)

Dr. Souvaine reported that the SCF chairman, Dr. José-Marie Griffiths, and SCF members discussed the Portfolio Review that was performed in May 2011 and progress on the COMPETES Act Mid-scale Instrumentation report. The subcommittee emphasized the importance of tracking full costs for new and existing facility projects and identifying trends that will help guide decisions. Members stressed the need for the Review to be connected with and integrated with other planning activities, particularly the unsolicited mid-scale research study.

Dr. William Miller, SCF Executive Secretary, and Dr. Asha Balakrishnan, STPI, presented a summary of a literature review of documents related to mid-scale infrastructure and the results of a recent survey distributed to NSF offices and directorates on mid-scale facilities. Although preliminary, the data will be a valuable resource for better understanding of how mid-scale facilities are constructed and operated. Members suggested additional information and relationships that could be explored using the data base. The next step in preparing the COMPETES report is to interview representatives of NSF offices and directorates to better understand the various approaches to meeting mid-scale facility needs across NSF.

CSB Task Force on Data Policies (DP)

Dr. Souvaine also reported that the DP chairman, Dr. José-Marie Griffiths, and DP members heard a report from Dr. Seidel, who updated the task force on related activities of the NSF Working Group, including plans to prototype an approach for scholarly publications and data that has been designed to inform policy and implementation. The task force reviewed a set of draft policy recommendations based on their findings to date, which included outcomes from a stakeholder workshop held in March 2011. CSB discussed the draft policy recommendations, where committee members suggested revisions. The task force will take the CSB member suggestions into account and bring a revised version forward at the September 2011 meeting. A final set of recommendations, along with a report, will be completed by the end of the 2011 calendar year.

f. Task Force on Merit Review (MR)

Dr. John Bruer, MR chairman, summarized what had transpired since May 2011, after the Board approved the public release of a draft principles and revised criteria document to allow input from the internal and external NSF communities. On June 14, 2011, Drs. Bowen and Suresh issued a joint NSB/NSF Dear Colleague Letter (DCL), asking interested stakeholders to submit comments on the draft principles and revised criteria document. The 30-day comment period ended on July 14, and many thoughtful and detailed comments from members of the community were received. The task force agreed that it needed to take the time to give those comments careful consideration. The task force did not attempt to finalize the criteria at the meeting, but discussed some of the major themes that had been raised in the comments. There were many constructive criticisms, which the task force will be taking some time to consider. In particular, MR will be looking at ways to reframe the discussion of the principles underlying the broader impacts review criteria. The task force concluded its meeting by outlining a plan to continue its discussions via teleconference, with a goal of presenting a final report at the December 2011 Board meeting.

Before ending the meeting, Dr. Bowen expressed his appreciation for all the work done by the Board Office staff and the NSF staff. He adjourned the Open Session at 2:30 p.m.

[signed]

Ann A. Ferrante
Executive Secretary
National Science Board

Attachments:

Appendix: NSB Calendar of Meetings, 2011 (NSB-11-46)

***Delegation of Authority to the Executive Committee (NSB-11-3), February 16, 2011, states that the Executive Committee “may act for the Board in those rare instances when 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.”

NATIONAL SCIENCE BOARD

CALENDAR OF MEETINGS

2012

February 2 - 3
(Thursday - Friday)

May 3 - 4
(Thursday - Friday)
[Annual Meeting and Awards Dinner]

July 17 - 18
(Tuesday - Wednesday)

September 19 - 20
(Wednesday - Thursday)
[Annual Retreat and Visit]

December 4 - 5
(Tuesday - Wednesday)