

**APPROVED MINUTES<sup>1</sup>  
OPEN SESSION  
431ST MEETING  
NATIONAL SCIENCE BOARD**

National Science Foundation  
Arlington, Virginia  
May 9-10, 2013

Members Present

Dan E. Arvizu, Chairman  
Kelvin K. Droegemeier, Vice Chairman  
Deborah L. Ball  
Arthur Bienenstock  
Ray M. Bowen  
Vinton G. Cerf  
Ruth David  
Inez Fung  
Esin Gulari  
G. Peter Lepage  
Alan I. Leshner\*  
W. Carl Lineberger  
Stephen Mayo  
Douglas D. Randall\*  
Geraldine Richmond  
Anneila I. Sargent  
Diane L. Souvaine  
Arnold F. Stancell  
Maria T. Zuber

Cora Marrett, *ex officio*

Members Absent

Bonnie L. Bassler  
France A. Córdova  
G.P. “Bud” Peterson  
Claude M. Steele  
Robert J. Zimmer

---

<sup>1</sup> The minutes of the 431<sup>st</sup> meeting were approved by the Board at the August 2013 meeting.

\*Absent from the reconvened Plenary Open Session held 1:00 p.m. – 2:06 p.m.

The National Science Board (Board, NSB) convened in Open Session at 10:40 a.m. on Friday, May 10, 2013 with Dr. Dan Arvizu, Chairman, presiding. (Agenda NSB-13-18, Board Book page 289). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

Prior to the meeting, Dr. Arvizu announced that the President appointed Dr. Stephen Mayo to the Class of 2018. Dr. Mayo is the Bren Professor of Biology and Chemistry and Chair of the Division of Biology at the California Institute of Technology.

Dr. Arvizu also gave the Oath of Office to newly appointed Board Members - Drs. Deborah Ball, Ruth David, and Stephen Mayo.

#### AGENDA ITEM 8: Presentations by Honorary Award Recipients

The Board heard presentations by three honorary award recipients in the following order:

Dr. Mung Chiang, the recipient of the 2013 Alan T. Waterman Award, gave a presentation entitled, "Our Networked Age." He is Professor of Electrical Engineering at Princeton University and an affiliated faculty in Applied and Computational Mathematics and in Computer Science. (Brief Biography, Board Book page 344)

Dr. Jo Anne Vasquez's presentation was entitled, "Engaging Minds and Enriching Lives by Investing in Arizona and Florida." She is the recipient of the 2013 NSB Public Service Award and Vice President and Program Director for Teacher and Curriculum Initiatives at the Helios Education Foundation. (Brief Biography, Board Book page 345; Presentation Book page 154)

Dr. Neal Lane, the recipient of the 2013 Vannevar Bush Award, presented a talk based on "The Future of Science: NSF Still Sprinting After 60 Years." Dr. Lane is the Malcolm Gillis University Professor, Senior Fellow of the James A. Baker III Institute for Public Policy, and Professor in the Department of Physics and Astronomy at Rice University. (Brief Biography, Board Book page 346)

Dr. Arvizu adjourned this portion of the Open Session at 12:05 p.m.

\*\*\*\*\*

The Board reconvened in Open Session at 1:00 p.m. on Friday, May 10, 2013. (Agenda NSB-13-18, Board Book page 289). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

#### AGENDA ITEM 9: Approval of Open Session Minutes, February 2013

The Board unanimously APPROVED the Open Session minutes of the February 2013 Board meeting (NSB-13-15, Board Book page 323).

## AGENDA ITEM 10: Chairman's Report

In the Chairman's Introduction on Thursday, May 9, 2013 and during the Chairman's Report in the Plenary Open Session on Friday, May 10, 2013, Dr. Arvizu announced and reported on several items.

### **a. Annual Awards Ceremony and Dinner**

The Board held the annual Awards Ceremony and Dinner at the Department of State's Diplomatic Reception Rooms on May 9, 2013. Dr. Arvizu stated that the event was one of the few opportunities of the Board to recognize lifelong leaders in science and technology, outstanding young researchers, and those who have made substantial public service contributions. The Board was also honored to receive a message from President Obama, which was presented by Dr. John Holdren, Assistant to the President for Science and Technology, Director of the White House Office of Science and Technology Policy (OSTP).

The main purpose of the Awards Ceremony was to recognize the distinguished recipients of the 2013 honorary awards.

- Dr. Neal Lane, Malcolm Gillis University Professor and Professor of Physics and Astronomy at Rice University, received the Vannevar Bush Award for outstanding contributions toward the welfare of mankind and the Nation through public service in science and technology.
- Dr. Mung Chiang, Professor of Electrical Engineering at Princeton University, received the Alan T. Waterman Award, which recognizes outstanding capability and exceptional promise for significant future achievements.
- Dr. Jo Anne Vasquez, Vice President and Program Director for Teacher and Curriculum Initiatives at the Helios Education Foundation, received the NSB Public Service Award for contributions toward increasing public understanding of science and engineering.

An event such as the annual Awards Ceremony and Dinner required an enormous amount of planning and organizing. On behalf of the Board, Dr. Arvizu thanked the Board Office and NSF staff who contributed to the efficient operation of this event - especially Ms. Ann Ferrante, Pamela McKinley, and Mayra Montrose who managed the awards programs and orchestrated the ceremony and formal dinner, as well as support from Ms. Annette Dreher, DeMonica Parks, and Kyscha Slater-Williams.

### **b. Results of Board Elections**

Dr. Arvizu announced the results of the Board Election, which took place in the Plenary Executive Closed Session. The Board elected Drs. Carl Lineberger and Anneila Sargent to the Executive Committee for 2-year terms from 2013 to 2015.

### **c. Congressional Testimony and Outreach**

Dr. Arvizu reported that he and Dr. Cora Marrett, Acting NSF Director, testified before the Subcommittee on Research of the House Committee on Science, Space, and Technology on

April 17, 2013. He presented concerns about the Nation's leadership in science and engineering along with information on the FY 2014 Budget Request, STEM education, major multi-user facilities, and NSB priorities. (Board Book page 352)

Also, during March 2013, Dr. Arvizu accompanied Dr. Subra Suresh, (former) NSF Director, to Chile for the inaugural ceremonies for the Atacama Large Millimeter Array (ALMA) project. He was also pleased to witness the signing of the new research partnership between the NSF Graduate Research Opportunities Worldwide (GROW) and Chile's National Commission for Scientific and Technological Research. The agreement offered a new international opportunity for NSF Graduate Research Fellows to engage in the global research enterprise by connecting them to leading scientists and research infrastructure around the world. Presently, there are GROW agreements between NSF and science agencies in 10 countries.

#### **d. Support for Blue Ribbon Panel Recommendations**

The publication, *More and Better Science in Antarctica Through Increased Logistical Effectiveness* (NSF-13-77, Board Book page 19), was released in March 2013. It includes the Board's letter to Dr. Suresh in support of NSF's approach to addressing the Blue Ribbon Panel recommendations. The letter indicates that the Board, through its Committee on Programs and Plans, carefully monitored the progress of both the review and NSF's response to the report.

#### **e. Committee Announcements**

Dr. Arvizu discharged the *ad hoc* Committee on Honorary Awards with thanks to Dr. Alan Leshner, chairman, and Drs. Ray Bowen, Esin Gulari, and Anneila Sargent, members.

He also discharged the *ad hoc* Committee on Nominating for NSB Elections with thanks to Dr. Douglas Randall, chairman, and Drs. Esin Gulari and Arnold Stancell, members.

Additionally, Dr. Arvizu thanked Ms. Ann Ferrante, who served as Executive Secretary to both of the above *ad hoc* committees, as well as Executive Secretary to the full Board.

He established the *ad hoc* Committee on Nominations for the NSB Class of 2014 -2020, with Dr. Droegemeier as chairman, and members to be determined.

Lastly, Dr. Arvizu asked Drs. Geraldine Richmond, Anneila Sargent, and Arnold Stancell to serve as a working group to help organize and plan the content and agenda for the Board's annual Retreat slated for September 19-20, 2013.

#### **f. Board Member Recognition**

Dr. Arvizu recognized Dr. Ray Bowen, who was acknowledged on March 5, 2013 by Texas A&M University with the Distinguished Alumnus Award - the highest honor bestowed upon former students of that university who have made significant contributions to society and whose accomplishments and careers have brought honor and distinction to Texas A&M and the Association of Former Students. Dr. Bowen holds a Ph.D. in Mechanical Engineering

from Texas A&M. He's had a distinguished academic career, and has served on the Board since 2002. Dr. Bowen is President Emeritus of Texas A&M University and Distinguished Professor at Rice University.

Dr. Arvizu also recognized Dr. Vinton Cerf, who was acknowledged as one of the five internet pioneers to share the first Queen Elizabeth Prize for Engineering. Dr. Cerf built the TCP and IP protocols upon which the internet functions. Nicknamed the "Nobel Prize of Engineers," the Queen Elizabeth Prize was established to celebrate engineering work of global benefit to humanity.

Dr. Droegemeier interjected that the *U.S. News and World Report* announced the recipients of the 2013 *U.S. News* STEM Leadership Hall of Fame Awards. He stated that Dr. Dan Arvizu is one of five honorees chosen from a group of outstanding nominees representing the fields of science, technology, engineering, and math. All of these awardees were pioneers in their own disciplines, but also helped lead the national effort to better prepare students and workers in the STEM fields. The awardees will be honored in a special ceremony at the *U.S. News* STEM Solutions National Conference in June 2013 in Austin, Texas. About 2,500 educators, scientists, business executives, nonprofit heads, government officials, and other leaders will attend this annual forum.

#### **g. Board Office Staff Introduction**

Dr. Arvizu welcomed Ms. DeMonica Parks, who is currently on assignment as a Management and Program Analyst, as part of the Board Office administrative management team. She will be providing management support in the areas of administrative operations and analysis, budgetary and financial programs, procurement and acquisition, meetings and events, and travel and transportation. Ms. Parks is a long-time NSF employee who has served many years with the Directorate for Education and Human Resources.

#### **h. Reference Article**

For the Board's reference, Dr. Arvizu noted a recent article from the *New York Times* entitled, "Questioning the Mission of College." (Board Book page 349)

#### **i. Webcast of Board Meeting / Concurrent Sessions**

The May 2013 Board meeting was Webcast and simultaneously available to viewers through the Internet. The Webcast included the Plenary Open Sessions of the full Board as well as Open Sessions of its committees. The Webcast is available from the NSB and NSF Web sites, <http://www.tvworldwide.com/events/nsf/130509/>.

#### **AGENDA ITEM 11: NSF Plan on Open Access**

Dr. Clifford Gabriel, Senior Advisor, Office of the Director, gave a summary on NSF's implementation of open access and its response to OSTP policy memorandum of February 22, 2013, which calls for the development of plans within 6 months to improve the availability of public and digital data from Federally-funded scientific research. (Board Book Addendum)

Dr. Gabriel explained that Dr. Suresh was active in promoting the issue of public scientific publications during his tenure. With his leadership, NSF brought together a group of Federal agencies to increase access to scholarly publications and data. The OSTP policy memorandum, “Increasing Access to the Results of Federally Funded Scientific Research” (Board Book Addendum), describes the expectations for Federal agencies. Highlights of the policy memo for publications include: a 12-month guideline for the embargo period, the importance of establishing good public-private collaborations, full public access to publication metadata upon first publication, Section 508 compliance, no unauthorized mass redistribution of scholarly publications, and accomplished within existing budgets.

In the area of highlights for digital data, NSF discussed the need to protect confidentiality, personal privacy, and recognize proprietary interests; the need for both intra- and extramural data management plans, evaluation of merits, and compliance to ensure that NSF will be able to cover the costs of making data available; appropriate attribution in cooperation with the private sector; and cost-benefits associated with long-term preservation of data.

For development of the plan, Dr. Gabriel explained that NSF will need to submit a plan to OSTP by August 22, 2013. A draft is anticipated by mid-July 2013, and NSF would like to have a teleconference with the Executive Committee to review the plans proposed to OSTP. He stated that NSF set a meeting for the week following the Board meeting (August 15-15, 2013) at the National Research Council (NRC), where stakeholders from across the spectrum will participate in training sessions and provide their perspectives on how best to implement this policy memo. There will be bi-annual reporting to OSTP on progress and implementation of the plan, which could be updated as appropriate.

For the next steps, NSF established an overarching public access steering group with Dr. Myron Guttmann, Assistant Director (AD), Directorate for Social, Behavioral, and Economic Sciences (SBE) and Dr. Gabriel serving as chairman. Two subgroups were also established: one looking at publications with Dr. Amy Friedlander, SBE Senior Advisor, as chairman; and another looking at additional data with Dr. Jane Silverthorn, Director, Division of Integrative Organismal Systems (ISO), Directorate for Biological Sciences (BIO), as chairman.

In NSF’s outreach efforts, Dr. Gabriel indicated that the public meeting at NRC will be co-sponsored by 23 agencies. NSF also talked to publishers both individually and as various coalitions, and heard from a range of groups that had an interest in this area. Additionally, NSF is conducting in-reach within the NSF community and through NSF-wide town hall meetings, as well as engaging in interagency discussion to coordinate outreach and planning.

Dr. Cerf commented that as President of the Association for Computing Machinery (ACM), his community is directly affected by the policy. The digital library at ACM generates about \$14 million a year, which is about a third of the AMC budget, and pays for a great deal of what AMC does. He observed that it may take time to adjust to the potential changes that this policy introduces. Additionally, with regard to data, he commented that there is also metadata, the calibration instruments used to carry out experiments plus maintenance of software for the objective of making that data accessible and usable over a period of many decades or even centuries. Finally, the term, “publication,” is changing, and Dr. Cerf suggested interdisciplinary mechanisms for consideration of “data” and “publications,” which are not always separable.

Dr. Gabriel responded that NSF considered many of Dr. Cerf's comments in its review. He mentioned that NSF guidelines include "products" of research, which include a range of items. Currently, they are looking at scholarly publications as the most practical focus. NSF will provide an update at the August 2013 meeting.

#### AGENDA ITEM 12: Director's Report

Dr. Cora Marrett, Acting NSF Director, reported on the following items:

##### **a. NSF Staff Introductions**

Dr. Roger M. Wakimoto joined NSF as Assistant Director for the Directorate for Geosciences (GEO) on February 25, 2013 from the University of Colorado. Prior to joining the University of Colorado, Dr. Wakimoto served as the Director of the National Center for Atmospheric Research (NCAR). He earned his Ph.D. in Geophysical Sciences from the University of Chicago.

Dr. C. Denise Caldwell was appointed Division Director, Division of Physics (PHY), Directorate for Mathematical and Physical Sciences (MPS) on April 21, 2013. Dr. Caldwell came to NSF in 1995 and was appointed to the Senior Executive Service (SES) as PHY Deputy Director in June 2007. Prior to joining NSF, she was a Professor of Physics at University of Central Florida and Yale University. She is a Fellow of the American Physical Society. Dr. Caldwell received her Ph.D. in Physics from Columbia University.

Dr. Peter Arzberger would join NSF in June 2013 as Senior Science Advisor, Office of the Director (OD). Dr. Arzberger will come to NSF from the University of California, San Diego, where he serves as the Founding Chair of the Pacific Rim Application and Grid Middleware Assembly (PRAGMA) and the Director of National Biomedical Computation Resource (NBCR). Dr. Arzberger previously served at NSF as a BIO Program Director, BIO Division Director, and Acting AD and Senior Advisor, Directorate for Computer and Information Science and Engineering (CISE). He received his Ph.D. in Mathematics from Purdue University.

##### **b. Public Service Recognition Week**

Dr. Marrett expressed appreciation to Dr. Arvizu for co-signing a Staff Memorandum to all NSF staff in honor of Public Service Recognition Week. She read an extract from the letter, which stated that "Public Service Recognition Week honors the men and women who serve our nation as federal, state, county, and local government employees. You ensure that our government is the best in the world!"

Dr. Marrett thanked the Office of Information Resource Management (OIRM) for having organized one of the most memorable and extraordinary events in honor of the Public Service Recognition Week, and for creating an unforgettable video of NSF staffers responding to the Recognition Week theme, "Why I Serve."

### **c. Presidential Rank Awards and Arthur S. Flemming Award**

At the Public Service Recognition Week event, Dr. Marrett recognized two NSF staff who received the Presidential Meritorious Executive Rank Award. The Presidential Rank Awards recognize and celebrate career SES members who are strong leaders and who consistently demonstrate strength, integrity, industry and a relentless commitment to public service.

Dr. Margaret A. Cavanaugh, GEO Deputy AD, shaped policies, strategies, and practices that enabled researchers to explore the edges of their disciplinary territories throughout her 22-year NSF career. Dr. Marrett stated that the collaborations and partnerships that Dr. Cavanaugh fostered, especially in the area of the environment, merit special attention. She added that Dr. Cavanaugh has been an extraordinary leader willing to take on any number of administrative responsibilities at NSF.

Dr. Joanne Roskoski, BIO Deputy AD, has a record of sustained excellence in her contributions to NSF's success during her 18 years in SES. Dr. Marrett stated that Dr. Roskoski is a key program and management strategist and innovator. Her expertise has been instrumental in formulating a research investment agenda within NSF, and she has also worked to represent NSF extremely well in interagency context.

Dr. Marrett also announced that Dr. Philip J. Puxley will receive the Arthur S. Flemming Award in recognition of outstanding and meritorious achievement in the Federal Government. The award was established in 1948 to recognize outstanding public service employees. Dr. Puxley would receive this honor in recognition of his leadership with the ALMA project - a \$1.3 billion aperture-synthesis radio telescope inaugurated in March 2013, and the world's most sensitive, highest resolution millimeter-wavelength telescope. He provided the technical and managerial oversight for this extremely complex project.

### **d. Future of NSF**

Dr. Marrett also mentioned that the future of NSF's headquarters, the next lease and location, have been in the hands of the General Services Administration (GSA) for the past several years. She reported that the NSF prospectus concerning space requirements was approved by both chambers of Congress, which was needed in order for GSA to sign a new lease. Because a new long term lease was not awarded in time to take the place of NSF's existing one, which expires in 2013, GSA executed a 4-year extension either for renovations in the present building or the completion of a new NSF Headquarters.

### **e. Congressional Update**

The NSF full year funding for FY 2013 was passed by the Senate on March 20, and the House on March 21, and signed into law on March 26, 2013. The FY 2013 final level is 2.1 percent below FY 2012, but 2.4 percent above where NSF would have ended under the full year continuing resolution.

An amendment was successfully offered on the floor of the Senate that would restrict all funding for political science, except for any projects that the Director certifies as “promoting national security or the economic interests of the United States.” NSF continues to review options regarding the implementation of this provision.

On April 25, 2013, Dr. Farnam Jahanian, CISE AD, testified at a joint hearing before the Research and Technology Subcommittees of the House Science, Space, and Technology Committee on next generation computing and big data analytics.

On May 9, 2013, Dr. James Ulvestad, Division Director, MPS Division of Astronomical Sciences (ATS), testified before a Joint Research and Space Subcommittee hearing before the House Science, Space, and Technology Committee on exoplanet research.

Lastly, NSF received a letter from Chairman Lamar Smith, House Committee on Science Space, and Technology, requesting information for five specific NSF awards. (Board Book Addendum) At the request of Dr. Arvizu, Dr. Marrett informed Chairman Smith on May 9, 2013 that her response will be delivered the week of May 12, 2013, after the Board had the opportunity to discuss this topic.

#### **f. Executive Committee Annual Report**

Dr. Marrett, as chairman of the Executive Committee (EC), reported that the 2012 Annual Report of the Executive Committee was approved by e-mail on April 24, 2013. She recommended that the Board accept the 2012 EC Annual Report, which covers the period from May 2012 to April 2013.

The Board unanimously ACCEPTED the 2012 Annual Report of the Executive Committee. (Board Book page 347, Appendix A)

#### AGENDA ITEM 13: Open Committee Reports

[Note: The Executive Committee (EC) did not meet in May 2013.]

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

Dr. Arnold Stancell reported on behalf of Dr. Bud Peterson, A&O chairman. He stated that Ms. Allison Lerner, NSF Inspector General (IG), gave an update on the Office of Inspector General (OIG) actions. Mr. Sal Ercolano, Clifton Larson Allen Partner-in-Charge of the NSF financial statement audit, provided an update on the FY 2013 audit. (Presentation Book page 95)

Ms. Martha “Marty” Rubenstein, NSF Chief Financial Officer (CFO), reported that all of NSF’s requests to waive American Recovery and Reinvestment Act (ARRA) acceleration requirements were approved by the Office of Management and Budget (OMB). Mses. Rubenstein and Lerner also noted that NSF was working with the newly appointed leadership at the University of Puerto Rico to address ongoing oversight issues. (Board Book page 128)

Dr. Wanda Ward, Head, Office of International and Integrative Activities (OIIA), provided a summary and context for the *Report to the National Science Board on the National Science Foundation's Merit Review Process, FY 2012* (NSB-13-33, Board Book pages 129, 130).

Dr. Ward and Ms. Judy Gan, Head, Office of Legislative and Public Affairs (OLPA), reported on a recent review of NSF's use of the Committee of Visitors (COV) mechanism. (Board Book pages 201, 202)

At the August 2013 meeting, the committee will discuss updating the A&O Charge and follow up on topics raised at this meeting.

#### **b. Committee on Science and Engineering Indicators (SEI)**

Dr. Ray Bowen, SEI chairman, reported that the committee began the meeting with an update of ongoing projects relating to *Science and Engineering Indicators (Indicators) 2014*.

The 2012 *Indicators* mobile application (app) will be submitted to the Apple Store, and it is expected that the approval process will take about a month. Additional platforms, such as Android, will be added after the app is released for iPads and iPhones.

Board Office staff was updating the 2012 "STEM Education Data and Trends" tool, which provides an interactive online platform to attract teachers, counselors, parents, students and other STEM education stakeholders to utilize the rich information contained in *Indicators*. The final revisions were almost complete. Board Members could review the tool on a computer set up in the Board Office, or through a URL (Board Book, page 114). Board Office staff will also develop a public release strategy for the tool, and will provide an update on the release of the tool at the August 2013 meeting. The committee voted to recommend that the Board approve the tool, subject to the final edits.

The Board unanimously APPROVED the "STEM Education Data and Trends" online tool, subject to final edits approved by the SEI chairman and the Board Chairman.

Ms. Jeri Mulrow, National Center for Science and Engineering Statistics (NCSES), provided an update on the project to redesign *Indicators* as a primarily digital document. The committee provided input in February 2013 and work had begun. Members urged staff to ensure, through their consultation with *Indicators* users in Congress and the White House, that a redesigned digital version of *Indicators* will meet their needs and comply with the Board's statutory requirements.

The committee discussed the topic for the Companion report to *Indicators 2014*. (Board Book, page 120). The report will be included and released parallel with *Indicators 2014*. At the February 2013 meeting, committee members requested that staff include competitiveness elements as part of the topic on the opportunities afforded by an S&E degree. The revised topic, tentatively titled, "A Science and Engineering Degree: Gateway to Opportunity and U.S. Economic Competitiveness," was approved by the committee. Dr. Arvizu and other Members stressed that as the Companion report is developed, Members leading the effort should be sure to identify the intended audience and to focus the report in a way that is timely and policy- relevant.

The Board unanimously APPROVED the Companion topic to *Science and Engineering Indicators 2014* on the science and engineering degree as it relates to the gateway to opportunity and U.S. economic competitiveness.

The majority of the meeting was spent on the review and discussion of the *Indicators 2014* draft chapters. Each author presented a summary of comments received from Board Members and expert reviewers. The NSB lead reviewer then provided a response, and other Board Members were invited to comment. Dr. Bowen thanked the NCSES staff, Board Members, and outside experts who provided helpful comments and suggestions that will improve the *Indicators 2014*. Due to time constraints, it was not possible to complete the discussion of Chapter 7, but the chairman will follow up with the committee.

Dr. Bowen added that a working group of committee and non-committee members was assembled to lead the development of the Companion reports. So far, Drs. Dan Arvizu and Arthur Bienenstock offered to serve on this working group, and SEI will solicit ideas and contributions from all Board Members.

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

#### CPP Program Portfolio Discussion: Review of Process and Next Topics

Dr. Diane Souvaine, CPP chairman, noted that the committee discussed with NSF staff and Board Members the ongoing Program Portfolio Planning (PPP) process. In February 2013, CPP decided that instead of engaging with NSF on fresh topics for the May 2013 meeting, CPP would take time to review existing topics since it had completed four PPP sessions. The goal was to review the framework for these discussions, refine the summary outcomes, and fine-tune the process for the next round of discussions. Dr. Souvaine noted that the presentations have had larger impacts – most notably, Dr. Marrett had the opportunity to highlight the discussion on cognitive science and neuroscience during a recent hearing before the Committee on Science, Space, and Technology. The NSF ADs joined the committee for a discussion on lessons learned and potential future topics.

Dr. Droegemeier stated that CPP has been moving towards a greater informality in these discussions, which is what the committee was striving for. He reiterated that he doesn't want NSF to feel pressure to "have it all done." Dr. Fleming Crim, MPS AD, stated that there is a delicate balance between bringing ideas to the committee early in the planning process, and having them well-formed enough for public consumption. Dr. Farnam Jahanian, CISE AD, suggested three categories for thinking about these exercises: emerging areas of exploration, major cross-cutting initiatives, and reviews that are broader than a single program or initiative.

Dr. Joan Ferrini-Mundy, AD, Directorate for Education and Human Resources (EHR), asked that CPP hear about areas that do not come before the Board naturally, such as educational initiatives that span directorates and accounts, for example, EHR and the Directorate for Engineering (ENG) recently began working together on engineering education. Dr. Jahanian also noted that this process requires a tremendous workload for NSF, and stated that it would be ideal to have topics in mind two or three meetings in advance to allow adequate time for preparation. Dr. John Wingfield, BIO AD, stated that the planning process for neuroscience resulted in recommenda-

tions that NSF found useful for turning into actionable items. Suggestions for future topics included global food security, understanding complex systems, and political science - in addition to other topic suggestions, such as Cyberinfrastructure Framework for 21<sup>st</sup> Century Science and Engineering (CIF21), international portfolio, workforce development, and Integrative Graduate Education and Research Traineeship (IGERT).

Dr. Droegemeier suggested soliciting NSF Advisory Committees for potential topics for upcoming meetings. Many ADs indicated that their Advisory Committees would be meeting shortly, and the committee asked the ADs to develop these ideas for discussion.

CPP will work with NSF to develop a schedule for the next four-plus meetings, and will schedule a teleconference in June 2013 to begin planning for the topics at the August 2013 Board meeting. The committee will also revise a document that captures the purpose and form of the portfolio planning exercises. As suggested by NSF, the committee will try to provide enough time for planning with at least several months of lead time.

#### Program Budget Overview: White House Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative

Dr. Wingfield gave a presentation on the BRAIN initiative, which was announced during release of the FY 2014 Budget. At the request of Dr. Marrett, he served as the liaison to the White House for this initiative. He noted that they met with other agencies to discuss complementary research efforts, and stated that white papers were being developed. Dr. Cerf underscored the importance of studying the dynamics of simple neural networks before more complex ones, and Dr. Wingfield agreed.

#### Polar Issues: End of Season Report

(Board Book pages 16, 18; Presentation Book page 4)

As part of the committee's responsibilities in overseeing polar programs and the Antarctic programs and facilities, CPP asked NSF for an end of season report on the Antarctic.

Dr. Scott Borg, Head, Section for Antarctic Sciences (ANT), GEO Division of Polar Programs (PLR), presented a number of science achievements including information about the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) project, research on sub-ice sheet lakes, modeling the interactions between ice-shelves and the ocean, and innovative tools used to replicate an ice coring system. Dr. Lineberger noted that logistics represent a majority of the costs of any project in Antarctica, and reduced overhead would have a huge impact on the amount of science that can be accomplished.

#### NSB Information Item: Laser Interferometer Gravitational Wave Observatory (LIGO) Renewal Proposal

(Presentation Book pages 10, 16)

Dr. Mark Coles, on detail to the MPS Division of Physics (PHY), as the program officer for this project, gave a presentation that included a brief introduction on LIGO for newer Board Members,

and plans for Advanced LIGO (AdvLIGO), which will be 10 times as sensitive in detecting gravitational waves as the original LIGO project. NSF plans to bring an action item to the Board in August 2013.

NSB Information Item: Advanced Technology Solar Telescope (ATST)  
(Presentation Book pages 28, 33)

Dr. Craig Foltz, Program Director, MPS Division of Astronomical Sciences (AST), gave a brief introduction on the history of ATST, and updated the committee on the status of rebaselining. The review process for the rebaseline resulted in a positive conclusion in March 2013. Dr. Sargent asked about possible descopeing. Dr. Foltz responded that the project was so well designed that it is particularly difficult to do rescope, that they have harvested about \$5.5 million in descopes, and that any additional descopeing would have major science implications. He also noted this is the only project of its type. NSF expects to bring an action item to the Board in August 2013.

NSB Discussion Item: Review and Approval of Revised CPP Charge  
(Board Book pages 16, 18)

The committee continued the ongoing discussion on the revised structure and charge for CPP. The draft Charge addressed new oversight responsibilities for the Antarctic, which CPP adopted when the Subcommittee on Polar Issues (SOPI) was discharged in December 2012 and folded back into the committee. The committee voted to recommend to the full Board that the revised charge be approved during this Plenary Session.

The Board unanimously APPROVED the revised Charge for the Committee on Programs and Plans to include the oversight responsibilities for Polar issues.  
(NSB-13-22, Appendix B)

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

Dr. Arnold Stancell reported on behalf of Dr. France Córdova, CSB chairman. He stated that the committee received an update on FY 2013 and FY 2014 budget-related items from Dr. Marrett. The final FY 2013 Budget for NSF was \$6.884 billion, down \$509 million or approximately 7 percent from the FY 2013 Budget Request and down 2.1 percent from the FY 2012 plan. Dr. Marrett reminded CSB members of the NSF FY 2013 Sequestration Guiding Principles such as re-affirming that NSF was striving to protect its own workforce and investments in the future STEM workforce, and to maintain its commitments to continuing awards or ongoing construction projects.

Dr. Marrett also provided the committee with an overview of FY 2014 budget activities since the February 2013 meeting, and proposed reorganization of STEM education activities. Additionally, she updated the committee on the status of the FY 2014 congressional budget resolutions and the prospects of sequestration remaining in place for FY 2014.

Dr. Córdova reported on the ongoing study in trends in science budgets. The Board Office worked with the Science and Technology Policy Institute (STPI) to compile 10-year trend data

on appropriations and funding levels, proposal funding rates, and research infrastructure funding. The Board Office and STPI plan to continue to explore ways to convey information about how NSF is leveraging funds by cooperating with other agencies or other nations. The small informal working group guiding this project expects to meet and review sample products in the near future, and will share these with the full committee as soon as they are ready.

#### Subcommittee on Facilities (SCF)

Dr. Stancell indicated that Dr. Carl Lineberger, chairman of the Subcommittee on Facilities (SCF), reported that the subcommittee discussed potential changes to the SCF charge (Board Book Addendum), horizon planning for Major Research Equipment and Facilities Construction (MREFC) projects, and the Annual Portfolio Review (APR) (Board Book Addendum).

Dr. Fae Korsmo, Staff Associate, Office of the Director (OD), provided a summary of the NSF current Horizon Planning Process followed by specific examples of horizon project planning provided by Dr. Crim, MPS AD, and Dr. Wakimoto, GEO AD.

The 2013 APR completion date was moved from May 2013 until mid-summer 2013 as a result of the delay in the President's Budget Request. Dr. Christopher Weber, STPI, reported on the results of the Portfolio Risk Survey (Presentation Book page 121). Dr. Lineberger stated that this presentation generated discussion that will be useful in the development of the 2013 APR. Dr. Córdova suggested that more discussion of this survey be included at the August 2013 meeting.

CSB also discussed the status of NSF's Strategic Plan development, *National Science Foundation, Investing in Science, Engineering, and Education for the Nation's Future, Strategic Plan for 2014-2018* (Board Book page 253). Mr. Alan Blatecky, Director, CISE Division of Advanced Cyberinfrastructure (ACI), who is currently leading NSF's strategic planning activities, provided the committee with an update (Presentation Book page 106). The committee discussed the strategic objectives associated with Goal 2 – Stimulate Innovation and Address Societal Needs through Research and Education. Dr. Córdova asked Mr. Blatecky to send a modified version of that Strategic Objective to the committee for review. CSB is supportive of NSF's submission of the Goals and Objectives portion of the plan to OMB in June 2013. A potential June or July 2013 teleconference could be convened to discuss the performance goals associated with the plan.

#### **e. Task Force on Administrative Burdens (AB)**

Dr. Arthur Bienenstock, AB chairman, reported that the task force had presentations and discussion on the administrative burdens associated with Institutional Animal Care and Use Committees (IACUCs) and Institutional Review Boards (IRBs).

Dr. Christian Newcomer, Executive Director, Association for Assessment and Accreditation of Laboratory Animals Care International (AAALAC), discussed the role of his organization as an accrediting body that promotes the humane treatment of animals in science. Likewise, Dr. Marjorie Speers, President and Chief Executive Officer, Association for the Accreditation of Human Research Protection Programs (AAHRPP), discussed her organization's role in accrediting organizations' human research protection programs.

Discussions focused on identifying how the accrediting bodies assess their own success, the need for harmonizing regulations and policies across Federal agencies, and how the task force should respond to the many requests from the community to address the high burden associated with IACUCs and IRBs. The presentations and resulting discussions surrounding IACUC and IRB regulations and practices will inform the task force as it moves forward with the charge of making policy recommendations to the full Board.

A summary of the comments received to date from the Request for Information (RFI) was provided. The Federation of American Societies for Experimental Biology (FASEB) will also provide extensive comments to the RFI from their members. The comment period for the RFI was extended to June 7, 2013. A summary of common themes was also provided from the recently held roundtable discussions at the NSF Grants Conference, Stanford University, Tufts University, and Georgia Institute of Technology.

Finally, the task force discussed the *Proposed OMB Uniform Guidance: Cost Principles, Audit, and Administrative Requirements for Federal Awards*. The task force will continue to discuss the proposed guidance and any concerns at upcoming teleconferences.

#### AGENDA ITEM 14: Chairman's Remarks

Dr. Arvizu had no further comments, and adjourned the Open Session at 2:06 p.m.

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

#### Attachments:

Appendix A: 2012 Annual Report of the Executive Committee ([NSB/EC-13-2](#))

Appendix B: Charge to the Committee on Programs and Plans ([NSB-13-22](#))

**2012 Annual Report of the Executive Committee  
National Science Board**

In accordance with the requirements of 42 U.S.C. § 1865 (d), I hereby submit this annual report of the National Science Board (Board, NSB) Executive Committee, as approved by the Executive Committee on April 24, 2013. This report covers the period from May 2012 through April 2013. Dr. Subra Suresh served as Director of the National Science Foundation (NSF) and the Board's Executive Committee chairman from May 2012 through March 2013. In addition to my duties as NSF Deputy Director, I served as acting Director of the NSF and chairman of the Board's Executive Committee for April 2013.

The elected Board membership of the Executive Committee during the past year was as follows: Dr. Dan E. Arvizu, Board Chairman; Dr. Kelvin K. Droegemeier, Board Vice Chairman; Dr. Carl Lineberger; and Dr. Diane L. Souvaine

Dr. Dedric A. Carter, Senior Advisor for Strategic Initiatives in the Office of the Director, served as Executive Secretary of the Executive Committee during this time period.

The Executive Committee met four times during this period. The first meeting was held December 4, 2012 in open session. During this meeting a new process for agenda development was discussed with respect to the development of the February National Science Board meeting agenda. Committee chairs were encouraged to share currently planned agenda topics and to begin to outline topics that may serve as future agenda topics.

The committee met on January 7, 2013 by teleconference in closed session. During this session, the committee discussed impartiality of the merit review process with respect to a board member proposal. The committee determined that there were no conflicts.

The committee met on January 31, 2013 by teleconference in open session to discuss and finalize the February agenda. The committee voted to accept the proposed February agenda with minor corrections as necessary to facilitate logistics.

The committee met on April 9, 2013 by teleconference in open session to discuss the proposed May National Science Board meeting agenda. The sense of the committee was to accept the proposed April National Science Board agenda with minor corrections as necessary to facilitate logistics.

In addition to the formal meetings of the Executive Committee previously reported, the committee also held 4 e-mail ballots. The committee issued an e-mail ballot on November 26, 2012 as a vote to close portions of the December meeting. Those portions were approved and reflected in the December National Science Board agenda. The committee issued an e-mail ballot on November 30, 2012 as a vote to transmit the OIG Semi-Annual report. That vote was approved and the report was submitted under the signature of the Board Chairman, Dr. Dan E. Arvizu. The committee issued an e-mail ballot on February 11, 2013 to close portions of the February National Science Board meeting. That vote was approved and reflected in the February National Science Board agenda. The final e-mail ballot was issued on April 24, 2013 to approve the 2012 Annual report of the National Science Board Executive Committee. Through that vote, the report was approved and submitted for publication.

The Executive Committee's powers and functions are based on a delegation of authority to it by the Board according to 42 U.S.C. § 1865(a). The Board's current delegation to the Executive Committee (Attachment B to NSB-99-158) authorizes the Executive Committee to approve awards on behalf of the Board when an immediate decision is required between Board meetings and when the necessary action is not within the authority of the Director of the National Science Foundation.

/s/

Dr. Cora B. Marrett  
Chairman  
Executive Committee

### **Charge to the Committee on Programs and Plans**

The standing Committee on Programs and Plans (CPP) is established to provide guidance and advice on major policy issues related to the research and related activities portfolio, to deliberate and make recommendations on the formulation of programs, and to make recommendations to the Board on approval of grants, contracts, and other arrangements and on the delegation of award authority to the Director.

Consequently, CPP is charged with providing oversight, guidance, and advice on major policy, process, and operational issues related to projects and programs. The Committee's deliberations are expected to provide a forum in which the Director fulfills his or her statutory obligation<sup>[1]</sup> to consult with the Board on the formulation of programs. CPP also has primary responsibility for Board's statutory obligations to approve the Major Research Equipment and Facilities Construction (MREFC) projects and their priority<sup>[2]</sup>.

In addition, NSF has a unique Federal role in the Polar Regions<sup>[3]</sup>. This is especially true in the Antarctic, where the Foundation is required, by Presidential directive, to budget for and manage the entire United States national program<sup>[4]</sup>. In recognition of the significance of these activities within the overall NSF portfolio, this Committee is specifically charged with overseeing and providing recommendations to the Board on these large scale investments.

- I. The Committee engages in strategic planning for NSF research and related activities, monitoring and providing guidance on the creation, development, implementation, and termination of initiatives in collaboration with NSF management and other NSB committees, particularly the Committee on Strategy and Budget. This is reflected in the Committee's deliberations on:
  - o planning, management, and oversight of large projects;
  - o candidates for large agency investments;
  - o opportunities created by new discoveries; joint ventures across Federal agencies, U.S. economic sectors, or national boundaries; and Administration or Congressional priorities;
  - o initiatives that may impact the research portfolio broadly, including those which involve multiple disciplines, industry or centers and those which are directed toward increasing the participation of traditionally underrepresented groups and organizations as well as early career researchers; and
  - o major policy issues related to the research portfolio, including agency award processes; solicited and unsolicited proposals; institutional contributions; reporting; renewals and supplementary awards; re-competition; sun setting or phase-out; and the criteria for merit review.
  - o other activities as deemed appropriate for Committee planning and deliberation.

---

<sup>[1]</sup> 42 USC § 1864(d);

<sup>[2]</sup> 42 USC § 1862(n-4(d))

<sup>[3]</sup> 15 USC § 4101

<sup>[4]</sup> [Presidential Memorandum 6646, February 5, 1982](#)

- II. Following comprehensive review and discussion, the Committee may submit recommendations for consideration by the full Board and action on:
- proposed awards for NSB approval as required by law and as set forth in the NSB delegation of authority;
  - new programs, major projects/facilities and their prioritization;
  - Polar programs, MREFC projects, and other long-term investments, including management and operational issues;
  - programs, initiatives, or policies that may significantly impact the research portfolio or the balance of activities across the Foundation; and
  - the results of task forces assigned to its purview.