

**APPROVED MINUTES
PLENARY OPEN SESSION
450TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation (NSF)
Arlington, Virginia
February 21-22, 2017

Members Present:

Maria T. Zuber, *NSB Chair*
Diane L. Souvaine, *NSB Vice Chair*
John L. Anderson
Deborah L. Ball
Roger N. Beachy
Arthur Bienenstock
Vinton G. Cerf
Vicki L. Chandler
Ruth A. David
W. Kent Fuchs
Inez Fung
Robert M. Groves
G. Peter Lepage
W. Carl Lineberger
Stephen L. Mayo
Victor R. McCrary
Emilio F. Moran
Ellen Ochoa
Sethuraman Panchanathan
G.P. Bud Peterson
Julia M. Phillips
Geraldine L. Richmond
Anneila I. Sargent

France A. Córdova, *ex officio*

Members Absent:

James S. Jackson

There being a quorum, the National Science Board (NSB, Board) convened in open session at 8:00 a.m. on Tuesday, February 21, 2017, with Dr. Zuber presiding.

NSB Chair's Opening Remarks

Dr. Zuber welcomed everyone to the NSB's 450th meeting and introduced the final Member of the Board class of 2022 — Dr. Ochoa — to whom she administered the oath of office.

Dr. Zuber then called the Board's attention to the publication of a new video on the NSF online video library entitled, "Ten Big Ideas for Future NSF Investment." She lauded the Office of Legislative and Public Affairs for its fine work in producing the video.

After a preview of the upcoming meeting agenda, the Chair turned the meeting over to the Director for her opening remarks.

NSF Director's Remarks

Dr. Córdova thanked the Chair for her comments and extended her welcome to Dr. Ochoa.

Dr. Córdova showcased the reach of NSF's work as evidenced by the frequent attention it garners in the prominent journals *Science* and *Nature* since the last Board meeting. The covers of these journals represented achievement across the Foundation with featured articles about research funded by MPS, GEO, BIO, and SBE Directorates. She stated that the work described in the articles demonstrates the true global nature of the funding reach of NSF.

Dr. Córdova continued by speaking about the recent outreach efforts undertaken by the Foundation with the new Administration and Congress. Those efforts include meeting with Congressional representatives from the relevant appropriations and authorizations committees. Dr. Córdova reported that Chairman John Culberson of the House Appropriations Subcommittee on Commerce, Justice, and Science visited NSF and met with herself and each of the Assistant Directors and Office Heads to discuss NSF programs. Chairman Culberson also offered advice on how to navigate the ongoing budget processes. Congressman Jim Langevin and Senator Tim Kaine also participated in the annual Cyber Corps job fair by offering welcoming remarks to over 550 students and 150 faculty members from about 70 schools. Dr. Córdova noted that the job fair focused on cybersecurity and offered an opportunity to highlight that NSF is truly training the next generation of scientists and engineers in the cybersecurity field.

Lastly on the Congressional front, Dr. Córdova spoke about the "Arc of Science" event held on February 15, in partnership with the Coalition for National Science Funding. The event was held on Capitol Hill and included speaking interventions by a number of Congressional members, including Rep. Lamar Smith, Chairman of the House Committee on Science, Space, and Technology, Rep. Eddie Bernice Johnson, Ranking Member, and committee members Rep. Dan Lipinski, Rep. Paul Tonko, Rep. Brett Guthrie, and Rep. Elizabeth Esty.

Transitioning to engagement with industry, Dr. Córdova highlighted her talk at the Washington Auto Show that featured an NSF-funded program at Carnegie Mellon University that developed an autonomous automobile. A variety of NSF-funded programs are constituent parts of this feat

including real time all tolerant computing, computer vision algorithm, vehicular communications, obeying traffic rules and verification technologies. She pointed out that, while there are many examples of how basic science provides the foundation for industry advances, it is incumbent upon those engaged in that science to make the science-to-industry connection more prominent.

Dr. Córdova then reported that the NSF INCLUDES program is off to a great start with 40 pilot programs funded across the country.

Speaking about international engagement, Dr. Córdova reported her signing of an agreement with the Science Foundation of Ireland to partner in funding three engineering research centers. She then went to the United Kingdom where she met Sir Mark Walport, Head of the Government Office for Science, to discuss the UK's planned consolidation of a number of research councils into an agency approximating the NSF mission. Dr. Córdova also attended the World Economic Forum where she delivered three talks addressing the importance of basic science to industry, delivery and innovation in health care, and outlook on global science, respectively.

Dr. Córdova closed her remarks with tributes to Dr. Eric Bloch and Dr. Vera Rubin. Dr. Bloch was a former Director of NSF. Dr. Rubin received the National Medal of Science from President Clinton.

The Chair thanked Dr. Córdova for her report.

Unveiling of New NSB Committees

Dr. Zuber then unveiled the new NSB organization that was discussed at the November NSB meeting and approved via email on January 5, 2017. Dr. Zuber reminded the members that the new structure was designed to balance workload, refocus the Board's attention, and position the Board to better engage with external stakeholders. She added that the process of developing committee charges tried to minimize overlap of committee mandates as well as the future of the Board's review hearings and strategic oversight responsibilities. Dr. Zuber noted that individual committee charges would be discussed in the respective committee meetings later in the agenda.

The new committees and their members are:

Committee on Awards and Facilities

- Dr. Peter LePage, Chair
- Dr. Deborah Ball
- Dr. Roger Beachy
- Dr. Artie Bienenstock
- Dr. Vicki Chandler
- Dr. Ruth David
- Dr. Inez Fung

- Dr. James Jackson
- Dr. Carl Lineberger
- Dr. Steve Mayo
- Dr. Emilio Moran
- Dr. Anneila Sargent

Committee on Strategy:

- Dr. Sethuraman Panchanathan, Chair
- Dr. Robert Groves
- Dr. Carl Lineberger
- Dr. Stephen Mayo
- Dr. Emilio Moran
- Dr. Anneila Sargent

Committee on Oversight:

- Dr. John Anderson, Chair
- Dr. Ruth David
- Dr. Inez Fung
- Dr. G.P. "Bud" Peterson
- Dr. Julia Phillips

Committee on National Science and Engineering Policy

- Dr. Geraldine Richmond, Chair
- Dr. John Anderson
- Dr. Arthur Bienenstock
- Dr. Vinton Cerf
- Dr. Kent Fuchs
- Dr. Robert Groves
- Dr. Peter Lepage
- Dr. Victor McCrary
- Dr. Julia Phillips

Committee on External Engagement:

- Dr. James Jackson, Chair
- Dr. Vinton Cerf, Vice Chair
- Dr. Deborah Ball
- Dr. Roger Beachy
- Dr. Vicki Chandler
- Dr. Kent Fuchs
- Dr. Inez Fung

- Dr. Robert Groves
- Dr. Victor McCrary

With no questions or remarks forthcoming, Dr. Zuber adjourned the Plenary Session at 8:30 a.m. with the reminder that the Plenary Open session would reconvene at 1:00 p.m. on Wednesday, February 22.

The National Science Board (NSB, Board) reconvened in open session at 1:05 p.m. on Wednesday, February 22, with Dr. Zuber presiding.

Chair's Remarks (continued)

After welcoming guests, Dr. Zuber began by recognizing notable achievements of three Board members. Dr. Panchanathan received the Institute of Electrical and Electronic Engineers Outstanding Leadership and Public Service Award. Dr. Souvaine was selected a fellow of the American Association for the Advancement of Science. Dr. Córdova presented the 2017 Duran Lecture for Public Service at the American Institute of Aeronautics and Astronautics. Dr. Zuber then offered the floor to Dr. Souvaine who recognized Dr. Zuber for her achievement in being named lead gravity investigator for the NASA asteroid mission to Psyche.

Dr. Zuber then addressed a few staff changes. She welcomed Dr. Brad Gutierrez and Mr. Paul Trotter to the Board Office, Dr. Gutierrez as the new Director of the Executive Secretariat and Mr. Trotter as a program assistant. She welcomed Dr. Karen King as a new executive secretary for the Committee on Strategy. She welcomed Dr. John Veysey to his new role as the Acting Executive Officer for the Board Office following the departure of Dr. Mike Van Woert. She noted that more would be said to honor Dr. Van Woert later in the agenda. Finally, she thanked Dr. Roger Wakimoto for his outstanding service as the Assistant Director for GEO.

Approval of Prior Minutes

With the transition to the new committee structure complete, Dr. Zuber called for the approval of the minutes from the November 2016 [Plenary](#) and Committee open sessions (A&O, CPP, Joint CPP-SCF, CSB, and SEI). Those minutes were approved as presented.

Director's Remarks

Dr. Córdova began her remarks with words of gratitude and congratulations to Dr. Wakimoto upon the completion of his tenure as Assistant Director of GEO. She then went on to introduce new acting Assistant Directors Dr. Scott Borg (GEO) and Dr. Barry Johnson (ENG), as well as Bill Easterling, a senior consultant working in GEO.

Dr. Córdova continued with an announcement that there were written updates from the [Office of Legislative and Public Affairs](#) (OLPA) and [Relocation Office](#). As there were no questions on these written items, she concluded her remarks.

Report: Enhancing Employee Engagement at NSF

Dr. Zuber turned to Dr. Joanne Tornow, NSF Chief Human Capital Officer, to provide a report on the NSF plan to enhance employee engagement. Dr. Tornow began by reviewing the results of the latest Federal Employee Viewpoint Survey (FEVS). She explained that this survey was conducted in April and May 2016 seeking opinions from nearly 900,000 permanent Federal employees representing 80 different agencies. NSF falls into the medium-size agency category. Dr. Tornow pointed the Board members to the [complete agency report](#) and the [NSF-wide executive summary](#) in their Board Books. With a government-wide response rate of 46%, Dr. Tornow applauded the NSF rate of 74%. Additionally, Dr. Tornow reported that all NSF scores except two (workload reasonableness and preparedness for potential security threats) were at or above the government average. After detailing some of the survey specifics, she summarized her presentation with the news that NSF has made steady progress over the past five years and has moved back into the top 10 places to work in the Federal government for mid-sized agencies for the first time in several years. OPM also recognized NSF for its improvement in employee engagement and high ratings in the new inclusion quotient, measuring fairness, openness, and empowerment. Interestingly, Dr. Tornow noted that when comparing the results of temporary staff with those of permanent staff, the temporary staff results were consistently higher than those of the permanent staff.

In reaction to the FEVS results, Dr. Tornow announced that the Office of Employee and Human Relations has partnered with the Office of Diversity and Inclusion, senior NSF leadership, and AFGE Local 3403 leadership to develop a three-year framework for improving employee engagement. The framework will focus on career development, workload, and performance and recognition. Dr. Tornow then offered to take questions.

Dr. Cerf stated that he was worried that the numbers [in the survey results] were not in the 80 and 90 percent range and suggested that discerning why that was not the case should be a high priority.

Dr. Tornow responded that she agreed with Dr. Cerf's observation but also added that the results received from OPM include percentages of people who respond neutrally or very negatively. She stated that identifying those areas where people had very strong negatives can signal where there is an issue that needs attention.

Dr. Córdova added that when the data is disaggregated by directorates and divisions you can see 80 and 90 percentage-level results. She added that her team is working to make sure the high scores are role models that can be emulated to help others achieve those same results, while at the same time identifying hotspots that need focused attention.

Dr. Bienenstock then asked what steps the NSF was going to take to address the concerns over workload given the current trend of more proposal actions per employee, new congressional mandates for work, and the extant hiring freeze.

Dr. Tornow acknowledged that she did not have an answer to that question. She went on to explain that the number of proposals per individual is not the only metric of workload and that there are considerations that need to be examined dealing with the current business model used by NSF, which is based on the organization's founding. The changing methods of scientific achievement, how proposals come to the Foundation, and the means used to make funding decisions are all in need of evaluation.

Dr. Ochoa asked if the questions in which a large disparity is seen in the results are analyzed along demographic lines to determine the influence of gender, race, age, etc.

Dr. Tornow responded that yes, the Foundation does look at that data breakdown and add in others to include job family and years of service. She also stated that the complexity of the various factors yields an endless variety of results depending on the demographic combinations used.

Dr. McCrary asked if there are any employee resource groups, indicating that in other technical and government organizations they can be another line of engagement between employees and between staff and external stakeholders. He also asked how many employees NSF currently has on staff.

Dr. Tornow stated that the employee resource groups exist informally, but the Office of Diversity and Inclusion is working on a more formalized structure. She added that the Foundation currently has approximately 13-1400 employees, not including contractors.

Dr. Córdova added that the total staff population being moved to the new headquarters in Alexandria is in the range of 2000, including IPAs, employees, fellows and contractors.

Dr. Zuber thanked Dr. Tornow for her presentation.

Open Committee Reports

Dr. Zuber then turned to the open committee reports, noting that the full record of committee activities would be detailed in the respective committee minutes.

Dr. Fung reported for the Committee on Oversight (CO) on behalf of Dr. Anderson. Dr. Fung reported that CO is confident in the plan that NSF presented for the move to the new Headquarters and is pleased with the degree to which NSF has considered unanticipated disruptions and the need for contingency and redundancy. She also reported that the Foundation received an unmodified opinion from the audit from Kearney & Company, the best possible opinion. Dr. Fung also reported that the CO charge had been approved for submission to the full Board for adoption.

Dr. Panchanathan reported that the Committee on Strategy had also reported that its new charge had been approved by the Committee for submission to the full Board for adoption. He requested

that any members who had feedback on the NSF strategic plan skeleton draft to please forward their comments to Ms. Kathy Jacquart by March 3, 2017.

Dr. Lepage reported on the Committee on Awards and Facilities (A&F) that the new charge was approved for submission to the full Board for adoption. He also reported that, following a few changes to the wording of one bullet, the draft delegation of authority resolution was approved for full Board consideration. Dr. Lepage then highlighted a series of presentations presented to A&F regarding Antarctica. The first was by the co-authors of the National Academy of Sciences report on the strategic vision for the NSF investment in Antarctic and Southern Ocean Research, followed by comments and observations by Drs. Ball, Chandler, and Groves on their site visit to Antarctica. A&F also received a briefing from Drs. Kurose, Ulvestad, Wakimoto, and Johnson on Engineering Feats Enabling Cutting Edge Science. Dr. Lepage concluded by advising that he is continuing to work with Dr. David on discussing the possibility of creating a sub-group with A&F that focuses on risk management in the O&M arena of NSF's largest facilities.

Dr. Richmond began her National Science and Engineering Policy (SEP) committee report by reporting that the new charge was approved for submission to the full Board for adoption. She then announced that the Committee had decided to plan a retreat soon to more thoroughly map out priorities for the next few years. Dr. Richmond then reported SEP had approved the STEM Ph.D.'s Career Pathways Companion Brief and info-graphic. On the topic of chapter reviews for the upcoming *Science and Engineering Indicators* publication, it was agreed that all Board members, not just SEP committee members should participate in reviewing the chapters of that effort before publication. Dr. Richmond concluded by addressing the discussion led by Committee member Dr. McCrary on the important issue of blue collar STEM. She reported that a working group would be established to explore the key issues and questions identified during the discussion.

Dr. Cerf represented the Committee on External Engagement (EE) in reporting that the new charge was approved for submission to the full Board for adoption. He also reported that EE discussed upcoming activities to include visits to Capitol Hill by Board members, the April rollout of NSB's new info-graphic policy brief, and the changes to the annual awards dinner, set for May 9, 2017. The Committee is also investigating options for engagement associated with the October visit to LIGO in Livingston, LA.

Vote: Revision to NSB's Delegation of Authority

Noting that the text of the Resolution to revise the NSB's [Delegation of Authority](#) was in the Board Book, Dr. Zuber called for and received a motion and second to approve the Resolution as presented. The motion was so approved.

Vote: Honoring Dr. Michael Van Woert for his Service to NSB

On the occasion of Dr. Van Woert's departure from the National Science Board Office, Dr. Zuber praised him for his many years of service to the Board and wished him well. She then requested that Dr. Veysey read the [Resolution](#) in Dr. Van Woert's honor. Upon completion of the reading, Dr. Zuber called for and received a motion and second to approve the Resolution as presented. The motion was so approved.

Vote: Companion Brief on Career Pathways of STEM PhDs

Dr. Zuber presented the [Companion Brief](#) for approval. Before the vote, she asked Dr. Richmond, as the Chair of SEP, if she had any remarks. Dr. Richmond thanked all the staff for their diligent work on the product and the rest of the SEP Committee for their leadership in developing the Brief. Dr. Zuber then called for and received a motion and second to approve the Resolution as presented. The motion was so approved.

Vote: New Committee Charges

Dr. Zuber began the discussion by thanking the staff and committees for their work and deliberations on arriving at consensus charges for the new committees. With the charges before the Board members, individual readings were dispensed. Going through in alphabetical order each of the committee charges received motions and seconds for approval. Each was so approved.

NSB Chair's Closing Remarks

There being no further business, Dr. Zuber adjourned the meeting at 3:23 p.m.

X 

Brad Gutierrez
Executive Secretary, NSB
Signed by: BRAD A GUTIERREZ