

**APPROVED MINUTES<sup>1</sup>  
OPEN SESSION  
422ND MEETING  
NATIONAL SCIENCE BOARD**

The University of Arizona  
Tucson, Arizona  
September 13, 2011

Members Present:

Ray M. Bowen, Chairman  
Dan E. Arvizu  
Camilla P. Benbow  
France A. Córdoba  
Kelvin K. Droegemeier  
Patricia D. Galloway  
José-Marie Griffiths  
Alan I. Leshner  
W. Carl Lineberger  
G.P. “Bud” Peterson  
Arthur K. Reilly  
Anneila I. Sargent\*  
Diane L. Souvaine\*\*  
Arnold F. Stancell\*  
Richard F. Thompson

Subra Suresh, *ex officio*

Members Absent:

Esin Gulari, Vice Chairman  
Mark R. Abbott  
John T. Bruer  
Douglas D. Randall  
Thomas N. Taylor

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<sup>1</sup> The minutes of the 422<sup>nd</sup> meeting were approved by the Board at the December 14, 2011 meeting.

\*Consultant

\*\*Participated in the second portion of the Open Session, beginning at 11:30 a.m.

The National Science Board (Board, NSB) convened in Open Session at 8:05 a.m. on Tuesday, September 13, 2011 with Dr. Ray Bowen, Chairman, presiding (Agenda NSB-11-59, Board Book page 33). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 3: Chairman's Introduction and Welcome from University of Arizona

Dr. Bowen stated that the Board looked forward to the opportunity to tour later in the day several of the outstanding facilities at The University of Arizona (UA) sponsored in part by NSF: the BIO5 Institute/iPlant Project, the Steward Observatory Mirror Lab, the Center for Integrated Access Networks, and the Energy Frontier Research Center. He thanked Dr. Thomas Peterson, currently Assistant Director, Directorate for Engineering (ENG), who formerly served as Dean, UA College of Engineering, for his coordination of efforts to help the Board plan for the off-site meeting.

Dr. Bowen introduced Dr. Eugene Sander, UA President (Brief Biography, Board Book Addendum). Dr. Sander welcomed the Board to UA. He gave a brief overview of the university that included the following statistics: one of the Nation's land-grant universities with 39,000 students and about 9,000 graduate students, and one of the Nation's most diverse major universities with about 24 percent of students from underrepresented groups. Of the university's \$565 million in research expenditures, about \$51 million are from NSF. UA ranks about 18th among public universities in total research and development, 26th among all universities, and 2nd in physical sciences.

AGENDA ITEM 4: Presentations on STEM Education and Outreach  
(Brief Biographies, Board Book Addendum)

Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, served as moderator. The focus of the presentations was on STEM education in Arizona. Although STEM jobs are growing in the U.S., the degree production in STEM is flat especially for minority groups. The presentation themes reflected the changing landscape of STEM undergraduate and graduate education, and the need for a multi-pronged approach to fix the shortfall.

The following speakers made presentations to the Board:

- ♦ Mr. Phil Stokes, Project Director, Southern Arizona Geosciences Union for Academics, Research, and Outreach (SAGUARO) Program
- ♦ Ms. Jennie Scott, Director of Curriculum and Articulation Services, Pima Community College, Tucson, Arizona
- ♦ Dr. Maria Teresa Velez, Associate Dean, Graduate College, UA
- ♦ Dr. Randall Richardson, Professor, Solid-Earth Geophysics, UA
- ♦ Dr. Sharon Hall, Assistant Professor, School of Life Science, Arizona State University (ASU), Tempe, Arizona

The presenters fielded questions from Board Members on several STEM-related topics. In response to a question from Dr. Alan Leshner on faculty tenure between disciplines and traditionalism within departments, Dr. Hall explained that the experience at ASU has been positive and supportive, although some junior faculty are split between two divisions and the traditional and nontraditional leadership of different departments. Dr. Carl Lineberger explored the question about what students do after graduation. The panelists replied that there are interdisciplinary degrees offered and that tracks show that the application and placement for those students into graduate programs is strong.

With respect to tenure of young faculty members in interdisciplinary areas, Dr. Subra Suresh, NSF Director, stated that the number of people who are highly interdisciplinary in their activities who have tenure is a fraction compared to traditional disciplinary areas. He suggested that the universities have the right metrics in place to assess interdisciplinary areas over a long period of time. Dr. Cora Marrett, NSF Deputy Director, asked how the universities track investments made in broadening participation beyond what might be done through special programs, and the panel responded that although not tracked now, they are trying new ways to address this issue.

Dr. Kelvin Droegemeier addressed the buy-in of university leadership to make new programs available. The panelists recognized the difficulty in making changes to curriculum. In response to Dr. Arnold Stancell's question about the kinds of degrees offered, the panelists explained that interdisciplinary programs are highly competitive and are in addition to traditional programs. Lastly, Mr. Arthur Reilly asked how the various programs were impacted by budgetary constraints. The panelists stated that the deans and department heads have the difficult job of dealing with cuts to their particular areas, but try to augment deficiencies with discretionary funds.

Dr. Bowen adjourned this portion of the Open Session at 9:30 a.m.

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The Board reconvened in Open Session at 11:30 a.m. on Tuesday, September 13, 2011 with Dr. Bowen presiding (Agenda NSB-11-59, Board Book page 33). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 5: Approval of Open Session Minutes, July 2011

The Board unanimously APPROVED the Open Session minutes of the July 2011 Board meeting (NSB-11-56, Board Book page 38).

## AGENDA ITEM 6: Chairman's Report

Dr. Bowen, NSB Chairman, reported that the NSF Authorization Act, Section 14, requires that the Board report to Congress any delegations of authority related to the use of the Major Research Equipment and Facilities Construction (MREFC) account. He reported to Congress that there had been no delegation of authority related to MREFC during the last year. The report, which was due on September 15, 2011, was submitted on September 2.

The Chairman reminded Board Members that the Board is considering locations for next year's off-site meeting and retreat, which will take place September 19-20, 2012. He asked Board Members to give suggestions to Dr. Michael Van Woert, Executive Officer and Board Office Director. The Board will discuss and select the location of the 2012 off-site meeting and retreat at the December 2011 meeting.

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

- ♦ Drs. Dan Arvizu, Alan Leshner, and Carl Lineberger were confirmed by the Senate on August 2, 2011, for the NSB Class of 2016.
- ♦ Dr. Anneila Sargent was nominated by the President on July 29, 2011, and replaces Dr. G. Wayne Clough, also for the NSB Class of 2016.

Dr. Bowen welcomed the Board's new Legal Counsel, Ms. Ann Bushmiller, who joined the Board Office on August 29, 2011. Ms. Bushmiller previously served as the Deputy Associate General Counsel for administrative law at the Federal Communications Commission. She has experience as an antitrust counsel, reviewing and analyzing proposed mergers and acquisitions of communications companies. Ms. Bushmiller was Associate Counsel to the President during the final year of the Clinton Administration, providing advice on antitrust, trade, and litigation matters and records obligations. Also, for 10 years, she was a partner at Sidley and Austin focusing on economic regulatory litigation. She currently serves on the Board of Trustees of Bates College, her alma mater, where she is chairman of the Audit and Legal Committee. She received her J.D. from the University of Chicago Law School in 1982.

## AGENDA ITEM 7: Director's Report

Dr. Suresh, NSF Director, reported on the following:

On September 7, 2011, NSF hosted a hazards research showcase on Capitol Hill in recognition of National Preparedness Month. In conjunction with the showcase, Senate Majority Leader, Harry Reid, met with Drs. Suresh and Marrett.

In response to Representative Frank Wolf's request regarding best practices on K-12 STEM education, NSF commissioned a report from the National Research Council (NRC), which was submitted to Congressman Wolf. As a result of that report, Drs. Suresh and Marrett will attend

an event at Drexel University in Philadelphia, on September 19, 2011, with key members of the NRC committee. NSF assistant directors were also slated to attend.

Dr. John Holdren, Director, Office of Science and Technology Policy (OSTP) and Dr. Suresh met regarding the Blue Ribbon Panel charged with reviewing U.S. science support operations in Antarctica. Mr. Norman Augustine will be the chairman, and members of the panel will be announced in the near future.

#### AGENDA ITEM 8: Open Committee Reports

##### **a. Committee on Programs and Plans, Task Force on Unsolicited Mid-Scale Research (CPP/MS)**

Dr. Kelvin Droegemeier, MS co-chairman, reported that the task force discussed a revised draft of the MS report outline. The task force plans to have a draft report for the full Board to review at the December 2011 meeting.

##### **b. Committee on Strategy and Budget, Subcommittee on Facilities (CSB/SCF)**

Dr. José-Marie Griffiths, SCF chairman, reported that the subcommittee discussed the data gathered from NSF on mid-scale instrumentation in support of the report to Congress, which is due in early January 2012. The subcommittee will meet by teleconference in October 2011 to continue its work on this task, and plans to provide the Board with a final draft of the COMPETES report for approval at the December 2011 meeting.

##### **c. CSB Task Force on Data Policies (DP)**

Dr. José-Marie Griffiths, DP chairman, reported that the task force reviewed and discussed a revised set of draft policy recommendations based on their findings to date, which include outcomes from a stakeholder workshop held in March 2011 and input from CSB during the July 2011 meeting. The task force will continue to work on the policy recommendations, and plans to have an updated version for the Board during the next few months. The task force also plans to provide the Board with a draft report at the December 2011 meeting.

##### **d. Task Force on Merit Review (MR)**

Dr. Alan Leshner, MR co-chairman, reported that the task force revised the principles/review criteria document in response to comments from Board Members and input from the stakeholder communities. The task force will continue to work on this document during the next few months, and plans to present a final report to the Board at the December 2011 meeting.

AGENDA ITEM 9: Chairman's Closing Remarks

Dr. Bowen thanked the speakers for their presentations on STEM education in Arizona. He stated that the energy the speakers put into their presentations reflected their commitment to these projects. He extended his appreciation to Dr. Tolbert and her staff for all their hard work to arrange the Board meeting and research site visits. Additionally, Dr. Bowen thanked the Board Office staff, both the Policy group as well as the Administrative team, for all their efforts to plan and attend to the many details of this off-site experience.

Dr. Bowen adjourned the Open Session at 12:00 Noon.

*[signed]*

Ann A. Ferrante  
Executive Secretary  
National Science Board