

**APPROVED MINUTES<sup>1</sup>  
OPEN SESSION  
433RD MEETING  
NATIONAL SCIENCE BOARD**

National Science Foundation  
Arlington, Virginia  
September 19, 2013

Members Present

Dan E. Arvizu, Chairman  
Kelvin K. Droegemeier, Vice Chairman  
Deborah L. Ball  
Arthur Bienenstock  
Ray M. Bowen  
Vinton G. Cerf  
Inez Fung  
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

Members Absent

Bonnie Bassler  
France A. Córdova  
Ruth David  
Esin Gulari  
G.P. “Bud” Peterson  
Claude M. Steele  
Robert J. Zimmer

Cora Marrett, *ex officio*

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<sup>1</sup> The minutes of the 433rd meeting were approved by the Board at the November 2013 meeting.

The National Science Board (Board, NSB) convened in Open Session at 8:10 a.m. on Thursday, September 19, 2013 with Dr. Dan Arvizu, Chairman, presiding. (Agenda NSB-13-54, Board Book page 7 and Addendum). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

#### AGENDA ITEM 1: Chairman's Introduction and Welcoming from the University of Washington

Dr. Arvizu stated that the Board was excited to be at the University of Washington (UW) in Seattle, and that UW was an important and widely respected institution for science and engineering, research and education. He stated that the "off-site" visit allows the Board to tour stellar facilities and meet with the science community to gain a sense of the issues and directions in science and engineering research and education. He noted that the Board looked forward to the opportunity to visit some of UW's outstanding facilities that were sponsored in part by the National Science Foundation – the Ocean Observatories Initiative (OOI) (Board Book page 17) and the Center for Sensorimotor Neural Engineering (CSNE) (Board Book page 23).

Before continuing, Dr. Arvizu recognized Dr. Geraldine Richmond, who was recently appointed as the University of Oregon's Presidential Chair in Science. Dr. Richmond specializes in chemistry, materials science, and chemical reactions on liquid surfaces at that university.

Dr. Arvizu introduced Mr. Michael Young, UW President (Brief Biography, Board Book page 8). A tenured Professor of Law, President Young has a long and distinguished record as an academic leader with broad experience in public service and diplomacy. Prior to his appointment at UW, he was a Professor of Law at several universities and held numerous Government positions, including Deputy Under Secretary for Economic and Agricultural Affairs and Ambassador for Trade and Environmental Affairs in the Department of State.

President Young welcomed the Board to UW and stated that he was pleased that the Board would have the opportunity to discuss the topic of advanced cyberinfrastructure at the venue that morning and to visit UW facilities afterward.

The September 2013 Plenary Open Session was Webcast and simultaneously available to viewers through the internet, [although the Webcast was not able to be archived on the NSB and NSF Web sites].

#### AGENDA ITEM 2: Presentations and Panel Discussion

(Brief Biographies, Board Book pages 10-13)  
(Presentation Book)

The theme of the panel presentations was, "The Future of Advanced Cyberinfrastructure for Science and Engineering, Research and Education." The presentations and panel discussion were moderated by Dr. Kelvin Droegemeier, NSB Vice Chairman.

The panel speakers were:

- Dr. Peter Lee, Corporate Vice President, Microsoft Research. Dr. Lee oversees the worldwide operations of Microsoft Research, an organization encompassing more than 1,100 scientists and engineers across 13 labs worldwide. Under Dr. Lee's leadership, Microsoft Research conducts both basic and applied research across many disciplines. His presentation was entitled, "Machine Learning and Its Impact on Future Cyber-infrastructure Needs."
- Dr. David Baker, Professor of Biochemistry and Investigator, UW Howard Hughes Medical Institute. Dr. Baker had a number of synergistic activities and received a number of awards including the UW Inventor of the Year Award and the Protein Society's Young Investigator Award among other prestigious honors. His presentation focused on protein structures.
- Dr. Thom Dunning, Director, National Center for Supercomputing Applications, the Institute for Advanced Computing Applications and Technologies, and Distinguished Chair for Research Excellence in the Department of Chemistry at the University of Illinois at Urbana-Champaign. In his 40-year career, Dr. Dunning spent 13 years in academia and 27 years in the U.S. Department of Energy's national laboratories. He authored more than 150 scientific publications on topics ranging from advanced techniques for molecular computations to computational studies of the spectroscopy of high power lasers. Dr. Dunning's presentation was entitled, "Thoughts on Future Cyberinfrastructure for Science and Engineering, Research and Education."
- Dr. Ed Lazowska, Bill and Melinda Gates Chair, UW Computer Science and Engineering, and Founding Director of the UW eScience Institute. His research and teaching concern the design, implementation, and analysis of high performance computing and communication systems, and, more recently, the techniques and technologies of data-intensive discovery. Dr. Lazowska's presentation was entitled, "Thoughts on the Future of Advanced Cyberinfrastructure for Science and Engineering, Research and Education."

### AGENDA ITEM 3: Chairman's Remarks

Dr. Arvizu thanked the distinguished speakers and Dr. Droegemeier, and stated that the Board appreciated the insightful and informative presentations on the critical issue of the future of advanced cyberinfrastructure. He said that the Board was honored to have this opportunity to engage in this enlightening forum. Dr. Arvizu also thanked President Young and UW for their hospitality and all the efforts by him, his staff, and the Board Office staff to make this meeting such a positive experience.

Dr. Arvizu adjourned the Open Session at 11:00 a.m.

*[signed]*

Ann A. Ferrante  
Executive Secretary  
National Science Board