

NSB-01-98

**APPROVED MINUTES<sup>1</sup>**  
**OPEN SESSION**  
**363<sup>rd</sup> MEETING**  
**NATIONAL SCIENCE BOARD**

The National Science Foundation  
Arlington, Virginia  
May 24, 2001

Members Present:

Eamon M. Kelly, Chairman  
John A. Armstrong  
Nina V. Fedoroff  
Mary K. Gaillard  
M.R.C. Greenwood  
Stanley V. Jaskolski  
George M. Langford  
Jane Lubchenco  
Joseph A. Miller, Jr.  
Diana S. Natalicio  
Michael G. Rossmann  
Maxine Savitz  
Luis Sequeira  
Daniel Simberloff  
Bob H. Suzuki  
Richard Tapia  
John A. White, Jr.  
Mark S. Wrighton

Rita R. Colwell, NSF Director

Members Absent:

Anita K. Jones, Vice Chair  
Pamela A. Ferguson  
Robert C. Richardson  
Vera Rubin  
Chang-lin Tien  
Warren M. Washington

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<sup>1</sup> The minutes of the 363<sup>rd</sup> meeting were approved by the Board at the August 8, 9 meeting.

The National Science Board (NSB) convened in Open Session at 2:15 p.m. on Thursday, May 24, 2001, with Dr. Eamon Kelly, Chairman of the Board, presiding (Agenda NSB-01-71). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 5: Presentations: Honorary Award Recipients

Dr. Kelly reported that at the Board's annual Awards Dinner, held on May 23 at the Department of State, honorary awards were presented to five outstanding scientists and communicators of science. Dr. Kelly introduced the three recipients present at the Open Session and invited them to speak about their award-winning work. Ms. Annette Berkovits, Senior Vice President for Education, represented the Education Division of the Wildlife Conservation Society of the Bronx Zoo, recipient of the group Public Service Award. She highlighted the critical role of informal science institutions in the Nation's science education system and noted opportunities for program expansion. Dr. Vahid Tarokh, Associate Professor in the Department of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology, received the Alan T. Waterman Award for his invention of space-time coding techniques. He summarized the anticipated growth in demand for wireless service, the scientific and technical challenges, and the benefits of using his space-time codes in transmitting data. Ms. Dava Sobel, author of the best-selling books *Longitude* and *Galileo's Daughter*, received the individual Public Service Award for enhancing the public's understanding of the role of science. She described her selection of topics and how the telling of a readable, true story makes science accessible to readers.

AGENDA ITEM 6: Open Session Minutes, March 2001

The Board APPROVED the Open Session minutes of the March 2001 meeting (NSB-01-41, Board Book Tab D).

AGENDA ITEM 7: Closed Session Items for August 2001

The Board APPROVED the Closed Session items for the August 2001 Board Meeting (NSB-01-65, Board Book Tab E).

To accommodate Board members' travel schedules, Dr. Kelly moved to two topics on which votes were to be taken. The first was under Agenda Item 10, NSB Annual Business, and the second was under Agenda Item 11, Committee Reports.

AGENDA ITEM 10: NSB Annual Business

**a. NSB Calendar 2002**

Dr. Kelly stated that the proposed calendar for Board meetings in 2002, developed after looking at dates of other professional meetings and polling Board members, would give the highest potential attendance.

The Board APPROVED the 2002 meeting calendar as distributed (NSB-01-93, Board Book Tab F).

AGENDA ITEM 11: Committee Reports

**a. Audit and Oversight (A&O)**

Dr. Kelly called on Dr. Stanley Jaskolski to report an item from the Audit and Oversight Committee.

Dr. Jaskolski reported that the A&O Committee had reviewed the management response to the Office of the Inspector General's (OIG's) semi-annual report and recommended acceptance of the management response and cover letter distributed to the Board.

The Board APPROVED the management response to the OIG's semi-annual report and the cover letter, as distributed.

Dr. Kelly then returned to the original order of the agenda, at Agenda Item 8, Chairman's Report.

AGENDA ITEM 8: Chairman's Report

**a. Results of Executive Committee Election**

Dr. Kelly reported that the Board re-elected Dr. M.R.C. Greenwood and Dr. Robert Richardson to the Executive Committee for two-year terms.

**b. Committee Business**

Dr. Kelly stated that the 2001 Vannevar Bush Award Committee, chaired by Dr. George Langford, had completed its task. Other members were Drs. Nina Fedoroff, Warren Washington, and Mark Wrighton. Dr. Kelly thanked the committee members for their hard work and excellent award selections and discharged the committee.

Dr. Kelly announced that Dr. Daniel Simberloff had replaced Dr. Joseph Miller on the Education and Human Resources (EHR) Subcommittee on *Science and Engineering Indicators*.

**c. Strategy and Budget Committee**

Dr. Kelly reminded Board members that they had agreed to establish a new standing committee, the Strategy and Budget Committee, at the March meeting. Dr. Anita Jones will serve as chair. Other members are Drs. Pamela Ferguson, Jane Lubchenco, Joseph Miller, Diana Natalicio, Warren Washington, and Mark Wrighton. Dr. Kelly noted that

the charge to the committee includes language regarding the full Board's approval of the National Science Foundation's (NSF's) budget submission and OIG's part of the budget.

**d. Congressional Visits**

Dr. Kelly reported that on May 16 he and Dr. Marta Cehelsky, Executive Officer, made courtesy calls on Representative Jim Walsh, Senator Kit Bond, and Representative Vern Ehlers, with the principal objective of bringing the Board's policy work to their attention. Issues raised by the members included the need for increased funding for science and engineering; the need for balance in the Federal research portfolio; international issues, such as genetically modified foods; issues affecting developing countries; science and engineering education; and the need for scientists to inform the public on science-related issues.

**e. Stakeholders' Symposium**

Dr. Kelly reported that the Committee on Strategic Policy Issues hosted a highly productive and well-attended Stakeholders' Symposium on May 21-22. Details will be provided under Committee Reports.

AGENDA ITEM 9: Director's Report

**a. Staff Introductions**

Dr. Rita Colwell, NSF Director, introduced two recently appointed staff: Ms. Marcia Tremaine, Director of the Division of Human Resource Management; and Ms. Mary Santonastasso, Director, Division of Grants and Agreements.

**b. Congressional Update**

Dr. Colwell reported that at the House Science Committee hearing held on April 25 committee members focused on how agencies set their science priorities and coordinate interagency research, and they were supportive of increased budgets for NSF, among other agencies. At the VA, HUD and Independent Agencies Appropriations Subcommittee hearing on May 16, subcommittee members signaled their interest in increasing funding for NSF beyond the budget request. Additional hearings by the Senate Appropriations Subcommittee and the House Research Subcommittee are scheduled in early June.

Dr. Colwell summarized several House and Senate bills that could affect NSF and science education. H.R. 1472 would reauthorize NSF for four years at funding levels that would reach \$7.7 billion by 2005. H.R. 1693 and H.R. 1858 would authorize a variety of programs to improve education in math, science, engineering, and technology. H.R. 1 and S. 1 are companion bills to reauthorize the Elementary and Secondary Education Act, including provisions for the Math and Science Partnership Program to be headed by NSF.

On May 8, the House passed House Concurrent Resolution 108, which honored NSF for 50 years of service to the Nation. The Senate passed a companion bill on May 10.

On May 16, Representatives Nick Smith, Felix Grucci, and Vernon Ehlers held a ceremony recognizing NSF's 50 years and presented the Director with a framed copy of the resolution.

**c. Follow-up to the Board's Communication Report**

Dr. Colwell stated that NSF has been working to enhance its communication and outreach activities in keeping with the Board's recommendations in *Communicating Science and Technology in the Public Interest*. First, NSF has provided up-to-date materials on the Board's website for members to use in their role as personal ambassadors for science. Second, NSF has outlined a strategy for communication and outreach, and Mr. Curt Suplee, Director of the Office of Legislative and Public Affairs (OLPA), is developing appropriate activities.

Mr. Suplee reported that the EHR Directorate has held workshops on how new communication technologies can be used to reach wider audiences and on metrics for assessing the effectiveness of these activities. OLPA is setting up a new website that is aimed at the general public and a set of symposia on difficult subjects for which NSF could become the national spokes-entity. Mr. George Wilson has joined the OLPA staff as outreach person to professional organizations and state scientific entities. In addition, OLPA is communicating with universities about getting predoctoral students to consider a subspecialty in science communication and perhaps to intern at NSF.

**d. Recent Developments in NSF's Environmental Portfolio**

Dr. Colwell asked Dr. Margaret Leinen, Assistant Director of the Geosciences Directorate, to provide an update of NSF activities to develop an environmental portfolio as recommended in the Board's *Environmental Science and Engineering for the 21<sup>st</sup> Century*. Dr. Leinen reported that the Advisory Committee is developing a long-term strategy and implementation plan, incorporating the environmental grand challenges report of the National Academy of Sciences as well as the Board's report. The Advisory Committee is inviting directorates to present their programs that have environmental components. The purpose of the presentations is to help the Advisory Committee understand the range of environmental programs in each directorate and to serve as a catalyst to encourage cross-cutting environmental themes. In addition, NSF has formed an informal group called the Interagency Forum for Environmental Research to exchange information, explore opportunities for interagency collaboration, form partnerships, and leverage activities already in place.

For the FY 2001 Biocomplexity in the Environment competition, NSF received 374 proposals for almost \$500 million; \$55 million is available for the competition. Solicitation was in four areas: coupled human and natural systems, coupled

bio-geochemical cycles, genome-enabled environmental science, and instrument development in environmental science.

In response to questions from Board members, Dr. Leinen made the following points:

- (1) NSF is actively involved in global change research, including climate variability and atmospheric composition. As chair of an interagency subcommittee that manages the U.S. Global Change Research Program, Dr. Leinen stated that the general approach to research had received substantial encouragement from the Office of Science and Technology Policy and the White House.
- (2) Engineering approaches are embedded in the proposals.
- (3) The competition received overwhelming response, and NSF is looking for ways to increase the success rate.

#### AGENDA ITEM 10: NSB Annual Business

##### **a. NSB Calendar 2002 (continued)**

Dr. Kelly noted that a number of Board members have expressed sentiment for more off-site meetings, especially at research locations where NSF has major activities. Suggested locations include Greenbank Observatory, the National Center for Atmospheric Research, the National High Magnetic Laboratory, Kitt Peak, and Arecibo. Board members were asked to think about these and other possible locations and be ready to discuss the issue at the August meeting.

A second issue is the best time to hold off-site meetings. Winter weather and attendance can be problems in February. It has been suggested that the 2002 policy meeting be held in February as planned, but that other times be considered for the 2003 meeting.

A third issue for discussion in August is potential topics for the 2002 policy meeting. Possible topics include infrastructure, national workforce policy, and the social sciences.

##### **b. Annual Report of the Executive Committee**

Dr. Kelly called on Dr. Colwell, chair of the Executive Committee, to present the annual report of committee activities (NSB/EC-01-10, Tab G).

Dr. Colwell reported that the Executive Committee took four actions during the past year on behalf of the Board. It approved (1) the NSF budget submission to the Office of Management and Budget, (2) the NSF OIG budget submission to the Office of Management and Budget, (3) the NSF Government Performance and Results Act (GPRA) Strategic Plan 2001 to 2006, and (4) the NSB interim report, "Toward a More Effective U.S. Role in International Science and Engineering."

## ADENDA ITEM 11: Committee Reports

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

Dr. Jaskolski, committee chair, reported that the committee received a GPRA update and discussed the GPRA cycle for this year. He noted that NSF GPRA reports have received a very high rating for their usefulness to the public. The committee also received an audit update from the OIG staff. Mr. Thomas Cooley, Director of the Office of Budget, Finance and Award Management, reported on the successful inaugural meeting of the Business and Operations Advisory Committee. He also reported on the tracking of NSB-approved awards and on the agency's response to the Gemini audit, in terms of responses to specific recommendations and the larger lessons learned. Dr. Jaskolski reminded the Board that, as a result of the NSB retreat in February, the committee was asked to look at how the Board could best use its time. In the fall the committee hopes to provide some recommendations for increasing productivity and making more effective use of Board time.

Dr. Kelly congratulated NSF senior management and staff on the improved GPRA reports that consistently receive very high rankings.

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

Dr. Lubchenco, acting for Dr. John Armstrong, committee chair, reported that the committee, with participation from EHR Committee members, discussed merit review criterion 2.

After the discussion with EHR members, the committee met separately and received updates on cyber-infrastructure, Gemini's use of contingency funds, and status of NSB-approved awards. The committee discussed and endorsed the new guidelines being developed for the Major Research Equipment (MRE) accounts. The guidelines will be used to review projects for the FY 2003 budget cycle. The committee requested additional language focusing on appropriate mechanisms for the external management of projects. The committee heard the status of current MRE projects proposed for the FY 2001 budget, a list of potential future projects, and a progress report on the first formal MRE investment in a distributed infrastructure project, the Network for Earthquake Engineering Simulation. The committee also recommended approval for two projects, ALMA and IRIS, on which the Board acted in Closed Session.

Dr. John White, chair of the CPP Task Force on Science and Engineering Infrastructure, reported that the task force is in the process of surveying the directorates in terms of future years' forecasts on infrastructure needs for the disciplines they serve. At this meeting, the task force received reports from several directorates—Social, Behavioral and Economic Sciences, Geosciences, Engineering, and Computer and Information Science and Engineering—and the Office of Polar Programs.

### **c. Education and Human Resources Committee (EHR)**

Dr. Bob Suzuki, committee chair, reported that committee members participated in the CCP discussion of Criterion 2, and the clear sentiment was that raising awareness of the community about the importance of Criterion 2 was the most pressing issue. Members were impressed by the efforts of the Office of Polar Programs Advisory Committee to provide detailed examples of activities that address Criterion 2. For the October Board meeting, NSF management will prepare a draft resolution on the importance of both merit review criteria, explore developing generic examples for Criterion 2, and develop a plan for communicating the importance and use of the two criteria.

After the discussion, EHR met separately and discussed the draft report “The Road to Excellence: The National Science Foundation’s Leadership in K-16 Science, Mathematics, Engineering, and Technology Education.” On the basis of that discussion, a new draft will be prepared for discussion at the August meeting. The committee agreed that no further work would be done on the draft position paper that had originally been prepared as a transition document, because much of its content will be in “The Road to Excellence.” The committee asked NSF to explore the interest expressed by the Sloan Foundation in partnering with NSF to develop a professional master’s degree in science, targeted at those who will work outside academia. The committee discussed the problem of under-representation of women and minorities at NSF-sponsored conferences and meetings, both as participants and invited speakers, and asked NSF management to consider expanding the Biological Sciences Directorate’s policy that makes awards for conference support contingent upon the inclusion of women and minorities among invited speakers. Finally, the committee heard reports on the FY 2002 budget, plans for the new Math and Science Partnerships, and plans for better communicating information about EHR programs and studies.

### **d. Task Force on International Issues in Science and Engineering (ISE)**

To accommodate travel schedules, Dr. Kelly next asked for the report of the Task Force on International Issues in Science and Engineering. Dr. Mary K. Gaillard, reporting on behalf of Dr. Natalicio, committee chair, reminded the Board that the committee issued two preliminary reports—a transition report recently sent to Secretary of State Powell and a guidance report for NSF Director. NSF has initiated a program to detail NSF staff to U.S. embassies for three-month stays. To date, 33 embassies have requested temporary scientific expertise, and nine possible matches have been identified. The Director established an internal group to look at NSF international activities. The group has issued a preliminary report, and Associate Directors are in the process of commenting on the draft and providing concrete recommendations. An action plan should be available this summer. The committee discussed a consolidated final report and agreed on a process for producing it.



### **c. EHR Subcommittee and Task Force**

Dr. Kelly then returned to reports of the EHR Subcommittee and Task Force.

#### *Subcommittee on Science and Engineering Indicators*

Dr. Richard Tapia, chair of the EHR Subcommittee on *Science and Engineering Indicators*, reported that the subcommittee discussed three draft chapter, reviewers' comments, and authors' responses. Teleconferences will be used to discuss the remaining draft chapters.

#### *Task Force on National Workforce Policies*

Dr. Miller, chair of the EHR Task Force on National Workforce Policies for Science and Engineering, reported that the task force heard three presentations to help identify useful science and engineering workforce data and gaps in those data. Dr. Lindsey Lowell, a demographer from Georgetown University's Institute for the Study of International Migration, discussed immigrant flows in U.S. science and technology. He was asked to provide the task force with a brief summary of where the data are adequate and where there are gaps. Dr. Susan Hackwood, Executive Director of the California Council on Science and Technology, reported on a recent critical path analysis of trends in the production of a science and technology workforce by California's schools, colleges, and universities. Dr. Lawrence Burton of NSF's Division of Science Resource Studies (SRS) reported on national survey data on mid-career education and transitions among science and technology workers. SRS was asked to provide trend data for the areas covered by Dr. Burton's presentation and some information on how the European Union is approaching analysis of similar workforce issues. The task force members agreed that preparing a report would be substantially aided by assistance from a data expert; SRS agreed to provide or help find an appropriate expert.

Using the California critical path analysis model, Dr. Miller will provide an outline for the task force's approach for discussion at the August meeting. Members also agreed that November 2001 was probably an unreasonable deadline for the final report, and additional time should be requested.

### **e. Committee on Science and Engineering Policy Issues (SPI)**

Dr. Kelly, committee chair, reported that the committee discussed the results of the two-day symposium (May 21-22) on the allocation of Federal resources for science and technology and the next steps toward a final report. He thanked the Director and Board members who participated. The lead speaker at the symposium was Newt Gingrich, who recommended a tripling of the NSF budget. The recommendations in the committee's discussion paper were well received in principle by the audience and panel members, though a few areas were indicated for expansion or revision. Committee members agreed on a schedule for producing a final report. For the August Board meeting, the committee will compile comments and produce a revised draft report and prepare an outline of a broader report for the Board's comment. For the October meeting, SPI will prepare a final report for Board approval.

AGENDA ITEM 12: Other Business

After thanking the many NSF staff members who helped prepare for the meeting,  
Dr. Kelly adjourned the Open Session at 4:39 p.m.

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Janice E. Baker  
Policy Writer/Editor