

**APPROVED MINUTES¹
OPEN SESSION
366th MEETING
NATIONAL SCIENCE BOARD**

The National Science Foundation
Arlington, Virginia
November 15, 2001

Members Present:

Eamon M. Kelly, Chairman
Anita K. Jones, Vice Chair
John A. Armstrong
Nina V. Fedoroff
Mary K. Gaillard
Stanley V. Jaskolski
George M. Langford
Jane Lubchenco
Diana S. Natalicio
Robert C. Richardson
Michael G. Rossmann
Vera Rubin
Maxine Savitz
Luis Sequeira
Daniel Simberloff
Bob H. Suzuki
Richard Tapia
Warren M. Washington
John A. White, Jr.
Mark S. Wrighton

Rita R. Colwell, NSF Director

Members Absent:

Pamela A. Ferguson
M.R.C. Greenwood
Joseph A. Miller, Jr.
Chang-lin Tien

¹ The minutes of the November 15, 2001 meeting were approved by the Board at the March 15, 2002 meeting.

The National Science Board (NSB) convened in Open Session at 1:15 p.m. on Thursday, November 15, 2001, with Dr. Eamon Kelly, Chairman of the Board, presiding (Agenda NSB-01-185). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 5: Open Session Minutes, October 2001 Meeting

The Board APPROVED the Open Session minutes of the October 2001 meeting (NSB-01-189, Board Book Tab C).

AGENDA ITEM 6: Closed Session Items for March 2002

The Board APPROVED the Closed Session items for the March 2002 Board Meeting (NSB-01-196 Board Book Tab D).

AGENDA ITEM 7: Chairman's Report

a. Dr. Rubin's Honors

Dr. Kelly announced that Dr. Vera Rubin has been named the 2001 recipient of The John Scott Award, given by the City of Philadelphia to women and men "whose inventions have contributed in some outstanding way to the comfort, welfare and happiness of mankind." Dr. Rubin is receiving the award for her seminal discoveries related to dark matter in the universe. In addition, in January 2002 the Carnegie Institution of Washington will host A Celebratory Symposium for Vera Rubin in honor of her numerous contributions to astronomy.

b. Dr. Tapia's Honors

Dr. Kelly congratulated Dr. Richard Tapia for two honors. The National Action Council for Minorities in Engineering presented him with the 2001 Reginald H. Jones Distinguished Service Award for his contributions in providing access to engineering and other science-based careers to a diverse group. Also, the San Diego Supercomputing Center at the University of California sponsored The Richard Tapia Celebration of Diversity in Computing Symposium in October in recognition of his technical contributions to the field and his leadership in developing computer career interests of a diverse student group.

c. Dr. Lubchenco's Position

Dr. Kelly announced that Dr. Jane Lubchenco was the first woman and the first biologist to be elected to head the International Council for Science (ICSU). Her presidency will begin in September 2002.

d. Committee Business before March Meeting

Dr. Kelly reminded Board members that their next meeting will be in March 2002. He urged committees to meet by teleconference or other means before then, if needed. The Executive Committee will schedule a teleconference meeting in January to deal with business matters that need attention before March.

e. Vice Chairs of Standing Committees

Dr. Kelly reminded Board members that in May a number of current Board members would likely move from official status to consulting status, including the chairs of three standing committees. To provide continuity of committee work during the transition period until Congress formally approves new Board members, Dr. Kelly named vice chairs for Audit and Oversight, Dr. Pamela Ferguson; Programs and Plans, Dr. Warren Washington; and Education and Human Resources, Dr. Diana Natalicio. He noted that a new Board Chair would have the right and responsibility to determine the arrangements of committees and their membership.

AGENDA ITEM 8: Director's Report

a. Staff Introductions

Dr. Rita Colwell, Director of the National Science Foundation (NSF), announced several staff appointments: Dr. Quentin Wheeler, Director of the Division of Environmental Biology; Dr. Wayne Van Citters, Jr., Director of the Division of Astronomical Sciences; Mr. Richard E. Hastings, Deputy Director of Management Operations and Policy in the Office of Budget, Finance and Award Management; and Dr. Robert Wharton, Executive Officer for the Office of Polar Programs. She also congratulated Dr. Karl Erb, Director of the Office of Polar Programs, for being the first American elected to chair the International Council of Managers of the National Antarctic Program.

b. Congressional Update

Dr. Colwell reported that no hearings involving NSF have occurred since the October Board meeting. On November 8, both the House and Senate passed the conference report for the VA/HUD and Independent Agencies appropriations bill. In the conference report, NSF received an 8.4 percent increase to \$4.8 billion. Research and Related Activities increased 7.6 percent, Major Research Equipment (MRE) by 14.4 percent, and Education and Human Resources by 11.4 percent. The Office of the Inspector General and the salaries and expenses account received their requested amounts.

AGENDA ITEM 9: NSB Guidelines on MRE Priorities

Dr. Kelly called on Dr. Anita Jones, chair of the Committee on Strategy and Budget, to report on the draft guidelines for setting priorities for the MRE and Facilities Construction account.

Dr. Jones reported that Congress had asked the Board to state more clearly the Board's priorities for supporting large and unique facilities that many disciplines require, recognizing that the demand exceeds the NSF budget. As a step toward grappling with these complex issues, the Committee on Strategy and Budget and the Committee on Programs and Plans jointly offered a resolution to the Board.

After a brief discussion, the Board APPROVED Resolution NSB-01-207:

Resolved, that as recommended by the NSB Committee on Strategy and Budget and the NSB Committee on Programs and Plans, the National Science Board APPROVES the statement of Guidelines for Setting Priority for Major Research Facilities, NSB-01-204. The Board will evaluate these guidelines over time.

Dr. Kelly thanked the members of both committees for their careful and time-consuming work on these difficult issues. [NSB-01-207 and NSB-01-204 are attached.]

AGENDA ITEM 10: Approval of International Report

Dr. Kelly called on Dr. Natalicio, chair of the Task Force on International Issues in Science and Engineering to present the final report, "Toward a More Effective Role for the U.S. Government in International Science and Engineering."

Dr. Natalicio reminded Board members that the task force had delayed presentation of the final report to consider the impact of September 11 events on the report and to incorporate final review comments. The Executive Summary is in its final form, but some editorial changes may still be made in the text of the report. She then asked the Board to approve the report for printing and distribution.

The Board APPROVED the report "Toward a More Effective Role for the U.S. Government in International Science and Engineering" (NSB-01-187) for printing and distribution, subject to final editorial changes by the Board Chair and the Chair of the Task Force on International Science and Engineering Issues.

Dr. Kelly thanked Dr. Natalicio and members of the task force: Drs. John Armstrong, Ferguson, Mary K. Gaillard, Stanley Jaskolski, Lubchenco, Luis Sequeira, and Erb. He offered special thanks to Dr. Alan Rapoport for his outstanding service as Executive Secretary.

ADENDA ITEM 11: Committee Reports

a. Audit and Oversight (A&O)

Dr. Jaskolski, committee chair, reported that the committee heard several presentations. Dr. Joseph Bordogna, NSF Deputy Director, discussed the role of NSF in the President's Management Council. Mr. David Radzanowski of the Science and Space Branch, Office of Management and Budget, discussed the President's Management Agenda scorecard

process. Dr. Christine Boesz, NSF Inspector General, presented her office's Semiannual Report to the Congress, and Dr. Bordogna provided the proposed NSF Management Response and draft transmittal letter.

Dr. Jaskolski read the draft transmittal letter from Dr. Kelly to the U.S. Senate, to accompany the Management Response and the Semiannual Report of the NSF Inspector General, and asked for Board approval.

The Board APPROVED the transmittal letter as read.

Dr. Jaskolski reported that Mr. Thomas Cooley, NSF Chief Financial Officer and Director of the Office of Budget, Finance and Award Management, briefed the committee on the recent Business and Operations Advisory Committee meeting, plans for the spring meeting, and risk assessment work being done to address cost-sharing issues. The committee may wish to support a further look at cost-sharing requirements and their impact on universities. Mr. Cooley also reported on accountability reporting for fiscal year 2001 and gave an update on the Federal Managers Financial Integrity Act and the effort to identify management challenges. The committee also received a report on some of the measures in the Government Performance and Results Act performance report for fiscal year 2001.

The IG Office reported on Fiscal Year 2001 Financial Management Statements and preliminary results of the Electronic Data Processing Audit and presented its performance plan and annual audit plan for fiscal year 2002. The committee discussed a pilot project to locate a few auditors in a satellite office in Denver, Colorado.

b. Committee on Programs and Plans (CPP)

Dr. Armstrong, committee chair, reported that as part of its continuing series of management and oversight reviews, the committee heard reports on the management and oversight of the international Gemini telescopes from Dr. Van Citters and from the Gemini Project Manager and Gemini Observatory Director.

The committee recommended two proposed awards for approval to the full Board: HIAPER and the Expanded Very Large Array. [The Board approved these awards in Closed Session.]

The committee received a report on "U.S. Astronomy and Astrophysics: Managing an Integrated Program," issued by the National Academy of Sciences/National Research Council. The report assessed Federal support of astronomical sciences and the roles of NSF and the National Aeronautics and Space Administration. The committee also received an update on the recompetition for the management of the National Optical Astronomy Observatory.

c. CPP Subcommittee on Polar Issues

Dr. Washington, subcommittee chair, reported that the subcommittee discussed personnel changes and the increasing problem of private collectors gathering meteorites from the dry valleys. The Office of Polar Programs and the NSF General Counsel are working on regulations to protect the meteorites so that they are available to the scientific community.

The subcommittee received a presentation on Arctic Programs and on-going reviews and on the status of the South Pole Modernization Project. The subcommittee supports the effort to increase the number of berths at the South Pole to 150 and asks the Executive Committee to take action if needed before the March meeting.

The subcommittee reaffirmed its support for the Ice Cube project, funded as part of the MRE account in the fiscal year 2002 budget, and asks the Executive Committee to take action if needed before the March meeting.

d. CPP Task Force on Science and Engineering Infrastructure (INF)

Dr. John White, task force chair, confirmed that the task force expects to bring a draft report to the CPP in March 2002.

e. Education and Human Resources Committee (EHR)

Dr. Bob Suzuki, committee chair, reported that the committee approved as an internal working document "The Road to Excellence: A Policy Framework for Sustained Leadership in K-16 Science, Mathematics, Engineering and Technology Education." The document articulates the principles that the committee will use to consider NSF policies and programs. Copies will be provided to the Board and to members of the EHR Directorate's Advisory Committee.

The committee received several reports. Dr. Judith Ramaley, Assistant Director of the EHR Directorate, briefed the committee on the recent EHR Advisory Committee meeting and discussed ways in which it might interact with the Board's EHR Committee. Dr. Lee Zia, Program Director in the Division of Undergraduate Education, reported on activities of the National Science, Mathematics, Engineering and Technology Education Digital Library, which has entered phase two, an integration effort involving the development and implementation of technical and organizational infrastructure. Dr. Ramaley briefed the committee on NSF's Math and Science Partnership effort, outlined several challenges related to implementation, and discussed Congressional mandates. Dr. Norman Fortenberry, acting Director of the Division of Human Resource Development, reported on NSF's diversity efforts. Mr. Lawrence Rudolph, NSF General Counsel, briefed the committee on diversity efforts at the National Institutes of Health.

The committee decided that in future meetings it will address the education programs that are taking place in directorates outside of the EHR Directorate and that it would like to hear more about other directorates' diversity activities.

f. EHR Subcommittee on Science and Engineering Indicators

Dr. Tapia, subcommittee chair, reported that the subcommittee discussed a draft statement related to the events of September 11 for possible inclusion in the "Science and Engineering Indicators—2002," but decided to recommend instead that a similar message be incorporated into the transmittal letter from Dr. Kelly to the President. Ms. Jean Pomeroy, Senior Policy Analyst in the Board Office, briefed the subcommittee on Washington's response to the September 11 events. It was decided that Dr. Tapia would discuss with the NSF Director a possible Board statement on science and national security.

The subcommittee approved the "Orange Book" draft of "Indicators—2002" after being informed by Mr. Rolf Lehming, Director of the Science and Engineering Indicators Program, that all Board members' revisions had been made and no further comments had been received. Mr. William Noxon, Senior Public Affairs Specialist in the Office of Legislative and Public Affairs, updated the committee on plans for the rollout of "Indicators—2002."

Dr. Robert Bell, Senior Scientist for Multidisciplinary Reviews in the IG Office, on detail to Science Resources Statistics, gave a status report on the feasibility and advisability of including a chapter on the environment in "Science and Engineering Indicators—2004."

g. EHR Task Force on National Workforce Policy (NWP)

In the absence of Dr. Joseph Miller, task force chair, Dr. George Langford reported that the task force continued to examine the "Report Framework" document. The Assistant Directors provided their insights on the document and concurred in the critical priority identified by the task force, namely the imperative of developing the Nation's domestic science and engineering workforce. In discussion, it was agreed that the task force report should present the benefits of greater domestic participation in science and engineering, the need to include students of diverse backgrounds, and the contributions of foreign students and immigrant scientists and engineers. The task force discussed ways to mobilize the Nation to consider the development of human resources for science and engineering as a grand challenge equivalent to the space race of decades ago.

h. Committee on Strategy and Budget (CSB)

Dr. Jones, committee chair, stated that the committee decided to focus on six issues for the next twelve months. Two previously selected issues will be continuing areas of study: award size and duration, and the relationship of the core program and new initiatives and priorities. Four additional issues were selected: (1) stipend support for graduate students and postdoctoral fellows, (2) a re-examination of recommendations in

Environmental Science and Engineering for the 21st Century and what has occurred since the report was issued, (3) behavioral, social, and economic sciences policy issues across NSF, and (4) infrastructure issues from the budgetary viewpoint.

The committee discussed policy guidelines with respect to Major Research Facilities, in cooperation with the Committee on Programs and Plans. [The Board approved the resolution in this session.]

The committee received two reports on on-going strategic issues. Mr. Robert Abel, Chief of the Budget Operations and Systems Branch, reported on the status of the NSF survey of principal investigators and grantee institutions to gather data related to award size and duration. Dr. George Strawn, acting Assistant Director of Computer and Information Science and Engineering (CISE), briefed the committee on the effect of the Information Technology Research Initiative on CISE and other directorates and highlighted new components of the core program that can be directly traced to the initiative.

i. Task Force on International Issues in Science and Engineering (ISE)

Dr. Natalicio, task force chair, reported that Dr. Edward Murdy, Senior Program Manager in the Office of Trans-Regional Affairs, Division of International Programs, made a presentation on furthering U.S. interests and leadership in the International Council for Scientific Unions.

The task force reviewed its final report for submission to the Board. [The Board approved the report earlier in this session.]

AGENDA ITEM 12: Other Business

Dr. Kelly adjourned the Open Session at 2:10 p.m.

Janice E. Baker
Policy Writer/Editor

Attachment 1 to NSB-01-208

NSB-01- 207

November 15, 2001

NATIONAL SCIENCE BOARD

RESOLUTION ON

GUIDELINES FOR SETTING PRIORITY FOR
MAJOR RESEARCH FACILITIES

RESOLVED, that as recommended by the NSB Committee on Strategy and Budget and the NSB Committee on Programs and Plans, the National Science Board APPROVES the statement of Guidelines for Setting Priority for Major Research Facilities, NSB-01-204. The Board will evaluate these guidelines over time.

November 15, 2001

National Science Board

Guidelines for Setting Priority for Major Research Facilities

The advancement of research and education in all fields of science and engineering depends – at some times – on equipment that permits observation and experimentation. Therefore, the National Science Foundation (NSF) funds such equipment. It also funds the research necessary to advance the engineering of next generation instruments that may enable entirely new and improved modalities of observation and experimentation.

Some of the equipment that enables the advancement of research is large, complex, and costly. The term *facility* is used to describe such equipment, because typically the equipment requires special sites or buildings to house it and a dedicated staff to effectively maintain and use the equipment. Multiple experimental researchers working in related disciplines share the use of such large facilities.

From time to time, a consensus arises within a research community that a particular new facility is required to advance the state of knowledge in the field. Such a consensus matures through broad community discussion. Through that discussion, a consortium sometimes arises from the community to take the responsibility to build and operate the facility for the good of the entire community. In all cases there are clearly stated research questions that only the unique, envisioned facility could help answer.

The National Science Board approves all large facility projects, as directed by the NSF Act of 1950 and based on the Board's revised delegation of authority to the Director (NSB-99-198, Appendix B, "Delegation of Authority," 335 NSB Meeting, November 18, 1999). When considering a facility project for approval, the Board reviews the need for such a facility, the research that will be enabled, readiness of plans for construction and operation, construction budget estimates, and operations budget estimates. Construction of many facilities is funded through the NSF Major Research Equipment and Facilities Construction account.

Due to cost, not all facilities can be built at the time that their need is determined and plans are in order for construction. Some priority order on facility construction projects must be set.

The guidelines observed by the Board in approving such major facility projects and in approving the NSF budget submission are:

Once project construction commences, highest priority is given to moving a project forward through multiple years of construction in a cost-effective way, as determined by sound engineering and as long as progress is appropriate. It is most cost-effective to complete initiated projects in a timely way, rather than to commence new projects at the cost of stretching out in-progress construction.

New candidate projects will be considered from the point of view of broadly serving the many disciplines supported by NSF.

Multiple projects for a single discipline, or for closely related disciplines, will be ordered based on a judgment of the contribution that they will make toward the advancement of research in those related fields. Community judgment on this matter is considered.

Projects will be authorized close to the time that funding requests are expected to be made.

International and interagency commitments are considered in setting priorities among projects.

The above are guidelines. Each facility consideration involves many complex issues. The Board will consider all relevant matters, and could deviate from these guidelines, given sound reasons to do so.