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REPORT
110–114

NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 2007

APRIL 30, 2007.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. GORDON of Tennessee, from the Committee on Science and Technology, submitted the following

R E P O R T

[To accompany H.R. 1867]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 1867) to authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Science Foundation, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Science Foundation Authorization Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) BOARD.—The term "Board" means the National Science Board established under section 2 of the National Science Foundation Act of 1950 (42 U.S.C. 1861).

(2) DIRECTOR.—The term "Director" means the Director of the Foundation.

(3) ELEMENTARY SCHOOL.—The term "elementary school" has the meaning given that term by section 9101(18) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801(18)).

(4) FOUNDATION.—The term "Foundation" means the National Science Foundation.

(5) INSTITUTION OF HIGHER EDUCATION.—The term "institution of higher education" has the meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(6) SECONDARY SCHOOL.—The term "secondary school" has the meaning given that term by section 9101(38) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801(38)).

SEC. 3. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2008.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $6,500,000,000 for fiscal year 2008.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $5,080,000,000 shall be made available for research and related activities, of which $115,000,000 shall be made available for the Major Research Instrumentation program;

(B) $873,000,000 shall be made available for education and human resources, of which—

(i) $94,000,000 shall be for Mathematics and Science Education Partnerships established under section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n);

(ii) $70,000,000 shall be for the Robert Noyce Scholarship Program established under section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1);

(iii) $44,000,000 shall be for the Science, Mathematics, Engineering, and Technology Talent Expansion Program established under section 8(7) of the National Science Foundation Authorization Act of 2002 (Public Law 107–368); and

(iv) $51,620,000 shall be for the Advanced Technological Education program established by section 3(a) of the Scientific and Advanced-Technology Act of 1992 (Public Law 102–476);

(C) $245,000,000 shall be made available for major research equipment and facilities construction;

(D) $285,600,000 shall be made available for agency operations and award management;

(E) $4,050,000 shall be made available for the Office of the National Science Board; and

(F) $12,350,000 shall be made available for the Office of Inspector General.

(b) FISCAL YEAR 2009.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $6,980,000,000 for fiscal year 2009.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $5,457,400,000 shall be made available for research and related activities, of which $123,100,000 shall be made available for the Major Research Instrumentation program;

(B) $934,000,000 shall be made available for education and human resources, of which—

(i) $100,600,000 shall be for Mathematics and Science Education Partnerships established under section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n);

(ii) $101,000,000 shall be for the Robert Noyce Scholarship Program established under section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1);

(iii) $55,000,000 shall be for the Science, Mathematics, Engineering, and Technology Talent Expansion Program established under section 8(7) of the National Science Foundation Authorization Act of 2002 (Public Law 107–368); and

(iv) $55,200,000 shall be for the Advanced Technological Education program as established by section 3(a) of the Scientific and Advanced-Technology Act of 1992 (Public Law 102–476);

(C) $262,000,000 shall be made available for major research equipment and facilities construction;

(D) $309,760,000 shall be made available for agency operations and award management;

(E) $4,120,000 shall be made available for the Office of the National Science Board; and

(F) $12,720,000 shall be made available for the Office of Inspector General.

(c) FISCAL YEAR 2010.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $7,493,000,000 for fiscal year 2010.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $5,863,200,000 shall be made available for research and related activities, of which $131,700,000 shall be made available for the Major Research Instrumentation program;

(B) $1,003,000,000 shall be made available for education and human resources, of which—

(i) $107,600,000 shall be for Mathematics and Science Education Partnerships established under section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n);

(ii) $133,000,000 shall be for the Robert Noyce Scholarship Program established under section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1);

(iii) $60,000,000 shall be for the Science, Mathematics, Engineering, and Technology Talent Expansion Program established under section 8(7) of the National Science Foundation Authorization Act of 2002 (Public Law 107–368); and

(iv) $59,100,000 shall be for the Advanced Technological Education program as established by section 3(a) of the Scientific and Advanced-Technology Act of 1992 (Public Law 102–476);

(C) $280,000,000 shall be made available for major research equipment and facilities construction;

(D) $329,450,000 shall be made available for agency operations and award management;

(E) $4,250,000 shall be made available for the Office of the National Science Board; and

(F) $13,100,000 shall be made available for the Office of Inspector General.

(d) MAJOR RESEARCH INSTRUMENTATION.—

(1) AWARD AMOUNT.—The minimum amount of an award under the Major Research Instrumentation program shall be $100,000. The maximum amount of an award under the program shall be $4,000,000, except if the total amount appropriated for the program for a fiscal year exceeds $125,000,000, in which case the maximum amount of an award shall be $6,000,000.

(2) USE OF FUNDS.—In addition to the acquisition of instrumentation and equipment, funds made available by awards under the Major Research Instrumentation program may be used to support the operations and maintenance of such instrumentation and equipment.

(3) COST SHARING.—

(A) IN GENERAL.—An institution of higher education receiving an award shall provide at least 30 percent of the cost from private or non-Federal sources.

(B) EXCEPTIONS.—Institutions of higher education that are not Ph.D.-granting institutions are exempt from the cost sharing requirement in sub-

paragraph (A), and the Director may reduce or waive the cost sharing requirement for—

(i) institutions—

(I) which are not ranked among the top 100 institutions receiving Federal research and development funding, as documented by the statistical data published by the Foundation; and

(II) for which the proposed project will make a substantial improvement in the institution's capabilities to conduct leading edge research, to provide research experiences for undergraduate students using leading edge facilities, and to broaden the participation in science and engineering research by individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b); and

(ii) consortia of institutions of higher education that include at least one institution that is not a Ph.D-granting institution.

(e) UNDERGRADUATE EDUCATION PROGRAMS.—The Director shall continue to carry out programs in support of undergraduate education, including those authorized in section 17 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–6). Funding for these programs shall increase in proportion to the increase in the total amount appropriated to the Foundation in any year for which appropriations are authorized by this Act.

(f) LIMIT ON PROPOSALS.—

(1) POLICY.—For programs that require as part of the selection process for awards the submission of preproposals and that also limit the number of preproposals that may be submitted by an institution, the Director shall allow the subsequent submission of a full proposal based on each preproposal that is determined to have merit following the Foundation's merit review process.

(2) REVIEW AND ASSESSMENT OF POLICIES.—The Board shall review and assess the effects on institutions of higher education of the policies of the Foundation regarding the imposition of limitations on the number of proposals that may be submitted by a single institution for programs supported by the Foundation. The Board shall determine whether current policies are well justified and appropriate for the types of programs that limit the number of proposal submissions. Not later that 1 year after the date of enactment of this Act, the Board shall summarize its findings and any recommendations regarding changes to the current policy on the restriction of proposal submissions in a report to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

(g) RESEARCH EXPERIENCES FOR UNDERGRADUATES.—The Director shall increase funding for the Research Experiences for Undergraduates program in proportion to the increase in the total amount appropriated to the Foundation for research and related activities in any year for which appropriations are authorized by this Act.

SEC. 4. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.

(a) FUNDING FOR CENTERS.—The Director shall continue to carry out the program of Centers for Research on Learning and Education Improvement as established in section 11 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–2).

(b) ELIGIBILITY FOR CENTERS.—Section 11 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–2) is amended—

(1) in subsection (a)(1), by inserting "or eligible nonprofit organizations" after "institutions of higher education";

(2) in subsection (b)(1) by inserting "or an eligible nonprofit organization" after "institution of higher education"; and

(3) in subsection (b)(1) by striking "of such institutions" and inserting "thereof".

SEC. 5. INTERDISCIPLINARY RESEARCH.

(a) IN GENERAL.—The Board shall evaluate the role of the Foundation in supporting interdisciplinary research, including through the Major Research Instrumentation program, the effectiveness of the Foundation's efforts in providing information to the scientific community about opportunities for funding of interdisciplinary research proposals, and the process through which interdisciplinary proposals are selected for support. The Board shall also evaluate the effectiveness of the Foundation's efforts to engage undergraduate students in research experiences in interdisciplinary settings, including through the Research in Undergraduate Institutions program and the Research Experiences for Undergraduates program.

(b) REPORT.—Not later than 1 year after the date of enactment of this Act, the Board shall provide the results of its evaluation under subsection (a), including a

recommendation for the proportion of the Foundation's research and related activities funding that should be allocated for interdisciplinary research, to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

SEC. 6. PILOT PROGRAM OF GRANTS FOR NEW INVESTIGATORS.

(a) IN GENERAL.—The Director shall carry out a pilot program to award one-year grants to individuals to assist them in improving research proposals that were previously submitted to the Foundation but not selected for funding.

(b) USE OF FUNDS.—Grants awarded under this section shall be used to enable an individual to resubmit an updated research proposal for review by the Foundation through the agency's competitive merit review process. Uses of funds made available under this section may include the generation of new data and the performance of additional analysis.

(c) ELIGIBILITY.—To be eligible to receive a grant under this section, an individual shall—

(1) not have previously received funding as the principal investigator of a research grant from the Foundation; and

(2) have submitted a proposal to the Foundation, which may include a proposal submitted to the Research in Undergraduate Institutions program, that was rated very good or excellent under the Foundation's competitive merit review process.

(d) SELECTION PROCESS.—The Director shall make awards under this section based on the advice of the program officers of the Foundation.

(e) PROGRAM ADMINISTRATION.—The Director may carry out this section through the Small Grants for Exploratory Research program.

(f) NATIONAL SCIENCE BOARD REVIEW.—The Board shall conduct a review and assessment of the pilot program under this section, including the number of new investigators funded, the distribution of awards by type of institution of higher education, and the success rate upon resubmittal of proposals by new investigators funded through this pilot program. Not later than 3 years after the date of enactment of this Act, the Board shall summarize its findings and any recommendations regarding changes to or the continuation of the pilot program in a report to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

SEC. 7. BROADER IMPACTS MERIT REVIEW CRITERION.

(a) IN GENERAL.—In evaluating research proposals under the Foundation's broader impacts criterion, the Director shall give special consideration to proposals that involve partnerships between academic researchers and industrial scientists and engineers that address research areas that have been identified as having high importance for future national economic competitiveness, such as nanotechnology.

(b) PARTNERSHIPS WITH INDUSTRY.—The Director shall encourage research proposals from institutions of higher education that involve partnerships with businesses and organizations representing businesses in fields that have been identified as having high importance for future national economic competitiveness and that include input on the research agenda from and cost-sharing by the industry partners.

(c) REPORT ON BROADER IMPACTS CRITERION.—Not later than 1 year after the date of enactment of this Act, the Director shall transmit to Congress a report on the impact of the broader impacts grant criterion used by the Foundation. The report shall—

(1) identify the criteria that each division and directorate of the Foundation uses to evaluate the broader impacts aspects of research proposals;

(2) provide a breakdown of the types of activities by division that awardees have proposed to carry out to meet the broader impacts criterion;

(3) provide any evaluations performed by the Foundation to assess the degree to which the broader impacts aspects of research proposals were carried out and how effective they have been at meeting the goals described in the research proposals;

(4) describe what national goals, such as improving undergraduate science, mathematics, and engineering education, improving K–12 science and mathematics education, promoting university-industry collaboration and technology transfer, and broadening participation of underrepresented groups, the broader impacts criterion is best suited to promote; and

(5) describe what steps the Foundation is taking and should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 8. POSTDOCTORAL RESEARCH FELLOWS.

(a) MENTORING.—The Director shall require that all grant applications that include funding to support postdoctoral researchers include a description of the mentoring activities that will be provided for such individuals, and shall ensure that this part of the application is evaluated under the Foundation's broader impacts merit review criterion. Mentoring activities may include career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics.

(b) REPORTS.—The Director shall require that annual reports and the final report for research grants that include funding to support postdoctoral researchers include a description of the mentoring activities provided to such researchers.

SEC. 9. RESPONSIBLE CONDUCT OF RESEARCH.

The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project.

SEC. 10. REPORTING OF RESEARCH RESULTS.

The Director shall ensure that all final project reports and citations of published research documents resulting from research funded, in whole or in part, by the Foundation, are made available to the public in a timely manner and in electronic form through the Foundation's Web site.

SEC. 11. SHARING RESEARCH RESULTS.

An investigator supported under a Foundation award, whom the Director determines has failed to comply with the provisions of section 734 of the Foundation Grant Policy Manual, shall be ineligible for a future award under any Foundation supported program or activity. The Director may restore the eligibility of such an investigator on the basis of the investigator's subsequent compliance with the provisions of section 734 of the Foundation Grant Policy Manual and with such other terms and conditions as the Director may impose.

SEC. 12. FUNDING FOR SUCCESSFUL STEM EDUCATION PROGRAMS.

(a) EVALUATION OF PROGRAMS.—The Director shall, on an annual basis, evaluate all of the Foundation's grants that are scheduled to expire within one year and—

(1) that have the primary purpose of meeting the objectives of the Science and Engineering Equal Opportunity Act (42 U.S.C. 1885 et seq.); or

(2) that have the primary purpose of providing teacher professional development.

(b) CONTINUATION OF FUNDING.—For grants that are identified under subsection (a) and that are deemed by the Director to be successful in meeting the objectives of the initial grant solicitation, the Director may extend the duration of those grants for up to 3 additional years beyond their scheduled expiration without the requirement for a recompetition. The Director may extend such grants for an additional 3 years following a second review within 1 year before the extended completion date, in accordance with subsection (a), and the determination by the Director that the objectives of the grant are being achieved.

(c) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of this Act, the Director shall submit a report to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate that—

(1) lists the grants which have been extended in duration by the authority provided under this section; and

(2) provides any recommendations the Director may have regarding the extension of the authority provided under this section to programs other than those specified in subsection (a).

SEC. 13. COST SHARING.

(a) IN GENERAL.—The Board shall evaluate the impact of its policy to eliminate cost sharing for research grants and cooperative agreements for existing programs that were developed around industry partnerships and historically required industry cost sharing, such as the Engineering Research Centers and Industry/University Cooperative Research Centers. The Board shall also consider the impact that the cost sharing policy has on initiating new programs for which industry interest and participation are sought.

(b) REPORT.—Not later than 6 months after the date of enactment of this Act, the Board shall report to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives, and the Committee on Com-

merce, Science, and Transportation, the Committee on Health, Education, Labor, and Pensions, and the Committee on Appropriations of the Senate, on the results of the evaluation under subsection (a).

SEC. 14. DONATIONS.

Section 11(f) of the National Science Foundation Act of 1950 (42 U.S.C. 1870(f)) is amended by inserting at the end before the semicolon ", except that funds may be donated for specific prize competitions".

SEC. 15. ADDITIONAL REPORTS.

(a) REPORT ON FUNDING FOR MAJOR FACILITIES.—

(1) PRECONSTRUCTION FUNDING.—The Board shall evaluate the appropriateness of the requirement that funding for detailed design work and other preconstruction activities for major research equipment and facilities come exclusively from the sponsoring research division rather than being available, at least in part, from the Major Research Equipment and Facilities Construction account.

(2) MAINTENANCE AND OPERATION COSTS.—The Board shall evaluate the appropriateness of the Foundation's policies for allocation of costs for, and oversight of, maintenance and operation of major research equipment and facilities.

(3) REPORT.—Not later than 6 months after the date of enactment of this Act, the Board shall report on the results of the evaluations under paragraphs (1) and (2) and on any recommendations for modifying the current policies related to allocation of funding for major research equipment and facilities to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives, and to the Committee on Commerce, Science, and Transportation, the Committee on Health, Education, Labor, and Pensions, and the Committee on Appropriations of the Senate.

(b) INCLUSION OF POLAR FACILITIES UPGRADES IN MAJOR RESEARCH EQUIPMENT AND FACILITIES CONSTRUCTION PLAN.—Section 201(a)(2)(D) of the National Science Foundation Authorization Act of 1998 (42 U.S.C. 1862l(a)(2)(D)) is amended by inserting "and for major upgrades of facilities in support of Antarctic research programs" after "facilities construction account".

(c) REPORT ON EDUCATION PROGRAMS WITHIN THE RESEARCH DIRECTORATES.—Not later than 6 months after the date of enactment of this Act, the Director shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate a report cataloging all elementary and secondary school, informal, and undergraduate educational programs and activities supported through appropriations for Research and Related Activities. The report shall display the programs and activities by directorate, along with estimated funding levels for the fiscal years 2006, 2007, and 2008, and shall provide a description of the goals of each program and activity. The report shall also describe how the programs and activities relate to or are coordinated with the programs supported by the Education and Human Resources Directorate.

(d) REPORT ON RESEARCH IN UNDERGRADUATE INSTITUTIONS PROGRAM.—The Director shall transmit to Congress along with the fiscal year 2011 budget request a report listing the funding success rates and distribution of awards for the Research in Undergraduate Institutions program, by type of institution based on the highest academic degree conferred by the institution, for fiscal years 2008, 2009, and 2010.

(e) ANNUAL PLAN FOR ALLOCATION OF EDUCATION AND HUMAN RESOURCES FUNDING.—

(1) IN GENERAL.—Not later than 60 days after the date of enactment of legislation providing for the annual appropriation of funds for the Foundation, the Director shall submit to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives, and to the Committee on Commerce, Science, and Transportation, the Committee on Health, Education, Labor, and Pensions, and the Committee on Appropriations of the Senate, a plan for the allocation of education and human resources funds authorized by this Act for the corresponding fiscal year, including any funds from within the research and related activities account used to support activities that have the primary purpose of improving education or broadening participation.

(2) SPECIFIC REQUIREMENTS.—The plan shall include a description of how the allocation of funding—

(A) will affect the average size and duration of education and human resources grants supported by the Foundation;

(B) will affect trends in research support for the effective instruction of mathematics, science, engineering, and technology;

(C) will affect the K-20 pipeline for the study of mathematics, science, engineering, and technology; and

(D) will encourage the interest of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) in mathematics, science, engineering, and technology, and help prepare such individuals to pursue postsecondary studies in these fields.

SEC. 16. ADMINISTRATIVE AMENDMENTS.

(a) TRIANNUAL AUDIT OF THE OFFICE OF THE NATIONAL SCIENCE BOARD.—Section 15(a) of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 4862n–5) is amended—

(1) in paragraph (3), by striking "an annual audit" and inserting "an audit every three years";

(2) in paragraph (4), by striking "each year" and inserting "every third year"; and

(3) by inserting after paragraph (4) the following new paragraph:

"(5) MATERIALS RELATING TO CLOSED PORTIONS OF MEETINGS.—To facilitate the audit required under paragraph (3) of this subsection, the Office of the National Science Board shall maintain the General Counsel's certificate, the presiding officer's statement, and a transcript or recording of any closed meeting, for at least 3 years after such meeting.".

(b) LIMITED TERM PERSONNEL FOR THE NATIONAL SCIENCE BOARD.—Subsection (g) of section 4 of the National Science Foundation Act of 1950 (42 U.S.C. 1863(g)) is amended to read as follows:

"(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than 5 professional staff members, technical and professional personnel on leave of absence from academic, industrial, or research institutions for a limited term and such operations and support staff members as may be necessary. Such staff shall be appointed by the Chairman and assigned at the direction of the Board. The professional members and limited term technical and professional personnel of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and the provisions of chapter 51 of such title relating to classification, and shall be compensated at a rate not exceeding the maximum rate payable under section 5376 of such title, as may be necessary to provide for the performance of such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act. Section 14(a)(3) shall apply to each limited term appointment of technical and professional personnel under this subsection. Each appointment under this subsection shall be subject to the same security requirements as those required for personnel of the Foundation appointed under section 14(a).".

(c) INCREASE IN NUMBER OF WATERMAN AWARDS TO THREE.—Section 6(c) of the National Science Foundation Authorization Act of 1975 (42 U.S.C. 1881a) is amended to read as follows:

"(c) Up to three awards may be made under this section in any one fiscal year.".

SEC. 17. NATIONAL SCIENCE BOARD REPORTS.

Paragraphs (1) and (2) of section 4(j) of the National Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1) and (2)) are amended by striking ", for submission to" and "for submission to", respectively, and inserting "and".

SEC. 18. NATIONAL ACADEMY OF SCIENCE REPORT ON DIVERSITY IN STEM FIELDS.

(a) IN GENERAL.—The Foundation shall enter into an arrangement with the National Academy of Sciences for a report, to be transmitted to the Congress not later than 1 year after the date of enactment of this Act, about barriers to increasing the number of underrepresented minorities in science, technology, engineering, and mathematics fields and to identify strategies for bringing more underrepresented minorities into the science, technology, engineering, and mathematics workforce.

(b) SPECIFIC REQUIREMENTS.—The Director shall ensure that the study described in subsection (a) addresses—

(1) social and institutional factors that shape the decisions of minority students to commit to education and careers in the science, technology, engineering, and mathematics fields;

(2) specific barriers preventing greater minority student participation in the science, technology, engineering, and mathematics fields;

(3) primary focus points for policy intervention to increase the recruitment and retention of underrepresented minorities in America's future workforce;

(4) programs already underway to increase diversity in the science, technology, engineering, and mathematics fields, and their level of effectiveness;

(5) factors that make such programs effective, and how to expand and improve upon existing programs;

(6) the role of minority-serving institutions in the diversification of America's workforce in these fields and how that role can be supported and strengthened; and

(7) how the public and private sectors can better assist minority students in their efforts to join America's workforce in these fields.

II. Purpose of the Bill

The purpose of this bill is to authorize appropriations for fiscal years 2008, 2009 and 2010 for the National Science Foundation and to impose requirements related to: major research instrumentation funded by the Foundation; application of merit review criteria used by the Foundation; mentoring and ethics training for students and postdoctoral research associates funded under Foundation grants; and reporting on allocation of funds for education and human resources activities supported by the Foundation.

III. Background and Need for the Legislation

NSF is an independent federal agency created by the National Science Foundation Act of 1950 (P.L. 81–507). NSF's mission is unique among the federal government's scientific research agencies in that it is to support science and engineering across all disciplines. NSF currently funds research and education activities at more than 2,000 universities, colleges, K–12 schools, businesses, and other research institutions throughout the United States. Virtually all of this support is provided through competitive, merit-reviewed grants and cooperative agreements. Although NSF's research and development budget accounts for only about three percent of all federally funded research, the role of NSF in promoting fundamental research is vital to the nation's scientific enterprise, as NSF provides approximately 20 percent of the federal support for basic research conducted at academic institutions.

Basic research pays enormous dividends to society. Economic growth, public health, national defense, and social advancement have all been tied to technological developments resulting from research and development. In fact, economists estimate that innovation and the application of new technology have generated at least half of the phenomenal growth in America's gross domestic product since World War II. In recent years, NSF-funded research in areas such as nanotechnology, information technology, computing, genetics, and climate has had a tremendous impact on society.

While the Administration's American Competitiveness Initiative (ACI) brought greater recognition and more money for NSF in fiscal year (FY) 2007, funding for NSF was stagnant for several years prior to ACI, and NSF needs to see steady growth over the long-term to maximize the agency's potential contribution to the nation's research enterprise. NSF is currently able to fund only about 25 percent of the grant proposals submitted because of limited funds; in some directorates, the percentage of grant proposals funded is as low as 10 percent. More funding for basic science is needed to feed the innovation pipeline and to ensure future economic growth, as well as to strengthen homeland defense and national security.

NSF was most recently authorized by the National Science Foundation Act of 2002 (P.L. 107–368), which authorized appropriations for NSF for FY 2003 through FY 2007. In addition to continuing authorizations of appropriations for three more years, several pol-

icy and administrative issues—including ones related to the Foundation's responsibilities for funding major research instrumentation at universities, for mentoring postdoctoral research associates, for reporting research results, for funding science, technology, engineering and mathematics (STEM) education programs, and for implementing responsible and clear cost-sharing guidelines—have arisen since the last authorization bill.

IV. Hearing Summary

During the 109th Congress, the House Committee on Science held five hearings relevant to H.R. 1867.

On Wednesday, March 9, 2005, the Subcommittee on Research held a hearing on National Science Foundation Budget and Management Challenges. Witnesses included (1) Dr. Arden L. Bement, Director of NSF; (2) Dr. Mark S. Wrighton, Chairman of the Audit and Oversight Committee of the National Science Board; and (3) Dr. Christine C. Boesz, Inspector General of the NSF. In addition to testifying about the FY 2006 budget request, witnesses discussed the most important short-term and long-term budget and management challenges facing NSF, and how they should be addressed, as well what NSF can do to ensure that limited research and management resources are allocated most effectively.

On Thursday, July 21, 2005, the Committee on Science held a hearing, U.S. Competitiveness: The Innovation Challenge, to examine the relationship between federal science and engineering research and education investments and U.S. economic competitiveness. The witnesses were (1) Mr. Nicholas Donofrio, Executive Vice President for Innovation and Technology at IBM Corporation; (2) Mr. John Morgridge, Chairman of Cisco Systems, Incorporated, and part-time professor at Stanford University's Graduate School of Business; and (3) Dr. William Brody, President of The Johns Hopkins University and co-chair of the Council on Competitiveness working group that authored the National Innovation Initiative. The witnesses emphasized that the educational system needs to provide students with a solid background in science and engineering fields so that the United States has access to a technologically-literate workforce. The witnesses also stressed that investments in basic university research provide the background knowledge necessary for future technology developments.

On Thursday, October 20, 2005, the Committee on Science held a hearing to receive testimony on the report released by NAS on October 12 entitled Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future. The report, which was requested by Congress, recommends ways to strengthen research and education in science and technology. The witnesses were (1) Mr. Norman R. Augustine, retired Chairman and CEO of the Lockheed Martin Corporation (Mr. Augustine chaired the committee that wrote the report); (2) Dr. P. Roy Vagelos, retired Chairman and CEO of Merck & Co. (Dr. Vagelos served on the committee that wrote the report); and (3) Dr. William A. Wulf, President of the National Academy of Engineering. The witnesses emphasized that solving the problems of global economic competition requires significant improvements to America's K–12 and higher education systems and greater support for basic research, including innovative research in cutting-edge fields.

The witnesses also stressed that the U.S. ability to innovate has been the source of U.S. prosperity and security, so future policy decisions should be aimed at generating an environment that supports innovation by creating a vibrant research base, educated workforce, and social climate that encourages students to pursue science and technology degrees.

On March 15, 2006, the Subcommittee on Research held a hearing on Undergraduate Science, Math and Engineering Education: What's Working? The purpose of the hearing was to examine how colleges and universities are improving their undergraduate science, math and engineering programs and how the federal government might help encourage and guide the reform of undergraduate science, math and engineering education to improve learning and to attract more students to courses in those fields. Witnesses (1) Dr. Elaine Seymour, author of Talking About Leaving: Why Undergraduates Leave the Sciences and the former Director of Ethnography and Evaluation Research at the University of Colorado at Boulder; (2) Dr. Daniel L. Goroff, Vice President and Dean of Faculty at Harvey Mudd College and co-director of the Sloan Foundation Scientific and Engineering Workforce Project based at the National Bureau of Economic Research; (3) Dr. John Burris, President of Beloit College in Wisconsin; (4) Dr. Carl Wieman, Distinguished Professor of Physics at the University of Colorado at Boulder and the recipient of the 2001 Nobel Prize in physics; and (5) Ms. Margaret Collins, Assistant Dean of Science, Business and Computer Technology at Moraine Valley Community College in Illinois. Witnesses testified about the critical role of NSF in improving undergraduate STEM education.

On May 3, 2006, the full Committee on Science held a hearing on The Role of the National Science Foundation in K–12 Science and Math Education. The purpose of the hearing was to review the effectiveness and value of the National Science Foundation's (NSF's) past and present programs in support of improvement of K–12 science and math education and to examine what role the Foundation should play in future federal initiatives for strengthening K–12 science and math education. Witnesses included (1) Dr. Dennis Bartels, executive director of the Exploratorium science museum in San Francisco, CA; (2) Dr. Joseph Heppert, Professor and Chair of Chemistry, and Director of the Center for Science Education at the University of Kansas; (3) Ms. Rebecca Pringle, physical science teacher at Susquehanna Township Middle School in Harrisburg, PA; and (4) Ms. Judy Snyder, math teacher at Eastside High School in Taylors, SC and a winner of a 2005 Presidential Award for Excellence in Mathematics and Science Teaching. The witnesses unanimously supported a leadership role for NSF in K–12 science and math education.

During the 110th Congress, the Subcommittee on Research and Science Education of the House Committee on Science and Technology held three hearings relevant to H.R. 1867.

On Tuesday, March 20, 2007, the Subcommittee held National Science Foundation Reauthorization, a legislative hearing with agency officials Dr. Arden Bement, Director of NSF, and Dr. Steven Beering, Chairman of the National Science Board. The witnesses responded to certain provisions in the legislative proposal, voiced strong support for the authorization levels proposed by the Com-

mittee, and offered specific recommendations of additional issues to consider as part of the NSF reauthorization legislation.

On Thursday, March 29, 2007, the Subcommittee held a second legislative hearing, Reauthorizing the National Science Foundation, Part II, to receive testimony from a panel of outside witnesses, including (1) Dr. Phyllis M. Wise, Provost, University of Washington, Seattle; (2) Dr. Catherine T. Hunt, President, American Chemical Society; (3) Dr. Margaret L. Ford, President, Houston Community College System—Northeast; (4) Dr. Carlos A. Meriles, Assistant Professor of Physics, City College of New York; and (5) Dr. Jeffrey J. Welser, Director of the Semiconductor Industry's Nanoelectronics Research Initiative. The witnesses responded to certain provisions in the legislative proposal, voiced unanimous and strong support for the authorization levels proposed by the Committee, and offered specific recommendations of additional issues to consider as part of the NSF reauthorization legislation.

On February 14, 2007 the full Committee on Science and Technology held a hearing with Office of Science and Technology Policy Director, Dr. John H. Marburger III, on the Administration's FY2008 Research and Development Budget Proposal. Dr. Marburger identified NSF as a priority agency under the Administration's American Competitiveness Initiative, and explained the connection between U.S. competitiveness and the Administration's proposed 7.7 percent increase in NSF's research budget. He also testified about NSF's leadership role in STEM education.

V. Committee Actions

As summarized in Section IV of this report, the Full Committee on Science heard testimony in the 109th Congress relevant to the programs authorized in H.R. 1867 at hearings held on July 21 and October 20, 2005 and on May 3, 2006; the Subcommittee on Research heard testimony in the 109th Congress relevant to the programs authorized in H.R. 1867 at hearings held on March 9, 2005 and March 15, 2006; the Full Committee on Science and Technology heard testimony in the 110th Congress relevant to the programs authorized in H.R. 1867 at a hearing held on February 14, 2007; and the Subcommittee on Research and Science Education heard testimony in the 110th Congress relevant to the programs authorized in H.R. 1867 at hearings held March 20 and March 29, 2007.

On April 16, 2007, Representative Brian Baird, Chairman of the Subcommittee on Research and Science Education of the Committee on Science and Technology, for himself and Representatives Ehlers, Gordon, Hooley, Bilbray, McNerney and Hill, introduced H.R. 1867, the National Science Foundation Authorization Act of 2007, a bill to authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Science Foundation, and for other purposes.

The Subcommittee on Research and Science Education met to consider H.R. 1867 on Thursday, April 19, 2007 and considered the following amendments to the bill:

1. On behalf of Ms. Johnson, Mr. Baird offered an amendment to Sec. 15 to require a report describing the allocation of funds authorized for education and human resources activities. The amendment was agreed to by voice vote.

2. On behalf of Ms. Johnson, Mr. Baird offered an amendment to create a new section requiring a National Academy of Sciences (NAS) report on broadening participation of minorities in the STEM workforce. The amendment was agreed to by voice vote.

3. Ms. Hooley offered an amendment to Sec. 3 to authorize appropriations for fiscal years 2008, 2009 and 2010 for the Research Experiences for Undergraduates (REU) program. The amendment was agreed to by voice vote.

Mr. Ehlers moved that the Subcommittee favorably report the bill, H.R. 1867, as amended, to the full Committee. The motion was agreed to by a voice vote.

The full Committee on Science and Technology met to consider H.R. 1867, as amended in Subcommittee, on Wednesday, April 25, 2007 and considered the following amendments to the bill:

1. Mr. Baird offered an amendment to make technical and clarifying amendments to the bill and to make the following additional changes:

- In Sec. 3(d)(3), on cost-sharing for Major Research Instrumentation awards (MRI), adds permission for a reduction or waiver of the cost-sharing requirement, at the discretion of the Director, for consortia of institutions of higher education that include at least one institution that is not a Ph.D.-granting institution;
- In Sec. 4, adds eligibility for awards under the Centers for Research on Learning and Education Improvement program for certain nonprofit organizations;
- In Sec. 16, adds new subsection to increase the number of Waterman Awards up to 3; and
- In Sec. 18, clarifies the charge for a report on diversity in STEM fields by listing specific topics for NAS to address in the report.

The amendment was agreed to by a voice vote.

2. Mr. Hall offered an amendment to Sec. 3(d) to set the cap for MRI awards at $4 million, or $6 million if the total appropriation for the MRI program exceeds $125 million. The amendment was agreed to by a voice vote.

3. Mr. Gingrey offered an amendment to Sec. 3 to strike the specific allocation for the REU program and instead require that funding for the program increase in proportion to increases in the total research budget. The amendment was agreed to by a voice vote.

Mr. Hall moved that the Committee favorably report the bill, H.R. 1867, as amended, to the House with the recommendation that the bill as amended do pass; that the staff be instructed to prepare the report and make necessary technical and conforming changes; and that the Chairman take all necessary steps to bring the bill before the House for consideration. The motion was agreed to by a voice vote.

Mr. Gordon moved that: (1) Members have two subsequent calendar days in which to submit supplemental, minority, or additional views on the measure; and (2) pursuant to clause 1 of rule 22 of the Rules of the House of Representatives, the Committee authorizes the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 1867, the National Science Foundation Authorization Act of 2007, as amended.

VI. Summary of Major Provisions of the Bill as Reported

H.R. 1867 authorizes $21 billion for the National Science Foundation (NSF) for fiscal years 2008–2010, including $16.4 billion for research and related activities, $2.8 billion for education and human resources, and $787 million for major research facilities. Specific allocations are made for major research instrumentation under the research account, and for K–12 and two-year college programs under the education account. The bill would also require the National Science Board to conduct studies on NSF's role in interdisciplinary research and on the impacts of NSF's new cost-sharing policy on university/industry partnerships. It would establish a pilot program of grants for new investigators and would require the Director to give special consideration to grant proposals involving industry partnerships. The bill would require NSF-funded researchers to report on mentoring activities for postdoctoral research fellows and NSF-funded institutions to train covered individuals in the ethical conduct of research. Finally, the bill would require a National Academy of Sciences report on barriers to and recommendations for broadening participation in STEM fields.

VII. Section-by-Section Analysis of the Bill as Reported

Sec. 1. Short title

The National Science Foundation Authorization Act of 2007.

Sec. 2. Definitions

Provides definitions for terms used in this Act.

Sec. 3. Authorization of appropriations

Authorizes $21 billion for the National Science Foundation (NSF) for fiscal years 2008–2010, including $16.4 billion for research and related activities (R&RA), $2.8 billion for education and human resources (EHR), and $787 million for major research facilities (MREFC). Allocates funding for major research instrumentation (MRI) program under the R&RA account, and for certain K–12 and two-year college education and teacher training programs under the EHR account. Sets the ceiling for MRI awards at $4 million, or $6 million if the total MRI budget exceeds $125 million, and requires 30 percent cost-sharing on MRI awards for Ph.D.-granting institutions, with exceptions for certain institutions and consortia of institutions at the discretion of the Director. Requires the Director to fund undergraduate education division programs at a growth rate equal to the Foundation's overall growth rate; and the Research Experiences for Undergraduates program at a rate equal to the R&RA growth rate.

Sec. 4. Centers for research on learning and education improvement

Requires the Director to continue funding these Centers, which were established by the 2002 NSF Reauthorization, and adds eligibility for awards for certain nonprofit organizations, as defined in the 2002 Act.

Sec. 5. Interdisciplinary research

Requires the National Science Board to evaluate the current and potential role of the Foundation in supporting interdisciplinary re-

search, in providing adequate information to the scientific community about opportunities for funding of interdisciplinary research proposals, and in engaging undergraduate students in interdisciplinary research.

Sec. 6. New investigators

Establishes a pilot program of one-year seed grants for new investigators to improve their likelihood of being awarded standard competitive research grants. Uses an existing funding mechanism, the Small Grants for Exploratory Research program, to carry out the pilot program. Requires the Board to evaluate the effectiveness of the pilot program after three years.

Sec. 7. Broader impacts merit review criterion

Requires the Director, in reviewing proposals under criterion 2 of the merit review process, to give special consideration to proposals that include partnerships between academic researchers and industrial scientists and engineers and that address research areas that have been identified as having high importance for future national economic competitiveness. Also requires the Director to encourage industry/university partnerships that include cost-sharing. Finally requires report to Congress on the impact of the broader impacts grant criterion used by the Foundation.

Sec. 8. Postdoctoral research fellows

Requires funded investigators to report on activities to mentor postdoctoral research fellows funded under their grants.

Sec. 9. Responsible conduct of research

Requires each institution funded by NSF research grants to provide a plan for appropriate training in the responsible and ethical conduct of research to supported individuals.

Sec. 10. Reporting of research results

Requires the Director to make available to the public, through the Foundation website, final project reports and all citations of published work resulting from NSF-funded research.

Sec. 11. Sharing research results

Makes investigators who fail to comply with existing NSF policy on sharing of research results (Section 734 of the NSF Grant Policy Manual) ineligible for future NSF awards until they comply with the policy.

Sec. 12. Funding for successful STEM education programs

Permits the Director to exempt from the recompete requirement certain STEM education programs, including minority-serving programs and teacher training programs, that continue to demonstrate positive performance.

Sec. 13. Cost sharing

Requires the Board to evaluate the impact of the ruling to eliminate cost-sharing at the Foundation on programs that already do involve or may involve industry partnership.

Sec 14. Donations

Allows NSF to accept private funds for certain prize competitions.

Sec. 15. Additional reports

Requires the Board to evaluate the Foundation policies on funding for pre-construction and maintenance and operation costs for major research equipment and facilities. Requires plans for upgrades of Antarctic facilities to be included in the annual national research facilities construction, repair and upgrades plan required under SEC 201(a)(1) of the NSF Authorization Act of 1998, as amended. Requires the Director to catalog all educational activities supported by R&RA programs and report to Congress. Requires the Director to report on funding success rates and distribution of awards for the Research in Undergraduate Institutions program. Requires the Director to report on how funds are allocated for education and human resources activities supported by the Foundation.

Sec. 16. Administrative amendments

Changes audit requirement from every year to every three years for assessment of the compliance of the Board with the requirements of the Government in Sunshine Act. Gives the Board authority to take on IPA assignees ("rotators") to supplement permanent staff. Increases the number of Waterman Awards up to three.

Sec. 17. National Science Board reports

Amends the National Science Foundation Act of 1950 so that National Science Board reports are submitted directly to Congress from the Board, rather than through the President.

Sec. 18. National Academy of Science report on diversity in STEM fields

Requires the Foundation to enter into a contract with the National Academies of Sciences for a report on barriers to and strategies for increasing participation of underrepresented minorities in STEM fields.

VIII. Committee Views

SECTION 3. AUTHORIZATION OF APPROPRIATIONS

Research and Related Activities.—The Committee supports the proposed increases for the math and physical sciences, computer sciences, and engineering directorates in the fiscal year 2008 request for research and related activities (R&RA). But the Committee also believes it is important to maintain adequate growth over the long term for all fields supported by NSF. Competitiveness depends on advances in biological sciences, physical sciences, mathematics, computer sciences, geosciences, engineering and the social sciences, as well as the interplay between these fields. The Committee expects future R&RA budgets to include adequate growth for the fields, including social and biological sciences, that saw smaller increases in the FY 2008 request.

The Committee also supports NSF's participation in the cross-agency, coordinated research initiatives in nanotechnology and in-

formation technology. In particular, the Committee applauds NSF for their increased focus on the environmental, health and safety aspects of nanotechnology in the FY 2008 budget request, including through the support of a new multidisciplinary center focusing on those topics, and the potential implications of such research for future regulation. The Committee expects NSF to take an active role in the development of a coordinated and prioritized research plan for EHS research across the agencies participating in the National Nanotechnology Initiative. The Committee also endorses NSF's support for research under the Social, Economic, and Workforce Implication component of the Networking and Information Technology Research and Development program since advancements in information technology and its growing pervasiveness in our society also raises substantial ethical and social questions.

The Committee is also aware that NSF funds some K–16 science, technology, engineering and mathematics (STEM) education activities from the R&RA account, and it encourages such activities. In particular, the Committee is interested in learning more about the synergies between research and education and how research grants can be used more effectively to stimulate both research endeavors and educational needs. The Committee included the requirement for the report in section 15 of the bill in order to gauge the scope and size of K–16 STEM education programs within R&RA. One valuable STEM education program funded through R&RA is the Research Experiences for Undergraduates (REU) program. The Committee recognizes the importance of the REU program for both recruitment and adequate training of students for careers or graduate studies in STEM fields. The REU program benefits not just the students by providing them with invaluable research experiences, but also the host institutions and the students' home institutions, by cross-pollinating ideas and people. The Committee is concerned about the adequacy of funding levels for the REU program in recent years and, consequently, included explicit language in the bill to ensure that funding for REU grows in proportion to the total research budget.

Education and Human Resources (EHR).—Once again, the Committee reiterates its strong support for the critical role that NSF plays in science, technology, engineering and mathematics (STEM) education at all levels, including K–12. Consequently, the funding authorized by the bill for the EHR budget grows at the same rate as the overall Foundation budget. In particular, the bill provides specific allocations for the K–12 STEM programs authorized in H.R. 362, including the Math and Science Partnerships Program, the Noyce Scholarships Program, and the STEM Talent Expansion Program. The FY 2008 authorization for EHR is higher than the President's request in order to accommodate the increase in the budgets for these specific programs while maintaining support for NSF's other education programs. The total FY 2008 authorization for NSF is $70 million more than the request, in order to accommodate the authorized increases in these critical K–12 education programs. The remainder of the funding increase required for these programs comes from a 1 percent reduction in the agency's proposed research budget. While the Committee strongly supports a growing NSF research budget, maintaining a robust STEM education budget is equally important, and it is necessary to address

past underfunding, particularly of the K–12 STEM education activities.

Workforce.—The Committee recognizes that administrative and operating expenses funded through the agency operations and award management (AOAM) account, including salaries, travel, infrastructure, information technology, and expansion of workspace, are putting a strain on the ability of the Foundation staff, and in particular the program officers, to keep up with the growing workload resulting from growing research budgets. The Committee strongly supports an AOAM budget that will help maintain a strong and healthy workforce and infrastructure in order to maintain a world class science agency. The Committee also understands that the Foundation is undertaking a long-range business plan, including a workforce plan, and expects that the Foundation will share the plan with Congress when it is complete.

Undergraduate STEM Education.—The language in Sec. 3(e) on undergraduate education is meant to underscore the importance of adequate funding for undergraduate programs, including for the Research Experiences for Undergraduates program and the Course, Curriculum, and Laboratory Improvement (CCLI) program. The Committee encourages NSF to take a more active role in disseminating the results of CCLI grants to other institutions, in particular to smaller institutions with fewer resources in emerging areas of science and technology both within and across disciplines. Furthermore, the Committee believes that the review panels for grants should have proportional representation relative to proposal pressure by type of institution, in order to ensure that panels take into consideration the unique conditions of each type of institution, including primarily undergraduate institutions. The Committee requests that NSF report on the three-year distribution of CCLI funding and success rates by type of institution, based on the highest academic degree conferred by the institution, along with the FY11 budget request.

With respect to the Advanced Technological Education (ATE) program, the Committee commends the Foundation for their successful efforts in building and expanding this program over the last 15 years. Community colleges are vital to educating the nation's STEM workforce, and many 2-year college graduates in STEM fields go straight into high-skills jobs, thanks in large part to the ATE program. However, there is growing demand in many industries for more advanced degrees. Therefore, the Committee believes that there is a need for increased emphasis on articulation between two-year and four-year institutions, as exemplified by the Process Technology ATE program at Houston Community College, and the related Gulf Coast Technology Articulation Partnership, an alliance of 100 industry members and 20 colleges. This program is focused on transitioning students from the Associate in Applied Science degree to the Bachelor of Science in Engineering Technology degree.

Service Sciences.—The Committee applauds the Foundation for its work to support the emerging multidisciplinary field of Service Science, which combines disciplines such as computer science, operations research, industrial engineering, business strategy and management sciences to meet the needs of the 21st century workforce. Services account for close to 80 percent of the U.S. economy, and sectors such as healthcare, energy, financial services, retail and

government, are increasingly reliant on service innovation. The Committee encourages NSF to continue its efforts and expand support for research and curricula development in this field.

Icebreakers.—It is the view of the Committee that polar icebreakers are essential instruments of United States national policy and that the U.S. Coast Guard should have the responsibility and the budget to construct new icebreakers and provide for the operations and maintenance costs of existing icebreakers, including any icebreakers required for resupply of U.S. Antarctic research facilities. The Committee endorses the National Academy of Sciences' recommendation for a Presidential Decision Directive to clearly align agency responsibilities and budgetary authorities accordingly.

Research Infrastructure.—In the Academic Research Facilities Modernization Act (Title II of the NSF Authorization Act of 1988 (42 U.S.C. 1862)), Congress created a program of awards for the repair, renovation, or, in exceptional cases, replacement of obsolete science and engineering facilities primarily devoted to research. Congress appropriated money for this program for a few years because the need at that time was dire. The Committee is interested in pursuing whether a need now exists to re-fund the program. To that end, the Committee requests that NSF and the Board revisit this issue and assess the relative priority of facilities modernization at academic institutions versus support for research awards, STEM education, and other types of research infrastructure for which NSF programs now exist (Major Research Equipment and Facilities Construction and Major Research Instrumentation). The Committee requests that NSF and the Board provide a report on the findings of their assessment to the Committee within one year of enactment of this Act.

SEC. 5. INTERDISCIPLINARY RESEARCH

The Committee recognizes that the Foundation is striving to respond to demands from within the community to support more interdisciplinary research and to develop a more coherent and transparent process for funding interdisciplinary research. Given how much the research enterprise has shifted in the last few years toward more interdisciplinary research, including more cyber-enabled research, and smaller and smaller dimensions that require a deep understanding of both biology and physics, we encourage the Director to develop a Foundation-wide policy to address the issue of interdisciplinary research.

In general, the Committee supports NSF efforts to promote interdisciplinary research across all directorates, such as between physical scientists and biological scientists, and at all levels of university research, from undergraduate research assistant through principal investigator. One successful model for interdisciplinary research is the Science and Technology Centers (STC) Integrative Partnerships program. The Committee strongly encourages the Foundation to fund new STCs in FY08 and beyond. In addition, the Committee encourages the Foundation to work with other appropriate agencies to foster interdisciplinary work across the agencies. For example, the Committee recommends that the Director explore the options for NSF to establish a program, in cooperation with the National Institutes of Health (NIH), to simultaneously advance the physical, mathematical, computational and life sciences—the so-

called "Bridging Sciences." The Committee understands that NIH is pursuing a similar proposal for collaboration with the NSF.

SEC. 6. PILOT PROGRAM OF GRANTS FOR NEW INVESTIGATORS

The Committee recognizes that this activity is already being implemented in some form in several of the research divisions, and commends those NSF staff for their role in mentoring young investigators. The Committee expects to see this scattered practice expanded into a Foundation-wide practice. On a related topic, the Committee understands that the Board has recommended a new Foundation-wide initiative on transformative research. The Committee requests that NSF provide the details of the implementation plan for the initiative when completed. Furthermore, the Committee recommends that the Director consider using this pilot program, at least in part, to fund young scientists with particularly novel, cutting-edge proposals—including those considered to be high-risk or transformative.

SEC. 7. BROADER IMPACTS MERIT REVIEW CRITERION

Research areas that have been identified as having high importance for future national economic competitiveness and that should warrant special consideration with respect to industry partnerships include such physical sciences, engineering and computing-related areas as nanotechnology, information technology, and communications technology. The Committee commends NSF for its leadership role in these areas and for its efforts to engage industry through the various Centers programs and other multi-year group awards. The Committee strongly encourages NSF to continue to issue solicitations for new awards under these programs.

The Committee does not intend in any way to devalue other broader impacts considered by review panels under Criterion 2, such as promoting learning and broadening participation. But, at the same time, the Committee understands from both the academic and industrial stakeholders that 1) much more can be done to foster university/industry partnerships across the Foundation and 2) for research in certain areas where industry has a direct long-range interest, it is appropriate to weight industry participation more heavily than other broader impacts.

The Committee is basing its emphasis on greater industry participation in part on the example set by the Semiconductor Industry Association (SIA) through its Nanoelectronics Research Initiative (NRI). In his March 29, 2007 testimony before the Research and Science Education Subcommittee, the NRI director stated that "the partnership between NSF and industry in NRI results in a more productive research program because it brings together the technical expertise of industrial research managers and university scientists. Moreover, by jointly funding research with industry, NSF can focus basic research efforts on scientific questions that have maximum potential economic impact." The SIA contribution to university basic research through the NRI is about $5 million per year, in addition to about $60 million invested in universities through research consortia. These numbers are modest to a multi-billion dollar industry, but significant to the university research enterprise.

The Committee supports the mission of NSF to support discovery research—that is, research that asks questions about how the world works before any particular problem or application has been identified. It is exactly this type of research that makes U.S. scientists the most creative in the world. However, when the federal government supports an initiative to address a specific challenge—in this case keeping the U.S. at the forefront of the innovation curve in areas such as nanotechnology and information technology—every opportunity should be taken to leverage private money and expertise. The NRI mission of finding a new computing switch to insure U.S. leadership in nanoelectronics is one example of where this can be done effectively, without compromising either NSF's mission to support basic research or the merit-review model through which it funds grants.

SEC. 9. RESPONSIBLE CONDUCT OF RESEARCH

The Committee recognizes that what constitutes "appropriate training" may not be the same for undergraduate students as for graduate students or postdocs. The Committee prefers to give the Director maximum flexibility in determining the full range of activities that would constitute appropriate training; however, the Committee does expect the Foundation to promptly develop and provide written guidelines and/or templates for universities to follow so that compliance can be verified by all parties, and to share any such guidelines with the Committee. When developing guidelines, the Foundation should bear in mind the financial impact that these measures will have on institutions and should seek to minimize such impacts accordingly.

The Committee recognizes that NSF grants are funded by federal taxpayer dollars. The Committee believes that it is important that federal research grant recipients are aware of the source of their funding and the responsibility that it carries. The Committee expects the Foundation to take steps to educate all of its grantees accordingly, and should consider requiring funding recipients to sign a certification that recognizes the source of the funding they are receiving and includes an agreement to conduct the research responsibly and consistent with the highest ethical and methodological standards.

SEC. 13. COST-SHARING

The Committee supports the Board's cost-sharing policy in general, especially as it pertains to research grants. However, there are specific programs and activities for which the Committee believes that cost-sharing requirements may be appropriate and tasks the Board to revisit their cost-sharing policy in the case of these limited number of programs and activities. The Committee is not at this time seeking a more comprehensive review of the cost-sharing policy.

SEC. 18. NATIONAL ACADEMY OF SCIENCES REPORT ON DIVERSITY IN STEM FIELDS

The National Academy's recent report, Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future, identified key policy recommendations for main-

taining American competitiveness. The report ranked the improvement of STEM education at the top of the list, and rightly recognized the need to ensure that students underrepresented in STEM disciplines, including women, low income and minority students, have equal access to the highest quality education in these disciplines. Following the "Gathering Storm" report, a 2006 NAS report considered, and made recommendations for overcoming, the barriers and bias faced by women in science and engineering. The Committee expects the Foundation to consider how the recommendations from that report can be incorporated into Foundation programs and practices.

The Committee would now like NAS to undertake an in-depth report on the unique challenges faced by underrepresented minorities and the steps that government, universities and the private sector can take to mitigate those challenges. The Committee expects the NAS report, when addressing the particular role of minority-serving institutions, to look across all types of minority-serving institutions, including Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities and other institutions of higher education serving a substantial number of minority students.

NSF has some critical programs, both within EHR and scattered throughout R&RA, to broaden participation in STEM fields. As long as the total budget for the Foundation continues to grow, the Committee expects programs at NSF designed to broaden the participation in STEM fields by individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) to receive annual funding increases at least in keeping with the rate of inflation.

Sec. 24 of the National Science Foundation Act of 2002 created a new program to award grants to minority-serving institutions to enhance the quality of undergraduate STEM education at such institutions. The Committee expects NSF to report on the status of this program, including total funding for the program and the distribution of awards made under the program. The Committee expects such a report within six months after enactment of this Act.

IX. Cost Estimate

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 1867 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 1867 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. Congressional Budget Office Cost Estimate

H.R. 1867—National Science Foundation Authorization Act of 2007

Summary: H.R. 1867 would authorize the appropriation of about $21 billion over the 2008–2010 period for ongoing operations of the National Science Foundation (NSF). NSF provides funding for basic research in science and engineering, as well as programs to improve science education and infrastructure. Assuming appropriation of the specified amounts, CBO estimates that implementing H.R. 1867 would cost $1.5 billion in 2008 and $19.5 billion over the 2008–2012 period. Enacting H.R. 1867 would have no significant effect on direct spending or revenues.

H.R. 1867 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA). The bill would benefit public institutions of higher education and any costs they may incur would result from complying with conditions for receiving federal assistance.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1867 is shown in the following table. The cost of this legislation falls within budget functions 050 (national defense) and 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—					
	2007	2008	2009	2010	2011	2012
SPENDING SUBJECT TO APPROPRIATION						
NSF Spending Under Current Law:						
Budget Authority	5,916	0	0	0	0	0
Estimated Outlays	5,631	4,451	2,083	769	253	8
Proposed Changes:						
Research and Related Activities:						
Authorization Level	0	5,080	5,457	5,863	0	0
Estimated Outlays	0	1,118	3,385	4,754	4,128	1,930
Education and Human Resources:						
Authorization Level	0	873	934	1,003	0	0
Estimated Outlays	0	105	461	721	766	435
Other NSF Activities:[1]						
Authorization Level	0	547	589	626	0	0
Estimated Outlays	0	299	448	563	260	137
Total Changes:						
Authorization Level	0	6,500	6,980	7,492	0	0
Estimated Outlays	0	1,522	4,294	6,038	5,154	2,502
NSF Spending Under H.R. 1867:						
Authorization Level	5,916	6,500	6,980	7,492	0	0
Estimated Outlays	5,631	5,973	6,377	6,807	5,407	2,510

[1] Includes funding for Agency Operations and Awards Management, Major Research Equipment and Facilities Construction, the Office of the Inspector General, and the Office of the National Science Board.

Basis of estimate: H.R. 1867 would authorize funding for NSF over the next three years. For this estimate, CBO assumes that the bill will be enacted in fiscal year 2007 and that the amounts authorized by the bill will be appropriated each year. Based on historical spending patterns, CBO estimates that implementing H.R. 1867 would cost about $19.5 billion over the 2008–2012 period, assuming appropriation of the specified amounts.

Research and related activities

H.R. 1867 would authorize the appropriation of $16.4 billion over the 2008–2010 period for programs under NSF's Research and Related Activities account. In 2007, these programs received an ap-

propriation of about $4.7 billion to support most of NSF's basic science, technology, engineering, and mathematics (STEM) research. Included in the bill's authorization level is $370 million over the three-year period for NSF's Major Research Instrumentation program, which provides grants to organizations to acquire and develop major research equipment that would not otherwise be available through other NSF programs. Based on historical spending patterns, CBO estimates that implementing these provisions would cost $1.1 billion in 2008 and $15.3 billion over the 2008–2012 period for ongoing research and related activities.

Education and human resources

The bill would authorize the appropriation of about $2.8 billion over the 2008–2010 period for NSF's Education and Human Resources programs. In 2007, these programs received an appropriation of $797 million to support and expand the STEM knowledge-base and workforce. Included in the bill's three-year authorization level is $303 million for Mathematics and Science Education Partnerships, $304 million for the Robert Noyce Scholarship Program, $159 million for the STEM Talent Expansion Program, and $166 million for the Advanced Technological Education program. Based on historical spending patterns, CBO estimates that implementing these provisions would cost $105 million in 2008 and $2.5 billion over the 2008–2012 period for ongoing operation of Education and Human Resources program.

Other NSF activities

The bill would authorize the appropriation of nearly $1.8 billion over the 2008–2010 period for other activities of NSF, including Agency Operations and Award Management ($925 million), Major Research Equipment and Facilities Construction ($787 million), the Office of the Inspector General ($38 million), and the Office of the National Science Board ($12 million). In 2007, NSF received appropriations totaling $453 million for these activities. Based on historical spending patterns, CBO estimates that implementing these provisions would cost $1.7 billion over the 2008–2012 period, assuming appropriation of the specified amounts.

Intergovernmental and private-sector impact: H.R. 1867 contains no intergovernmental or private-sector mandates as defined in UMRA. Public institutions of higher education would benefit from math and science grants programs authorized in the bill. Institutions that choose to participate in those programs may incur costs to comply with the conditions of the federal assistance, including cost-sharing requirements, but such costs would be incurred voluntarily.

Estimate prepared by: Federal Costs: Daniel Hoople. Impact on State, Local, and Tribal Governments: Lisa Ramirez-Branum. Impact on the Private Sector: Craig Cammarata.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

XI. Compliance With Public Law 104–4

H.R. 1867 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

The oversight findings and recommendations of the Committee on Science and Technology are reflected in the body of this report.

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause (3)(c) of House rule XIII, the goals of H.R. 1867 are to authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Science Foundation.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 1867.

XV. Federal Advisory Committee Statement

H.R. 1867 does not establish nor authorize the establishment of any advisory committee.

XVI. Congressional Accountability Act

The Committee finds that H.R. 1867 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. Earmark Identification

H.R. 1867 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9(d), 9(e), or 9(f) of rule XXI.

XVIII. Statement on Preemption of State, Local, or Tribal Law

This bill is not intended to preempt any state, local, or tribal law.

XIX. Changes in Existing Law Made by the Bill, as Reported

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 2002

* * * * * * *

SEC. 11. ESTABLISHMENT OF CENTERS FOR RESEARCH ON MATHEMATICS AND SCIENCE LEARNING AND EDUCATION IMPROVEMENT.

(a) Establishment.—

(1) In general.—(A) The Director shall award grants to institutions of higher education *or eligible nonprofit organiza-*

tions (or consortia thereof) to establish multidisciplinary Centers for Research on Learning and Education Improvement.

* * * * * * *

(b) SELECTION PROCESS.—

(1) APPLICATION.—An institution of higher education *or an eligible nonprofit organization* (or a consortium [of such institutions] *thereof*) seeking funding under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum, a description of—

(A) * * *

* * * * * * *

SEC. 15. ADMINISTRATIVE AMENDMENTS.

(a) BOARD MEETINGS.—

(1) * * *

* * * * * * *

(3) COMPLIANCE AUDIT.—The Inspector General of the Foundation shall conduct [an annual audit] *an audit every three years* of the compliance by the Board with the requirements described in paragraph (2). The audit shall examine the proposed and actual content of closed meetings and determine whether the closure of the meetings was consistent with section 552b of title 5, United States Code.

(4) REPORT.—Not later than February 15 of [each year] *every third year*, the Inspector General of the Foundation shall transmit to the Committee on Science of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Health, Education, Labor, and Pensions of the Senate the audit required under paragraph (3) along with recommendations for corrective actions that need to be taken to achieve fuller compliance with the requirements described in paragraph (2), and recommendations on how to ensure public access to the Board's deliberations.–

(5) MATERIALS RELATING TO CLOSED PORTIONS OF MEETINGS.—To facilitate the audit required under paragraph (3) of this subsection, the Office of the National Science Board shall maintain the General Counsel's certificate, the presiding officer's statement, and a transcript or recording of any closed meeting, for at least 3 years after such meeting.

* * * * * * *

NATIONAL SCIENCE FOUNDATION ACT OF 1950

* * * * * * *

NATIONAL SCIENCE BOARD

SEC. 4. (a) * * *

* * * * * * *

[(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than five professional staff members and such clerical staff members as may be necessary. Such staff shall be appointed by the Chairman and assigned at the direction of the Board. The professional members of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and the provisions of chapter 51 of such title relating to classification, and compensated at a rate not exceeding the maximum rate payable under section 5376 of such title, as may be necessary to provide for the performance of such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act. Each appointment under this subsection shall be subject to the same security requirements as those required for personnel of the Foundation appointed under section 14(a).]

(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than 5 professional staff members, technical and professional personnel on leave of absence from academic, industrial, or research institutions for a limited term and such operations and support staff members as may be necessary. Such staff shall be appointed by the Chairman and assigned at the direction of the Board. The professional members and limited term technical and professional personnel of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and the provisions of chapter 51 of such title relating to classification, and shall be compensated at a rate not exceeding the maximum rate payable under section 5376 of such title, as may be necessary to provide for the performance of such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act. Section 14(a)(3) shall apply to each limited term appointment of technical and professional personnel under this subsection. Each appointment under this subsection shall be subject to the same security requirements as those required for personnel of the Foundation appointed under section 14(a).

* * * * * * *

(j)(1) The Board shall render to the President[, for submission to] *and* the Congress no later than January 15 of each even numbered year, a report on indicators of the state of science and engineering in the United States.

(2) The Board shall render to the President [for submission to] *and* the Congress reports on specific, individual policy matters related to science and engineering and education in science and engineering, as the Board, the President, or the Congress determines the need for such reports.

* * * * * * *

GENERAL AUTHORITY OF FOUNDATION

SEC. 11. The Foundation shall have the authority, within the limits of available appropriations, to do all things necessary to carry out the provisions of this Act, including, but without being limited thereto, the authority—

(a) * * *

* * * * * * *

(f) to receive and use funds donated by others, if such funds are donated without restriction other than that they be used in furtherance of one or more of the general purposes of the Foundation*, except that funds may be donated for specific prize competitions*;

* * * * * * *

SECTION 201 OF THE NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 1998

SEC. 201. NATIONAL RESEARCH FACILITIES.

(a) FACILITIES PLAN.—

(1) * * *

(2) CONTENTS OF THE PLAN.—The plan shall include—

(A) * * *

* * * * * * *

(D) for each project funded under the major research equipment and facilities construction account *and for major upgrades of facilities in support of Antarctic research programs*—

(i) * * *

* * * * * * *

SECTION 6 OF THE NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 1975

SEC 6. (a) * * *

* * * * * * *

[(c) No more than one award shall be made under this section in any one fiscal year.**]**

(c) Up to three awards may be made under this section in any one fiscal year.

XX. COMMITTEE RECOMMENDATIONS

On April 25, 2007, the Committee on Science and Technology favorably reported the National Science Foundation Act by a voice vote, and recommended its enactment.

XXI. Proceedings of the Markup by the Subcommittee on Research and Science Education on H.R. 1867, the National Science Foundation Authorization Act of 2007

The Subcommittee met, pursuant to call, at 2:51 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Brian Baird [Chairman of the Subcommittee] presiding.

Chairman BAIRD. Good afternoon. The Subcommittee on Research and Science Education will come to order. Pursuant to notice, the Subcommittee on Research and Science meets to consider the following: H.R. 1867, the *National Science Foundation Authorization Act of 2007.* We will now proceed with the markup, beginning with opening statement, and I will begin.

I would like to thank everyone for being here first of all, especially my dear friend Vern Ehlers for his work in this. It is in the tradition of this committee that this has truly been a bipartisan effort, and I am pleased with the product we have produced. This afternoon, the Committee will markup H.R. 1867, the *National Science Foundation Authorization Act of 2007.* Dr. Ehlers and several other Members of the Subcommittee join me in introducing this bill, which was developed with input from a diverse range of stakeholders in the research and STEM education communities. NSF is the only federal agency whose mission is to support science and engineering across all disciplines. Currently, NSF funds 20 percent of all basic research conducted at American colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing. NSF is a proposal-driven agency. This means that the overwhelming of research grants funded by NSF are unsolicited, thereby helping to cultivate a scientific-research enterprise in which the capacity for creativity and innovation is unrivaled throughout the world.

NSF also has a mission to achieve excellence in U.S. science, technology, engineering, and mathematics education at all levels, in all settings from kindergarten through post-doctoral training, from classrooms to science museums to online resources.

The National Science Foundation was last authorized by Congress in 2002. In that Act, Congress authorized a five-year doubling for NSF. Unfortunately, in fiscal year 2007, the final year of the previous authorization, NSF's actual budget is only $5.9 billion, about three billion short of what was authorized in the last bill.

On the one hand, I am disappointed that we did not get more for NSF in the annual appropriations give-and-take, and at the same time, I am optimistic about NSF's prospects for increasing budgets in the next several years. What makes this authorization different is that we have the support of the Administration, the leadership in the House, Congress as a whole, and leading voices in industry

to pass legislation that helps keep our scientific enterprise and our capacity for innovation number one in the world.

As we see high-paying jobs outsourced, our children graduating high school well behind their international peers in understanding basic science, China surging ahead in the export of high-tech products, it has finally sunk in. Funding basic research and teaching our children math and science has a huge impact on our economy, on our competitiveness, and on the well being of our population.

H.R. 1867 will authorize nearly $21 billion for NSF over three years, representing an annual growth rate of just over seven percent. Of that total, $16.4 billion would be available to fund research, primarily through competitive grants; $2.8 billion would be available for STEM-education programs, including $765 million for three critical K through 12 programs, math and science partnerships, Noyce teacher scholarship, and the Tech Talent Program. And an additional $790 million would be available for construction of world-class research facilities and equipment. But NSF cannot keep up with the growing research and education budgets without support for a growing workforce and maintenance of its own infrastructure, including such seemingly mundane needs as office space and computers for its employees. Therefore, in this bill, we have also authorized an agency-operation budget that grows at the same seven percent rate for a total of $925 million over three years. The remaining $50 million would fund the National Science Board, the oversight body for the Foundation, and the Office of the Inspector General. In addition to authorizing appropriations for the Foundation, H.R. 1867 contains several other important provisions. Section 3 provides specific funding for the Advanced Technology Education Program, which to date has helped create 2,000 and 16,800 courses that successfully prepare two-year college students across the country for a high-tech workforce. Section 3 also increases the cap on awards for major research instrumentation, step-wise, as the total MRI budget grows in order to accommodate a wider range of state-of-the-art research tools. Section 5 requires an evaluation of NSF's role in supporting interdisciplinary research, which is increasingly central to scientific progress and technological innovation. Section 6 establishes a pilot program of one-year seed grants for new investigations to help improve funding rates for young investigators and stimulate higher risk research. Section 7 encourages university-industry partnerships to make every federal research dollar go further and to engage the private sector in setting research priorities in areas of national needs. Section 8 requires funded investigators to report on activities to mentor post-doctoral research scholars, the most under-mentored, under-compensated, and under-recognized segment of the higher education STEM pipeline. Section 9 requires NSF-funded institutions to train covered individuals, in particular students, in the responsible and ethical conduct of research. Section 12 encourages continuity of funding for certain STEM education programs that can continue to demonstrate success without requiring them to redesign and recompete their proposal every five years. Section 13 requires an evaluation of the impact of NSF's new cost-sharing policy on existing and potential university-industry partnerships.

In addition to the items just listed, the bill has several other provisions to address administrative and budget issues at the Foundation, require reports on area of interest to the Committee, and ensure that important programs continue to receive adequate attention and funding. As you can see, we did not just copy what was done before. I think we listened to the feedback of people from a broad spectrum, and improved the good work that had preceded us.

I would like to thank my colleague Dr. Ehlers and other Members of the Committee, including Ms. Hooley and Ms. Johnson, for their thoughtful contributions to this bipartisan bill. With your input, we have a stronger bill that addresses the needs of broad range of stakeholders in the scientific community. I urge my colleagues to support H.R. 1867 and yield the floor to my friend Mr. Ehlers.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

This afternoon the Research and Science Education Subcommittee will mark up H.R. 1867, the *National Science Foundation Authorization Act of 2007.* Dr. Ehlers and several other Members of the Subcommittee joined me in introducing this bill, which was developed with input from a diverse range of stakeholders in the research and STEM education communities.

NSF is the only federal agency whose mission is to support science and engineering across all disciplines. Currently, NSF funds 20 percent of all basic research conducted at American colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

NSF is a proposal-driven agency. That means that the overwhelming majority of research grants funded by NSF are unsolicited, thereby helping to cultivate a scientific research enterprise in which the capacity for creativity and innovation is unrivaled in the world.

NSF also has a mission to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education at all levels and in all settings, from kindergarten through post-doctoral training, from classrooms to science museums to online resources.

The National Science Foundation was last reauthorized by Congress in 2002. In that Act, Congress authorized a five-year doubling for NSF. Unfortunately, in fiscal year 2007, the final year of the previous authorization, NSF's actual budget is only $5.9 billion—about $3 billion short of what was authorized in the last bill.

On the one hand, I am disappointed that we didn't get more for NSF in the annual appropriations give-and-take. On the other hand, I am optimistic about NSF's prospects for steadily increasing budgets in the next several years. What makes this authorization different is that we have the support of the Administration, the Leadership in the House, Congress as a whole, *and* leading voices in industry, to pass legislation that helps keep our scientific enterprise—and our capacity for innovation—number one in the world.

As we see high-paying jobs outsourced, our children graduating high school well behind their international peers in understanding of basic science concepts, China surging ahead in export of high-tech products—it has finally sunk in. Funding basic research and teaching our kids math and science has a huge impact on our economy, on our competitiveness, and on the well-being of our population.

H.R. 1867 would authorize nearly $21 billion for NSF over three years—representing an annual growth rate of just over seven percent. Of that total—

- $16.4 billion would be available to fund research, primarily through competitive grants;
- $2.8 billion would be available for STEM education programs, including $765 million for three critical K–12 programs—Math and Science Partnerships, Noyce Teacher Scholarships, and the Tech Talent program; and
- $790 million would be available for construction of world-class research facilities and equipment.

But NSF can't keep up with the growing research and education budgets without support for a growing workforce and maintenance of its infrastructure, including such seemingly mundane needs as office space and computers for its employees.

Therefore, we have also authorized an agency operations budget that grows at the same seven percent rate, for a total of $925 million over three years.

The remaining $50 million would fund the National Science Board, the oversight body for the Foundation; and the Office of the Inspector General.

In addition to authorizing appropriations for the Foundation, H.R. 1867 contains several other important provisions—

- Section 3 provides specific funding for the Advanced Technological Education program, which to date has helped create 2,000 programs and 16,800 courses that successfully prepare two-year college students across the country for the high-tech workforce;
- Section 3 also increases the cap on awards for major research instrumentation step-wise as the total MRI budget grows, in order to accommodate a wider range of state-of-the-art research tools;
- Section 5 requires an evaluation of NSF's role in supporting interdisciplinary research, which is increasingly central to scientific progress and technological innovation;
- Section 6 establishes a pilot program of one-year seed grants for new investigators to help improve funding rates for young investigators and stimulate higher-risk research;
- Section 7 encourages university/industry partnerships in order to make every federal research dollar go further and to engage the private sector in setting research priorities in areas of national need;
- Section 8 requires funded investigators to report on activities to mentor postdoctoral research scholars—the most under-mentored, under-compensated, and under-recognized segment of the higher education STEM pipeline;
- Section 9 requires NSF-funded institutions to train covered individuals, in particular students, in the responsible and ethical conduct of research;
- Section 12 encourages continuity of funding for certain STEM education programs that can continue to demonstrate success, without requiring them to redesign and recompete their proposals every five years;
- Section 13 requires an evaluation of the impacts of NSF's new cost-sharing policy on existing and potential university/industry partnerships.

In addition to the items just listed, the bill has several other provisions to address administrative and budget issues at the Foundation, to require reports on areas of interest to the Committee, and to ensure that important programs continue to receive adequate attention and funding.

I would like to thank my colleague Dr. Ehlers and other Members of the Subcommittee, including Ms. Hooley and Ms. Johnson, for their thoughtful contributions to this bipartisan bill. With your input we have a stronger bill that addresses the needs of a broad range of stakeholders in the scientific community. I urge my colleagues to support H.R. 1867.

Mr. EHLERS. I thank Chairman Baird for yielding, but also and especially, I thank Chairman Baird and the Committee staff for their hard work on this bill. It is an excellent bill, and I am pleased that a large bipartisan group of Members of this committee have joined me in co-sponsoring the *National Science Foundation Authorization Act of 2007.*

This bill would provide a three-year authorization for the National Science Foundation, an agency that provides critical support for researchers, educators and students in science, technology, engineering and mathematics—usually abbreviated as STEM. Given the "flattening" of our world today, these subject are increasingly critical to our global competitiveness. The ability to innovate has always set the United States apart, and I believe that the expertise of the NSF has laid the groundwork for that reputation. American creativity has resulted in the highest standard of living in the world, a well as a large number of wonderful research developments and ideas that have come out of that. And we certainly want to keep encouraging that creativity and innovation. The *NSF Au-*

thorization Act of 2007 seeks to build on the foundation established over 60 years ago when Vannevar Bush's recommendations on science policy led to the creation of this unique institution. Among other things, it fortifies the Math and Science Partnership Program, expands the existing scholarship programs for STEM majors and creates new opportunities for innovative ideas to be funded.

I have said before that writing a bill such as this is particularly challenging because the NSF is typified by exceptional efficiency and successes. Finding areas of needed change is not an easy task. Nonetheless, we have heard from a number of witnesses, both internal and external to the Foundation, who have offered helpful insights on possible ways to strengthen the NSF. This subcommittee has incorporated some of that feedback in the bill that we are marking up today. I also expect that since this bill has been on somewhat of a fast track, there will be opportunities to improve it later in the process as we receive more comprehensive comments from NSF stakeholders. I am pleased that this bill establishes a pathway to double the total budget of the Foundation. In 2002, Congresswoman Biggert and I collaborated and the Congress wholeheartedly supported a five-year doubling path for the Foundation, though unfortunately, appropriations have fallen far short of that target. Personally, I would like to have us reinstitute that five-year doubling, but I am pleased that the bill at least establishes a 10-year instead of a five-year pathway. I hope the levels authorized will also be appropriated, and I do hope that someday we will be able to speed up both the authorization and appropriation processes. I know that many Members of this committee will work tirelessly to make sure that these numbers become a reality, and I would also call it a floor that hopefully we can do better than that. In addition, given the strong bipartisan support for the NSF, I would have also preferred to see this bill authorize the agency for more than three years.

Finally, I would like to mention an important provision absent from the bill we are marking up today. In the Antarctic, NSF performs important research on climate change, among other subjects, that requires the use of icebreakers. These boats are expensive to maintain and operate, yet are a critical part of the NSF's mission. For many years, these icebreakers were provided without cost to the NSF by the Coast Guard. In view of the Coast Guard's lack of resources at this point, causes partially by terrorism, we have developed a new problem here. While we wanted to—and I believe the Chair also wanted to do this—we wanted to solve this problem here. We could not do it because of jurisdictional problems. Another committee would have demanded that they look at the bill, and that would have held it up beyond reason. So I certainly concur with the Chairman's activity in removing that part, but I just simply want to say I believe the Committee needs to revisit this topic, perhaps on the Floor, perhaps in conference, but we have to, at some point, include the statutory language necessary to insure that NSF has the means to prudently manage Antarctic activities, including the use of icebreakers.

I look forward to working with Chairman Baird. I appreciate him on this bill and congratulate him on the product, and I look for-

ward to continue to work with him and colleagues on the bill. I yield back.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

I am pleased a bipartisan group of Members of this committee have joined me in co-sponsoring the *National Science Foundation Authorization Act of 2007,* and thank Chairman Baird and the Committee staff for their hard work.

This bill would provide a three-year authorization for the National Science Foundation (NSF), an agency that provides critical support for researchers, educators, and students in science, technology, engineering and mathematics (STEM). Given the "flattening" of our world today, these subjects are increasingly critical to our global competitiveness. The ability to innovate has always set the United States apart, and I believe that the expertise of the NSF has laid the groundwork for that distinguished reputation.

The *NSF Authorization Act of 2007* seeks to build on the foundation established over 60 years ago when Vannevar Bush's recommendations on science policy led to the creation of this unique institution. Among other things, it fortifies the Math and Science Partnership program, expands existing scholarship programs for STEM majors, and creates new opportunities for innovative ideas to be funded. I have said before that writing a bill such as this is particularly challenging because the NSF is typified by exceptional efficiency and success; finding areas of needed change is not an easy task. Nonetheless, we have heard from a number of witnesses, both internal and external to the Foundation, who have offered helpful insights on possible ways to strengthen the NSF. The Subcommittee has incorporated some of that feedback in the bill we are marking up today. I also expect that since this bill has been on somewhat of a fast track, there will be opportunities to improve it later in the process, as we receive more comprehensive comments from NSF stakeholders.

I am pleased that this bill establishes a pathway to double the total budget of the Foundation. In 2002, Congress wholeheartedly supported a five-year doubling path for the Foundation, though unfortunately appropriations have fallen far short of that target. Though I am discouraged the bill establishes a ten-year instead of five-year pathway, I hope that the levels authorized will also be appropriated. I know that many Members of this committee will work tirelessly to make sure these numbers become a reality. In addition, given the strong bipartisan support for the NSF, I would have also preferred to see this bill authorize the agency for more than three years.

Finally, I would like to mention an important provision absent from the bill we are marking up today. In the Antarctic, NSF performs important research on climate change among other subjects that requires the use of icebreakers. These boats are expensive to maintain and operate, yet are a critical part of the NSF's mission. While I understand mention of icebreakers has been removed from today's bill due to jurisdictional concerns, I believe the Committee needs to revisit this topic and include the statutory language necessary to ensure that NSF has the means to prudently manage Antarctic activities.

I look forward to working with Chairman Baird and my colleagues on this bill.

Chairman BAIRD. I thank Mr. Ehlers, and I would respond to your observation abut the icebreakers, that I fully share your commitment, and it is definitely something that we will take up in the Committee. It is an essential part of our polar activities, and we will make sure we do what we can, but you are right about the jurisdictional issues, and that is the reason that is not particularly addressed in the bill as it stands now.

Without objection, I would indicate that Members may place any statements in the record at this point. I would ask unanimous consent that the bill is considered as read and open to amendment at any point and that Members proceed with amendments in the order of the roster.

Without objection, so ordered.

The first amendment is to be offered by Eddie Bernice Johnson from Texas. She is not here, and I will offer the amendment in her stead.

She has been, as many of you know, a tireless of advocate of education for women and disadvantaged minorities, and this amendment and the following will reflect her commitment to that. This amendment would require the National Science Foundation to submit a plan to Congress each year for how it will allocate its education and human resource funds. Section 7 of the current NSF law mandates the agency submit a similar plan for the research and related activities portion of its budget; however, there has not been a requirement for NSF to report on how it will allocate its budget for education and human resource activities. This amendment mandates such a plan. It requires that this plan include a description of how the education and human resource funding allocations will, one, affect the average size and duration of the EHR grants supported by NSF; two, affect trends in research support for the effective instruction of math, science, engineering and technology; three, affect the K–20 pipeline for the study of STEM; and four, encourage the interest of under-represented minorities in STEM, and help prepare them to pursue post-secondary studies in these fields. Careful planning of NSF's education budget is important to achieving our shared objective in expanding the pool of scientists and engineers and improving the quality of math and science education in the U.S. For this reason, I support the amendment and urge its adoption. It occurs to me, I perhaps should have had the Clerk read the amendment first. So the Clerk will report the amendment.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

This amendment, which I am offering on behalf of Congressman Eddie Bernice Johnson, would require NSF to submit a plan to Congress each year for how it will allocate its Education and Human Resources Funds.

Section 7 of the current NSF law mandates that the agency submit a similar plan for the Research and Related Activities portion of its budget. However, there has not been a requirement for NSF to report on how it will allocate its budget for Education and Human Resources activities.

This amendment mandates such a plan. It requires that this plan include a description of how Education and Human Resources funding allocations will:

(1) affect the average size and duration of E&HR grants supported by NSF;
(2) affect trends in research support for the effective instruction of math, science, engineering and technology;
(3) affect the K–20 pipeline for the study of STEM; and
(4) encourage the interest of under-represented minorities in STEM, and help them prepare to pursue post-secondary studies in these fields.

Careful planning of NSF's Education budget is important to achieving our shared objective of expanding the pool of scientists and engineers and improving the quality of math and science education in the U.S. For this reason, I support this amendment and urge its adoption.

The CLERK. Amendment to H.R. 1867, offered by Ms. Eddie Bernice Johnson of Texas.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman, for considering this amendment to the *NSF Reauthorization Act of 2007.*

My amendment would require NSF to annually submit a plan for how the foundation will allocate its Education and Human Resources Funds.

The plan will be submitted to Members on the House and Senate Committees of science jurisdiction, and also to the Members on the Appropriations Committees.

Section 7 of the current NSF law mandates that the agency submit a similar plan for the Research and Related Activities portion of its budget.

This current policy directs NSF to describe how its budget allocations will affect the average size and duration of research grants.

The plan should also include information on trends in research support for major fields of science, math, and engineering.

However, there has not been a requirement for NSF to report on how it will allocate its budget for Education and Human Resources activities.

Mr. Chairman, Section 3 of the *NSF Authorization Act of 2002* states that NSF's policy objectives shall be, among others, to:

(1) expand the pool of scientists and engineers in the U.S.;

(2) improve the quality of math and science education, particularly in kindergarten through grade 12;

(3) raise post-secondary enrollment rates in STEM for individuals identified in section 33 or 34 of the *Science and Engineering Equal Opportunities Act;* and

(4) increase access to higher education in STEM fields for students from low-income households.

Careful planning of the Education section and other portions of the NSF budget is important for the success of these objectives.

This activity is also important to enable pertinent Congressional committees to oversee a transparent planning process and provide appropriate oversight. That is our mission.

As I mentioned, my amendment would require NSF to report a plan for the allocation of its Education and Human Resources budget for the upcoming fiscal year.

The amendment states that the plan shall include a description of how E&HR funding allocations:

(1) will affect the average size and duration of E&HR grants supported by NSF;

(2) will affect trends in research support for the effective instruction of math, science, engineering, and technology;

(3) will affect the K–20 pipeline for the study of STEM; and

(4) will encourage the interest of under-represented minorities in STEM, and help them prepare to pursue post-secondary studies in these fields.

My friend and colleague, Representative Rubén Hinojosa, a Member of the Education and Labor Committee, is a strong advocate of this policy change, as am I.

It is our intent that this amendment will draw greater focus and increased transparency on the planning and budgeting of NSF's STEM education activities.

I appreciate the Subcommittee's consideration of this amendment and yield back the balance of my time.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

And having already articulated the reasons that I support the amendment, I will now invite anyone—I was so excited to offer Eddie's amendment—I am happy to offer anyone else who wishes to make any additional comments.

Hearing none, the motion occurs on the amendment. All in favor will indicate by saying aye. Those opposed no.

The ayes have it. The amendment is agreed to.

The second amendment on the roster is an amendment offered by the gentlelady from Texas. I will again offer the amendment on her behalf. But this time, the Clerk will report the amendment before I do.

The CLERK. An amendment to H.R. 1867, offered by Ms. Eddie Bernice Johnson of Texas.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman, for considering my amendment.

As a Co-Chair of the Diversity & Innovation Caucus, I have a strong interest in ensuring that members of under-represented minorities have greater opportunities to enter—and succeed—in our science, technology, engineering and math workforce.

Mr. Chairman, I move to submit names of the Diversity and Innovation Caucus for the official record.

Current workforce trends compiled by NSF and other entities demonstrate that Blacks, Hispanics, Native Americans and other minorities are not entering STEM fields at rates proportionate to their numbers in our population.

Most recent NSF data reports that, of all scientists employed in this country, nearly 75 percent are White. A pitiful 3.5 percent are Black, and three percent are Hispanic. I respectfully submit this information for the record.

Mr. Chairman, of all the progress the United States has made in computing, technology, and health science, we are still not taking care of our minority populations!

For some reason, minorities are not entering the STEM workforce, and current NSF policies are not helping to change this problem.

My district, in Dallas, Texas, is 42 percent Black, and 34 percent Hispanic. A majority of the students in my district are members of under-represented minorities, and they live in high-poverty areas.

I believe that these children deserve a fair chance at access to highly qualified science and math instruction. These children deserve the same opportunities as students living in affluent areas to earn graduate degrees in STEM and succeed in the workforce.

Representative Silvestre Reyes, who represents the El Paso area in west Texas, strongly agrees with me that a *Gathering Storm*-like report should be done that contains policy suggestions to increase diversity in STEM.

Representative Reyes has been a strong advocate and good friend, and I want to acknowledge his engagement and good work on this issue.

This amendment would direct the NSF to work with the National Academy of Sciences to produce such a report.

The amendment states that the Foundation shall enter into an arrangement with the National Academy of Sciences for a report, to be transmitted to the Congress no later than one year after the date of enactment of this Act, about barriers to increasing the number of under-represented minorities in science, technology, engineering, and mathematics fields.

This report shall also identify strategies for bringing more under-represented minorities into the STEM workforce.

Mr. Chairman, I would like to thank you for your proactive stance on the diversity issue. Your partnership and support have been important to me, and your technical background is truly an asset to this committee.

I would also like to thank the staff, especially your designee and the staff of Chairman Gordon and Mr. Reyes, for their work on this legislation.

In closing, I urge the Members of this subcommittee to support this amendment intended to facilitate policies that will foster greater diversity in the STEM workforce. I yield back.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so order. And I will recognize myself for five minutes to explain the amendment.

This amendment, which I am also offering on behalf of Congresswoman Johnson was drafted also in cooperation with Congressman Silvestre Reyes. It would direct the NSF to work with the National Academy of Sciences to produce a report that contains policy suggestions to increase diversity in STEM. Current workforce trends, compiled by NSF and other entities, demonstrate that African Americans, Hispanics, Native Americans, and other minorities are not entering STEM fields at rate proportionate to their numbers in our population. The amendment states that the Foundation shall enter into an arrangement with the National Academy of Sciences for a report to be transmitted to Congress, not later than one year after the date of the enactment of this Act, about barriers to increasing the numbers of under-represented minorities in science, technology, engineering, and math fields. The report shall also identify strategies for bringing more under-represented minorities into the STEM workforce.

As Co-Chair of the Diversity and Innovation Caucus, Congresswoman Johnson, who has been a clear leader in the House on this issue, has worked tirelessly to ensure that members of under-represented minorities have greater opportunity to enter and succeed in our science, technology, engineering, and math workforce. I commend her and Congressman Reyes for their commitment, and would urge adoption of this amendment. Are there any additional Members? Mr. Ehlers is recognized for five minutes.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

This amendment, which I am also offering on behalf of Congresswoman Johnson, was drafted in cooperation with Congressman Silvestre Reyes. It would direct the NSF to work with the National Academy of Sciences to produce a report that contains policy suggestions to increase diversity in STEM.

Current workforce trends compiled by NSF and other entities demonstrate that African-Americans, Hispanics, Native Americans and other minorities are not entering STEM fields at rates proportionate to their numbers in our population.

The amendment states that the Foundation shall enter into an arrangement with the National Academy of Sciences for a report, to be transmitted to Congress not later than one year after the date of enactment of this Act, about barriers to increasing the number of under-represented minorities in science, technology, engineering, and mathematics fields.

The report shall also identify strategies for bringing more under-represented minorities into the STEM workforce.

As Co-Chair of the Diversity & Innovation Caucus, Congresswoman Johnson has been a clear leader in the House on this issue and has worked tirelessly to ensure that members of under-represented minorities have greater opportunities to enter and succeed in our science, technology, engineering, and math workforce.

I commend her for her commitment, and urge adoption of this amendment.

Mr. EHLERS. Thank you, Mr. Chairman.

I do support the amendment, but Mr. Reyes name was mentioned. Is he a Member of this committee?

Chairman BAIRD. No, he is not, but he worked with Ms. Johnson.

Mr. EHLERS. All right. I think his name cannot be on an amendment offered in the Committee.

Chairman BAIRD. All right. I appreciate that point. I was merely giving him credit where credit is due, but not officially on the amendment. Thank you. Any additional comments on the amendment? I appreciate that. Without any objection, then, we will proceed with the vote.

A vote occurs on the amendment. Those in favor will signify by saying aye. Those opposed no. The ayes have it. The motion carries and the amendment is adopted.

The third amendment on the roster is an amendment offered by the gentlelady, and my near neighbor, Ms. Hooley from the State of Oregon, who has also been a champion of these sorts of issues. Ms. Hooley, are you ready to proceed with your amendment?

Ms. HOOLEY. Mr. Chair, I have an amendment at the desk.

Chairman BAIRD. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 1867 offered by Ms. Hooley of Oregon.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentlelady from Oregon for five minutes to explain her amendment.

Ms. HOOLEY. Thank you, Mr. Chair. I would first like to thank you and the Ranking Member for all of your work on this issue,

and for your staff's willingness to work with my office to ensure that this legislation is the best that it can be.

I know that my colleagues join me in recognizing of promoting STEM education in this country as a means of preserving America's place in the global economy. My amendment does just that by seeing that a program with a proven track record for producing researchers and engineers is given the funding that it deserves in order to continue to serve our country's students.

My amendment establishes specific funding levels for the research experiences for undergraduate program, rather than having it exist as part of the general budget for the research and related activities section. This is an important designation to make, since the REU program has its funding not increase at the same rate as the rest of the Foundation. Anecdotal evidence suggests that students who are able to participate in REU programs to be trained in research are more likely to pursue careers and further education in STEM disciplines, becoming researchers, engineers, technicians, math and science teachers that our nation so desperately needs.

In my own district, students at Willamette University in Salem, Oregon, and Lewis and Clark College in Portland, Oregon have taken advantage of these funds to participate in summer research programs, both at their own schools and at schools across the country. In addition, larger research universities in my State, like Oregon State University, conduct summer research programs that draw REU students from across the country. The cross-pollination that occurs when students from different institutions and different regions have a chance to work together benefits the students, the host schools, and the schools that the students return to.

Again, I thank the Chairman for his support for this amendment and for the REU Program, and I urge my colleagues to join me in seeing that this program has the funding that it deserves.

Thank you, and I yield back.

[The prepared statement of Ms. Hooley follows:]

PREPARED STATEMENT OF REPRESENTATIVE DARLENE HOOLEY

Mr. Chairman, I have an amendment at the desk. Thank you Mr. Chairman. I would first like to thank you for your work on this issue and for you and your staff's willingness to work with my office to ensure that this legislation is the best that it can be.

I know that my colleagues join me in recognizing the importance of promoting STEM education in this country as a means of preserving America's place in the global economy. My amendment does just that by seeing that a program with a proven track record for producing researchers and engineers is given the funding that it deserves in order to continue to serve our country's students.

My amendment establishes specific funding levels for the Research Experiences for Undergraduates program rather than having it exist as part of the general budget for the Research and Related Activities section. This is an important designation to make since the REU program has seen its funding not increase at the same rate as the rest of the Foundation.

Anecdotal evidence suggests that students who are able to participate in REU programs and be trained in research are more likely to pursue careers and further education in STEM disciplines, becoming the researchers, engineers, technicians, and math and science teachers that our nation so desperately need.

In my own district, students at Willamette University in Salem, OR and Lewis and Clark College in Portland, OR have taken advantage of these funds to participate in summer research programs both at their own schools and at schools across the country.

In addition, larger research universities in my State, like Oregon State University, conduct summer research programs that draw REU students from across the country.

The cross-pollination that occurs when students from different institutions and different regions have a chance to work together benefits the students, the host schools, and the schools that the students return to.

Again, I thank the Chairman for his support for this amendment and for the REU program and I urge my colleagues to join me in seeing that this program has the funding that it deserves.

Thank you and I yield back the balance of my time.

Chairman BAIRD. I thank the gentlelady. Are there any other Members——

Mr. NEUBERGER. Mr. Chairman.

Chairman BAIRD. Yes, the gentleman from Texas.

Mr. NEUBERGER. Yes, I have a question for Ms. Hooley. Now, you said that these programs have been funded in another category in the past. Is that correct?

Ms. HOOEY. Well, they have been under a general funding category, and what has happened, those funds have gone down. For example, two years ago, they were at $58 million, and then they went to $56 million, and so what we are doing is saying they are an important part; they need their own designation. And we would put them—instead of being in the general category, they are put separate from that.

Mr. NEUBERGER. So did we reduce the general category by the amount commensurate with what you are specifically earmarking?

Ms. HOOLEY. No, the general category stays the same. It just designates that these go up on an annual basis.

Mr. NEUBERGER. So then we added additional authorization with this, rather than making it neutral?

Ms. HOOLEY. No, it is neutral.

Chairman BAIRD. If the gentleman would yield momentarily.

Essentially what happened was we fire-walled this within the existing program. The authorization already exists to allocate funds in this fashion. What has happened is basically those funds have been used for other purposes, thereby leaving less for this important area, and all this amendment does, it doesn't create a new program. It just recognizes one and firewalls a portion of the existing program for that purpose, recognizing its importance.

Mr. NEUBERGER. And this amendment does not increase that amount of authorization in the original bill. Is that correct?

Chairman BAIRD. Absolutely correct.

Ms. HOOLEY. No.

Mr. NEUBERGER. I thank the gentlewoman. Thank you.

Ms. HOOLEY. Thank you.

Chairman BAIRD. I thank the gentleman for his question. Mr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I am really torn on this amendment because I very strongly support the program. It is an excellent program, and I have seen the results of it myself. And I also support the intent of the amendment.

At the same time, we have always tried to minimize the amount to which we subdivide the NSF budget and authorize bits and pieces of it for a couple of reasons. First of all, they operate under an organic act, and they have been given considerable freedom to operate within that. Another reason is that if we start designating

or authorizing separately, that may well lead to this becoming a line-item at some point, and very often line-items like that are more susceptible to attack, rather than simply lumping it together and letting the Foundation decide.

Another factor is that the decreases of the past—let us see, just the last two budgets when—'08 is up slightly from '07; '07 was down a little. But that was an abysmal year financially all of the way around.

So I am torn. I would think a better approach to take would be a sense of Congress or else report language saying how important we believe this is, and encouraging the Foundation to increase the amount allocated to it, thereby not infringing on their wishes, but also making it clear what our wishes are. And I think it would probably have the same effect without impinging on their ability to make their decisions freely.

My concern is not so great that I will oppose the amendment or fight against it, but I just wanted to register that point. And I hope as this bill proceeds, we can try to work out an accommodation that ensures that these institutions do get this money, because they should have it, and frankly, I think it should be increased. But also, make it clear that we do not want to break tradition and start authorizing relatively small programs, that might in some way make them more susceptible in the future.

So I will be happy to support the amendment and continue working with you and sponsor the amendment to see if we can come up with a good solution to that problem.

Thank you. I yield back.

Chairman BAIRD. I respect and appreciate the gentleman's comments, and I will yield myself five minutes. As both Mr. Ehlers and I taught at the university level and taught undergraduates, I think we both know, personally, the absolute importance of proving high-quality research opportunities for undergraduates, both because when they graduate, they will be expected to have skill levels that they will acquire from doing research themselves, but also this is the seed corn, if you will, for our graduate programs. And under-funded or under-equipped undergraduate opportunities will limit their ability to do that. And it is almost precisely because this is a relatively small portion of the NSF's budget overall that I think we provide some protection for that.

I, however, agree that we don't necessarily want to micro-manage these NSF funding bills, but at the same time, we want to—I think it is valid for the Congress to put down a marker on behalf of undergraduate education, if one looks at the relative percentage of expenditures that are dedicated to that function versus other uses, and I think that is what Congresswoman Hooley is focusing on, as a former educator herself, and when you visit our colleges and universities and you see the vast bulk of the students there are, indeed, in the undergraduate programs, making sure we have a bit of protection for them is sound.

I appreciate the gentleman's indication that he will be supportive of this, but I also think we can probably work together to see how we can best recognize and respect your concerns while protecting this, I think, important function of NSF for the literally hundreds

of thousands of undergraduates who have a potential to benefit from it.

Other Members wishing to offer comments or amendment?

With that, the motion occurs on the vote. All in favor will say aye. Those opposed will say no.

They ayes have it, and the amendment is agreed to.

Are there any other amendments? Hearing none, the vote will be on the Bill H.R. 1867, the *National Science Foundation Authorization Act of 2007,* as amended.

All those in favor will signify by saying aye. All those opposed will say no.

In the opinion of the Chair, the ayes have it. Those are the kinds of votes we like.

I recognize Mr. Ehlers to offer a motion.

Mr. EHLERS. Mr. Chairman, I move that the Subcommittee favorably report H.R. 1867, as amended, to the Full Committee. Furthermore, I move that staff be instructed to prepare the Subcommittee a legislative report and make necessary technical and conforming changes to the bill, as amended, in accordance with the recommendation of the Subcommittee.

Chairman BAIRD. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table. Additionally, Subcommittee Members may submit additional or minority views on the measure.

I want to thank the Members for their attendance and all of those who have contributed to this, particularly the staff for their long, long hours of hard work. With that, this concludes our subcommittee markup.

[Whereupon, at 3:18 p.m., the Subcommittee was adjourned.]

Appendix:

H.R. 1867, Section-by-Section Summary, Amendment Roster

.....
(Original Signature of Member)

110TH CONGRESS
1ST SESSION

H. R. _____

To authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Science Foundation, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. BAIRD (for himself and [see ATTACHED LIST of cosponsors]) introduced the following bill; which was referred to the Committee on

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A BILL

To authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Science Foundation, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Science Foundation Authorization Act of 2007".

SEC. 2. DEFINITIONS.

In this Act:

(1) BOARD.—The term ''Board'' means the National Science Board established under section 2 of the National Science Foundation Act of 1950 (42 U.S.C. 1861).

(2) DIRECTOR.—The term ''Director'' means the Director of the Foundation.

(3) ELEMENTARY SCHOOL.—The term ''elementary school'' has the meaning given that term by section 9101(18) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801(18)).

(4) FOUNDATION.—The term ''Foundation'' means the National Science Foundation.

(5) INSTITUTION OF HIGHER EDUCATION.—The term ''institution of higher education'' has the meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(6) SECONDARY SCHOOL.—The term ''secondary school'' has the meaning given that term by section 9101(38) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801(38)).

SEC. 3. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2008.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $6,500,000,000 for fiscal year 2008.

1 (2) SPECIFIC ALLOCATIONS.—Of the amount
2 authorized under paragraph (1)—
3 (A) $5,080,000,000 shall be made avail-
4 able for research and related activities, of which
5 $115,000,000 shall be made available for the
6 Major Research Instrumentation program;
7 (B) $873,000,000 shall be made available
8 for education and human resources, of which—
9 (i) $94,000,000 shall be for Mathe-
10 matics and Science Education Partner-
11 ships established under section 9 of the
12 National Science Foundation Authorization
13 Act of 2002 (42 U.S.C. 1862n);
14 (ii) $70,000,000 shall be for the Rob-
15 ert Noyce Scholarship Program established
16 under section 10 of the National Science
17 Foundation Authorization Act of 2002 (42
18 U.S.C. 1862n–1);
19 (iii) $44,000,000 shall be for the
20 Science, Mathematics, Engineering, and
21 Technology Talent Expansion Program es-
22 tablished under section 8(7) of the Na-
23 tional Science Foundation Authorization
24 Act of 2002 (Public Law 107–368); and

1 (iv) $51,620,000 shall be for the Ad-
2 vanced Technological Education program
3 established by section 3(a) of the Scientific
4 and Advanced-Technology Act of 1992
5 (Public Law 102–476);
6 (C) $245,000,000 shall be made available
7 for major research equipment and facilities con-
8 struction;
9 (D) $285,600,000 shall be made available
10 for agency operations and award management;
11 (E) $4,050,000 shall be made available for
12 the Office of the National Science Board; and
13 (F) $12,350,000 shall be made available
14 for the Office of Inspector General.
15 (b) FISCAL YEAR 2009.—
16 (1) IN GENERAL.—There are authorized to be
17 appropriated to the Foundation $6,980,000,000 for
18 fiscal year 2009.
19 (2) SPECIFIC ALLOCATIONS.—Of the amount
20 authorized under paragraph (1)—
21 (A) $5,457,400,000 shall be made avail-
22 able for research and related activities, of which
23 $123,100,000 shall be made available for the
24 Major Research Instrumentation program;

1 (B) $934,000,000 shall be made available
2 for education and human resources, of which—
3 (i) $100,600,000 shall be for Mathe-
4 matics and Science Education Partner-
5 ships established under section 9 of the
6 National Science Foundation Authorization
7 Act of 2002 (42 U.S.C. 1862n);
8 (ii) $101,000,000 shall be for the
9 Robert Noyce Scholarship Program estab-
10 lished under section 10 of the National
11 Science Foundation Authorization Act of
12 2002 (42 U.S.C. 1862n–1);
13 (iii) $55,000,000 shall be for the
14 Science, Mathematics, Engineering, and
15 Technology Talent Expansion Program es-
16 tablished under section 8(7) of the Na-
17 tional Science Foundation Authorization
18 Act of 2002 (Public Law 107–368); and
19 (iv) $55,200,000 shall be for the Ad-
20 vanced Technological Education program
21 as established by section 3(a) of the Sci-
22 entific and Advanced-Technology Act of
23 1992 (Public Law 102–476);

(C) $262,000,000 shall be made available for major research equipment and facilities construction;

(D) $309,760,000 shall be made available for agency operations and award management;

(E) $4,120,000 shall be made available for the Office of the National Science Board; and

(F) $12,720,000 shall be made available for the Office of Inspector General.

(c) FISCAL YEAR 2010.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $7,493,000,000 for fiscal year 2010.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $5,863,200,000 shall be made available for research and related activities, of which $131,700,000 shall be made available for the Major Research Instrumentation program;

(B) $1,003,000,000 shall be made available for education and human resources, of which—

(i) $107,600,000 shall be for Mathematics and Science Education Partnerships established under section 9 of the

1 National Science Foundation Authorization
2 Act of 2002 (42 U.S.C. 1862n);
3 (ii) $133,000,000 shall be for the
4 Robert Noyce Scholarship Program estab-
5 lished under section 10 of the National
6 Science Foundation Authorization Act of
7 2002 (42 U.S.C. 1862n–1);
8 (iii) $60,000,000 shall be for the
9 Science, Mathematics, Engineering, and
10 Technology Talent Expansion Program es-
11 tablished under section 8(7) of the Na-
12 tional Science Foundation Authorization
13 Act of 2002 (Public Law 107–368); and
14 (iv) $59,100,000 shall be for the Ad-
15 vanced Technological Education program
16 as established by section 3(a) of the Sci-
17 entific and Advanced-Technology Act of
18 1992 (Public Law 102–476);
19 (C) $280,000,000 shall be made available
20 for major research equipment and facilities con-
21 struction;
22 (D) $329,450,000 shall be made available
23 for agency operations and award management;
24 (E) $4,250,000 shall be made available for
25 the Office of the National Science Board; and

(F) $13,100,000 shall be made available for the Office of Inspector General.

(d) MAJOR RESEARCH INSTRUMENTATION.—

(1) AWARD AMOUNT.—The minimum amount of an award under the Major Research Instrumentation program shall be $100,000. The maximum amount of an award under the program shall be $6,000,000, except—

(A) if the total amount appropriated for the program for a fiscal year exceeds $125,000,000, in which case the maximum amount of an award shall be $8,000,000; or

(B) if the total amount appropriated for the program for a fiscal year exceeds $200,000,000, in which case the maximum amount of an award shall be $12,000,000.

(2) USE OF FUNDS.—In addition to the acquisition of instrumentation and equipment, funds made available by awards under the Major Research Instrumentation program may be used to support the operations and maintenance of such instrumentation and equipment.

(3) COST SHARING.—

(A) IN GENERAL.—An institution of higher education receiving an award shall provide at

1 least 30 percent of the cost from private or
2 non-Federal sources.
3 (B) EXCEPTIONS.—Institutions of higher
4 education that are not Ph.D.-granting institu-
5 tions are exempt from the cost sharing require-
6 ment in subparagraph (A), and the Director
7 may reduce or waive the cost sharing require-
8 ment for institutions—
9 (i) which are not ranked among the
10 top 100 institutions receiving Federal re-
11 search and development funding, as docu-
12 mented by the statistical data published by
13 the Foundation; and
14 (ii) for which the proposed project will
15 make a substantial improvement in the in-
16 stitution's capabilities to conduct leading
17 edge research, to provide research experi-
18 ences for undergraduate students using
19 leading edge facilities, and to broaden the
20 participation in science and engineering re-
21 search by individuals identified in section
22 33 or 34 of the Science and Engineering
23 Equal Opportunities Act (42 U.S.C. 1885a
24 or 1885b).

1 (e) UNDERGRADUATE EDUCATION PROGRAMS.—The
2 Director shall continue to carry out programs in support
3 of undergraduate education, including those authorized in
4 section 17 of the National Science Foundation Authoriza-
5 tion Act of 2002 (42 U.S.C. 1862n–6). Funding for these
6 programs shall increase in proportion to the increase in
7 the total amount appropriated to the Foundation in any
8 year for which appropriations are authorized by this Act.
9 (f) LIMIT ON PROPOSALS.—
10 (1) POLICY.—For programs that require as
11 part of the selection process for awards the submis-
12 sion of preproposals and that also limit the number
13 of preproposals that may be submitted by an institu-
14 tion, the Director shall allow the subsequent submis-
15 sion of a full proposal based on each preproposal
16 that is determined to have merit following the Foun-
17 dation's merit review process.
18 (2) REVIEW AND ASSESSMENT OF POLICIES.—
19 The Board shall review and assess the effects on in-
20 stitutions of higher education of the policies of the
21 Foundation regarding the imposition of limitations
22 on the number of proposals that may be submitted
23 by a single institution for programs supported by the
24 Foundation. The Board shall determine whether cur-
25 rent policies are well justified and appropriate for

the types of programs that limit the number of proposal submissions. Not later that 1 year after the date of enactment of this Act, the Board shall summarize its findings and any recommendations regarding changes to the current policy on the restriction of proposal submissions in a report to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate.

SEC. 4. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT.

The Director shall continue to carry out the program of Centers for Research on Learning and Education Improvement as established in section 11 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–2).

SEC. 5. INTERDISCIPLINARY RESEARCH.

(a) IN GENERAL.—The Board shall evaluate the role of the Foundation in supporting interdisciplinary research, including through the Major Research Instrumentation program, the effectiveness of the Foundation's efforts in providing information to the scientific community about opportunities for funding of interdisciplinary research pro-

1 posals, and the process through which interdisciplinary
2 proposals are selected for support. The Board shall also
3 evaluate the effectiveness of the Foundation's efforts to
4 engage undergraduate students in research experiences in
5 interdisciplinary settings, including through the Research
6 in Undergraduate Institutions program and the Research
7 Experiences for Undergraduates program.

8 (b) REPORT.—Not later than 1 year after the date
9 of enactment of this Act, the Board shall provide the re-
10 sults of its evaluation under subsection (a), including a
11 recommendation for the proportion of the Foundation's re-
12 search and related activities that should be allocated for
13 interdisciplinary research, to the Committee on Science
14 and Technology of the House of Representatives and the
15 Committee on Commerce, Science, and Transportation
16 and the Committee on Health, Education, Labor, and
17 Pensions of the Senate.

18 **SEC. 6. PILOT PROGRAM OF GRANTS FOR NEW INVESTIGA-**
19 **TORS.**

20 (a) IN GENERAL.—The Director shall carry out a
21 pilot program to award one-year grants to individuals to
22 assist them in improving research proposals that were pre-
23 viously submitted to the Foundation but not selected for
24 funding.

1 (b) USE OF FUNDS.—Grants awarded under this sec-
2 tion shall be used to support the generation of new data
3 and the performance of additional analysis to enable an
4 individual to resubmit an updated research proposal for
5 review by the Foundation through the agency's competi-
6 tive merit review process.
7 (c) ELIGIBILITY.—To be eligible to receive a grant
8 under this section, an individual shall—
9 (1) not have previously received funding as the
10 principal investigator of a research grant from the
11 Foundation; and
12 (2) have submitted a proposal to the Founda-
13 tion, which may include a proposal submitted to the
14 Research in Undergraduate Institutions program,
15 that was rated very good or excellent under the
16 Foundation's competitive merit review process.
17 (d) SELECTION PROCESS.—The Director shall make
18 awards under this section based on the advice of the pro-
19 gram officers of the Foundation.
20 (e) PROGRAM ADMINISTRATION.—The Director may
21 carry out this section through the Small Grants for Ex-
22 ploratory Research program.
23 (f) NATIONAL SCIENCE BOARD REVIEW.—The
24 Board shall conduct a review and assessment of the pilot
25 program under this section, including the number of new

1 investigators funded, the distribution of awards by type
2 of institution of higher education, and the success rate
3 upon resubmittal of proposals by new investigators funded
4 through this pilot program. Not later than 3 years after
5 the date of enactment of this Act, the Board shall summa-
6 rize its findings and any recommendations regarding
7 changes to or the continuation of the pilot program in a
8 report to the Committee on Science and Technology of the
9 House of Representatives and the Committee on Com-
10 merce, Science, and Transportation and the Committee on
11 Health, Education, Labor, and Pensions of the Senate.

12 **SEC. 7. BROADER IMPACTS MERIT REVIEW CRITERION.**

13 (a) IN GENERAL.—In evaluating research proposals
14 under the Foundation's broader impacts criterion, the Di-
15 rector shall give special consideration to proposals that in-
16 volve partnerships between academic researchers and in-
17 dustrial scientists and engineers that address research
18 areas that have been identified as having high importance
19 for future national economic competitiveness, such as
20 nanotechnology.

21 (b) PARTNERSHIPS WITH INDUSTRY.—The Director
22 shall encourage research proposals from institutions of
23 higher education that involve partnerships with businesses
24 and organizations representing businesses in fields that
25 have been identified as having high importance for future

1 national economic competitiveness and that include input
2 on the research agenda from and cost-sharing by the in-
3 dustry partners.

4 (c) REPORT ON BROADER IMPACTS CRITERION.—
5 Not later than 1 year after the date of enactment of this
6 Act, the Director shall transmit to Congress a report on
7 the impact of the broader impacts grant criterion used by
8 the Foundation. The report shall—

9 (1) identify the criteria that each division and
10 directorate of the Foundation uses to evaluate the
11 broader impacts aspects of research proposals;

12 (2) provide a breakdown of the types of activi-
13 ties by division that awardees have proposed to carry
14 out to meet the broader impacts criterion;

15 (3) provide any evaluations performed by the
16 Foundation to assess the degree to which the broad-
17 er impacts aspects of research proposals were car-
18 ried out and how effective they have been at meeting
19 the goals described in the research proposals;

20 (4) describe what national goals, such as im-
21 proving undergraduate science, mathematics, and
22 engineering education, improving K–12 science and
23 mathematics education, promoting university-indus-
24 try collaboration and technology transfer, and broad-
25 ening participation of underrepresented groups, the

1 broader impacts criterion is best suited to promote;
2 and
3 (5) describe what steps the Foundation is tak-
4 ing and should take to use the broader impacts cri-
5 terion to improve undergraduate science, mathe-
6 matics, and engineering education.

7 **SEC. 8. POSTDOCTORAL RESEARCH FELLOWS.**

8 (a) MENTORING.—The Director shall require that all
9 grant applications that include funding to support
10 postdoctoral researchers include a description of the men-
11 toring activities that will be provided for such individuals,
12 and shall ensure that this part of the application is evalu-
13 ated under the Foundation's broader impacts merit review
14 criterion. Mentoring activities may include career coun-
15 seling, training in preparing grant applications, guidance
16 on ways to improve teaching skills, and training in re-
17 search ethics.

18 (b) REPORTS.—The Director shall require that an-
19 nual reports and the final report for research grants that
20 include funding to support postdoctoral researchers in-
21 clude a description of the mentoring activities provided to
22 such researchers.

23 **SEC. 9. RESPONSIBLE CONDUCT OF RESEARCH.**

24 The Director shall require that each institution that
25 applies for financial assistance from the Foundation for

1 science and engineering research or education describe in
2 its grant proposal a plan to provide appropriate training
3 and oversight in the responsible and ethical conduct of re-
4 search to undergraduate students, graduate students, and
5 postdoctoral researchers participating in the proposed re-
6 search project.

7 **SEC. 10. REPORTING OF RESEARCH RESULTS.**

8 The Director shall ensure that all final project re-
9 ports and citations of published research documents re-
10 sulting from research funded, in whole or in part, by the
11 Foundation, are made available to the public in a timely
12 manner and in electronic form through the Foundation's
13 Web site.

14 **SEC. 11. SHARING RESEARCH RESULTS.**

15 An investigator supported under a Foundation
16 award, whom the Director determines has failed to comply
17 with the provisions of section 734 of the Foundation Grant
18 Policy Manual, shall be ineligible for a future award under
19 any Foundation supported program or activity. The Direc-
20 tor may restore the eligibility of such an investigator on
21 the basis of the investigator's subsequent compliance with
22 the provisions of section 734 of the Foundation Grant Pol-
23 icy Manual and with such other terms and conditions as
24 the Director may impose.

1 **SEC. 12. FUNDING FOR SUCCESSFUL STEM EDUCATION**
2 **PROGRAMS.**

3 (a) EVALUATION OF PROGRAMS.—The Director shall,
4 on an annual basis, evaluate all of the Foundation's grants
5 that are scheduled to expire within one year and—

6 (1) that have the primary purpose of meeting
7 the objectives of the Science and Engineering Equal
8 Opportunity Act (42 U.S.C. 1885 et seq.); or

9 (2) that have the primary purpose of providing
10 teacher professional development.

11 (b) CONTINUATION OF FUNDING.—For grants that
12 are identified under subsection (a) and that are deemed
13 by the Director to be successful in meeting the objectives
14 of the initial grant solicitation, the Director may extend
15 the duration of those grants for up to 3 additional years
16 beyond their scheduled expiration without the requirement
17 for a recompetition. The Director may extend such grants
18 for an additional 3 years following a second review within
19 1 year before the extended completion date, in accordance
20 with subsection (a), and the determination by the Director
21 that the objectives of the grant are being achieved.

22 (c) REPORT TO CONGRESS.—Not later than 2 years
23 after the date of enactment of this Act, the Director shall
24 submit a report to the Committee on Science and Tech-
25 nology of the House of Representatives and to the Com-
26 mittee on Commerce, Science, and Transportation and the

1 Committee on Health, Education, Labor, and Pensions of
2 the Senate that—
3 (1) lists the grants which have been extended in
4 duration by the authority provided under this sec-
5 tion; and
6 (2) provides any recommendations the Director
7 may have regarding the extension of the authority
8 provided under this section to programs other than
9 those specified in subsection (a).

10 **SEC. 13. COST SHARING.**

11 (a) IN GENERAL.—The Board shall evaluate the im-
12 pact of its policy to eliminate cost sharing for research
13 grants and cooperative agreements for existing programs
14 that were developed around industry partnerships and his-
15 torically required industry cost sharing, such as the Engi-
16 neering Research Centers and Industry/University Coop-
17 erative Research Centers. The Board shall also consider
18 the impact that the cost sharing policy has on initiating
19 new programs for which industry interest and participa-
20 tion are sought.

21 (b) REPORT.—Not later than 6 months after the date
22 of enactment of this Act, the Board shall report to the
23 Committee on Science and Technology and the Committee
24 on Appropriations of the House of Representatives, and
25 the Committee on Commerce, Science, and Transpor-

1 tation, the Committee on Health, Education, Labor, and
2 Pensions, and the Committee on Appropriations of the
3 Senate, on the results of the evaluation under subsection
4 (a).

5 **SEC. 14. DONATIONS.**

6 Section 11(f) of the National Science Foundation Act
7 of 1950 (42 U.S.C. 1870(f)) is amended by inserting at
8 the end before the semicolon ", except that funds may be
9 donated for specific prize competitions".

10 **SEC. 15. ADDITIONAL REPORTS.**

11 (a) REPORT ON FUNDING FOR MAJOR FACILITIES.—
12 (1) PRECONSTRUCTION FUNDING.—The Board
13 shall evaluate the appropriateness of the require-
14 ment that funding for detailed design work and
15 other preconstruction activities for major research
16 equipment and facilities come exclusively from the
17 sponsoring research division rather than being avail-
18 able, at least in part, from the Major Research
19 Equipment and Facilities Construction account.
20 (2) MAINTENANCE AND OPERATION COSTS.—
21 The Board shall evaluate the appropriateness of the
22 Foundation's policies for allocation of costs for, and
23 oversight of, maintenance and operation of major re-
24 search equipment and facilities.

1 (3) REPORT.—Not later than 6 months after
2 the date of enactment of this Act, the Board shall
3 report on the results of the evaluations under para-
4 graphs (1) and (2) and on any recommendations for
5 modifying the current policies related to allocation of
6 funding for major research equipment and facilities
7 to the Committee on Science and Technology and
8 the Committee on Appropriations of the House of
9 Representatives, and to the Committee on Com-
10 merce, Science, and Transportation, the Committee
11 on Health, Education, Labor, and Pensions, and the
12 Committee on Appropriations of the Senate.
13 (b) INCLUSION OF POLAR FACILITIES UPGRADES IN
14 MAJOR RESEARCH EQUIPMENT AND FACILITIES CON-
15 STRUCTION PLAN.—Section 201(a)(2)(D) of the National
16 Science Foundation Authorization Act of 1998 (42 U.S.C.
17 1862l(a)(2)(D)) is amended by inserting ''and for major
18 upgrades of facilities in support of Antarctic research pro-
19 grams'' after ''facilities construction account''.
20 (c) REPORT ON EDUCATION PROGRAMS WITHIN THE
21 RESEARCH DIRECTORATES.—Not later than 6 months
22 after the date of enactment of this Act, the Director shall
23 transmit to the Committee on Science and Technology of
24 the House of Representative and the Committee on Com-
25 merce, Science, and Transportation and the Committee on

1 Health, Education, Labor, and Pensions of the Senate a
2 report cataloging all elementary and secondary school, in-
3 formal, and undergraduate educational programs and ac-
4 tivities supported through appropriations for Research
5 and Related Activities. The report shall display the pro-
6 grams and activities by directorate, along with estimated
7 funding levels for the fiscal years 2006, 2007, and 2008,
8 and shall provide a description of the goals of each pro-
9 gram and activity. The report shall also describe how the
10 programs and activities relate to or are coordinated with
11 the programs supported by the Education and Human Re-
12 sources Directorate.

13 (d) REPORT ON RESEARCH IN UNDERGRADUATE IN-
14 STITUTIONS PROGRAM.—The Director shall transmit to
15 Congress along with the fiscal year 2011 budget request
16 a report listing the funding success rates and distribution
17 of awards for the Research in Undergraduate Institutions
18 program, by type of institution based on the highest aca-
19 demic degree conferred by the institution, for fiscal years
20 2008, 2009, and 2010.

21 **SEC. 16. ADMINISTRATIVE AMENDMENTS.**

22 (a) TRIANNUAL AUDIT OF THE OFFICE OF THE NA-
23 TIONAL SCIENCE BOARD.—Section 15(a) of the National
24 Science Foundation Authorization Act of 2002 (42 U.S.C.
25 4862n–5) is amended—

1 (1) in paragraph (3), by striking ''an annual
2 audit'' and inserting ''an audit every three years'';
3 (2) in paragraph (4), by striking ''each year''
4 and inserting ''every third year''; and
5 (3) by inserting after paragraph (4) the fol-
6 lowing new paragraph:
7 ''(5) MATERIALS RELATING TO CLOSED POR-
8 TIONS OF MEETINGS.—To facilitate the audit re-
9 quired under paragraph (3) of this subsection, the
10 Office of the National Science Board shall maintain
11 the General Counsel's certificate, the presiding offi-
12 cer's statement, and a transcript or recording of any
13 closed meeting, for at least 3 years after such meet-
14 ing.''.
15 (b) LIMITED TERM PERSONNEL FOR THE NATIONAL
16 SCIENCE BOARD.—Subsection (g) of section 4 of the Na-
17 tional Science Foundation Act of 1950 (42 U.S.C.
18 1863(g)) is amended to read as follows:
19 ''(g) The Board may, with the concurrence of a ma-
20 jority of its members, permit the appointment of a staff
21 consisting of not more than 5 professional staff members,
22 technical and professional personnel on leave of absence
23 from academic, industrial, or research institutions for a
24 limited term and such operations and support staff mem-
25 bers as may be necessary. Such staff shall be appointed

1 by the Chairman and assigned at the direction of the
2 Board. The professional members and limited term tech-
3 nical and professional personnel of such staff may be ap-
4 pointed without regard to the provisions of title 5, United
5 States Code, governing appointments in the competitive
6 service, and the provisions of chapter 51 of such title relat-
7 ing to classification, and shall be compensated at a rate
8 not exceeding the maximum rate payable under section
9 5376 of such title, as may be necessary to provide for the
10 performance of such duties as may be prescribed by the
11 Board in connection with the exercise of its powers and
12 functions under this Act. Section 14(a)(3) shall apply to
13 each limited term appointment of technical and profes-
14 sional personnel under this subsection. Each appointment
15 under this subsection shall be subject to the same security
16 requirements as those required for personnel of the Foun-
17 dation appointed under section 14(a).''.

18 **SEC. 17. NATIONAL SCIENCE BOARD REPORTS.**

19 Paragraphs (1) and (2) of section 4(j) of the National
20 Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1)
21 and (2)) are each amended by striking '', for submission
22 to'' and inserting ''and''.

SECTION-BY-SECTION SUMMARY OF
H.R. 1867, THE NATIONAL SCIENCE FOUNDATION
AUTHORIZATION ACT OF 2007

SEC. 1. SHORT TITLE—The National Science Foundation Authorization Act of 2007.

SEC. 2. DEFINITIONS—Provides definitions for terms used in this Act.

SEC. 3. AUTHORIZATION OF APPROPRIATIONS—Authorizes $21 billion for the National Science Foundation (NSF) for fiscal years 2008–2010, including $16.4 billion for research and related activities (R&RA), $2.8 billion for education and human resources (EHR), and $787 million for major research facilities (MREFC). Allocates funding for major research instrumentation (MRI) under the R&RA account, and for certain education programs, including those authorized under H.R. 362. (See attached funding table for more detail.) Raises the ceiling for MRI awards step-wise as the total MRI budget grows and requires 30 percent cost-sharing on MRI awards for certain Ph.D.-granting institutions. Requires the Director to fund undergraduate education division programs at a growth rate at least equal to the Foundation's overall growth rate.

SEC. 4. CENTERS FOR RESEARCH ON LEARNING AND EDUCATION IMPROVEMENT—Requires the Director to continue funding these Centers, which were established by the 2002 NSF Reauthorization.

SEC. 5. INTERDISCIPLINARY RESEARCH—Requires the National Science Board to evaluate the current and potential role of the Foundation in supporting interdisciplinary research, in providing adequate information to the scientific community about opportunities for funding of interdisciplinary research proposals, and in engaging undergraduate students in interdisciplinary research.

SEC. 6. NEW INVESTIGATORS—Establishes a pilot program of one-year seed grants for new investigators to improve their likelihood of being awarded standard competitive research grants. Uses an existing funding mechanism, the Small Grants for Exploratory Research program, to carry out the pilot program. Requires the Board to evaluate the effectiveness of the pilot program after three years.

SEC. 7. BROADER IMPACTS MERIT REVIEW CRITERION—Requires the Director, in reviewing proposals under criterion 2 of the merit review process, to give special consideration to proposals that include partnerships between academic researchers and industrial scientists and engineers and that address research areas that have been identified as having high importance for future national economic competitiveness. Also requires the Director to encourage industry/university partnerships that include cost-sharing. Finally requires report to Congress on the impact of the broader impacts grant criterion used by the Foundation.

SEC. 8. POSTDOCTORAL RESEARCH FELLOWS—Requires funded investigators to report on activities to mentor postdoctoral research fellows funded under their grants.

SEC. 9. RESPONSIBLE CONDUCT OF RESEARCH—Requires each institution funded by NSF research grants to provide a plan for appropriate training in the responsible and ethical conduct of research to supported individuals.

SEC. 10. REPORTING OF RESEARCH RESULTS—Requires the Director to make available to the public, through the Foundation website, final project reports and all citations of published work resulting from NSF-funded research.

SEC. 11. SHARING RESEARCH RESULTS—Makes investigators who fail to comply with existing NSF policy on sharing of research results (Section 734 of the NSF Grant Policy Manual) ineligible for future NSF awards until they comply with the policy.

SEC. 12. FUNDING FOR SUCCESSFUL STEM EDUCATION PROGRAMS—Permits the Director to exempt from the recompete requirement certain STEM education programs, including minority-serving programs and teacher training programs, that continue to demonstrate positive performance.

SEC. 13. COST SHARING—Requires the Board to evaluate the impact of the ruling to eliminate cost-sharing at the Foundation on programs that already do involve or may involve industry partnership.

SEC 14. DONATIONS—Allows NSF to accept private funds for certain prize competitions.

SEC. 15. ADDITIONAL REPORTS—Requires the Board to evaluate the Foundation policies on funding for pre-construction and maintenance and operation costs for major research equipment and facilities. Requires plans for upgrades of Antarctic facilities to be included in the annual national research facilities construction, repair and upgrades plan required under SEC 201(a)(1) of the *NSF Authorization Act of 1998,* as amended. Requires the Director to catalog all educational activities supported by R&RA programs and report to Congress. Requires the Director to report on funding success rates and distribution of awards for the Research in Undergraduate Institutions program.

SEC. 16. ADMINISTRATIVE AMENDMENTS—Changes audit requirement from every year to every three years for assessment of the compliance of the Board with the requirements of the *Government in Sunshine Act.* Gives the Board authority to take on IPA assignees ("rotators") to supplement permanent staff.

SEC. 17. NATIONAL SCIENCE BOARD REPORTS—Amends the *National Science Foundation Act of 1950* so that National Science Board reports are submitted directly to Congress from the Board, rather than through the President.

Funding Levels

Account	Current**	FY08 Request	FY08	Change from FY07	FY09	FY10	3-year TOTAL
			Authorizations in H.R. 1867				
Research	4765	5132	5080.0	6.6%	5457.4	5863.2	16401
MRI	*90*	*114*	*115.0*		*123.1*	*131.7*	*370*
REU	*57*	*57*	*63*		*68.7*	*73.5*	*205*
Education	698	751	873.0	25.1%	934.0	1003.0	2810
*MSP**	*46*	*46*	*94.0*		*100.6*	*107.6*	*302*
*Noyce**	*9*	*10*	*70.0*		*101.0*	*133.0*	304
*Tech Talent**	*25*	*30*	*44.0*		*55.0*	*60.0*	*159*
ATE	*45*	*52*	*51.6*		*55.2*	*59.1*	166
Major Facilities	191	245	245.0	28.3%	262.0	280.0	787
Agency Operations	247	286	285.6	15.7%	309.8	329.5	925
National Sci. Board	3.94	4.03	4.05	0.8%	4.12	4.25	12
Inspector General	11.4	12.4	12.4	8.3%	12.7	13.1	38
AGENCY TOTAL	**5916**	**6429**	**6500**	9.9%	**6980**	**7493**	**20973**
Annual Growth		8.7%	9.9%		7.4%	7.3%	

* The Math and Science Partnerships Program (MSP), the Noyce Scholarship Program, and the Science, Mathematics, Engineering and Technology Talent Expansion Program (known both as "Tech Talent" and STEP) were all authorized for the first time in the National Science Foundation Act of 2002, and reauthorized with changes in H.R. 362. The breakouts for the programs listed here are identical to the out-year authorizations contained in H.R. 362. Duplication in authorized funding will be resolved later.

** Current funding is based on the FY 2007 CR. Pending final numbers from NSF, we have assumed that those programs in accounts funded at FY 2006 levels were funded at the lower of their FY 2006 level and the FY 2007 request (only for MSP was the FY 2007 request lower than FY06 funding).

MRI = Major Research Instrumentation
REU = Research Experiences for Undergraduates
ATE = Advanced Technological Education

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION
SUBCOMMITTEE MARKUP
APRIL 19, 2007

H.R. 1867 – *the National Science Foundation Authorization Act of 2007*

AMENDMENT ROSTER

No.	Sponsor	Description	Results
1	Mr. Baird for Ms. Johnson	Adds a subsection (d) to Section 15 requiring an annual report to Congress with details about the allocation of funds for activities to improve education and broaden participation.	Accepted by voice vote.
2	Mr. Baird for Ms. Johnson	Requires a National Academy of Sciences Report on barriers to and recommendations for broadening participation of underrepresented minorities in STEM fields.	Accepted by voice vote.
3	Ms. Hooley	Creates an allocation from within the Research and Related Activities account to support the Research Experience for Undergraduates program: $63 million for FY08; $68.7 million for FY09; and $73.5 million for FY10.	Accepted by voice vote.

AMENDMENT TO H.R. 1867
OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

Page 22, after line 12, insert the following new subsection:

1 (e) ANNUAL PLAN FOR ALLOCATION OF EDUCATION
2 AND HUMAN RESOURCES FUNDING.—
3 (1) IN GENERAL.—Not later than 60 days after
4 the date of enactment of legislation providing for the
5 annual appropriation of funds for the Foundation,
6 the Director shall submit to the Committee on
7 Science and Technology and the Committee on Ap-
8 propriations of the House of Representatives, and to
9 the Committee on Commerce, Science, and Trans-
10 portation, the Committee on Health, Education,
11 Labor, and Pensions, and the Committee on Appro-
12 priations of the Senate, a plan for the allocation of
13 education and human resources funds authorized by
14 this Act for the corresponding fiscal year, including
15 any funds from within the research and related ac-
16 tivities account used to support activities that have
17 the primary purpose of improving education or
18 broadening participation.

1 (2) SPECIFIC REQUIREMENTS.—The plan shall
2 include a description of how the allocation of fund-
3 ing—
4 (A) will affect the average size and dura-
5 tion of education and human resources grants
6 supported by the Foundation;
7 (B) will affect trends in research support
8 for the effective instruction of mathematics,
9 science, engineering, and technology;
10 (C) will affect the K-20 pipeline for the
11 study of mathematics, science, engineering, and
12 technology; and
13 (D) will encourage the interest of individ-
14 uals identified in section 33 or 34 of the
15 Science and Engineering Equal Opportunities
16 Act (42 U.S.C. 1885a or 1885b) in mathe-
17 matics, science, engineering, and technology,
18 and help prepare such individuals to pursue
19 postsecondary studies in these fields.

AMENDMENT TO H.R. 1867
OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

At the end of the bill, insert the following new section:

1 **SEC. 18. NATIONAL ACADEMY OF SCIENCE REPORT ON DI-**
2 **VERSITY IN STEM FIELDS.**

3 The Foundation shall enter into an arrangement with
4 the National Academy of Sciences for a report, to be
5 transmitted to the Congress not later than 1 year after
6 the date of enactment of this Act, about barriers to in-
7 creasing the number of underrepresented minorities in
8 science, technology, engineering, and mathematics fields
9 and to identify strategies for bringing more underrep-
10 resented minorities into the science, technology, engineer-
11 ing, and mathematics workforce.

AMENDMENT TO H.R. 1867

OFFERED BY MS. HOOLEY OF OREGON

Page 3, line 4, insert ", and of which $63,000,000 shall be made available for the Research Experience for Undergraduates program" after "Instrumentation program".

Page 4, line 21, insert ", and of which $68,700,000 shall be made available for the Research Experience for Undergraduates program" after "Instrumentation program".

Page 6, line 14, insert ", and of which $73,500,000 shall be made available for the Research Experience for Undergraduates program" after "Instrumentation program".

XXII. Proceedings of the Full Committee Markup on H.R. 1867, the National Science Foundation Authorization Act of 2007

The Committee met, pursuant to call, at 10:00 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. The Committee on Science and Technology will come to order. Pursuant to notice, the Committee on Science and Technology meets to consider the following measures, H.R. 1867, the *National Science Foundation Authorization Act of 2007;* H.R. 1868, *Technology Innovation and Manufacturing Stimulation Act of 2007;* H. Con. Res. 95, *Honoring the career and research accomplishments of Frances E. Allen, the 2006 recipient of the A.M. Turing Award;* and H. Res. 316, *Recognizing the accomplishments of Roger D. Kornberg, Andrew Fire, Craig Mello, John C. Mather, and George F. Smoot for being awarded Nobel Prizes in the fields of chemistry, physiology or medicine, and physics.*

And we will now proceed with the markup. Today the Committee is meeting to markup four good, bipartisan bills. The first bill we will consider today is H.R. 1867, the *National Science Foundation Authorization Act of 2007.* H.R. 1867 was introduced by Chairman Baird, Ranking Member Ehlers, and other Members of the Research and Science Education Subcommittee. The Subcommittee met last Wednesday to consider H.R. 1867 and favorably reported the bill by voice vote after adopting three amendments. I want to thank and congratulate Members of the Subcommittee for their hard work and bipartisan cooperation on this excellent bill.

The core of this bill is the three-year authorization that keeps the Foundation on a ten-year doubling path. NSF is a major source of federal backing for basic research at universities across all disciplines, and Members of the Science and Technology Committee often have a difficult time explaining to our constituents and other Members of Congress why it is so important to fund basic research. The benefits to you and me can seem so intangible in comparison to many of the other things the Federal Government does. But with the publicity around the recent reports like *Rising Above the Gathering Storm,* more of our colleagues and constituents understand that federally funded research pays enormous dividends to society.

Economic growth, public health, national defense, and social advancements have all been tied to technological developments resulting from basic research. Let me just quickly add that as we know, there is a long time between basic research and applied research; and what we are talking about really—when we look at the big problems today, whether they are energy independence, whether it is climate change, whether it is competitiveness, our kids' and grandkids' jobs really are going to depend upon the technology that is developed today. There are seven billion people in the world, half

of which make less $2 a day. We can't compete with them at $2. We don't want to. So it is the technologies that we are developing today that are going to let our kids and grandkids be more productive, and that is why it is so important that the National Science Foundation continue to do its work.

In addition to providing strong research budgets, H.R. 1867 provides important funding for some critical STEM education programs including three K0912 programs this committee expanded and refined in H.R. 362 which I am happy to say just passed the House yesterday. And again, I want to thank everyone here for that bipartisan work. It is a good bill. Mr. Gingrey spoke on it, and certainly Ralph and others spoke to that. I hope that everybody is in their local newspapers today because you were all a part of this bill, and it is a very good bill.

And I am pleased that H.R. 1867 once again reaffirms the critical role that the National Science Foundation plays with STEM education. This is a good bill, and I urge my colleagues to support it and continue to work with me to assure that the rest of our colleagues in Congress understand the value of basic research as we do.

Today we will also take up H.R. 1868, the *Technology Innovation and Manufacturing Stimulation Act of 2007*. This is an authorization bill for the programs of the National Institute of Standards and Technology, NIST. This bill is a bipartisan product of the Technology and Innovation Subcommittee, and I want to commend Chairman Wu and Ranking Member Gingrey for moving this bill through the Subcommittee expeditiously. The Science and Technology Committee needs to send a strong signal to the Appropriations Committees about the importance we place on full funding of NIST. The pace of technology keeps accelerating, particularly in areas such as biofuels, pharmaceutical biologics, and health care IT. NIST has an important role to play in the adoption of these technologies through the creation of standards and the new measurement technologies.

And let me speak just a moment on this. You know, NIST is probably one of the most under-estimated aspects of the Federal Government. It was originally meant to take care of measures and standards. Now it goes much beyond that, and I think it is an agency that all of us can feel comfortable with because this is not a regulatory agency. This is an agency that brings together the business community and the manufacturing community, to work out problems on standards. And I think you are going to find that our committee here, besides the Technology and Innovation Subcommittee, is going to get a lot more respect within Washington and elsewhere because of this agency. We are where the Commerce Committee has been stagnant in terms of health care IT. Ways and Means hasn't been able to go forward. We are going to be able to step forward and solve some of those problems where the health care community is going to look at the Science and Technology Committee as the one who made that breakthrough. Financial services is going to look at us pretty soon as a committee that can make those kind of breakthroughs because of NIST. So we are going to continue working on that, and I think you are going to see NIST help us to make our committee much more relevant.

The Committee is also aware of the important role that the Manufacturing Extension Partnership, MEP, plays in keeping good manufacturing jobs here in the United States, and NIST has a proven track record of implementing its technology development programs.

Finally, the last two measures we are considering today, H. Con. Res. 95 and H.Res. 316 recognize the outstanding achievements of a group of American scientists. It is important that Congress recognize Americans who achieve great things in science, not just for the satisfaction of individual scientists but to show the public that Congress truly values the work that scientists do.

And now I will recognize Mr. Hall to present his opening statement.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Good Morning. Pursuant to notice, the Committee on Science and Technology meets to consider the following measures:

- **H.R. 1867,** the *National Science Foundation Authorization Act of 2007;*
- **H.R. 1868,** *Technology Innovation and Manufacturing Stimulation Act of 2007;*
- **H. Con. Res. 95,** *Honoring the career and research accomplishments of Frances E. Allen, the 2006 recipient of the A.M. Turing Award;* and
- **H. Res. 316,** *Recognizing the accomplishments of Roger D. Kornberg, Andrew Fire, Craig Mello, John C. Mather, and George F. Smoot for being awarded Nobel Prizes in the fields of chemistry, physiology or medicine, and physics.*

Today the Committee is meeting to markup four good bipartisan bills. The first bill we will consider today is H.R. 1867, the *National Science Foundation Authorization Act of 2007.* H.R. 1867 was introduced by Chairman Baird, Ranking Member Ehlers and other Members of the Research and Science Education Subcommittee.

The Subcommittee met last Wednesday to consider H.R. 1867, and favorably reported the bill by voice vote after adopting three amendments. I want to thank and congratulate Members of the Subcommittee for their hard work and bipartisan cooperation on this excellent bill. The core of this bill is the three-year authorization that keeps the Foundation on a 10-year doubling path.

NSF is a major source of federal backing for basic research at universities, across all disciplines.

Members of the Science and Technology Committee often have a difficult time explaining to our constituents and other Members of Congress why it is so important to fund basic research. The benefits to you and me can seem so intangible in comparison to many of the other things the Federal Government funds.

But with the publicity around recent reports like *"Rising Above the Gathering Storm,"* more of our colleagues and constituents understand that federally-funded research pays enormous dividends to society. Economic growth, public health, national defense, and social advancement have all been tied to technological developments resulting from basic research.

In addition to providing strong research budgets, H.R. 1867 provides important funding for some critical STEM education programs, including three K0912 programs that this committee expanded and refined in H.R. 362, which I am happy to say just passed the House yesterday.

The education programs at NSF are perhaps more tangible to the typical American, as everybody wants their children to be taught by highly qualified teachers and to graduate high school and community college prepared for the workforce of the 21st Century, or to have the opportunity to pursue even higher degrees if they so desire.

I am pleased that H.R. 1867 once again reaffirms the critical role that NSF plays in STEM education. This is a good bill. I urge my colleagues to support it, and to continue to work with me to ensure that the rest of our colleagues in Congress understand the value of basic research as we do.

Today, we'll also take up H.R. 1868, the *Technology Innovation and Manufacturing Stimulation Act of 2007.* This is an authorization bill for the programs of the National institute of Standards and Technology (NIST).

This bill is the bipartisan product of the Technology and Innovation Subcommittee. I want to commend Chairman Wu and Ranking Member Gingrey for moving this bill through the Subcommittee expeditiously. The Science and Technology Committee needs to send a strong signal to the Appropriations Committee about the importance we place on full funding for NIST.

H.R. 1868 places the NIST budget on the path to doubling over the next 10 years. The Science and Technology Committee has always been in the "amen corner" for fully funding all of NIST.

The pace of technology keeps accelerating—particularly in areas such as biofuels, pharmaceutical biologics and health care IT. NIST has an important role to play in the adoption of these technologies through the creation of standards and new measurement technologies.

This committee is also aware of the important role that the Manufacturing Extension Partnership (MEP) program plays in keeping good manufacturing jobs here in the U.S. And NIST has a proven track record in implementing its technology development program. H.R. 1868 does an excellent job of balancing and funding these priorities and everyone on this committee should support this legislation.

Finally, the last two measures we are considering today, H.Con.Res. 95 and H.Res. 316, recognize the outstanding achievements of a group of American scientists.

It is important that Congress recognizes Americans who achieve great things in the sciences, not just for the satisfaction of the individual scientists, but to show the public that the Congress truly values the work that scientists do.

I recognize Mr. Hall to present his opening remarks.

Mr. HALL. Mr. Chairman, thank you for the chance to make some opening remarks. Of course, as you say, we are considering two authorization bills relating to the President's American Competitive Initiative and two resolutions honoring the accomplishments of some very eminent American scientists.

The *National Science Foundation Authorization Act of 2007* authorizes funding for NSF for the next three fiscal years. This measure goes a long way in keeping with the President's ACI plan to double the budget within ten years. In fact, it goes slightly beyond that to incorporate some of the additions to education programs that the House passed just yesterday.

I appreciate the work of the Subcommittee Ranking Member, Mr. Ehlers, for his dedication and work on this bill; and I thank the Chairman and I thank Congressman Baird for their willingness to cooperate on making this really a truly bipartisan endeavor. I look forward to our continuing working together to improve this legislation and pass it with broad support.

I am also pleased that we are marking up H.R. 1868, the *Technology Innovation and Manufacturing Stimulation Act of 2007.* H.R. 1868 supports the President's ACI by setting the NIST lab budget on a path to double by fiscal year 2017. This bill ensures that America's small- and medium-sized manufacturers have access to the latest technologies and processes by authorizing the Manufacturing Extension Partnership Program.

Finally, H.R. 1868 authorizes the Technology Innovation Program to promote the swift development of high-risk research into marketable technologies. And I thank Dr. Ehlers and Dr. Gingrey for their extensive input into developing this bill, as well as the staff who dedicated considerable time in this endeavor. Also I want to thank my Democratic colleagues for incorporating these important priorities in this bipartisan legislation.

Mr. Chairman, I am also pleased this committee will honor six esteemed American scientists today. H. Con. Res. 95 recognizes the first woman to receive the prestigious computer science A.M. Turing Award, Frances Allen. H. Res. 316 honors the five American scientists who received Nobel Prizes in 2006, Roger Kornberg for chemistry, Andrew Fire for medicine, Craig Mello for Medicine, John Mather for physics, and George Smoot for physics.

And before I close, I want to point out that the NSF and NIST bills as you have said, Mr. Chairman, both major pieces of legislation, were developed after only a few hearings on each topic, only one in the case of NIST. These hearings were at the subcommittee level, so only a few Members of the Committee were able to attend the hearings. Also, with regard to the NIST bill, there was never a hearing on the New Technology Innovation Program. In fact, these two bills were put together so quickly we have yet to receive all the witnesses' response and questions—their response to the questions for the record submitted by Members of the Committee.

So Mr. Chairman, while I certainly support these bills in their current form and once I have received all of the witnesses' response, I or some other Members may want to propose further amendments to these bills when they are considered on the House Floor, and I know you will work with us on that.

With that, I yield back the balance of my time, and I thank you for laying out a good bill and preparing for a good hearing. I yield back.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

- H.R. 1867, *National Science Foundation Authorization Act of 2007*
- H.R. 1868, *Technology Innovation and Manufacturing Stimulation Act of 2007*
- H.Con.Res. 95, *Honoring the Career and Research Accomplishments of Frances E. Allen, the 2006 Recipient of the A.M. Turing Award*
- H.Res. 316, *Recognizing the accomplishments of Roger D. Kornberg, Andrew Fire, Craig Mello, John C. Mather, and George F. Smoot for being award Nobel Prizes in the fields of chemistry, physiology or medicine, and physics.*

Thank you, Chairman Gordon, for the chance to make some opening remarks about today's markup. Today we are considering two authorization bills related to the President's American Competitiveness Initiative (ACI) and two resolutions honoring the accomplishments of eminent American scientists.

The *National Science Foundation (NSF) Authorization Act of 2007,* H.R. 1867, authorizes funding for NSF for the next three fiscal years. This measure goes a long way in keeping with the President's ACI plan to double the budget within ten years. In fact, it goes slightly beyond that to incorporate some of the additions to education programs that the House passed yesterday. I appreciate the work of the Subcommittee Ranking Member, Mr. Ehlers, for his dedication and work on this bill and thank the Chairman and Mr. Baird for their willingness to cooperate on making this a bipartisan endeavor. I look forward to our continuing to work together to improve this legislation and pass it with broad support.

I am pleased to be an original co-sponsor of H.R. 1868, the *Technology Innovation and Manufacturing Stimulation Act of 2007.* H.R. 1868 supports the President's ACI by setting NIST's lab budget on a path to double the budget by fiscal year 2017. The bill will ensure America's small- and medium-sized manufacturers have access to the latest technologies and processes by authorizing the Manufacturing Extension Partnership Program. Finally, H.R. 1868 authorizes the Technology Innovation Program to promote the swift development of high-risk research into marketable technologies. I thank Dr. Ehlers and Dr. Gingrey for their extensive input in developing this bill and my Democratic colleagues for incorporating our priorities into this bipartisan legislation.

I also am pleased the Committee will honor six esteemed American scientists today. H.Con.Res. 95 recognizes the first woman to receive the prestigious computer science A.M. Turner award, Frances Allen. H.Res. 316 honors the five American scientists who received Nobel prizes in 2006: Roger Kornberg for chemistry; Andrew Fire for medicine; Craig Mello for medicine; John Mather for physics; and George Smoot for physics.

Before I close, I want to point out that the NSF and NIST bills, both major pieces of legislation, were developed after only one hearing on each topic. Those hearings were at the Subcommittee level, so only a few Members of the Committee were able to attend the hearings. In the case of the NIST bill there was never a hearing on the new Technology Innovation Program. In fact, these two bills were put together so quickly that we have yet to receive all of the witnesses' responses to questions for the record submitted by Members of this committee. Therefore, Mr. Chairman, while I support these bills in their current form, once I have reviewed all of the witnesses responses I, or other Members, may want to propose further amendments to these bills when they are considered on the House Floor.

With that I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Hall. Let me assure you that we want to continue to work in the spirit that we have to get good bills. You know, the last NIST authorization was in 1992 out of this committee. It has been five years since we had a National Science Foundation authorization. There have been lots of hearings in between, but you know, it is time to get something done; and we want to have the best bill possible, and you can be absolutely assured that we will continue with that collaboration.

Without objection, Members may place statements in the record at this point.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Chairman Gordon, Ranking Member Hall, and Members of the Committee on Science and Technology,

H.R. 1867, the *National Science Foundation Authorization Act of 2007,* is to me, one of the most important bills this committee will consider during the 110th Congress.

The bill authorizes appropriations for fiscal years 2008092010, including funding for research and related activities, education and human resources and research facilities.

Provisions were made for major research instruments and the Research Experiences for Undergraduates program. The bill also touches the K 0912 and two-year college programs under the education account.

The bill would also require the National Science Board to report on NSF's role in interdisciplinary research and on the impacts of NSF's new cost-sharing policy on university/industry partnerships.

It would establish a grant program for new investigators and require the Director to give special consideration to grant proposals involving industry partnerships.

H.R. 1867 would require NSF-funded researchers to report on mentoring activities for postdoctoral research fellows and NSF-funded institutions to train individuals in the ethical conduct of research.

Finally, and most important to me, the bill would require a National Academy of Sciences report on barriers to and recommendations for broadening minority participation in STEM fields.

Mr. Chairman, I would like to commend you and my colleagues on this committee for your dedication to improving programs to diversify our scientific workforce.

My district, in Dallas, is in a high-need area of low-income families. Many of our schools are experiencing a shortage of qualified math and science teachers.

Students in my district struggle to keep pace on standardized tests.

I have always viewed a strong education to be the key to lifting oneself out of poverty.

Math and science education is especially important, because the careers of tomorrow will demand a strong foundation in these subjects.

The National Science Foundation, along with other agencies, plays a pivotal role in enhancing math and science education.

NSF is also tasked with broadening the participation of under-represented minorities in science, technology, engineering and math.

This committee, perhaps more than any other group, is poised to make a difference in our national competitiveness in STEM.

Mr. Chairman, this is a good bill. I believe it will be good for Dallas and for our nation as a whole.

I yield back the balance of my time.

[The prepared statement of Mr. Lipinski follows:]

PREPARED STATEMENT OF REPRESENTATIVE DANIEL LIPINSKI

Thank you Mr. Chairman; I am pleased to be here today to act on this important legislation.

I'd like to point out that this markup comes on the heels of yesterday's House passage of the "10,000 Teachers, 10 Million Minds" and "Sowing the Seeds" legislation. Both of these bills were introduced in response to the *Rising Above the Gathering Storm* recommendations on improving America's competitiveness in the world, and today's legislation will further build upon that commitment.

Today we stand at the cusp of numerous technological breakthroughs that will completely revolutionize our way of life; from hydrogen and other advanced fuels technologies to nanotechnology that has the potential to impact virtually every sector of our economy. The support that this legislation provides to American researchers will ensure that these breakthroughs continue.

One important pilot program established by this bill will provide one-year seed grants for new investigators to improve their likelihood of being awarded standard competitive research grants. As a past recipient of a grant from NSF, I know just how beneficial this will be to our young researchers. In return for funding some of these investigators, NSF and the country may benefit from new technologies that otherwise would not have made it out of the lab.

As a proud cosponsor of H.R. 1867, I urge the Committee to pass this important legislation and further America's dedication to science.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

This bill would provide a three-year authorization for the National Science Foundation (NSF), an agency that provides critical support for researchers, educators, and students in science, technology, engineering and mathematics (STEM). Among other things, it fortifies the Math and Science Partnership program, expands existing scholarship programs for STEM majors, and creates new opportunities for innovative ideas to be funded.

I think everyone on this committee understands the importance of NSF. Its research results in technologies that are later applied by other agencies, ranging from Doppler radar, which has saved many lives through accurate weather forecasts, to new devices which greatly improve health diagnosis and care, and to laser-guided weapons, which have revolutionized combat and helped to keep more of our troops out of harms way.

NSF is also a key supporter of Science, Technology, Engineering and Mathematics (STEM) education. Now, more than ever, we must invest in our children's education to develop their talent, ensure their success, and maintain the quality of our workforce and the strength of our economy. NSF, with its expertise in merit-review awards, is uniquely positioned to contribute to math and science education and directly impact our nation's competitiveness.

In 2002, Congress wholeheartedly supported a five-year doubling path for the Foundation, but unfortunately appropriations have fallen far short of that target. Though I am discouraged the bill establishes a ten-year instead of five-year pathway, I understand the Chairman is committed to seeing that these authorized levels are fully-funded in the appropriations process.

I am pleased a bipartisan group of Members of this committee have joined me in co-sponsoring the *National Science Foundation Authorization Act of 2007,* and thank Chairman Baird and the Committee staff for their hard work.

Chairman GORDON. We will now consider H.R. 1867, the *National Science Foundation Authorization Act of 2007*. I yield to the Chairman of the Research and Science Education Subcommittee, Mr. Baird, for five minutes to describe his bill.

Mr. BAIRD. I thank the Chair and I want to begin by congratulating the Chair and really the entire Committee for passage of two very important pieces of legislation dealing with research and education. It is a testimony to the leadership of the Chair and to really an accomplishment for the Full Committee; and I want to put that into context. I think many Members may be pleasantly surprised to see so many young faces in our crowd today. I understand that they are Members of the Council for Undergraduate Research, and they are here as my understanding as part of the Posters on the Hill Session and I would just take this opportunity to encourage Members to join them at Rayburn B338, 339, or 340 to see some of the outstanding research being conducted by these young people. And I personally want to express my appreciation by giving you a round of applause for these young scientists who are here with us today.

You will see what we are doing today is marking up the National Science Foundation bill. It is H.R. 1867, the *National Science Foundation Authorization Act of 2007.* My friend and colleague, Dr. Ehlers, and several other Members of the Subcommittee on Research and Science Education joined us in introducing the bill which was developed with input from a diverse range of NSF stakeholders. We received much of our input during two Subcommittee hearings in March, but Dr. Ehlers and I made personal trips to NSF with the Director of NSF and the Science Board as well. A number of other hearings preceded the hearings in this committee this year as well as countless other informal conversations, both before and following those hearings.

We tried to limit provisions of the bill to policy, administrative, and budget issues that have arisen since the last authorization in 2002 while leaving the Foundation with a maximum flexibility in translating our guidance into practice.

On April 19th, the Subcommittee met to consider H.R. 1867 and favorably reported the bill as amended by voice vote after adopting three amendments. I want to thank all of my colleagues on the Subcommittee for helping to improve this bill and move it expeditiously through the Subcommittee, and I want to take this chance to thank Representative Hall and Representative Gingrey for working in a good bipartisan manner to address some of their concerns with Ms. Hooley and myself and we are pleased that I think the results will improve the bill.

The National Science Foundation is the only federal agency whose mission is to support science and engineering across all disciplines. NSF funds 20 percent of all basic research at American colleges and universities. In many fields such as mathematics, computer science, and the social sciences, NSF is the major source of federal backing. NSF is a proposal-driven agency, meaning that the overwhelming majority of research grants and funds are unsolicited basic research grants, thereby helping to cultivate a scientific research enterprise in which the capacity for creativity and innovation is unrivaled in the world. NSF also has a mission to achieve excellence in U.S. science, technology, engineering, and mathematics, STEM education at all levels and in all settings from K through post-doctoral training. I don't think the Committee can stress enough the critical leadership role NSF has in improving

STEM education, and again I want to thank Chairman Gordon for his leadership on this issue.

As we have seen high-paying jobs outsourced and our children graduating high school well behind their international peers in basic science, we realize more and more that funding basic research and teaching our kids math and science has a huge impact on our economy, our competitiveness, and the well-being of our population, and I believe on our national security. H.R. 1867, the bill before us today, addresses these concerns by increasing funding for the basic research supported by NSF, strengthening NSF's STEM education programs and highlighting major policy issues at the forefront of the research community, including support for interdisciplinary research, mentoring of young investigators such as we see here today, and how best to facilitate and carry out our university and industry partnerships.

H.R. 1867 will authorize nearly $21 billion for NSF over three years. This represents an annual growth rate of over seven percent of that total. $16.4 billion would be available to fund research primarily through competitive grants. $2.8 billion will be available for STEM education programs including $765 million for three critical K through 12 programs, math and science partnership, Noyce Teacher Scholarships, and the Tech Talent Program. $790 million will be available for construction of world-class research facilities and equipment.

But NSF can't keep up with the growing research and education budgets without a growing workforce and maintenance of its infrastructure, including such seemingly mundane needs as office space and computers for NSF employees. Therefore, we have also authorized an agency operations budget that grows at seven percent for a total of $925 million over three years, and I would underscore to my colleagues that this particular importance was very strongly emphasized to Dr. Ehlers and I during our visits with NSF and their staff.

The remaining $50 million would fund the National Science Board, the oversight body for the Foundation, and the important Office of Inspector General.

Specific elements of H.R. 1867 include Section 3 which provides specific funding for Advanced Technological Education Program which to date has helped create over 2,000 programs and 16,300 courses that prepare two-year college students across the country for the high-tech workforce. Section 3 also increases the cap on awards for major research instrumentation step-wise as the total MRI budget grows in order to accommodate a wider range of state-of-the-art research tools. Section 5 requires an evaluation of NSF's role in supporting interdisciplinary research which is increasingly central to scientific progress and technological innovation. Section 6 establishes a pilot program of one-year seed grants for new investigators to help improve funding rates for young investigators. Section 7 encourages university-industry partnerships. Section 8 requires funded investigators to report on activities to mentor postdoctoral research scholars. Section 9 requires NSF-funded institutions to train covered individuals, in particular students in the responsible and ethical conduct of research. Section 12 encourages continuity of funding for certain STEM educations that can con-

tinue to demonstrate success without requiring a redesign and recompete of proposals every five years. Section 13 requires an evaluation of the impacts of NSF's new cost-sharing policy on existing and potential university partnerships. Section 15 requires a few reports to Congress, including one on funding for major facilities and another on allocating funding for education for human resource activities. Finally, Section 18 requires a National Academy of Sciences Report on barriers and strategies for increasing the participation of under-represented minorities in STEM fields. Again, that is something Ms. Eddie Bernice Johnson has been a tireless advocate for.

I would like to conclude by again thanking Dr. Ehlers and other Members of the Subcommittee, including Ms. Johnson and Ms. Woolsey, Chairman Gordon, and Ranking Member Hall for their thoughtful contributions to this bipartisan bill. We have a stronger bill thanks to your input. It addresses the needs of NSF stakeholders, and I urge support of H.R. 1867. Yield back.

[The prepared statement of Mr. Baird follows:]

PREPARED STATEMENT OF REPRESENTATIVE BRIAN BAIRD

Good morning. The bill before us now is H.R. 1867, the *National Science Foundation Authorization Act of 2007.* My colleague Dr. Ehlers, and several other Members of the Subcommittee on Research and Science Education joined me in introducing this bill, which was developed with input from a diverse range of NSF stakeholders. We received much of this input during two Subcommittee hearings in March. But a number of hearings that preceded those, as well as countless informal conversations with NSF stakeholders both before and following those hearings, also informed the details of this bill. We tried to limit provisions in the bill to policy, administrative and budget issues that have arisen since the last authorization in 2002, while leaving the Foundation with maximum flexibility in translating our guidance into practice.

On April 19 the Subcommittee met to consider H.R. 1867 and favorably reported the bill as amended by voice vote after adopting three amendments. I want to thank all of my colleagues on the Subcommittee for helping to improve this bill and move it expeditiously through the Subcommittee.

The National Science Foundation is the only federal agency whose mission is to support science and engineering across all disciplines. Currently, NSF funds 20 percent of all basic research conducted at American colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

NSF is a proposal-driven agency, meaning that the overwhelming majority of research grants it funds are unsolicited basic research grants, thereby helping to cultivate a scientific research enterprise in which the capacity for creativity and innovation is unrivaled in the world.

NSF also has a mission to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education at all levels and in all settings, from kindergarten through postdoctoral training. I don't think this Committee can stress enough the critical leadership role that NSF has in improving STEM education, and I want to thank Chairman Gordon for his leadership on this issue.

As we see high-paying jobs outsourced, our children graduating high school well behind their international peers in understanding of basic science concepts, China surging ahead in export of high-tech products—it has finally sunk in. Funding basic research and teaching our kids math and science has a huge impact on our economy, on our competitiveness, and on the well-being of our population.

H.R. 1867 addresses these concerns by increasing funding for the basic research supported by NSF, strengthening and expanding NSF's STEM education programs, and highlighting several major policy issues at the forefront of the research community, including support for interdisciplinary research, mentoring of young investigators, and how best to facilitate and carry out university/industry partnerships.

Specifically, H.R. 1867 would authorize nearly $21 billion for NSF over three years—representing an annual growth rate of just over seven percent. Of that total—

- $16.4 billion would be available to fund research, primarily through competitive grants;
- $2.8 billion would be available for STEM education programs, including $765 million for three critical K0912 programs—Math and Science Partnerships, Noyce Teacher Scholarships, and the Tech Talent program; and
- $790 million would be available for construction of world-class research facilities and equipment.

But NSF can't keep up with the growing research and education budgets without support for a growing workforce and maintenance of its infrastructure, including such seemingly mundane needs as office space and computers for its employees. Therefore, we have also authorized an agency operations budget that grows at the same seven percent rate, for a total of $925 million over three years.

The remaining $50 million would fund the National Science Board, the oversight body for the Foundation; and the Office of the Inspector General.

In addition to authorizing appropriations for the Foundation, H.R. 1867 contains several other important provisions—

- Section 3 provides specific funding for the Advanced Technological Education program, which to date has helped create 2,000 programs and 16,800 courses that successfully prepare two-year college students across the country for the high-tech workforce;
- Section 3 also increases the cap on awards for major research instrumentation step-wise as the total MRI budget grows, in order to accommodate a wider range of state-of-the-art research tools;
- Section 5 requires an evaluation of NSF's role in supporting interdisciplinary research, which is increasingly central to scientific progress and technological innovation;
- Section 6 establishes a pilot program of one-year seed grants for new investigators to help improve funding rates for young investigators and stimulate higher-risk research;
- Section 7 encourages university/industry partnerships in order to make every federal research dollar go further and to engage the private sector in setting research priorities in areas of national need;
- Section 8 requires funded investigators to report on activities to mentor postdoctoral research scholars—the most under-mentored, under-compensated, and under-recognized segment of the higher education STEM pipeline;
- Section 9 requires NSF-funded institutions to train covered individuals, in particular students, in the responsible and ethical conduct of research;
- Section 12 encourages continuity of funding for certain STEM education programs that can continue to demonstrate success, without requiring them to redesign and recompete their proposals every five years;
- Section 13 requires an evaluation of the impacts of NSF's new cost-sharing policy on existing and potential university/industry partnerships;
- Section 15 requires a few reports to Congress, including one on funding for major facilities, and one on allocation of funding for education and human resources activities;
- Section 18 requires a National Academy of Sciences report on barriers to and strategies for increasing the participation of under-represented minorities in STEM fields.

I would like to thank my colleague Dr. Ehlers and other Members of the Subcommittee, including Ms. Johnson and Ms. Hooley, for their thoughtful contributions to this bipartisan bill. With your input we have a stronger bill that addresses the needs of a broad range of NSF stakeholders. I urge my colleagues to support H.R. 1867.

Chairman GORDON. Thank you very much, Dr. Baird. Mr. Hall is recognized.

Mr. HALL. I will yield to Dr. Ehlers if he might want to comment on the bill.

Mr. EHLERS. Thank you for yielding, and I will be brief. Unfortunately, I was supposed to leave about two minutes ago to go testify before the Appropriations Subcommittee trying to get more money

for the National Science Foundation. And that goes hand in glove with this bill.

I will submit my statement for the record. Let me just briefly state it is an excellent bill. I appreciate the work that Dr. Baird has done on this, and it is important to recognize that the National Science Foundation is the crown jewel of the government's efforts in research. Not only that, it is the crown jewel of much of government. The Department of Management and Budget a few years ago ranked the National Science Foundation the highest of all government agencies in terms of what they accomplished for the money that was given to them and for their efficiency of administration.

It is a great organization. I will not repeat all the details of what is in the bill, but I am just delighted to be involved in producing this bill. I am especially proud that we are on a doubling track again. I would prefer it be a shorter doubling track than ten years. I would prefer five years, but I recognize the spending difficulties we are facing right now.

The last comment I want to make is to the students in the audience. When I ran for Congress, I didn't even realize it until after I was elected and a reporter checked through some 220 years of records that it turned out I was the first research physicist ever elected to the United States Congress. Now, that is an indictment of the physics community. There should have been physicists here before.

There is a huge amount of technical work to be done in the Congress, and much of what we deal with requires a knowledge of science. I encourage each and every one of you, because I am not going to be around that much longer, but I encourage each and every one of you to think seriously about at some point in your career entering the political arena, whether it is in the school board so that the school will have better math, science instruction, or the state legislature or the Congress. We desperately need technical expertise in the governing bodies of this Nation, and I hope you will consider that—doing that in a way that doesn't jeopardize your scientific careers.

Mr. HALL. Excuse me. I thought you were finishing. Go ahead.

Mr. EHLERS. Just one quick comment. I would much rather still be in the classroom and in the lab. It is a lot more fun. But this is something I have to do, and I hope it is something that you eventually will do as well. I am pleased to yield back.

Mr. HALL. I thank you for that and I called on you because I knew you were very knowledgeable there and I knew you would have some good advice for students out here for one reason. The other reason is Appropriations Committee asked me to keep you over here just as long as I could.

Mr. EHLERS. That is one thing the students have to learn. Many people will plot against you for trying to do good things.

Mr. HALL. Thank you, with that I yield back.

Chairman GORDON. Dr. Ehlers, are you recommending some of them move to Grand Rapids this afternoon?

Mr. EHLERS. That would be fine. It is a great place to live, and the sooner you want to replace me, the happier I will be.

Chairman GORDON. Let me just quickly say a sincere thanks to Dr. Baird and Dr. Ehlers for their very hands on—you can see they

have a passion for the National Science Foundation. This was a hands-on effort, and I don't think we have ever had a combination of two folks that have worked better, known more about this agency; and for your information, it is interesting—some of you—and I remember. I don't know whether anybody else remembers Tim Valentine. Tim Valentine was the Chairman of this subcommittee, and it was in 1992 on Valentine's Day that the last time that NSF—I mean the NIST authorization was passed and signed in by the President. It was sort of a Valentine's Day gift to him. And so I think 15 years later with your leadership, we are going to see that accomplished again. So I thank you.

Does anyone else wish to be recognized? Yes, Mr. Rohrabacher.

Mr. ROHRABACHER. Well, let me note that Mr. Valentine is a very fine man and does a great job when he was here; and when I first came to Congress, Mr. Valentine was my first chairman. And again, he is sort of—you are keeping with his tradition, Mr. Chairman, because he was a fine person, worked hard, and did everything in a very bipartisan way.

I would like to ask a question about—we are of course authorizing a large amount of spending here today, and I was wondering—by the way, this is the first time I have known that you are a doctor, and I have been mistakenly just not calling you by your first name rather than Dr. Baird all this time.

Chairman GORDON. He is the kind of doctor you might want to talk to.

Mr. ROHRABACHER. That is good. That was a good comeback. Dr. Baird, I got a problem. I was wondering—I am sorry to bring this up but it says here—I guess we are talking about $4,765,000,000 in research—goes specifically to research. How much of that is going to global warming research?

Mr. BAIRD. I don't have that information off the top of my head. As you know there are various directorates within NSF. The particular allocations for those directorates are recommended by the Board, and I can get that for you, Mr. Rohrabacher, but I don't know.

Mr. ROHRABACHER. Let me know this that again, I am not—don't want to get into this long argument about whether global warming exists and whether it is caused by human beings. The more I have read—the more NASA reports I have read about the other planets warming up, not just Mars. Now we find the other planets are warming up as well just confirms to me that it is—we are talking about the sun which we can't have much to do with that. But let me know this. I just came from a meeting in my office where a group of women were just requesting $25 million more be spent for screening for breast cancer. And I am very sympathetic with that, and it seems to me that when we pass bills like this—and I know that scientists say, well, we are doing this for good science purposes, you know. Even if we—all the research we do on global warming is good for good science anyway, we can just stick it right into the computer of human knowledge, whatever we come up with. You know, it just seems to me that we have to be very, very careful with the money we are spending in the name of science is wisely spent because we don't have enough money to screen women who have breast cancer throughout the country. And it seems to me

that $25 million—you know, you can say, okay, that is a good idea. But if we are spending billions of dollars on research that maybe does not have a purpose, we should be very cautious about that. It is just a thought.

Mr. BAIRD. If I may briefly respond, I actually share the gentleman's concern that we spend our money wisely. In fact at the first convening of this subcommittee, I made precisely that point. I believe to the extent that scientists are receiving federal dollars, it is especially incumbent upon them to make sure that they are using that money wisely and well. And the example I gave in my opening comments of our opening hearing was I have got to somehow go back home and justify to the logger who is risking his life in the woods and putting food on his family's plate to the fisherman who is off the coast of Washington State to the guy working in the steel mill, wherever, and say we believe that spending your hard-earned taxpayer dollars is worthwhile; and I believe it is incumbent on scientists themselves to ask that question. Is the research I am doing with the federal dollars sufficiently important to spend somebody's hard-earned wages? Not all of it is, but I think most of it is. And I would share—the other thing I would say on the global warming front, I respect and recognize the gentleman's concerns. I think there are also many other—you may say that some aspect of research is going to global warming but it will be addressing other things like the health of our crops and the health of our forests, et cetera, water supply systems. They may tie that in some way to global warming, but it is probably not exclusively to global warming, so we will have other benefits.

But the gentleman's point, the scientific dollars need to be spent wisely and well, and the research has to meet high standards is absolutely correct.

Mr. ROHRABACHER. And it is not just coming out of the taxpayers' pockets, it is coming out of money that we have available for things like breast cancer screening. So thank you very much, Mr. Chairman.

Chairman GORDON. Thank you. Let me also say to the gentleman, one of the reasons that we resurrected the Oversight and Investigation Subcommittee was to make sure that our dollars were being spent well. And you know, I think that is a part of our job. We have limited resources. If we are not spending them well, then we are taking away from something else. And somewhat as Dr. Baird said, I think most of the climate change—if it is climate change, I think most of it really is looking for alternative energy and it is really an energy problem and climate change is really a secondary kind of—I mean, aspect to it.

Mr. ROHRABACHER. Will the Chairman yield for just one moment?

Chairman GORDON. Absolutely.

Mr. ROHRABACHER. Let me just note, and I am not going to name the institution, but I went down to visit an institution and I actually had a wonderful meeting on global warming in their new global warming center which was made out of—I mean, they had a beautiful dining room and they had wonderful facilities there where they were able to sit around and talk about global warming and it cost millions of dollars. And it was nothing more than a

beautiful new building for these scientists to sit around in. It didn't even include any of the—there were even any machines there and everything like that. And they had a wonderful executive dining room in which they treated the Congressmen to lunch and everything like that. And quite frankly, that is—I don't know if some of the—a lot of the other money that we are spending in the name of that isn't going to that rather than research—I mean, the actual research that does help crops or forests or things like that.

So there is some things that we need to be looking at, making sure the money is being spent in a way that is absolutely beneficial rather than just for people's comfort and scientists' comfort.

Mr. BAIRD. May I respond briefly to that, Mr. Chairman?

Chairman GORDON. If you would—I am sure very brief.

Mr. BAIRD. I will be very brief because I want to get to the markup, but to reassure the gentleman, it is my understanding that except in the case of large facilities, you know, where the infrastructure needs a building, NSF dollars typically don't go to buildings.

Mr. ROHRABACHER. This was a facility.

Mr. BAIRD. But was it funded by—it may or may not have been funded by NSF dollars.

Chairman GORDON. Thank you. We always appreciate your input, Mr. Rohrabacher. We hope you had a good lunch there also.

We need to bring this to a close. Let me just quickly say I think Dr. Ehlers shares most all of our opinions here is that we are all disappointed that the doubling of NSF takes ten years. That is not much more than inflation, but I think it is realistic. And it is something that we are all swallowing because again, we are trying to be realistic and move the ball forward, and we thank you for it.

So does anyone else wish to be recognized? Ms. Johnson.

Ms. JOHNSON. I just want to submit my statement.

Chairman GORDON. And we certainly will have the record open for anyone else that wants to submit their remarks. And if there are no other—Ms. Hooley?

Ms. HOOLEY. Yes, I would just particularly like to thank Dr. Gingrey for the work that he did with me on our amendment that was brought up. A concern was brought up last time on undergraduate research, and so it is actually very appropriate that the students are here that those dollars go for. So I just want to thank him for the work on that. I think it makes it a better piece of legislation and it accomplishes what we want to accomplish by making sure the money is there for that undergraduate work.

Chairman GORDON. Okay. If I might extend on that comment just a little bit. We really are trying to develop good bipartisan legislation with input from all, and I think that was a good example in that we were told—Ms. Hooley had an amendment and we were told that Dr. Gingrey was opposed to that amendment and, you know, which is perfectly fine. And so we told Darlene that and she said, well, he is a friend of mine. Let me just go talk to him. And so they went over and talked to him and worked it out; and hopefully again, we have a better bill. And I hope that we are trying to create that kind of dialogue so that folks can talk with each other. We are supposed to have differences and we should, but let us get the non-real differences aside and talk about the real differences. So again, we appreciate you working that out.

Is there anyone else that has a comment? If not, I ask unanimous consent that the bill is considered as read and open to amendment at any point and that Members proceed with the amendments in the order of the roster. Without objection, so ordered.

Chairman GORDON. The first amendment on the roster is offered by the gentleman from Washington State, Dr. Baird. Are you ready to proceed with your amendment?

Mr. BAIRD. I am.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R.——

Chairman GORDON. I will ask unanimous consent. Let me just—you know——

Mr. HALL. Mr. Chairman?

Chairman GORDON. I hate to interrupt. Yes, Mr. Hall.

Mr. HALL. Could you at least let the Clerk read the title of the amendment of each of them?

Chairman GORDON. Absolutely. If the Clerk will proceed?

The CLERK. Amendment to H.R. 1867 offered by Mr. Baird of Washington.

Chairman GORDON. And I will ask unanimous consent to dispense with the reading, and I say that just to expedite, not to be discourteous to our clerk and not to—but that is how the procedures go. Anytime someone wants us to go further, it is unanimous consent. So without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. BAIRD. Mr. Chairman, my amendment to H.R. 1867 makes a few technical and clarifying changes to the bill following last week's Subcommittee markup. In addition, our amendment contains the following substantive changes.

First, in Section 3D, subparagraph 3 on cost sharing for major research instrumentation awards, the amendment adds permission for a reduction or waiver of the MRI cost-sharing requirement at the discretion of the Director for consortia of institutions of higher education that include at least one institution that is not a Ph.D. granting institution. This provision will help build partnerships between major research universities and small undergraduate institutions to increase access to state-of-the-art research tools and experiences for both faculty and students at the smaller institutions.

Second, in Section 4 we added eligibility for awards under the Centers for Research on Learning and Education Improvement Programs for certain non-profit organizations. A number of non-profit research institutes around the country, including those housed at leading science museums, have repeatedly demonstrated their ability to take leadership roles and to build partnerships with universities in STEM education research. This provision would make those non-profits eligible for awards under the Centers program provided they meet all the other criteria including an ability to attract and support graduate students.

Third, in Section 16 we added a new subsection to increase the number of Waterman Awards to three. The annual Waterman Award recognizes an outstanding young researcher in any field of science or engineering supported by the Foundation. Under this

new provision, the Director may award up to three Waterman Awards per year. It has come to our attention that on at least one occasion it literally came down to a coin toss between equally outstanding young researchers. At the request of the Director of NSF, we increased the number of possible awards to avoid a repeat of this unfortunate situation. We are not mandating the three be awarded but allowing that in the case of outstanding qualifications.

Finally, Section 18, we clarified the change—the charge to National Academy of Sciences for a report on diversity in STEM fields by listing specific topics for NAS to address in the report, including the role of minority-serving institutions in the diversity of America STEM workforce and a means for evaluating the effectiveness of diversity programs. Ms. Johnson suggested this clarification to improve upon her original amendment by providing more specific guidelines to the NAS on the issue—to the National Academies on the issues that we would like to see addressed in the report. As it turns out, some Senators put in a very similar request through a letter to the National Academy of Sciences, and NAS is already looking for funding to do this exact study. We are happy to support their efforts to carry this out and look forward to their specific recommendations on the role that NSF and NSF-supported institutions can play in increasing opportunities for under-represented minorities to pursue studies and careers in STEM fields.

I would urge adoption of this amendment and appreciate the good work of all those who contributed to it. I yield back the balance of my time.

[The prepared statement of Mr. Baird follows:]

PREPARED STATEMENT OF REPRESENTATIVE BRIAN BAIRD

Thank you, Mr. Chairman.

My amendment to H.R. 1867 makes a few technical and clarifying changes to the bill identified following last week's Subcommittee markup.

In addition, my amendment contains the following substantive changes:

First, in Section 3(d)(3), on cost-sharing for Major Research Instrumentation awards, the amendment adds permission for a reduction or waiver of the MRI cost-sharing requirement, at the discretion of the Director, for consortia of institutions of higher education that include at least one institution that is not a Ph.D.-granting institution. This provision would help build partnerships between major research universities and small undergraduate institutions to increase access to state-of-the-art research tools and experiences for both faculty and students at the smaller institutions.

Second, in Section 4, we added eligibility for awards under the Centers for Research on Learning and Education Improvement program for certain nonprofit organizations. A number of nonprofit research institutes around the country, including those housed at leading science museums, have repeatedly demonstrated their ability to take leadership roles and to build partnerships with universities in STEM education research. This provision would make those non-profits eligible for awards under this Centers program provided they meet all of the other criteria, including an ability to attract and support graduate students.

Third, in Section 16, we added a new subsection to increase the number of Waterman Awards to three. The annual Waterman Award recognizes an outstanding young researcher in any field of science or engineering supported by the Foundation. Under this new provision, the Director may award up to three Waterman awards per year. It has come to our attention that on at least one occasion, it literally came down to a coin toss between two equally outstanding young researchers. At the request of the Director, we increased the number of possible awards to avoid a repeat of this unfortunate situation.

Finally, in Section 18, we clarified the charge of the National Academy of Sciences for a report on diversity in STEM fields by listing specific topics for NAS to address in the report, including the role of minority-serving institutions in the diversity of

America's STEM workforce, and means for evaluating the effectiveness of diversity programs. Ms. Johnson suggested this clarification to improve upon her original amendment by providing more specific guidance to the National Academies on the issues that we would like to see addressed in their report. As it turns out, some Senators have put in a similar request through a letter to the National Academy of Sciences, and NAS is already looking for funding to do this exact study. WE are happy to support their efforts to carry out this study and look forward to their specific recommendations on the role that NSF and NSF-supported institutions can play in increasing opportunities for under-represented minorities to pursue studies and careers in STEM fields.

I urge adoption of my amendment.

Chairman GORDON. Is there further discussion on the amendment? If not the vote occurs on the amendment. All in favor say aye? Those opposed say no. The ayes have it and the amendment is agreed to.

The second amendment on the roster is offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment—the title of the amendment, anyway.

The CLERK. Amendment to H.R. 1867 offered by Mr. Hall of Texas.

Chairman GORDON. You want to——

Mr. HALL. That is all right.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objections, so ordered. The gentleman is recognized for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, thank you. This amendment is fairly simple. It makes a maximum single instrument request for major research instrumentation $4 million. Currently the cap is at $2 million. Based on recommendations of the recent National Academy of Sciences Report on Advanced Research Instrumentation and Facilities, the NSF fiscal year 2008 budget request raised this cap from $2 million to $4 million, and I think the doubling of the program is reasonable. The bill before us goes far beyond that requested, increased the cap to $6 million and escalate it I think all the way up to $12 million, depending on the level of appropriation.

My amendment simply sets the cap at $4 million and provides for a $2 million additional increase if appropriations grow to more than $125 million.

I appreciate the Chairman for working with me on this very fair compromise and encourage my colleagues to support this amendment. I yield back.

Chairman GORDON. Let me concur that Mr. Hall has made a good bill better, and we thank him for his input on this. Is there further discussion on the amendment?

Mr. BAIRD. Mr. Chairman, I would just echo your compliments to Mr. Hall. I appreciate him raising this issue. Our goal has been to raise the amount of funds available to institutions for this kind of instrumentation. I think he raised a legitimate point about the cap, and I appreciate his willingness to adjust it as additional funding becomes available and would urge passage of this amendment.

Chairman GORDON. Is there further discussion of the amendment? If not, the vote occurs on the amendment. All in favor say

aye? Those opposed say no. The ayes have it. The amendment is agreed to.

The third amendment on the roster is offered by the gentleman from Georgia, Dr. Gingrey. Are you ready to proceed with your amendment?

Mr. GINGREY. Mr. Chairman, I am.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 1867 offered by Mr. Gingrey of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. The gentleman is recognized for five minutes to explain the amendment.

Mr. GINGREY. Mr. Chairman, thank you, and I want to thank my good friend from Oregon, Ms. Hooley, who commented on the overall bill just moments ago. Indeed we have worked together on my amendment.

My amendment basically started out with a concern over designating a certain amount of funding for the research experiences for undergraduate programs, REU. And I know we have the students here that Dr. Baird recognized at the outset that possibly have been beneficiaries—well, indeed, we are, the American people, are beneficiaries of their research work, and I hope that they will all have an opportunity to stop by this afternoon and see some of that. And I commend them. But I felt in wanting to amend the overall bill that came out of the Subcommittee, a concern not to get into too much micro-managing of the National Science Foundation, particularly in regard to research and related activities and the amount of funding for that. We want to make sure that they maintain the flexibility without too much earmarking if you will. But I really appreciate my good friend from Oregon, Ms. Hooley. And we have talked about this and she is right. There is this concern that the REU Program probably has been neglected within research and related activities budget. So I commend her for wanting to make sure that that particular line item is properly funded.

So what we agreed to, and I appreciate her cooperation on that, was just to say, well, in proportion to the increased amount of overall funding in the National Science Foundation's related research activities, as that particular section's funding is increased, we would increase in the same percentage the amount of funding for the REU Program. Again the REU Program, Research Experience Undergraduate Program.

Mr. Chairman, that in essence is my amendment, and again I want to thank Darlene Hooley, my good friend from Oregon. We had a great conversation about this on the Floor yesterday as we applauded each another on the passage, Mr. Chairman, of 362 and 363. We are doing great work on this committee, and I am proud to be on it and I thank you and I will be glad to yield to Ms. Hooley if she has any further comments. But that kind of concludes my presentation on the amendment, Mr. Chairman.

Ms. HOOLEY. I thank my good friend for yielding, and again, it allows this program to expand; and I think when you have students that work with students at other schools, other institutions, when you have that cross-pollination that occurs when you work together, it benefits not only the students, the whole schools, and the

schools the students return to. So I think it is a terrific program. I think we have come up with a great compromise, and frankly, it is better than my original amendment. I am happy to admit that. So I appreciate again your working with me on this, and I yield back my time.

Chairman GORDON. Okay. I think we got the point though, but once again to be sure everybody heard, all in favor say aye. All opposed no. The ayes have it. The amendment was agreed to.

Are there other amendments? Ms. Johnson.

Ms. JOHNSON. Thank you, Mr. Chairman. I have an amendment at the desk, and I appreciate the opportunity to present my amendment. Are there copies to disperse? Here, it is in this stack. Thank you, Mr. Chairman. The next one.

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall.

Mr. HALL. I would ask unanimous consent to be listed as a cosponsor of the bill that we are just passing.

Chairman GORDON. Without objection, that would be a great honor. Okay. If there are no more amendments, then the vote will be on the bill, H.R. 1867 as amended. All in favor say aye. All opposed no. In the opinion of The Chair, the ayes have it.

Now, I recognize Mr. Hall to offer a motion.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 1867 as amended to the House with the recommendation that the bill as amended do pass. Further, I move that staff be instructed to prepare the legislative report and make necessary technical and conforming changes and that the Chairman take all the necessary steps to bring the bill before the House for consideration. I yield back my time.

Chairman GORDON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye, opposed no. The ayes have it. The bill is reported favorably. Without objection the motion to reconsider is laid upon the table. I move the Members have two subsequent calendar days in which to submit supplemental minority or additional views on the measure. I move pursuant to Clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 1867, the *National Science Foundation Authorization Act of 2007* as amended. Without objection, so ordered.

And finally, let me look at all of you say thank you for being the hard core and staying here as we completed our business. We had four good resolutions today, and I want to thank all of you again; and this meeting is concluded.

[Whereupon, at 11:28 a.m., the Committee was adjourned.]

Appendix:

SUBCOMMITTEE MARKUP REPORT, H.R. 1867 (AS REPORTED FROM SUBCOMMITTEE), AMENDMENT ROSTER

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION
SUBCOMMITTEE MARKUP
APRIL 19, 2007

H.R. 1868, the Technology Innovation and Manufacturing Stimulation Act of 2007 Subcommittee Report

I. Purpose

The purpose of this bill is to authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Institute of Standards and Technology (NIST) and to require a triennial planning document for the Institute; to establish advisory boards for the Institute's two industrial technology programs; to create manufacturing science grant programs and research fellowships; to create a new technology innovation program; and to make technical corrections to the NIST statute.

II. Background and Need for Legislation

Founded in 1901, the National Institute of Standards and Technology (NIST) has developed and promoted measurement, standards, and technology to enhance productivity, facilitate trade, and improve quality of life. NIST is a non-regulatory agency of the U.S. Commerce Department's Technology Administration.

NIST operates in two primary locations: Gaithersburg, MD and Boulder, CO. It also operates two institutes jointly with other organizations: the Center for Advanced Research in Biotechnology in Rockville, MD (with the University of Maryland) and JILA in Boulder, CO (with the University of Colorado).

NIST's staff includes approximately 2,700 scientist, engineers, technicians, and support personnel. In addition, 1,800 associates complement the staff, and NIST partners with about 1,500 manufacturing specialists and staff at affiliated centers around the country. Three NIST scientists have earned the Nobel Prize in the last 10 years.

NIST carries out its mission through four cooperative programs:

- The **NIST laboratories** conduct research supporting U.S. technology infrastructure by developing tools to measure, evaluate, and standardize, enabling U.S. companies to innovate and remain competitive.
- The **Baldrige National Quality Program** promotes excellence among U.S. manufacturers, service companies, educational institutions, and health care providers; conducts outreach programs; and manages the annual Malcolm Baldrige National Quality Award recognizing performance excellence and quality among businesses, and education, health care and nonprofit organizations.
- The **Manufacturing Extension Partnership (MEP)** offers technical and business assistance services to improve the productivity and competitiveness of small manufacturers through a nationwide network of local centers. The centers are funded by a one-third equal match from federal funds, State funds, and fees charged for services.
- The **Advanced Technology Program (ATP)** accelerates the development of high-risk, innovative technologies that promise broad benefits for the nation by co-funding R&D partnerships with the private sector, including universities.

In addition, NIST operates two national research facilities:

- The **NIST Center for Neutron Research (NCNR)** provides an intense source of neutrons used to probe the molecular and atomic structure and dynamics of a wide range of materials. This facility is used heavily by industry. In 2006, researchers from over 40 national labs, 140 U.S. universities, and 60 U.S. companies conducted research at the facility in collaboration with NIST scientists.
- The **Center for Nanoscale Science and Technology (CNST)** leverages the unique capabilities of the NIST Advanced Measurement Laboratory complex, providing state-of-the-art facilities for nanomanufacturing and nanometrology where industry, universities and other federal laboratories can collaborate in solving critical measurement and fabrication issues necessary to convert nanoscale discoveries into products.

The Administration's *American Competitiveness Initiative* (ACI) calls for a 10-year doubling of the funding of the NIST laboratories, in recognition of the contribution basic measurement and standardization science makes to American innovation. However, in recent years the budget requests for both ATP and MEP have recommended significant funding cuts to both programs, with Congress generally restoring the funding.

NIST's last comprehensive authorization was by the *American Technology Preeminence Act of 1991* (P.L. 102 09245, enacted in 1992) which authorized all of NIST's programs for fiscal years 1992 and 1993. A portion of NIST was most recently authorized by the *Technology Administration Act of 1998* (P.L. 10509309, enacted in 1998), which authorized only the laboratory programs of the Institute for fiscal years 1998 and 1999. Since those bills, NIST has submitted legislative authorization requests to the Congress (most recently in 2002) and completed a major laboratory upgrade at its Gaithersburg, MD campus (the Advanced Metrology Laboratory). It has also embarked on laboratory upgrades to its Boulder, CO campus and requested funds for upgrades to the Center for Neutron Research. In addition, starting in FY07 the NIST budget request has included significant increases for its laboratory activities.

III. Subcommittee Actions

The Subcommittee on Technology and Innovation heard testimony in the 110th Congress relevant to the programs authorized in H.R. 1868 at a hearing held February 15, 2007. The witnesses at that hearing were Dr. William Jeffrey, Director of NIST; Dr. Stan Williams, Senior Fellow at Hewlett-Packard testifying on behalf of ASTRA, the Alliance for Science & Technology Research in America; Mr. Michael Borrus, General Partner of X/Seed Capital; Mr. Peter Murray, Vice President of Welch Allyn, Inc.; and Mr. Michael Ryan, President and CEO of TUG Technologies Corporation.

On April 17, 2007, Representative David Wu, Chairman of the Subcommittee on Technology and Innovation of the Committee on Science and Technology, for himself and Representatives Gingrey, Gordon, Hall (TX), Mitchell, and Ehlers, introduced H.R. 1868, the *Technology Innovation and Manufacturing Stimulation Act of 2007,* a bill to authorize appropriations for fiscal years 2008, 2009, and 2010 for the National Institute of Standards and Technology, and for other purposes.

The Subcommittee on Technology and Innovation met to consider H.R. 1868 on Thursday, April 19, 2007, and considered the following amendments to the bill:

1. Mr. Wu and Dr. Gingrey offered an amendment to make technical corrections to the bill.
2. Mr. Matheson offered an amendment to emphasize the need for technology transfer projects to be included in the Manufacturing Extension Center competitive grant program created in Section 203 (c) of the bill.

By unanimous consent, the amendments were considered en bloc, and were agreed to by voice vote. The bill as amended was then adopted by voice vote. Dr. Gingrey moved that the Subcommittee favorably report H.R. 1868 as amended to the Full Committee, and the motion was agreed to by voice vote.

IV. Summary of Major Provisions of the Bill

Title I of H.R. 1868 authorizes $2.5 billion for the National Institute of Standards and Technology for fiscal years 2008092010, including $1.5 billion for scientific and technical research and services (STRS), $24 million for the Malcolm Baldrige National Quality Award Program; $230 million for construction and maintenance; $367 million for the Manufacturing Extension Partnership (MEP); and $402 million for the Technology Innovation Program (TIP), which is established in Section 204 of the bill to replace the Advanced Technology Program (ATP). Title II requires the Director to submit a three-year programmatic planning document and updates concurrent with the annual budget request, and requires the Visiting Committee on Advanced Technology (VCAT) to comment on this document; creates Advisory Boards for the MEP and TIP, which have significant industry representation and are required to comment on relevant sections of the programmatic planning document and updates; establishes a competitive grant program within MEP for MEP Centers or consortia of Centers to research manufacturing technologies; repeals the Advanced Technology Program and establishes the Technology Innovation Program, which will award cost-shared grants to small- and medium-sized businesses and joint ventures including universities and other organizations to pursue high-risk technologies with potential significant broad benefits to the Nation; and establishes a program of research fellowships at NIST in manufacturing sciences, and a program of collaborative manufacturing grants for industry and non-industry partnerships to pursue innovative,

multi-disciplinary manufacturing technologies. Title III makes a number of technical changes to the NIST statute.

V. Section-by-Section Analysis of the Bill, as reported by the Subcommittee

SEC. 1. Short title—The Technology Innovation and Manufacturing Stimulation Act of 2007.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. Scientific and Technical Research and Services—Authorizes $470.9 million in FY08, $497.8 million in FY09, and $537.6 million in FY10 for the NIST lab activities. Authorizes $7.9 million in FY08, $8.1 million in FY09, and $8.3 million in FY10 for the Baldrige National Quality Award Program. Authorizes $93.9 million in FY08, $86.4 million in FY09, and $49.7 million for construction and maintenance of facilities.

SEC. 102. Industrial Technology Services—Authorizes $110 million in FY08, $141.5 million in FY09, and $150.5 million in FY10 for the Technology Innovation Program (TIP), which replaces the existing Advanced Technology Program (ATP) (see Section 204). Requires that at least $45 million in each year be for new TIP awards. Authorizes $113.0 million in FY08, $122.0 million in FY09, and $131.8 million in FY10 for the Manufacturing Extension Partnership (MEP). Sets aside up to $1 million in FY08 and $4 million in FY09 and FY10 from the MEP funds for a competitive grant program established in Section 203(c).

TITLE II—INNOVATION AND TECHNOLOGY POLICY REFORMS

SEC. 201. Institute-Wide Planning Report—Requires the Director of NIST to submit a three-year programmatic planning document for NIST to the Congress concurrent with the budget submission the first year after enactment, and then to submit yearly updates with each new budget submission.

SEC. 202. Report by Visiting Committee—Changes the reporting requirement for the Visiting Committee on Advanced Technology (VCAT) to be due 30 days after the submission of the President's budget to Congress, and requires the VCAT to comment on the NIST Director's three-year planning document.

SEC. 203. Manufacturing Extension Partnership—Establishes the MEP Advisory Board, which consists of 10 members appointed by the NIST Director, serving three-year terms. Two members must be employed by or on advisory boards of the MEP Centers, and five others must be from small manufacturers. None can be federal employees. The board meets no less than twice a year, and provides the NIST Director with advice on and assessments of MEP. It also comments on the relevant sections of the NIST Director's three-year planning document at the same time as the VCAT. The Board is governed by the Federal Advisory Committee Act (FACA). Allows MEP to accept funds from other federal agencies and from the private sector. Establishes the MEP competitive grants program for MEP Centers or consortia of Centers. The grants are peer reviewed and competitively awarded for Center(s) to conduct projects to solve new or emerging manufacturing problems. Awardees are not required to provide matching funds.

SEC. 204. Technology Innovation Program—Repeals the existing Advanced Technology Program (ATP) statute and creates the Technology Innovation Program (TIP).

- *Establishment*—Creates the "Technology Innovation Program" with the purpose of assisting businesses and universities to accelerate the development of high-risk technologies that will have a broadly-based economic impact.
- *Grants*—Provides the Director of NIST with the authority to make grants under this program to either small or medium-sized businesses or joint ventures. For applicants that are single companies, they must be small or medium-sized businesses. Grants are for no more than $3 million over three years, but can be extended at no additional cost provided there is congressional notice. The funding may only be used for direct costs, and can not be more than 50 percent of total costs. Grants may also be made to joint ventures, which must be led by a small or medium business or a university. A joint venture grant may not exceed $9 million over five years and the federal share of the project must be no more than 50 percent.
- *Award Criteria*—Provides criteria for the selection of grants based upon scientific and technological merit, the project's potential for benefits that extend beyond direct return to the applicant, the inclusion of a technical planning document, the technical competence of the project team and the organizational struc-

ture and management plan, and an explanation of why TIP support is necessary.

• *External Review of Proposals*—Requires the Director to consult with industry or other expert sources with no proprietary or financial interest in the project to review the need for or value of any proposal.

• *Intellectual Property Rights Ownership*—Addresses allocation of intellectual property developed by a joint venture. Allows IP to vest to any participant as agreed to by the joint venture participants. In accordance with current law allows the Federal Government to retain a license for any IP for U.S. Government use only. Makes clear that joint venture participants can license their IP.

• *Program Operation*—Requires the Director to issue regulations within nine months of enactment for the operation of the program, including selection criteria, financial and audit procedures and dissemination of results.

• *Continuation of ATP Grants*—Requires the TIP to continue funding for awards made under the prior Advanced Technology Program.

• *Coordination with Other Federal Technology Programs*—Requires the Director to coordinate with other federal agencies to ensure there is no duplication of effort.

• *Acceptance of Funds From Other Federal Agencies*—Allows NIST to accept funds from other federal agencies to fund TIP awards. Any awards so funded must be selected and carried out as all other TIP awards.

• *TIP Advisory Board*—Establishes the TIP Advisory Board, which consists of 10 members appointed by the NIST Director, serving three-year terms. Seven members must be from U.S. industry, and none can be federal employees. The board meets no less than twice a year, and provides the NIST Director with advice on and assessments of TIP. It also comments on the relevant sections of the NIST Director's three-year planning document at the same time as the VCAT. The Board is governed by the Federal Advisory Committee Act (FACA).

• *Definitions*—

Eligible Company—is majority owned by U.S. citizens or is owned by a parent company incorporated in another country provided that the company's participation is in U.S. economic interests, including R&D investment in the U.S. and increasing U.S. employment. Also, the country of incorporation must afford similar opportunities for U.S. companies, and provide for effective protection of IP rights.

Joint Venture—includes either two separately owned for-profit companies and the lead must be a small or medium business or at least one small or medium business and one institution of higher education where either can be the lead. Joint ventures may include additional for-profit companies, institutions of higher education or other organizations (such as research institutes).

SEC. 205. Research Fellowships—Raises the amount NIST can spend on research fellowships from one percent to 1.5 percent of the total appropriations. This will also allow for additional manufacturing research fellowships as established in Section 207.

SEC. 206. Collaborative Manufacturing Research Pilot Grants—Establishes a collaborative manufacturing research pilot grant program for partnerships between at least one industry and one non-industry partner, with the purpose of fostering collaboration and conducting applied research on manufacturing. The award can be no more than one-third of the cost of the partnership, with no more than an additional one-third coming from other federal sources. Selection criteria for the awards are based on the breadth of impact of the project, the novelty and scientific merit of the proposal, and the demonstrated capability of the participants. Awards must be distributed among a range of industry sectors and firm sizes. NIST will run one pilot competition and awards will be for three years.

SEC. 207. Manufacturing Fellowship Program—Establishes a program of postdoctoral and senior research fellowships at NIST in manufacturing sciences.

SEC. 208. Meetings of Visiting Committee on Advanced Technology—Reduces the frequency of meetings for the Visiting Committee on Advanced Technology (VCAT) from quarterly to twice annually.

TITLE III—MISCELLANEOUS

SEC. 301. Post-Doctoral Fellows—Raises the cap on the number of post-doctoral fellows that NIST can accept each year from 60 to 120.

SEC. 302. Financial Agreements Clarification—Authorizes NIST to enter into grants and cooperative agreements, in addition to its current authority to enter into contracts and cooperative research and development agreements (CRADAs).

SEC. 303. Working Capital Fund Transfers—Authorizes NIST to transfer up to 0.25 percent of its total appropriations, and any funds from other agencies given to NIST to produce Standard Reference Materials, into the Working Capital Fund.

SEC. 304. Retention of Depreciation Surcharge—Allows NIST to retain the building use and depreciation surcharge fees that are charged by the General Services Administration.

SEC. 305. Non-Energy Inventions Program—Repeals an outdated statute requiring the NIST Director to establish a program to evaluate inventions.

SEC. 306. Redefinition of the Metric System—Clarifies in statute that the metric system used in the U.S. is the modern system of metric measurement units.

SEC. 307. Repeal of Redundant and Obsolete Authority—Eliminates archaic, special-case language related to the definition of units of electrical and light measurement.

SEC. 308. Clarification of Standard Time and Time Zones—Specifies that standard time in the U.S. is Coordinated Universal Time, and fixes technical problems in statute with the time zone definitions.

H.R. 1867, AS REPORTED BY THE SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

On April 19, 2007

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the "National Science
3 Foundation Authorization Act of 2007".

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) BOARD.—The term "Board" means the Na-
7 tional Science Board established under section 2 of
8 the National Science Foundation Act of 1950 (42
9 U.S.C. 1861).

10 (2) DIRECTOR.—The term "Director" means
11 the Director of the Foundation.

12 (3) ELEMENTARY SCHOOL.—The term "elemen-
13 tary school" has the meaning given that term by
14 section 9101(18) of the Elementary and Secondary
15 Education Act of 1965 (20 U.S.C. 7801(18)).

16 (4) FOUNDATION.—The term "Foundation"
17 means the National Science Foundation.

18 (5) INSTITUTION OF HIGHER EDUCATION.—The
19 term "institution of higher education" has the

meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(6) SECONDARY SCHOOL.—The term ''secondary school'' has the meaning given that term by section 9101(38) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801(38)).

SEC. 3. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2008.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $6,500,000,000 for fiscal year 2008.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) $5,080,000,000 shall be made available for research and related activities, of which $115,000,000 shall be made available for the Major Research Instrumentation program, and of which $63,000,000 shall be made available for the Research Experience for Undergraduates program;

(B) $873,000,000 shall be made available for education and human resources, of which—

(i) $94,000,000 shall be for Mathematics and Science Education Partnerships established under section 9 of the

1 National Science Foundation Authorization
2 Act of 2002 (42 U.S.C. 1862n);
3 (ii) $70,000,000 shall be for the Rob-
4 ert Noyce Scholarship Program established
5 under section 10 of the National Science
6 Foundation Authorization Act of 2002 (42
7 U.S.C. 1862n–1);
8 (iii) $44,000,000 shall be for the
9 Science, Mathematics, Engineering, and
10 Technology Talent Expansion Program es-
11 tablished under section 8(7) of the Na-
12 tional Science Foundation Authorization
13 Act of 2002 (Public Law 107–368); and
14 (iv) $51,620,000 shall be for the Ad-
15 vanced Technological Education program
16 established by section 3(a) of the Scientific
17 and Advanced-Technology Act of 1992
18 (Public Law 102–476);
19 (C) $245,000,000 shall be made available
20 for major research equipment and facilities con-
21 struction;
22 (D) $285,600,000 shall be made available
23 for agency operations and award management;
24 (E) $4,050,000 shall be made available for
25 the Office of the National Science Board; and

1 (F) $12,350,000 shall be made available
2 for the Office of Inspector General.
3 (b) FISCAL YEAR 2009.—
4 (1) IN GENERAL.—There are authorized to be
5 appropriated to the Foundation $6,980,000,000 for
6 fiscal year 2009.
7 (2) SPECIFIC ALLOCATIONS.—Of the amount
8 authorized under paragraph (1)—
9 (A) $5,457,400,000 shall be made avail-
10 able for research and related activities, of which
11 $123,100,000 shall be made available for the
12 Major Research Instrumentation program, and
13 of which $68,700,000 shall be made available
14 for the Research Experience for Undergradu-
15 ates program;
16 (B) $934,000,000 shall be made available
17 for education and human resources, of which—
18 (i) $100,600,000 shall be for Mathe-
19 matics and Science Education Partner-
20 ships established under section 9 of the
21 National Science Foundation Authorization
22 Act of 2002 (42 U.S.C. 1862n);
23 (ii) $101,000,000 shall be for the
24 Robert Noyce Scholarship Program estab-
25 lished under section 10 of the National

1 Science Foundation Authorization Act of
2 2002 (42 U.S.C. 1862n–1);
3 (iii) $55,000,000 shall be for the
4 Science, Mathematics, Engineering, and
5 Technology Talent Expansion Program es-
6 tablished under section 8(7) of the Na-
7 tional Science Foundation Authorization
8 Act of 2002 (Public Law 107–368); and
9 (iv) $55,200,000 shall be for the Ad-
10 vanced Technological Education program
11 as established by section 3(a) of the Sci-
12 entific and Advanced-Technology Act of
13 1992 (Public Law 102–476);
14 (C) $262,000,000 shall be made available
15 for major research equipment and facilities con-
16 struction;
17 (D) $309,760,000 shall be made available
18 for agency operations and award management;
19 (E) $4,120,000 shall be made available for
20 the Office of the National Science Board; and
21 (F) $12,720,000 shall be made available
22 for the Office of Inspector General.
23 (c) FISCAL YEAR 2010.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Foundation $7,493,000,000 for
3 fiscal year 2010.
4 (2) SPECIFIC ALLOCATIONS.—Of the amount
5 authorized under paragraph (1)—
6 (A) $5,863,200,000 shall be made avail-
7 able for research and related activities, of which
8 $131,700,000 shall be made available for the
9 Major Research Instrumentation program, and
10 of which $73,500,000 shall be made available
11 for the Research Experience for Undergradu-
12 ates program;
13 (B) $1,003,000,000 shall be made avail-
14 able for education and human resources, of
15 which—
16 (i) $107,600,000 shall be for Mathe-
17 matics and Science Education Partner-
18 ships established under section 9 of the
19 National Science Foundation Authorization
20 Act of 2002 (42 U.S.C. 1862n);
21 (ii) $133,000,000 shall be for the
22 Robert Noyce Scholarship Program estab-
23 lished under section 10 of the National
24 Science Foundation Authorization Act of
25 2002 (42 U.S.C. 1862n–1);

(iii) $60,000,000 shall be for the Science, Mathematics, Engineering, and Technology Talent Expansion Program established under section 8(7) of the National Science Foundation Authorization Act of 2002 (Public Law 107–368); and

(iv) $59,100,000 shall be for the Advanced Technological Education program as established by section 3(a) of the Scientific and Advanced-Technology Act of 1992 (Public Law 102–476);

(C) $280,000,000 shall be made available for major research equipment and facilities construction;

(D) $329,450,000 shall be made available for agency operations and award management;

(E) $4,250,000 shall be made available for the Office of the National Science Board; and

(F) $13,100,000 shall be made available for the Office of Inspector General.

(d) MAJOR RESEARCH INSTRUMENTATION.—

(1) AWARD AMOUNT.—The minimum amount of an award under the Major Research Instrumentation program shall be $100,000. The maximum

1 amount of an award under the program shall be
2 $6,000,000, except—
3 (A) if the total amount appropriated for
4 the program for a fiscal year exceeds
5 $125,000,000, in which case the maximum
6 amount of an award shall be $8,000,000; or
7 (B) if the total amount appropriated for
8 the program for a fiscal year exceeds
9 $200,000,000, in which case the maximum
10 amount of an award shall be $12,000,000.
11 (2) USE OF FUNDS.—In addition to the acquisi-
12 tion of instrumentation and equipment, funds made
13 available by awards under the Major Research In-
14 strumentation program may be used to support the
15 operations and maintenance of such instrumentation
16 and equipment.
17 (3) COST SHARING.—
18 (A) IN GENERAL.—An institution of higher
19 education receiving an award shall provide at
20 least 30 percent of the cost from private or
21 non-Federal sources.
22 (B) EXCEPTIONS.—Institutions of higher
23 education that are not Ph.D.-granting institu-
24 tions are exempt from the cost sharing require-
25 ment in subparagraph (A), and the Director

may reduce or waive the cost sharing requirement for institutions—

(i) which are not ranked among the top 100 institutions receiving Federal research and development funding, as documented by the statistical data published by the Foundation; and

(ii) for which the proposed project will make a substantial improvement in the institution's capabilities to conduct leading edge research, to provide research experiences for undergraduate students using leading edge facilities, and to broaden the participation in science and engineering research by individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(e) UNDERGRADUATE EDUCATION PROGRAMS.—The Director shall continue to carry out programs in support of undergraduate education, including those authorized in section 17 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–6). Funding for these programs shall increase in proportion to the increase in

1 the total amount appropriated to the Foundation in any
2 year for which appropriations are authorized by this Act.
3 (f) LIMIT ON PROPOSALS.—
4 (1) POLICY.—For programs that require as
5 part of the selection process for awards the submis-
6 sion of preproposals and that also limit the number
7 of preproposals that may be submitted by an institu-
8 tion, the Director shall allow the subsequent submis-
9 sion of a full proposal based on each preproposal
10 that is determined to have merit following the Foun-
11 dation's merit review process.
12 (2) REVIEW AND ASSESSMENT OF POLICIES.—
13 The Board shall review and assess the effects on in-
14 stitutions of higher education of the policies of the
15 Foundation regarding the imposition of limitations
16 on the number of proposals that may be submitted
17 by a single institution for programs supported by the
18 Foundation. The Board shall determine whether cur-
19 rent policies are well justified and appropriate for
20 the types of programs that limit the number of pro-
21 posal submissions. Not later that 1 year after the
22 date of enactment of this Act, the Board shall sum-
23 marize its findings and any recommendations re-
24 garding changes to the current policy on the restric-
25 tion of proposal submissions in a report to the Com-

1 mittee on Science and Technology of the House of
2 Representatives and to the Committee on Commerce,
3 Science, and Transportation and the Committee on
4 Health, Education, Labor, and Pensions of the Sen-
5 ate.

6 **SEC. 4. CENTERS FOR RESEARCH ON LEARNING AND EDU-**
7 **CATION IMPROVEMENT.**

8 The Director shall continue to carry out the program
9 of Centers for Research on Learning and Education Im-
10 provement as established in section 11 of the National
11 Science Foundation Authorization Act of 2002 (42 U.S.C.
12 1862n–2).

13 **SEC. 5. INTERDISCIPLINARY RESEARCH.**

14 (a) IN GENERAL.—The Board shall evaluate the role
15 of the Foundation in supporting interdisciplinary research,
16 including through the Major Research Instrumentation
17 program, the effectiveness of the Foundation's efforts in
18 providing information to the scientific community about
19 opportunities for funding of interdisciplinary research pro-
20 posals, and the process through which interdisciplinary
21 proposals are selected for support. The Board shall also
22 evaluate the effectiveness of the Foundation's efforts to
23 engage undergraduate students in research experiences in
24 interdisciplinary settings, including through the Research

1 in Undergraduate Institutions program and the Research
2 Experiences for Undergraduates program.
3 (b) REPORT.—Not later than 1 year after the date
4 of enactment of this Act, the Board shall provide the re-
5 sults of its evaluation under subsection (a), including a
6 recommendation for the proportion of the Foundation's re-
7 search and related activities that should be allocated for
8 interdisciplinary research, to the Committee on Science
9 and Technology of the House of Representatives and the
10 Committee on Commerce, Science, and Transportation
11 and the Committee on Health, Education, Labor, and
12 Pensions of the Senate.

13 **SEC. 6. PILOT PROGRAM OF GRANTS FOR NEW INVESTIGA-**
14 **TORS.**

15 (a) IN GENERAL.—The Director shall carry out a
16 pilot program to award one-year grants to individuals to
17 assist them in improving research proposals that were pre-
18 viously submitted to the Foundation but not selected for
19 funding.
20 (b) USE OF FUNDS.—Grants awarded under this sec-
21 tion shall be used to support the generation of new data
22 and the performance of additional analysis to enable an
23 individual to resubmit an updated research proposal for
24 review by the Foundation through the agency's competi-
25 tive merit review process.

1 (c) ELIGIBILITY.—To be eligible to receive a grant
2 under this section, an individual shall—
3 (1) not have previously received funding as the
4 principal investigator of a research grant from the
5 Foundation; and
6 (2) have submitted a proposal to the Founda-
7 tion, which may include a proposal submitted to the
8 Research in Undergraduate Institutions program,
9 that was rated very good or excellent under the
10 Foundation's competitive merit review process.
11 (d) SELECTION PROCESS.—The Director shall make
12 awards under this section based on the advice of the pro-
13 gram officers of the Foundation.
14 (e) PROGRAM ADMINISTRATION.—The Director may
15 carry out this section through the Small Grants for Ex-
16 ploratory Research program.
17 (f) NATIONAL SCIENCE BOARD REVIEW.—The
18 Board shall conduct a review and assessment of the pilot
19 program under this section, including the number of new
20 investigators funded, the distribution of awards by type
21 of institution of higher education, and the success rate
22 upon resubmittal of proposals by new investigators funded
23 through this pilot program. Not later than 3 years after
24 the date of enactment of this Act, the Board shall summa-
25 rize its findings and any recommendations regarding

1 changes to or the continuation of the pilot program in a
2 report to the Committee on Science and Technology of the
3 House of Representatives and the Committee on Com-
4 merce, Science, and Transportation and the Committee on
5 Health, Education, Labor, and Pensions of the Senate.

6 **SEC. 7. BROADER IMPACTS MERIT REVIEW CRITERION.**

7 (a) IN GENERAL.—In evaluating research proposals
8 under the Foundation's broader impacts criterion, the Di-
9 rector shall give special consideration to proposals that in-
10 volve partnerships between academic researchers and in-
11 dustrial scientists and engineers that address research
12 areas that have been identified as having high importance
13 for future national economic competitiveness, such as
14 nanotechnology.

15 (b) PARTNERSHIPS WITH INDUSTRY.—The Director
16 shall encourage research proposals from institutions of
17 higher education that involve partnerships with businesses
18 and organizations representing businesses in fields that
19 have been identified as having high importance for future
20 national economic competitiveness and that include input
21 on the research agenda from and cost-sharing by the in-
22 dustry partners.

23 (c) REPORT ON BROADER IMPACTS CRITERION.—
24 Not later than 1 year after the date of enactment of this
25 Act, the Director shall transmit to Congress a report on

1 the impact of the broader impacts grant criterion used by
2 the Foundation. The report shall—
3 (1) identify the criteria that each division and
4 directorate of the Foundation uses to evaluate the
5 broader impacts aspects of research proposals;
6 (2) provide a breakdown of the types of activi-
7 ties by division that awardees have proposed to carry
8 out to meet the broader impacts criterion;
9 (3) provide any evaluations performed by the
10 Foundation to assess the degree to which the broad-
11 er impacts aspects of research proposals were car-
12 ried out and how effective they have been at meeting
13 the goals described in the research proposals;
14 (4) describe what national goals, such as im-
15 proving undergraduate science, mathematics, and
16 engineering education, improving K–12 science and
17 mathematics education, promoting university-indus-
18 try collaboration and technology transfer, and broad-
19 ening participation of underrepresented groups, the
20 broader impacts criterion is best suited to promote;
21 and
22 (5) describe what steps the Foundation is tak-
23 ing and should take to use the broader impacts cri-
24 terion to improve undergraduate science, mathe-
25 matics, and engineering education.

1 **SEC. 8. POSTDOCTORAL RESEARCH FELLOWS.**

2 (a) MENTORING.—The Director shall require that all
3 grant applications that include funding to support
4 postdoctoral researchers include a description of the men-
5 toring activities that will be provided for such individuals,
6 and shall ensure that this part of the application is evalu-
7 ated under the Foundation's broader impacts merit review
8 criterion. Mentoring activities may include career coun-
9 seling, training in preparing grant applications, guidance
10 on ways to improve teaching skills, and training in re-
11 search ethics.

12 (b) REPORTS.—The Director shall require that an-
13 nual reports and the final report for research grants that
14 include funding to support postdoctoral researchers in-
15 clude a description of the mentoring activities provided to
16 such researchers.

17 **SEC. 9. RESPONSIBLE CONDUCT OF RESEARCH.**

18 The Director shall require that each institution that
19 applies for financial assistance from the Foundation for
20 science and engineering research or education describe in
21 its grant proposal a plan to provide appropriate training
22 and oversight in the responsible and ethical conduct of re-
23 search to undergraduate students, graduate students, and
24 postdoctoral researchers participating in the proposed re-
25 search project.

1 **SEC. 10. REPORTING OF RESEARCH RESULTS.**

2 The Director shall ensure that all final project re-
3 ports and citations of published research documents re-
4 sulting from research funded, in whole or in part, by the
5 Foundation, are made available to the public in a timely
6 manner and in electronic form through the Foundation's
7 Web site.

8 **SEC. 11. SHARING RESEARCH RESULTS.**

9 An investigator supported under a Foundation
10 award, whom the Director determines has failed to comply
11 with the provisions of section 734 of the Foundation Grant
12 Policy Manual, shall be ineligible for a future award under
13 any Foundation supported program or activity. The Direc-
14 tor may restore the eligibility of such an investigator on
15 the basis of the investigator's subsequent compliance with
16 the provisions of section 734 of the Foundation Grant Pol-
17 icy Manual and with such other terms and conditions as
18 the Director may impose.

19 **SEC. 12. FUNDING FOR SUCCESSFUL STEM EDUCATION**
20 **PROGRAMS.**

21 (a) EVALUATION OF PROGRAMS.—The Director shall,
22 on an annual basis, evaluate all of the Foundation's grants
23 that are scheduled to expire within one year and—

24 (1) that have the primary purpose of meeting
25 the objectives of the Science and Engineering Equal
26 Opportunity Act (42 U.S.C. 1885 et seq.); or

1 (2) that have the primary purpose of providing
2 teacher professional development.
3 (b) CONTINUATION OF FUNDING.—For grants that
4 are identified under subsection (a) and that are deemed
5 by the Director to be successful in meeting the objectives
6 of the initial grant solicitation, the Director may extend
7 the duration of those grants for up to 3 additional years
8 beyond their scheduled expiration without the requirement
9 for a recompetition. The Director may extend such grants
10 for an additional 3 years following a second review within
11 1 year before the extended completion date, in accordance
12 with subsection (a), and the determination by the Director
13 that the objectives of the grant are being achieved.
14 (c) REPORT TO CONGRESS.—Not later than 2 years
15 after the date of enactment of this Act, the Director shall
16 submit a report to the Committee on Science and Tech-
17 nology of the House of Representatives and to the Com-
18 mittee on Commerce, Science, and Transportation and the
19 Committee on Health, Education, Labor, and Pensions of
20 the Senate that—
21 (1) lists the grants which have been extended in
22 duration by the authority provided under this sec-
23 tion; and
24 (2) provides any recommendations the Director
25 may have regarding the extension of the authority

1 provided under this section to programs other than
2 those specified in subsection (a).

3 **SEC. 13. COST SHARING.**

4 (a) IN GENERAL.—The Board shall evaluate the im-
5 pact of its policy to eliminate cost sharing for research
6 grants and cooperative agreements for existing programs
7 that were developed around industry partnerships and his-
8 torically required industry cost sharing, such as the Engi-
9 neering Research Centers and Industry/University Coop-
10 erative Research Centers. The Board shall also consider
11 the impact that the cost sharing policy has on initiating
12 new programs for which industry interest and participa-
13 tion are sought.

14 (b) REPORT.—Not later than 6 months after the date
15 of enactment of this Act, the Board shall report to the
16 Committee on Science and Technology and the Committee
17 on Appropriations of the House of Representatives, and
18 the Committee on Commerce, Science, and Transpor-
19 tation, the Committee on Health, Education, Labor, and
20 Pensions, and the Committee on Appropriations of the
21 Senate, on the results of the evaluation under subsection
22 (a).

23 **SEC. 14. DONATIONS.**

24 Section 11(f) of the National Science Foundation Act
25 of 1950 (42 U.S.C. 1870(f)) is amended by inserting at

1 the end before the semicolon ", except that funds may be
2 donated for specific prize competitions".

3 **SEC. 15. ADDITIONAL REPORTS.**

4 (a) REPORT ON FUNDING FOR MAJOR FACILITIES.—

5 (1) PRECONSTRUCTION FUNDING.—The Board
6 shall evaluate the appropriateness of the require-
7 ment that funding for detailed design work and
8 other preconstruction activities for major research
9 equipment and facilities come exclusively from the
10 sponsoring research division rather than being avail-
11 able, at least in part, from the Major Research
12 Equipment and Facilities Construction account.

13 (2) MAINTENANCE AND OPERATION COSTS.—
14 The Board shall evaluate the appropriateness of the
15 Foundation's policies for allocation of costs for, and
16 oversight of, maintenance and operation of major re-
17 search equipment and facilities.

18 (3) REPORT.—Not later than 6 months after
19 the date of enactment of this Act, the Board shall
20 report on the results of the evaluations under para-
21 graphs (1) and (2) and on any recommendations for
22 modifying the current policies related to allocation of
23 funding for major research equipment and facilities
24 to the Committee on Science and Technology and
25 the Committee on Appropriations of the House of

1 Representatives, and to the Committee on Com-
2 merce, Science, and Transportation, the Committee
3 on Health, Education, Labor, and Pensions, and the
4 Committee on Appropriations of the Senate.

5 (b) INCLUSION OF POLAR FACILITIES UPGRADES IN
6 MAJOR RESEARCH EQUIPMENT AND FACILITIES CON-
7 STRUCTION PLAN.—Section 201(a)(2)(D) of the National
8 Science Foundation Authorization Act of 1998 (42 U.S.C.
9 1862l(a)(2)(D)) is amended by inserting ''and for major
10 upgrades of facilities in support of Antarctic research pro-
11 grams'' after ''facilities construction account''.

12 (c) REPORT ON EDUCATION PROGRAMS WITHIN THE
13 RESEARCH DIRECTORATES.—Not later than 6 months
14 after the date of enactment of this Act, the Director shall
15 transmit to the Committee on Science and Technology of
16 the House of Representative and the Committee on Com-
17 merce, Science, and Transportation and the Committee on
18 Health, Education, Labor, and Pensions of the Senate a
19 report cataloging all elementary and secondary school, in-
20 formal, and undergraduate educational programs and ac-
21 tivities supported through appropriations for Research
22 and Related Activities. The report shall display the pro-
23 grams and activities by directorate, along with estimated
24 funding levels for the fiscal years 2006, 2007, and 2008,
25 and shall provide a description of the goals of each pro-

1 gram and activity. The report shall also describe how the
2 programs and activities relate to or are coordinated with
3 the programs supported by the Education and Human Re-
4 sources Directorate.

5 (d) REPORT ON RESEARCH IN UNDERGRADUATE IN-
6 STITUTIONS PROGRAM.—The Director shall transmit to
7 Congress along with the fiscal year 2011 budget request
8 a report listing the funding success rates and distribution
9 of awards for the Research in Undergraduate Institutions
10 program, by type of institution based on the highest aca-
11 demic degree conferred by the institution, for fiscal years
12 2008, 2009, and 2010.

13 (e) ANNUAL PLAN FOR ALLOCATION OF EDUCATION
14 AND HUMAN RESOURCES FUNDING.—

15 (1) IN GENERAL.—Not later than 60 days after
16 the date of enactment of legislation providing for the
17 annual appropriation of funds for the Foundation,
18 the Director shall submit to the Committee on
19 Science and Technology and the Committee on Ap-
20 propriations of the House of Representatives, and to
21 the Committee on Commerce, Science, and Trans-
22 portation, the Committee on Health, Education,
23 Labor, and Pensions, and the Committee on Appro-
24 priations of the Senate, a plan for the allocation of
25 education and human resources funds authorized by

1 this Act for the corresponding fiscal year, including
2 any funds from within the research and related ac-
3 tivities account used to support activities that have
4 the primary purpose of improving education or
5 broadening participation.
6 (2) SPECIFIC REQUIREMENTS.—The plan shall
7 include a description of how the allocation of fund-
8 ing—
9 (A) will affect the average size and dura-
10 tion of education and human resources grants
11 supported by the Foundation;
12 (B) will affect trends in research support
13 for the effective instruction of mathematics,
14 science, engineering, and technology;
15 (C) will affect the K-20 pipeline for the
16 study of mathematics, science, engineering, and
17 technology; and
18 (D) will encourage the interest of individ-
19 uals identified in section 33 or 34 of the
20 Science and Engineering Equal Opportunities
21 Act (42 U.S.C. 1885a or 1885b) in mathe-
22 matics, science, engineering, and technology,
23 and help prepare such individuals to pursue
24 postsecondary studies in these fields.

1 **SEC. 16. ADMINISTRATIVE AMENDMENTS.**

2 (a) TRIANNUAL AUDIT OF THE OFFICE OF THE NA-
3 TIONAL SCIENCE BOARD.—Section 15(a) of the National
4 Science Foundation Authorization Act of 2002 (42 U.S.C.
5 4862n–5) is amended—

6 (1) in paragraph (3), by striking ''an annual
7 audit'' and inserting ''an audit every three years'';

8 (2) in paragraph (4), by striking ''each year''
9 and inserting ''every third year''; and

10 (3) by inserting after paragraph (4) the fol-
11 lowing new paragraph:

12 ''(5) MATERIALS RELATING TO CLOSED POR-
13 TIONS OF MEETINGS.—To facilitate the audit re-
14 quired under paragraph (3) of this subsection, the
15 Office of the National Science Board shall maintain
16 the General Counsel's certificate, the presiding offi-
17 cer's statement, and a transcript or recording of any
18 closed meeting, for at least 3 years after such meet-
19 ing.''.

20 (b) LIMITED TERM PERSONNEL FOR THE NATIONAL
21 SCIENCE BOARD.—Subsection (g) of section 4 of the Na-
22 tional Science Foundation Act of 1950 (42 U.S.C.
23 1863(g)) is amended to read as follows:

24 ''(g) The Board may, with the concurrence of a ma-
25 jority of its members, permit the appointment of a staff
26 consisting of not more than 5 professional staff members,

1 technical and professional personnel on leave of absence
2 from academic, industrial, or research institutions for a
3 limited term and such operations and support staff mem-
4 bers as may be necessary. Such staff shall be appointed
5 by the Chairman and assigned at the direction of the
6 Board. The professional members and limited term tech-
7 nical and professional personnel of such staff may be ap-
8 pointed without regard to the provisions of title 5, United
9 States Code, governing appointments in the competitive
10 service, and the provisions of chapter 51 of such title relat-
11 ing to classification, and shall be compensated at a rate
12 not exceeding the maximum rate payable under section
13 5376 of such title, as may be necessary to provide for the
14 performance of such duties as may be prescribed by the
15 Board in connection with the exercise of its powers and
16 functions under this Act. Section 14(a)(3) shall apply to
17 each limited term appointment of technical and profes-
18 sional personnel under this subsection. Each appointment
19 under this subsection shall be subject to the same security
20 requirements as those required for personnel of the Foun-
21 dation appointed under section 14(a).''.

22 **SEC. 17. NATIONAL SCIENCE BOARD REPORTS.**

23 Paragraphs (1) and (2) of section 4(j) of the National
24 Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1)

1 and (2)) are each amended by striking ", for submission
2 to" and inserting "and".

3 **SEC. 18. NATIONAL ACADEMY OF SCIENCE REPORT ON DI-**
4 **VERSITY IN STEM FIELDS.**

5 The Foundation shall enter into an arrangement with
6 the National Academy of Sciences for a report, to be
7 transmitted to the Congress not later than 1 year after
8 the date of enactment of this Act, about barriers to in-
9 creasing the number of underrepresented minorities in
10 science, technology, engineering, and mathematics fields
11 and to identify strategies for bringing more underrep-
12 resented minorities into the science, technology, engineer-
13 ing, and mathematics workforce.

COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
APRIL 25, 2007

AMENDMENT ROSTER

H.R. 1867 – *the National Science Foundation Authorization Act of 2007*

No.	Sponsor	Description	Results
1	Mr. Baird	Manager's amendment containing technical and clarifying changes as well as the following substantive changes: • Adds permission in Sec.3 for a waiver of cost-sharing on MRI grants for consortia of institutions that include at least one undergraduate institution; • Adds eligibility for Centers in Sec. 4 for certain nonprofit organizations; • Allows the Director to award up to 3 Waterman Awards per year; • Clarifies charge to National Academy of Sciences in Sec. 18 report on minorities in STEM fields.	Adopted by voice vote.
2	Mr. Hall	Reduces the cap on Major Research Instrumentation (MRI) awards under Sec. 3(d) from $6 million to $4 million and strikes the step-wise increase thereafter.	Adopted by voice vote.
3	Mr. Gingrey	Strikes specific allocation in Sec. 3 for Research Experiences for Undergraduates (REU) program; instead requires increases for REU in proportion to the total research budget.	Adopted by voice vote.

AMENDMENT TO H.R. 1867

OFFERED BY MR. BAIRD OF WASHINGTON

Page 2, line 18, strike "of which".

Page 2, line 19, strike "Experience" and insert "Experiences".

Page 4, line 13, strike "of which".

Page 4, line 14, strike "Experience" and insert "Experiences".

Page 6, line 10, strike "of which".

Page 6, line 11, strike "Experience" and insert "Experiences".

Page 9, line 2, strike "institutions".

Page 9, line 3, insert "institutions—" after "(i)".

Page 9, line 3, indent and insert "(I)" before "which are not".

Page 9, line 8, strike "(ii)" and insert "(II)".

Page 9, line 18, strike the period and insert "; and".

Page 9, after line 18, insert the following new clause:

1 (ii) consortia of institutions of higher
2 education that include at least one institu-
3 tion that is not a Ph.D-granting institu-
4 tion.

Page 11, line 8, insert "(a) FUNDING FOR CENTERS.—" before "The Director shall".

Page 11, after line 12, insert the following new subsection:

5 (b) ELIGIBILITY FOR CENTERS.—Section 11 of the
6 National Science Foundation Authorization Act of 2002
7 (42 U.S.C. 1862n–2) is amended—
8 (1) in subsection (a)(1), by inserting "or eligi-
9 ble nonprofit organizations" after "institutions of
10 higher education";
11 (2) in subsection (b)(1) by inserting "or an eli-
12 gible nonprofit organization" after "institution of
13 higher education"; and
14 (3) in subsection (b)(1) by striking "of such in-
15 stitutions" and inserting "thereof".

Page 12, line 7, insert "funding" after "related activities".

Page 12, lines 20 through 25, amend subsection (b) to read as follows:

1 (b) USE OF FUNDS.—Grants awarded under this sec-
2 tion shall be used to enable an individual to resubmit an
3 updated research proposal for review by the Foundation
4 through the agency's competitive merit review process.
5 Uses of funds made available under this section may in-
6 clude the generation of new data and the performance of
7 additional analysis.

Page 25, after line 21, insert the following new subsection:

8 (c) INCREASE IN NUMBER OF WATERMAN AWARDS
9 TO THREE.—Section 6(c) of the National Science Founda-
10 tion Authorization Act of 1975 (42 U.S.C. 1881a) is
11 amended to read as follows:
12 "(c) Up to three awards may be made under this sec-
13 tion in any one fiscal year.".

Page 26, line 5, insert "(a) IN GENERAL.—" before "The Foundation shall".

Page 26, after line 13, insert the following new subsection:

14 (b) SPECIFIC REQUIREMENTS.—The Director shall
15 ensure that the study described in subsection (a) address-
16 es—
17 (1) social and institutional factors that shape
18 the decisions of minority students to commit to edu-

1 cation and careers in the science, technology, engi-
2 neering, and mathematics fields;
3 (2) specific barriers preventing greater minority
4 student participation in the science, technology, en-
5 gineering, and mathematics fields;
6 (3) primary focus points for policy intervention
7 to increase the recruitment and retention of under-
8 represented minorities in America's future work-
9 force;
10 (4) programs already underway to increase di-
11 versity in the science, technology, engineering, and
12 mathematics fields, and their level of effectiveness;
13 (5) factors that make such programs effective,
14 and how to expand and improve upon existing pro-
15 grams;
16 (6) the role of minority-serving institutions in
17 the diversification of America's workforce in these
18 fields and how that role can be supported and
19 strengthened; and
20 (7) how the public and private sectors can bet-
21 ter assist minority students in their efforts to join
22 America's workforce in these fields.

AMENDMENT TO H.R. 1867
OFFERED BY MR. HALL OF TEXAS

Page 8, lines 2 through 10, strike "$6,000,000" and all that follows through "shall be $12,000,000" and insert "$4,000,000, except if the total amount appropriated for the program for a fiscal year exceeds $125,000,000, in which case the maximum amount of an award shall be $6,000,000".

AMENDMENT TO H.R. 1867

OFFERED BY MR. GINGREY OF GEORGIA

Page 2, lines 17 through 20, strike ", and of which" and all that follows through "Undergraduates program".

Page 4, lines 12 through 15, strike ", and of which" and all that follows through "Undergraduates program".

Page 6, lines 9 through 12, strike ", and of which" and all that follows through "Undergraduates program".

Page 11, after line 5, insert the following new subsection:

1 (g) RESEARCH EXPERIENCES FOR UNDERGRADU-
2 ATES.—The Director shall increase funding for the Re-
3 search Experiences for Undergraduates program in pro-
4 portion to the increase in the total amount appropriated
5 to the Foundation for research and related activities in
6 any year for which appropriations are authorized by this
7 Act.