U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY

HEARING CHARTER

Keeping America FIRST: Federal Investments in Research, Science, and Technology
at NSF, NIST, OSTP and interagency STEM Programs

Wednesday, November 13, 2013
10:00 a.m. - 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On November 13th, the Research and Technology Subcommittee will hold a hearing to examine the fundamental science and research activities at the National Science Foundation (NSF), National Institutes for Standards and Technology (NIST), and the Office of Science and Technology Policy (OSTP). The coordination of Science, Technology, Engineering and Mathematics (STEM) education programs across several federal agencies will also be examined during this hearing. Witnesses have been asked to testify on their perspectives about a discussion draft of legislation entitled the Frontiers in Innovative Research, Science, and Technology (or FIRST) Act (see attached Discussion Draft).

Witnesses

Dr. Richard Buckius, Vice President for Research, Purdue University

Dr. Daniel Sarewitz, Co-Director, Consortium for Science, Policy & Outcomes, Professor of Science and Society, Arizona State University

Dr. Timothy Killeen, President, The Research Foundation for SUNY, Vice Chancellor for Research, SUNY System Administration

Mr. James Brown, Executive Director, STEM Education Coalition

Overview

National Science Foundation (NSF)

The NSF is the primary source of federal funding for non-medical basic research. The NSF is the major source of federal funding for many fields of scientific endeavor. Through more than 11,700 competitive awards per year, NSF supports an average of 326,000 scientists, engineers, educators and students at universities, laboratories and field sites all over the U.S. and

throughout the world. These grants fund specific research proposals that have been judged the most promising by a merit-review system.

NSF's research and education activities can be divided into 6 major funding areas:

Research and Related Activities (RRA) comprises the majority of the Foundation's activities and budget by funding research in biological sciences, computer science, engineering, geosciences, mathematics, physical sciences, and the social sciences. Additional research activities include funding of international and integrative activities, and the U.S. Artic Research Commission. Research awards are awarded from a competitive, merit-review process.

Education and Human Resources (EHR) supports the preparation of a diverse, globally competent STEM workforce and a STEM-literate citizenry through investment in research and development on STEM education and learning.

Major Research Equipment and Facilities Construction (MREFC) is responsible for funding the construction of large research facilities, ranging from ground-based telescopes to research ships. Funding for the design, operation and management of these major user facilities is included in the RRA budget.

Agency Operations and Award Management (AOAM) funds all internal operations of NSF.

National Science Board (NSB) is responsible for establishing policies for NSF and for providing national science policy advice to the President and Congress.

Office of the Inspector General (OIG) conducts and supervises audits and investigations of NSF programs, evaluates allegations of research misconduct, and issues reports to the NSB, Foundation, and Congress regarding problems, corrective actions, and progress towards improving the management and conduct of NSF programs.

Federal STEM Education Programs and Activities

The Administration's FY14 budget request, released in April 2013, included a proposal to reorganize STEM education programs across the federal government. The proposal would decrease the number of federal STEM programs from 236 to 110, with 126 programs either eliminated or consolidated into existing programs and grow the number of agencies with federal STEM programs from 13 to 14, to include the Smithsonian Institution. The proposal identified the U.S. Department of Education as the lead for K-12 instruction and the National Science Foundation (NSF) as the lead on undergraduate and graduate STEM education. The Smithsonian Institution would lead the Administration's work on informal education activities, activities that take place outside the classroom. The Committee held a hearing in June 2013 to review the Administration's proposal.[1]

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[1] http://science.house.gov/hearing/full-committee-hearing-stem-education-administration%E2%80%99s-proposed-re-organization

The 2010 COMPETES Act (P.L. 111-358) included a number of requirements for the review and coordination of federal STEM programs. The Act required the National Science and Technology Council, an interagency group led by the White House Office of Science and Technology Policy, to form a Committee on STEM (CoSTEM) to develop and implement a 5-year strategic plan. CoSTEM released an inventory of federal STEM programs in December 2011 and the final Strategic Plan was released in May 2013, over a month after the reorganization was proposed.

Prior to completing the Strategic Plan, CoSTEM released a progress report in February 2012. In the progress report CoSTEM found among the hundreds of federally-funded STEM activities identified in the report that none had the same objectives, target audiences, products, or STEM fields of focus. The report acknowledged that "this conclusion should not be interpreted to mean there are no opportunities for improving the alignment, deployment, and efficiency of federal STEM education investments."[2]

Office of Science and Technology Policy (OSTP)

The National Science and Technology Policy, Organization, and Priorities Act of 1976 authorized the establishment of the Office Science and Technology Policy (OSTP) to specifically advise the President on science and technology policy issues. OSTP also leads interagency efforts to development and implement science and technology budgets and to coordinate science education efforts.

The mission of OSTP has several aspects: "first, to provide the President and his senior staff with accurate, relevant, and timely scientific and technical advice on all matters of consequence; second, to ensure that the policies of the Executive Branch are informed by sound science; and third, to ensure that the scientific and technical work of the Executive Branch is properly coordinated so as to provide the greatest benefit to society."[3]

National Institute of Standards and Technology (NIST)

NIST is a non-regulatory agency within the Department of Commerce. Originally founded in 1901 as the National Bureau of Standards, NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. By working closely alongside industry, NIST has become recognized as a provider of high-quality information utilized by the private sector.

NIST operates two main research laboratories in Gaithersburg, Maryland, and Boulder, Colorado, as well as radio stations in Hawaii and Colorado. NIST also maintains partnerships with the Hollings Marine Labs in Charleston, South Carolina, the Joint Institute for Laboratory Astrophysics (JILA) with the University of Colorado in Boulder, as well as the Center for

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[2] *Coordinating Federal Science, Technology, Engineering, and Mathematics (STEM) Education Investments: Progress Report.* Committee on STEM Education, National Science and Technology Council, p. 10. http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_federal_stem_education_coordination_report.pdf

[3] http://www.whitehouse.gov/administration/eop/ostp/about

Advanced Research in Biotechnology (CARB) and the Joint Quantum Institute with the University of Maryland.

NIST employs approximately 3,000 scientists, engineers, technicians, support, and administrative personnel. NIST hosts an additional 2,700 associates and facility users from academia, industry, and other government agencies each year. NIST also partners with 1,300 manufacturing specialists and staff at about 400 Manufacturing Extension Partnership (MEP) service locations around the country.[4]

NIST has three main budget accounts:

Scientific and Technical Research and Services (STRS)

STRS includes NIST's Core Laboratory research programs. STRS initiatives also include advanced manufacturing, cybersecurity research and standards and education, developing measurement tools and standards for cyber physical systems, advancing broadband communications, and disaster resilience.

Construction of Research Facilities (CRF)

CRF supports construction of new facilities and maintenance and repair of existing NIST buildings.

Industrial Technology Services (ITS)

In addition to the NIST laboratories, NIST manages several extramural programs supporting industry. ITS includes the Manufacturing Extension Partnership (MEP) program. The MEP program is a public/private partnership run by Centers in all 50 states and Puerto Rico that provides technical assistance for small- and medium-sized manufacturers to modernize their operations and adapt to foreign competition. MEP Centers are supported by equal contributions from federal funds, state funds, and industry client fees.

NIST currently operates six laboratory units which conduct research and development for measurement science, standards, and technology: the Material Measurement Laboratory (MML); the Physical Measurement Laboratory (PLM); the Engineering Laboratory (EL); the Information Technology Laboratory (ITL); the Center for Nanoscale Science and Technology (CNST); and the Center for Neutron Research (NCNR).

Technology Transfer

In fiscal year 2012, the Federal Government funded more than $131 billion in research and development (R&D) activities. Colleges and universities conduct the majority of basic research in the United States, and cumulatively receive more than half of their total research funding from federal agencies. Because of the large amounts expended by the Federal Government on basic research by universities, research institutes, and national laboratories,

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[4] http://www.nist.gov/public_affairs/general_information.cfm (Updated April 11, 2013).

efforts to improve the transfer of federally-funded research are of interest to both the Federal Government and stakeholders across the nation.

Recently, there has been bipartisan support to establish a grant program within Federal Agencies that currently participate in the Small Business Technology Transfer program to support innovative approaches to technology transfer at institutions of higher education, nonprofit research institutions, and Federal laboratories[5]. The purpose of this program is to accelerate the commercialization of federally funded research and technology by small business concerns, including new businesses.

Networking Information Technology Research and Development (NITRD)

Originally authorized in the High-Performance Computing Act of 1991 (P.L. 102-194), the NITRD program is the main R&D investment portfolio of 15 federal participating agencies in networking, computing, software, cyber security and related information technologies. The program totals over $3.7 billion in FY2013 (with the National Science Foundation being the principal contributor). Other federal agencies participate in program activities beyond the 15 member agencies. The NITRD program supports a number of research areas, including big data, cyber physical systems, cyber security and information assurance, health technology, high performance computing and large scale networking.

The NITRD Subcommittee of the National Science and Technology Council (NSTC) is the working body for interagency planning and coordination and includes representatives from each of the participating NITRD agencies as well as the Office of Management and Budget (OMB). The National Coordination Office (NCO) provides staff support for the NITRD Subcommittee and the program's advisory committee and serves as the public interface for the program.

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[5] http://science.house.gov/hearing/subcommittee-research-and-technology-improving-technology-transfer-universities-research