



## NATIONAL SCIENCE FOUNDATION

### Funding Highlights:

- Provides \$7.4 billion for the National Science Foundation, which is \$340 million above the 2012 enacted level. Investments are made in research priorities and savings of \$66 million are realized through terminations and reductions in lower-priority programs.
- Maintains the President's commitment to double funding for key basic research agencies, including a robust 5 percent increase over the 2012 enacted level for NSF.
- Fosters the development of a clean energy economy by providing \$203 million for a cross-agency sustainability research effort focused on renewable energy technologies and complex environmental- and climate-system processes.
- Supports future job creation in advanced manufacturing and emerging technologies with \$414 million for multidisciplinary research targeted at new materials, wireless communications, cyberinfrastructure, "smart" infrastructure, and robotics technologies.
- Protects the Nation's critical information technology infrastructure with \$57 million for a coordinated cybersecurity research initiative.
- Develops the next generation of scientific leaders with \$459 million for the prestigious graduate fellowship and early career faculty programs.
- Advances evidence-based reforms in K-16 science and math education, including improved undergraduate instruction at research universities and a joint math education initiative with the Department of Education.
- Makes tough reductions and terminations to lower-priority education, outreach, and research programs, which will save over \$66 million.
- Cuts administrative expenses, which will save an additional \$19 million.

The National Science Foundation (NSF) is the key Federal grant-making agency responsible for supporting the full breadth of non-biomedical science and engineering research at the Nation's universities and colleges. NSF's research programs and high-tech workforce development programs help drive future economic growth, global competitiveness, and the creation of high-wage jobs for American workers. NSF plays a critical role in the implementation of the President's Plan for Science and Innovation. To support this important mission and underscore the priority the Administration places on innovation, the President's 2013 Budget provides \$7.4 billion for NSF, 5 percent above the 2012 enacted level, and focuses on cross-cutting research priorities in advanced manufacturing, clean energy, wireless communications, and science and mathematics education. Consistent with Administration-wide efforts to reduce spending in a tight fiscal environment, the Budget realizes savings by reducing administrative costs and eliminating funding for lower priority education and research programs that lack evidence of impact or do not align well with NSF's core mission responsibilities.

### ***Invests in American Competitiveness***

**Supports the Fundamental Research that Underpins Progress in Science, Technology, and Innovation.** The Administration proposes \$3.2 billion for the core fundamental research grant programs at NSF. The Budget also provides \$63 million for the second year of an interdisciplinary research and education initiative that is changing the way the agency solicits and funds innovative cross-disciplinary proposals that may not have fared well under the standard peer review process.

**Lays the Groundwork for the Industries and Jobs of the Future.** NSF focuses on linking the results of fundamental research to societal needs, including building human capacity through educating tomorrow's science, technology, engineering, and mathematics (STEM)

workforce. To encourage interdisciplinary research for a future bio-economy, the Budget provides \$30 million for innovative proposals at the interface of biology, mathematics, the physical sciences, and engineering. The Administration proposes \$106 million, an increase of \$28 million above the 2012 enacted level, for the second year of a cyberinfrastructure initiative that will accelerate the pace of discovery in all research disciplines. Given the large and growing importance of the wireless communication sector, the Budget also provides \$51 million for an interdisciplinary program to develop innovative approaches and technologies to enable more flexible and efficient access to the radio spectrum.

**Supports the Long-Term Competitiveness of American Manufacturing.** The Administration proposes \$149 million, an increase of \$39 million above the 2012 enacted level, for basic research targeted at developing revolutionary new manufacturing technologies in partnership with other Federal agencies and the private sector. This advanced manufacturing research is part of a larger \$257 million research initiative aimed at transforming static systems, processes, and infrastructure into adaptive, pervasive "smart" systems with embedded computational intelligence that can sense, adapt, and react. This larger research initiative also provides \$28 million for NSF's contribution to the National Robotics Initiative, which will accelerate the development and use of robots in the United States.

**Supports the Long Term Development of a Clean Energy Economy.** The Administration proposes \$355 million, an increase of \$14 million above the 2012 enacted level, for research that is directly relevant to future clean energy technologies such as solar power generation and energy efficiency. In coordination with other Federal agencies, this clean energy research is a key component of an integrated approach to increasing U.S. energy independence, enhancing environmental stewardship, reducing energy and carbon intensity, and generating sustainable economic growth.

**Accelerates Innovations from the Laboratory to the Market.** While the knowledge gained from NSF-supported basic research frequently advances a particular field of science or engineering, some results also show immediate potential for broader applicability and impact in the business world. The Administration proposes \$19 million for the new public-private “Innovation Corps” program at NSF aimed at bringing together the technological, entrepreneurial, and business know-how necessary to bring discoveries ripe for innovation out of the university lab.

**Develops the Next Generation of Scientific Leaders.** The Administration proposes \$459 million, an increase of \$55 over the 2012 enacted level, for two prestigious agency-wide science and engineering workforce development programs: the graduate research fellowship program and the faculty early career development program. These two programs recognize and support the best and brightest scientists and engineers at the formative stages of their careers. The Budget will also provide \$49 million for a new effort within NSF to integrate and leverage STEM education research to improve learning in science and engineering disciplines and to capitalize on the scientific assets across NSF to enhance outcomes in learning and education programs.

**Promotes a Secure and Reliable Cyberspace.** The Administration proposes \$110 million for a basic research initiative at NSF aimed at protecting the Nation’s critical information technology infrastructure, including the Internet, from a wide range of threats that challenge its security, reliability, availability, and overall trustworthiness. This initiative will be managed in partnership with other Federal agencies consistent with the Administration’s strategic plan for cybersecurity research and development.

**Builds and Operates a Cutting-Edge Suite of Major Scientific Research Facilities.** The Administration proposes \$196 million to continue the construction of four cutting-edge research projects: the world’s largest solar telescope, a fundamental gravitational physics

experiment, an ecological observation network that spans the United States, and an unprecedented set of ocean observatories. The operation of NSF’s existing research facilities—such as the academic research fleet, the Cornell synchrotron source, and the South Pole Station—is equally important, so the Administration proposes \$843 million to maintain this unique suite of facilities.

### ***Increases the Number and Quality of STEM Graduates***

**Improves Undergraduate Math and Science Instruction.** The Administration proposes \$20 million for the second year of a teacher-training research and development program for undergraduate teachers. This new program will transform the way science, engineering, and math is taught to undergraduate students. Competitive proposals will target the teaching of all undergraduate courses and the teaching practices of all faculty members in a department for all, or most, of the relevant departments at an institution. This program will support research on how to achieve widespread sustainable implementation of improved STEM undergraduate teaching practices and student outcomes at major universities, particularly for future K-12 STEM teachers. The Administration also proposes \$61 million, an increase of 56 percent over 2012 enacted, for NSF’s Transforming Undergraduate Education in STEM program. This increase will provide targeted research and development funds to design, test, and implement more effective educational materials, curriculum, and methods to improve undergraduate learning and completion rates in STEM for a diverse population.

**Improves K-16 Math Education and Knowledge Building.** The Administration proposes \$30 million at NSF (in combination with \$30 million at the Department of Education) for a jointly administered mathematics education initiative. This new program will create a multi-agency STEM tiered evidence initiative on K-16 mathematics that

will combine the strength in mathematics education research at NSF with the Department of Education's State and school district connections and program scale up expertise. The program would provide grants to researchers, or programs with the greatest potential for transformational impact, and provide incentives for State, local, and institutional decision makers to infuse proven practices into math education programs. The program will lead to the creation of a knowledge-building infrastructure and model a new approach to grantmaking that systematically takes educational programs from early research through widespread effective use. This program is a pilot for a model that will be implemented more widely as part of the Federal STEM education strategic plan.

### ***Makes Tough Choices***

**Reduces Administrative Expenses and Terminates Low-Priority Programs.** The Administration proposes to terminate or reduce several research and public affairs programs that have achieved their original goals, are no longer innovative, or are tangential to the agency's core mission. NSF will also promote efficiency and effectiveness through improved business processes and the use of technology. The Administration proposes to repurpose the savings from these administrative efficiencies and low-priority program terminations to provide programmatic increases for high priority areas of basic research, innovation, workforce development, and science education.

#### **National Science Foundation** (In millions of dollars)

	Actual 2011	Estimate	
		2012	2013
Discretionary Budget Authority:			
Research and Related Activities .....	5,510	5,689	5,983
Education and Human Resources .....	861	829	876
Major Research Equipment and Facilities Construction .....	117	197	196
Agency Operations and Award Management .....	299	299	299
Office of the Inspector General .....	14	14	14
Office of the National Science Board .....	5	4	4
Total, Discretionary budget authority .....	6,806	7,032	7,372
 Total, Discretionary outlays .....	 7,050	 8,045	 7,368
 Mandatory Outlays:			
H-1B Visa Fee Programs .....	115	152	150
Donations and Receipts .....	-19	84	10
Total, Mandatory outlays .....	96	236	160
 Total, Outlays .....	 7,146	 8,281	 7,528