National Science Foundation

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National Science Foundation

- *The National Science Foundation (NSF) is a United States government agency that supports fundamental research and education in all the non-medical fields of science and engineering.*
- *In some fields, such as mathematics, computer science, economics, and the social sciences, the NSF is the major source of federal backing.*

The National Science Foundation (NSF) is a United States government agency that supports fundamental research and education in all the non-medical fields of science and engineering. Its medical counterpart is the National Institutes of Health. With an annual budget of about US$7.8 billion (fiscal year 2018), the NSF funds approximately 24% of all federally supported basic research conducted by the United States' colleges and universities. In some fields, such as mathematics, computer science, economics, and the social sciences, the NSF is the major source of federal backing.

The NSF's director and deputy director are appointed by the President of the United States, and confirmed by the United States Senate, whereas the 24 presidentially appointed members of the National Science Board (NSB) do not require Senate confirmation. The director and deputy director are responsible for administration, planning, budgeting and day-to-day operations of the foundation, while the NSB meets six times a year to establish its overall policies. The current NSF director, confirmed in March 2014, is astronomer France A. Córdova, former president of Purdue University.

History and mission

- *The NSF is the only U.S. federal agency with a mandate to support all non-medical fields of research.*
- *Its stated mission is "To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense."*
- *The NSF was established by the National Science Foundation Act of 1950.*

The NSF was established by the National Science Foundation Act of 1950. Its stated mission is "To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense." The NSF's scope has expanded over the years to include many areas that were not in its initial portfolio, including the social and behavioral sciences, engineering, and science and mathematics education. The NSF is the only U.S. federal agency with a mandate to support all non-medical fields of research.

Budget and performance history

- *In 2012, political science research was barred from NSF funding following the passage of the Flake Amendment.*
- *In 1981, the Office of Management and Budget (OMB) introduced a proposal to reduce the NSF social sciences directorate's budget by 75%.*
- *Various bills have been introduced to direct funds within the NSF.*

After the technology boom of the 1980s, both sides of the aisle have generally embraced the notion that government-funded basic research is essential for the nation's economic health and global competitiveness, and for national defense.[citation needed] That support has manifested itself in an expanding budget—from $1 billion in 1983 ($2.52bn in 2018 dollars) to just under $7.8 billion by FY 2018, (fiscal year 2018 enacted level). NSF has published annual reports since 1950, which since the new millennium have been two reports, variously called Performance Report and Accountability Report or Performance Highlights and Financial Highlights; the latest available FY 2013 Agency Financial Report was posted December 16, 2013, and the 6 page FY 2013 Performance and Financial Highlights was posted March 25, 2013. Recently, the organization has been focusing on obtaining high return on investment from their spending on scientific research.

Various bills have been introduced to direct funds within the NSF. In 1981, the Office of Management and Budget (OMB) introduced a proposal to reduce the NSF social sciences directorate's budget by 75%. Economist Robert A. Moffit suggests a connection between this proposal and Democratic Senator William Proxmire's Golden Fleece Award series criticizing "frivolous" government spending—Proxmire's first Golden Fleece had been awarded to the NSF in 1975, for granting $84,000 to a social science project investigating why people fall in love. Ultimately, the OMB's 75% reduction proposal failed, but the NSF Economics Program budget did fall 40%. In 2012, political science research was barred from NSF funding following the passage of the Flake Amendment. Legislation requiring specific appropriations for various directorates was also approved by the House of Representatives in May 2015. This legislation broke the precedent of granting the NSF autonomy to determine its own priorities.

Timeline

Pre–World War II

- *Academic research in science and engineering occasionally received federal funding.*

Although the federal government had established nearly 40 scientific organizations between 1910 and 1940, the US relied upon a primarily laissez-faire approach to scientific research and development. Academic research in science and engineering occasionally received federal funding. Within University laboratories, almost all support came from private contributions and charitable foundations. In industrial laboratories, the concentration of workers and funding (some through military and government programs as a result of Roosevelt's New Deal) would eventually raise concern during the wartime period. In particular, concerns were raised that industry laboratories were largely allowed full patent rights of technologies developed with federal funds. These concerns, in part, led to efforts like Senator Harley M. Kilgore's "Science Mobilization Act" (see below).

1940–49

- *Separately, President Franklin D. Roosevelt sponsored creation of organizations to coordinate federal funding of science for war, including the National Defense Research Committee and the Office of Scientific Research and Development both from 1941-1947.*
- *It proposed creating a new federal agency, the National Research Foundation.*
- *The bills called for the creation of a centralized science agency, but differed in governance and research supported.*

Amidst growing awareness that US military capability depended on strength in science and engineering, Congress considered several proposals to support research in these fields. Separately, President Franklin D. Roosevelt sponsored creation of organizations to coordinate federal funding of science for war, including the National Defense Research Committee and the Office of Scientific Research and Development both from 1941-1947. Despite broad agreement over the principle of federal support for science, working out a consensus how to organize and manage it required five years. The five-year political debate over the creation of a national scientific agency has become a topic for academic study, and is currently understood from a variety of perspectives. Themes include disagreements over administrative structure, patents and inclusion of social sciences, a populist-versus-scientist dispute, as well as the roles of political parties, Congress, and President Truman.

Most commonly, this debate is characterized by the conflict between New Deal Senator Harley M. Kilgore and OSRD head Vannevar Bush. Narratives about the National Science Foundation prior to the 1970s typically concentrated on Vannevar Bush and his 1945 publication Science—The Endless Frontier. In this report, Vannevar Bush, then head of the Office of Scientific Research and Development which ran the Manhattan Project that outlived it, addressed what should be done in the postwar years to further foster

government commitment to science and technology. Issued to President Harry S. Truman in July 1945, the report laid out a strong case for federally-funded scientific research, arguing that the nation would reap rich dividends in the form of better health care, a more vigorous economy, and a stronger national defense. It proposed creating a new federal agency, the National Research Foundation.

Upon reexamining the historical record, scholars discovered that the NSF first appeared as a comprehensive New Deal Policy proposed by Sen. Harley Kilgore of West Virginia. In 1942, Senator Kilgore introduced the "Science Mobilization Act" (S. 1297), which did not pass. Perceiving organizational chaos, elitism, over-concentration of funds in a small set of universities, and lack of incentives for socially applicable research, Kilgore envisioned a comprehensive and centralized research body supporting basic and applied research which would be controlled by members of the public and civil servants rather than scientific experts. The public would own the rights to all patents funded by public monies and research monies would be equitably spread across universities. Kilgore's supporters included non-elite universities, small businesses and the Budget Bureau. His proposals received mixed support.

Vannevar Bush, an opponent of Kilgore, preferred science policy to be driven by experts and scientists rather than public and civil servants. Bush was concerned that public interests would politicize science, and believed that scientists would make the best judges of the direction and needs of their field. While Bush and Kilgore both agreed that on the need for a national science policy, Bush maintained that scientists should continue to own the research results and patents, wanted project selection limited to scientists, and focused support on basic research, not in the social sciences, leaving the market to support applied projects.

Sociologist Daniel Kleinman divides the debate into three broad legislative attempts. The first attempt consisted of the 1945 Magnuson bill (S. 1285), the 1945 Science and Technology Mobilization Bill, a 1945 compromise bill (S. 1720), a 1946 compromise bill (S. 1850), and the Mills Bill (H.B. 6448). The Magnuson bill was sponsored by Senator Warren Magnuson and drafted by the OSRD, headed by Vannevar Bush. The Science and Technology Mobilization bill was promoted by Harley Kilgore. The bills called for the creation of a centralized science agency, but differed in governance and research supported. The second attempt, in 1947, included Senator H. Alexander Smith's bill S. 526, and Senator Elbert Thomas's bill S. 525. The Smith bill reflected ideas of Vannevar Bush, while the Thomas bill was identical to the previous year's compromise bill (S. 1850).

After amendments, the Smith bill made it to President Truman's desk, but it was vetoed. Truman wrote that he did so with regret, but that the proposed agency would have been "divorced from control by the people to an extent that implies a distinct lack of faith in the democratic process". The third attempt began with the introduction of S. 2385 in 1948. This was a compromise bill cosponsored by Smith and Kilgore, and Bush aide John Teeter had contributed in the drafting process. In 1949, S. 247 was introduced by the same group of senators behind S. 2385, marking the fourth and final effort to establish a national science agency. Essentially identical to S. 2385, S. 247 passed the Senate and the House with a few

amendments. It was signed by President Truman on May 10, 1950. Kleinman points out that the final NSF bill closely resembles Vannevar Bush's proposals.

1950–1959

- *The idea expanded to encompass the National Optical Astronomy Observatory, the National Radio Astronomy Observatory, the National Solar Observatory, the Gemini Observatory and the Arecibo Observatory, all of which are funded in whole or in part by NSF.*
- *16 creating the National Science Foundation.*
- *which provided for a National Science Board of twenty-four part-time.*

In 1950 Harry S. Truman signed Public Law 507, or 42 U.S.C. 16 creating the National Science Foundation. which provided for a National Science Board of twenty-four part-time. In 1951 Truman nominated Alan T. Waterman, chief scientist at the Office of Naval Research, to become the first Director. With the Korean War underway, the agency's initial budget was just $151,000 for 9 months. After moving its administrative offices twice, NSF began its first full year of operations with an appropriation from Congress of $3.5 million, far less the almost $33.5 million requested with which 28 research grants were awarded. After the 1957 Soviet Union orbited Sputnik 1, the first ever man-made satellite, national self-appraisal questioned American education, scientific, technical and industrial strength and Congress increased the NSF appropriation for 1958 to $40 million. In 1958 the NSF selected Kitt Peak, near Tucson, Arizona, as the site of the first national observatory, that would give any astronomer unprecedented access to state-of-the-art telescopes; previously major research telescopes were privately funded, available only to astronomers who taught at the universities that ran them. The idea expanded to encompass the National Optical Astronomy Observatory, the National Radio Astronomy Observatory, the National Solar Observatory, the Gemini Observatory and the Arecibo Observatory, all of which are funded in whole or in part by NSF. The NSF's astronomy program forged a close working relationship with NASA, also founded in 1958, in that the NSF provides virtually all the U.S. federal support for ground-based astronomy, while NASA's responsibility is the U.S. effort in space-based astronomy. In 1959 the U.S. and other nations concluded the Antarctic Treaty reserving Antarctica for peaceful and scientific research, and a presidential directive gave the NSF responsibility for virtually all U.S. Antarctic operations and research in form of the United States Antarctic Program.

1960–1969

- *The foundation started the "Institutional Support Program", a capital funding program designed to build a research infrastructure among U.S. universities; it was the single largest beneficiary of NSF budget growth in the 1960s.*

- *Emphasis on international scientific and technological competition accelerated NSF growth.*
- *By 1968, the NSF budget stood at nearly $500 million.*

Emphasis on international scientific and technological competition accelerated NSF growth. The foundation started the "Institutional Support Program", a capital funding program designed to build a research infrastructure among U.S. universities; it was the single largest beneficiary of NSF budget growth in the 1960s. In 1960, the NSF's appropriation was $152.7 million and 2,000 grants were made. In 1968 the Deep Sea Drilling Project began (until 1983), which revealed evidence about the concepts of continental drift, sea floor spreading and the general youthfulness of the ocean basins compared to Earth. The program became a model of international cooperation as several foreign countries joined. By 1968, the NSF budget stood at nearly $500 million.

1970–1979

- *In 1972 the NSF launched the biennial "Science & Engineering Indicators" report to the US President and Congress, as required by the NSF Act of 1950.*
- *The NSF expanded these laboratories into a nationwide network of Materials Research Science and Engineering Centers.*
- *In 1972 the NSF took over management of twelve interdisciplinary materials research laboratories from the Defense Department's Advanced Research Projects Agency (DARPA).*

In 1972 the NSF took over management of twelve interdisciplinary materials research laboratories from the Defense Department's Advanced Research Projects Agency (DARPA). These university-based laboratories had taken a more integrated approach than did most academic departments at the time, encouraging physicists, chemists, engineers, and metallurgists to cross departmental boundaries and use systems approaches to attack complex problems of materials synthesis or processing. The NSF expanded these laboratories into a nationwide network of Materials Research Science and Engineering Centers. In 1972 the NSF launched the biennial "Science & Engineering Indicators" report to the US President and Congress, as required by the NSF Act of 1950. In 1977 the first interconnection of unrelated networks was developed, run by DARPA.

1980–1989

- *The U.S. Antarctic Program was taken out of the NSF appropriation now requiring a separate appropriation.*
- *In 1983, NSF budget topped $1 billion for the first time.*
- *Major increases in the nation's research budget were proposed as "the country recognizes the importance of research in science and technology, and education".*

During this decade, increasing NSF involvement lead to a three-tiered system of internetworks managed by a mix of universities, nonprofit organizations and government

agencies. By the mid-1980s, primary financial support for the growing project was assumed by the NSF. In 1983, NSF budget topped $1 billion for the first time. Major increases in the nation's research budget were proposed as "the country recognizes the importance of research in science and technology, and education". The U.S. Antarctic Program was taken out of the NSF appropriation now requiring a separate appropriation. The NSF received more than 27,000 proposals and funded more than 12,000 of them in 1983. In 1985, the NSF delivered ozone sensors, along with balloons and helium, to researchers at the South Pole so they can measure stratospheric ozone loss. This was in response to findings earlier that year, indicating a steep drop in ozone over a period of several years. The Internet project continued, now known as NSFNET.

1990–1999

- *In 1990 the NSF's appropriation passed $2 billion for the first time.*
- *Since passage of the Small Business Technology Transfer Act of 1992 (Public Law 102-564, Title II), NSF has been required to reserve 0.3% of its extramural research budget for Small Business Technology Transfer awards, and 2.8% of its R&D budget for small business innovation research.*
- *During that debate, NSF was both lauded and criticized for favoring the standards.*
- *NSF funded the development of several curricula based on the NCTM standards, devised by the National Council of Teachers of Mathematics.*

In 1990 the NSF's appropriation passed $2 billion for the first time. NSF funded the development of several curricula based on the NCTM standards, devised by the National Council of Teachers of Mathematics. These standards were widely adopted by school districts during the subsequent decade. However, in what newspapers such as the Wall Street Journal called the "math wars", organizations such as Mathematically Correct complained that some elementary texts based on the standards, including Mathland, have almost entirely abandoned any instruction of traditional arithmetic in favor of cutting, coloring, pasting, and writing. During that debate, NSF was both lauded and criticized for favoring the standards. In 1991 the NSFNET acceptable use policy was altered to allow commercial traffic. By 1995, with private, commercial market thriving, NSF decommissioned the NSFNET, allowing for public use of the Internet. In 1993 students and staff at the NSF-supported National Center for Supercomputing Applications (NCSA) at the University of Illinois, Urbana-Champaign, developed Mosaic, the first freely available browser to allow World Wide Web pages that include both graphics and text. Within 18 months, NCSA Mosaic becomes the Web browser of choice for more than a million users, and sets off an exponential growth in the number of Web users. In 1994 NSF, together with DARPA and NASA, launched the Digital Library Initiative. One of the first six grants went to Stanford University, where two graduate students, Larry Page and Sergey Brin, began to develop a search engine that used the links between Web pages as a ranking method, which they later commercialized under the name Google. In 1996 NSF-funded research established beyond doubt that the chemistry of the atmosphere above Antarctica was grossly abnormal and that levels of key chlorine compounds are greatly elevated. During two months of

intense work, NSF researchers learned most of what is known about the ozone hole. In 1998 two independent teams of NSF-supported astronomers discovered that the expansion of the universe was actually speeding up, as if some previously unknown force, now known as dark energy, is driving the galaxies apart at an ever-increasing rate. Since passage of the Small Business Technology Transfer Act of 1992 (Public Law 102-564, Title II), NSF has been required to reserve 0.3% of its extramural research budget for Small Business Technology Transfer awards, and 2.8% of its R&D budget for small business innovation research.

2000–2009

- *NSF joined with other federal agencies in the National Nanotechnology Initiative, dedicated to the understanding and control of matter at the atomic and molecular scale.*
- *The NSF's "Survey of Public Attitudes Toward and Understanding of Science and Technology" revealed that the public had a positive attitude toward science, but a poor understanding of it.*
- *In 2001, NSF's appropriation passed $4 billion.*

NSF joined with other federal agencies in the National Nanotechnology Initiative, dedicated to the understanding and control of matter at the atomic and molecular scale. NSF's roughly $300 million annual investment in nanotechnology research was still one of the largest in the 23-agency initiative. In 2001, NSF's appropriation passed $4 billion. The NSF's "Survey of Public Attitudes Toward and Understanding of Science and Technology" revealed that the public had a positive attitude toward science, but a poor understanding of it. During 2004–5 NSF sent "rapid response" research teams to investigate the aftermath of the Indian Ocean tsunami disaster and Hurricane Katrina. An NSF-funded engineering team helped uncover why the levees failed in New Orleans. In 2005, NSF's budget stood at $5.6 billion, in 2006 it stood at $5.91 billion for the 2007 fiscal year (October 1, 2006 through September 30, 2007), and in 2007 NSF requested $6.43 billion for FY 2008.

2010–present

- *As of May 2018, Heather Wilson, the secretary of the Air force signed that letter of intent with the director of NSF initiating partnership for the research related to space operations and Geosciences, advanced material sciences, information and data sciences, and workforce and processes.*
- *In early 2018, it was announced that Trump would cut NSF Research Funding by 30% but quickly rescinded this due to backlash.*

President Obama requested $7.373 billion for fiscal year 2013. Due to the October 1, 2013 shutdown of the Federal Government, and NSF's lapse in funding, their website was down "until further notice," but was brought back online after the US government passed their budget. In 2014, NSF awarded rapid response grants to study a chemical spill that contaminated the drinking water of about 300,000 West Virginia residents. In early 2018, it

was announced that Trump would cut NSF Research Funding by 30% but quickly rescinded this due to backlash. As of May 2018, Heather Wilson, the secretary of the Air force signed that letter of intent with the director of NSF initiating partnership for the research related to space operations and Geosciences, advanced material sciences, information and data sciences, and workforce and processes.

Grants and the merit review process

- *In addition to researchers and research facilities, NSF grants also support science, engineering and mathematics education from pre-K through graduate school.*
- *In June 2010, the National Science Board (NSB), the governing body for NSF and science advisers to both the legislative and executive branches, convened a 'Task Force on Merit Review' to determine "how well the current Merit Review criteria used by the NSF to evaluate all proposals were serving the agency."*

The NSF seeks to fulfill its mission chiefly by issuing competitive, limited-term grants in response to specific proposals from the research community and establishing cooperative agreements with research organizations. It does not operate its own laboratories, unlike other federal research agencies, notable examples being NASA and the National Institutes of Health (NIH). The NSF uses four main mechanisms to communicate funding opportunities and generate proposals: dear colleague letters, program descriptions, program announcements, and program solicitations.

The NSF receives over 50,000 such proposals each year, and funds about 10,000 of them. Those funded are typically projects that are ranked highest in a 'merit review' process, the current version of which was introduced in 1997. Reviews are carried out by ad hoc reviewers and panels of independent scientists, engineers, and educators who are experts in the relevant fields of study, and who are selected by the NSF with particular attention to avoiding conflicts of interest. For example, reviewers cannot work at the NSF itself, nor for the institution that employs the proposing researchers. All proposal evaluations are confidential: the proposing researchers may see them, but they do not see the names of the reviewers.

The first merit review criterion is 'intellectual merit', the second is that of the 'broader societal impact' of the proposed research; the latter has been met with opposition from the scientific and policy communities since its inception in 1997. In June 2010, the National Science Board (NSB), the governing body for NSF and science advisers to both the legislative and executive branches, convened a 'Task Force on Merit Review' to determine "how well the current Merit Review criteria used by the NSF to evaluate all proposals were serving the agency." The task force reinforced its support for both criteria as appropriate for the goals and aims of the agency, and published a revised version of the merit review criteria in its 2012 report, to clarify and improve the function of the criteria. However, both criteria already had been mandated for all NSF merit review procedures in the 2010 re-authorization of the America COMPETES Act. The Act also includes an emphasis on

promoting potentially transformative research, a phrase which has been included in the most recent incarnation of the 'merit review' criteria.

Most NSF grants go to individuals or small groups of investigators, who carry out research at their home campuses. Other grants provide funding for mid-scale research centers, instruments, and facilities that serve researchers from many institutions. Still, others fund national-scale facilities that are shared by the research community as a whole. Examples of national facilities include the NSF's national observatories, with their giant optical and radio telescopes; its Antarctic research sites; its high-end computer facilities and ultra-high-speed network connections; the ships and submersibles used for ocean research; and its gravitational wave observatories.

In addition to researchers and research facilities, NSF grants also support science, engineering and mathematics education from pre-K through graduate school. Undergraduates can receive funding through Research Experiences for Undergraduates summer programs. Graduate students are supported through Integrative Graduate Education Research Traineeships (IGERT) and Alliance for Graduate Education and the Professoriate (AGEP) programs and through the Graduate Research Fellowships, NSF-GRF. K-12 and some community college instructors are eligible to participate in compensated Research Experiences for Teachers programs. In addition, an early career-development program (CAREER) supports teacher-scholars that most effectively integrate research and education within the mission of their organization, as a foundation for a lifetime of integrated contributions.

National Science Foundation's former headquarters

Scope and organization

- *Scientists from research institutions can join the NSF as temporary program directors, called "rotators", overseeing the merit review process and searching for new funding opportunities.*
- *The NSF also offers contracting opportunities.*
- *As of May 2018, the NSF has 53 existing contracts.*
- *The NSF is broadly organized into four offices, seven directorates, and the National Science Board.*

The NSF is broadly organized into four offices, seven directorates, and the National Science Board. It employs about 2,100 people in permanent, temporary and contractual positions at its headquarters in Alexandria, Virginia. Prior to 2017, its headquarters were located in Arlington, Virginia.

In addition to around 1,400 permanent employees and the staffs of the NSB office and the Office of the Inspector General, the NSF workforce includes some 200 scientists on temporary duty and 450 contract workers. Scientists from research institutions can join the NSF as temporary program directors, called "rotators", overseeing the merit review process and searching for new funding opportunities. These assignments typically last 1–2 years, but may extend to 4. The NSF also offers contracting opportunities. As of May 2018, the NSF has 53 existing contracts.

Offices

- *The NSF also supports research through several offices within the Office of the Director, including the Office of Cyberinfrastructure, Office of Polar Programs, Office of Integrative Activities, and Office of International Science and Engineering.*

Office of the Director

Office of the Inspector General

Office of Budget, Finance, and Award Management

Office of Information & Resource Management

The NSF also supports research through several offices within the Office of the Director, including the Office of Cyberinfrastructure, Office of Polar Programs, Office of Integrative Activities, and Office of International Science and Engineering.

Research directorates

- *Social, Behavioral and Economic Sciences (neuroscience, management, psychology, sociology, anthropology, linguistics, science of science policy and economics)*

- *Computer and Information Science and Engineering (fundamental computer science, computer and networking systems, and artificial intelligence)*
- *The NSF organizes its research and education support through seven directorates, each encompassing several disciplines:*

The NSF organizes its research and education support through seven directorates, each encompassing several disciplines:

Biological Sciences (molecular, cellular, and organismal biology, environmental science)

Computer and Information Science and Engineering (fundamental computer science, computer and networking systems, and artificial intelligence)

Engineering (bioengineering, environmental systems, civil and mechanical systems, chemical and transport systems, electrical and communications systems, and design and manufacturing)

Geosciences (geological, atmospheric and ocean sciences)

Mathematical and Physical Sciences (mathematics, astronomy, physics, chemistry and materials science)

Social, Behavioral and Economic Sciences (neuroscience, management, psychology, sociology, anthropology, linguistics, science of science policy and economics)

Education and Human Resources (science, technology, engineering and mathematics education at every level)

Overseas sites

- *Prior to October 2018, NSF maintained three overseas offices to promote collaboration between the science and engineering communities of the United States and other continents' scientific communities:*
- *Rather than maintain dedicated offices, NSF will dispatch small teams to specific international institutions.*

Prior to October 2018, NSF maintained three overseas offices to promote collaboration between the science and engineering communities of the United States and other continents' scientific communities:

Brussels for Europe, formerly based in Paris (established 1984; relocated to Brussels in 2015)

Tokyo for East Asia, except China (established 1960)

Beijing for China (established 2006)

All three overseas offices were shut down in October 2018, to reflect the agency's move to a more nimble international posture. Rather than maintain dedicated offices, NSF will dispatch small teams to specific international institutions. Teams may work for up to a week on-site to evaluate research and explore collaborations with the institution.

Crosscutting programs

- *In addition to the research it funds in specific disciplines, the NSF has launched a number of projects that coordinate the efforts of experts in many disciplines, which often involve collaborations with other U.S. federal agencies.*
- *The science of learning*

In addition to the research it funds in specific disciplines, the NSF has launched a number of projects that coordinate the efforts of experts in many disciplines, which often involve collaborations with other U.S. federal agencies. Examples include initiatives in:

Nanotechnology

The science of learning

Digital libraries

The ecology of infectious diseases

National Center for Science and Engineering Statistics

- *NSF's National Center for Science and Engineering Statistics (NCSES) gathers data from surveys and partnerships with other agencies to offer official data on the American science and engineering workforce, graduates of advanced U.S. science and engineering programs, and R&D expenditures by U.S. industry.*

NSF's National Center for Science and Engineering Statistics (NCSES) gathers data from surveys and partnerships with other agencies to offer official data on the American science and engineering workforce, graduates of advanced U.S. science and engineering programs, and R&D expenditures by U.S. industry. NCSES is one of the principal U.S. statistical agencies.[citation needed] It is a part of the NSF's Social, Behavioral and Economic Sciences Directorate (SBE).

Public attitudes and understanding

- *Comparison surveys elsewhere in the world, including Japan and Europe, have indicated public interest in science and technology is lower than in the US, with China a notable exception.*
- *NSF surveys of public attitudes and knowledge have consistently shown that the public has a positive view of science but has little scientific understanding.*

NSF surveys of public attitudes and knowledge have consistently shown that the public has a positive view of science but has little scientific understanding.[citation needed] The greatest deficit remains the public's understanding of the scientific method. Comparison surveys elsewhere in the world, including Japan and Europe, have indicated public interest in science and technology is lower than in the US, with China a notable exception. A majority of Americans (54%) had heard "nothing at all" about nanotechnology in 2008.[citation needed]

Criticism

- *Some historians of science have argued that the National Science Foundation Act of 1950 was an unsatisfactory compromise between too many clashing visions of the purpose and scope of the federal government.*
- *That pattern would continue after 1957 when U.S. anxiety over the launch of Sputnik led to the creation of the National Aeronautics and Space Administration (space science) and the Defense Advanced Research Projects Agency (defense-related research).*

In May 2011, Republican Senator Tom Coburn released a 73-page report, "National Science Foundation: Under the Microscope", receiving immediate attention from such media outlets as The New York Times, Fox News, and MSNBC. The report found fault with various research projects and was critical of the social sciences. It started a controversy about political bias and a Congressional Inquiry into federally sponsored research. In 2014, Republicans proposed a bill to limit the NSF Board´s authority in grant-writing.

In 2013, the NSF had funded the work of Mark Carey at University of Oregon with a $412,930 grant, which included a study concerning gender in glaciological research. After its January 2016 release, the NSF drew criticism for alleged misuse of funding.

Some historians of science have argued that the National Science Foundation Act of 1950 was an unsatisfactory compromise between too many clashing visions of the purpose and scope of the federal government. The NSF was certainly not the primary government agency for the funding of basic science, as its supporters had originally envisioned in the aftermath of World War II. By 1950, support for major areas of research had already become dominated by specialized agencies such as the National Institutes of Health (medical research) and the U.S. Atomic Energy Commission (nuclear and particle physics). That pattern would continue after 1957 when U.S. anxiety over the launch of Sputnik led to the creation of the National Aeronautics and Space Administration (space science) and the Defense Advanced Research Projects Agency (defense-related research).

See also

- *American Association for the Advancement of Science*
- *Civilian Research & Development Foundation*
- *United States National Academy of Sciences*

- *Research council*
- *C-MORE, the Center for Microbial Oceanography: Research and Education, an NSF Science and Technology Center*
- *National Digital Library Program (NDLP)*
- *Science and Technology Policy Institute*

American Association for the Advancement of Science

Capital Jury Project

C-MORE, the Center for Microbial Oceanography: Research and Education, an NSF Science and Technology Center

International Council on Nanotechnology

Mid-InfraRed Technologies for Health and the Environment (MIRTHE) (largely based at Princeton University in the US)

National Digital Information Infrastructure and Preservation Program

National Digital Library Program (NDLP)

Research council

Scientific literacy

Science and Technology Policy Institute

SedDB, online database for sediment geochemistry

U.S. Civilian Research & Development Foundation

United States National Academy of Sciences

USA.gov

USAFacts

References

Further reading

External links

- *Historic technical reports from the National Science Foundation (and other federal agencies) are available in the Technical Report Archive and Image Library (TRAIL)*

- *National Science Foundation in the Federal Register*

Official Website

National Science Foundation in the Federal Register

IGERT

TerraFly Autopilot Walk from Metro to NSF offices

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