

# National Science Foundation

## FY1998 Accountability Report







## A Message from the Director of the National Science Foundation

It is my pleasure to present the National Science Foundation's first Accountability Report. This inaugural report highlights the Foundation's continuing commitment both to scientific excellence and to the sound stewardship of the public's resources.

The "clean opinion" received by NSF deserves special notice. This confirms that NSF has financial management systems and administrative operations of the highest quality and integrity. In this my first year as Director, it is immensely gratifying to be associated with such a strong administrative and financial team. The audit results reinforce the outstanding reputation for which NSF is admired the world over.

Science and engineering have become essential to progress and opportunity throughout our society. Numerous studies show that technological innovation and scientific discovery have generated at least half of the nation's productivity growth over the last 50 years. Today, the concurrent revolution in "info-tech" and "bio-tech" promise even greater progress and prosperity for coming generations.

Realizing this promise, however, requires the wisest investments in research and education—investments that extend our imaginations and adhere to the highest standards of efficiency and integrity. These goals go hand-in-hand at NSF, and this Accountability Report makes clear that the Foundation will always work to deliver the highest returns to the American taxpayer.

A handwritten signature in black ink, appearing to read "Rita R. Colwell". The signature is fluid and cursive, with a large initial "R" and "C".

Rita R. Colwell  
Director



## A Message from the Chief Financial Officer

I am pleased to present a series of National Science Foundation “firsts” to you!!

- ▶ the NSF’s first Accountability Report, a consolidated presentation of the Foundation’s financial and programmatic performance during FY 1998, providing the Congress and the public with a single, integrated source of information about the National Science Foundation’s mission, operations, and performance;
- ▶ the NSF’s first unqualified “clean” opinion from our independent auditors on our consolidated financial statements. We have always believed NSF to have excellent financial management systems, so this clean opinion is a very important achievement for us; and
- ▶ the NSF’s initial presentation of performance information—the Foundation’s goals and results—in the GPRA framework. While the first performance report is not due until March 2000, NSF staff piloted a presentation of FY 1998 data within the framework of NSF’s GPRA Strategic Plan and NSF’s FY 1999 Annual Performance Plan, allowing us to test data sources and processes. The discussion of program performance in the Management’s Discussion and Analysis section of this report is a presentation of some of the significant performance information that was collected and developed for this exercise.

This integrated look at NSF programs and operations gives the reader a good overview of why and how we do business, and the impact our investments have on the Nation’s research and technology enterprise. We make every effort to provide these services to the public through financial and administrative management systems that are of the highest integrity, at the cutting edge of world-class business practices, and with an eye toward keeping our overhead costs and those of our customers to a minimum.

This report highlights only a few of the broad spectrum of science, mathematics and engineering research and education activities that the Foundation supports. I invite you to visit NSF’s Internet web site ([www.nsf.gov](http://www.nsf.gov)) for more information. We welcome your comments and suggestions on how we at NSF can continue to promote the progress of science.

A handwritten signature in black ink, appearing to read 'JKull', with a long, sweeping horizontal line extending to the right.

Joseph L. Kull  
Chief Financial Officer

## The NSF Vision

The National Science Foundation is a catalyst for progress through investment in science, mathematics, and engineering. Guided by its longstanding commitment to the highest standards of excellence in the support of discovery and learning, NSF pledges to provide the stewardship necessary to sustain and strengthen the nation's science, mathematics, and engineering capabilities and to promote the use of those capabilities in service to society.

NSF is confident in the power of its connections and partnerships to deliver the greatest return on this investment. It will exercise leadership in strengthening linkages among the many individuals, institutions, and organizations that are committed to progress in research and education. It will dedicate itself to fostering the natural connections between the processes of learning and discovery.

4 At the core of this vision is a dynamic and diverse community of researchers, educators, and institutions who work in partnership with NSF. This community shares with NSF a commitment to discovery and learning, to enhancing the Nation's capacity for excellence in research and education, and to the use of science, mathematics, and engineering for the betterment of humanity.

## NSF in a Changing World: The National Science Foundation's Strategic Plan

*On the Cover: The water scorpion is one denizen of a unique groundwater ecosystem that is home to many newly-discovered species of invertebrates. NSF-funded researchers studied the environment of Romania's Movile Cave in an effort to understand the role microorganisms play in the dissolution of limestone and the formation of caves. These researchers may collaborate with NASA on future space missions. These missions will look for evidence of extraterrestrial life—life that may be present in underground caves similar to Movile. Photo: Serban M. Sarbu, Ph.D.*

*With support from NSF, researchers in Suriname are working with shamans—traditional village doctors—to identify and test rainforest plants with possible medicinal value. The idea behind the project is to tap both the rich diversity of natural biological materials and the wealth of knowledge about the healing properties of plants that is part of the traditional culture of the local people.*

*Photo: Joshua Rosenthal*

## FY1998 Accountability Report

[www.nsf.gov/bfa/dfm/stmtpg.htm](http://www.nsf.gov/bfa/dfm/stmtpg.htm)

### Table of Contents

- 7 Management's Discussion and Analysis
  - 8 Agency Profile
  - 14 Program Performance During FY 1998
  - 24 Discussion and Analysis of the Financial Statements
  - 28 Management Integrity and Controls
  - 29 Other Reporting Requirements
  - 30 Year 2000 Progress
  - 31 Limitations of Financial Statements
  
- 33 FY 1998 Consolidated Financial Statements
  - 34 Annual Financial Statements and Notes
  - 54 Required Supplemental Information—Stewardship Reporting
  - 56 Required Supplemental Information—Budgetary Resources
  
- 59 Auditors' Report
  - 60 Overview of Independent Auditors' Reports on NSF's FY1998 Financial Statements
  - 62 Independent Auditors' Report on Financial Statements
  - 64 Independent Auditors' Report on Compliance With Laws and Regulations
  - 66 Independent Auditors' Report on Internal Control over Financial Reporting
  
- 70 Management's Response
  
- 73 Appendix
  - 74 Description of NSF Directorates and Management Offices
  - 76 NSF Executive Staff
  - 77 National Science Board Members
  - 78 List of Acronyms

6

America has been particularly successful in capturing the benefits of the scientific and engineering enterprise, but it will take continued investment in this enterprise if we hope to stay ahead of our economic competitors in the rest of the world.

The United States of America must maintain and improve its pre-eminent position in science and technology in order to advance human understanding of the universe and all it contains, and to improve the lives, health, and freedom of all peoples.

[Unlocking Our Future: Toward a New National Science Policy](#)  
House Science Committee Report to Congress, September 1998



# Management's Discussion and Analysis



7

*The Arecibo Observatory is part of the National Astronomy and Ionosphere Center (NAIC), a national research center operated by Cornell University under a cooperative agreement with the National Science Foundation (NSF). As the site of the world's largest single-dish radio telescope, the Observatory is recognized as one of the most important national centers for research in radio astronomy, planetary radar and terrestrial astronomy. The NSF-supported Arecibo telescope was featured in the movies "Contact" and "Goldeneye."  
Photo: National Science Foundation Collection/ National Astronomy and Ionosphere Center*



## The NSF Statutory Mission:

To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.



*This still image simulates the effects of refracted light at one of the supercomputing centers supported by NSF. These centers are making a significant contribution to the way scientists and engineers conduct research.*

*Photo: Robert Russ*

## Agency Profile

In the years since World War II, America's science enterprise has become unparalleled in scope and quality. America's investment in science and engineering research and education has directly contributed to the nation's economic growth and to the health and welfare of its people. Science and technology have been the primary instigators of change and progress, and it has been estimated that as much as one-half of the nation's economic productivity can be attributable to technological innovation and the science that supports it. Science and technology have contributed to an increased standard of living in most of the world's modern industrial societies, and have had enormous impact on health care, agriculture, environmental protection and national defense.

### NSF's MISSION

The National Science Foundation (NSF) was created by Congressional enactment of the National Science Foundation Act of 1950, to parlay America's very successful large-scale wartime research and development effort to a peacetime enterprise. NSF's authorizing legislation directs the Foundation to initiate and support basic scientific research and research fundamental to the engineering process; programs to strengthen scientific and engineering research potential; and education programs at all levels in all fields of science and engineering. The Act also authorized the establishment of an information base for science and engineering appropriate for development of national and international policy.

For nearly five decades the Foundation has promoted and advanced scientific progress in the United States by investing in the nation's science and engineering intellectual and physical infrastructure. However, in contrast to other federal agencies that support research focused on specific missions, such as space exploration, NSF has the unique federal responsibility of strengthening the overall health of science and engineering across all disciplines and providing leadership across the frontier of scientific and engineering knowledge.

In education, especially science and math education, there will be a ripple affect on work skills throughout the 21st century. If we undermine or leave behind a significant segment of the population, we write a prescription to undermine all other national goods.

Dr. Rita Colwell, NSF Director  
from a speech given at the AAAS Science Policy Seminar Series,  
September 1998

### Number of People Involved in NSF Activities - FY 1998 Estimate

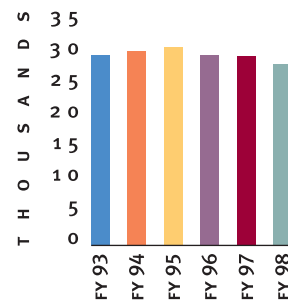
<b>24,660</b>	<b>SENIOR RESEARCHERS</b>
<b>9,070</b>	<b>OTHER PROFESSIONALS</b>
<b>5,060</b>	<b>POSTDOCTORAL ASSOCIATES</b>
<b>19,990</b>	<b>GRADUATE STUDENTS</b>
<b>27,110</b>	<b>UNDERGRADUATE STUDENTS</b>
<b>13,760</b>	<b>K-12 STUDENTS</b>
<b>87,980</b>	<b>K-12 TEACHERS</b>
<b>187,630</b>	<b>TOTAL</b>

### WHAT WE DO AND HOW WE DO IT

NSF is analogous to a venture capital organization that provides seed money to fund creative opportunities in the exploration of science, mathematics, and engineering research and education. The Foundation itself does not conduct research nor operate laboratories. Rather, NSF provides funding to support the best ideas and most capable people in their pursuit of new knowledge, discoveries and innovation.

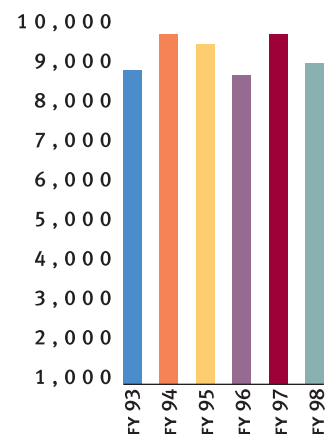
NSF makes grants, contracts and cooperative agreements to approximately 2,000 colleges, universities, K-12 schools, academic consortia, nonprofit institutions and small businesses throughout the United States. The Foundation also maintains partnerships with international organizations around the world. NSF accounts for about one-fourth of the federal support to academic institutions for basic research. NSF programs involve nearly 200,000 research scientists, engineers, mathematicians, teachers and students, ranging from K-12 to postdoctoral associates.

### Number of Competitive Proposals



NSF uses merit review with external peer evaluation to select about 9,000 new awards each year from about 28,000 competitive proposals submitted by the science and engineering community. In total, NSF maintains about 21,000 active awards at any one time. The merit review process is critical to the Foundation's efforts to foster the highest standards of excellence and accountability. NSF program officers rely on the recommendations of expert reviewers to help make often difficult decisions on how

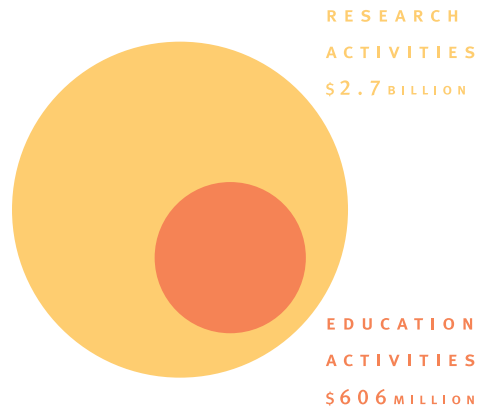
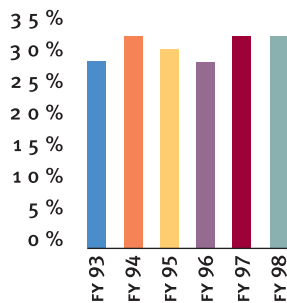
### Number of Competitive Awards



to best allocate limited resources and to target those proposals that promise to produce the most significant contributions. Merit review is successful because of the thousands of experts from various fields who volunteer their time to evaluate and determine which proposals deserve consideration for funding. In FY 1998, over 200,000 reviews were provided by experts as part of this merit review process.

10

### Funding Rate of all Competitive Proposals



### NSF'S PRIMARY LINES OF BUSINESS: RESEARCH AND EDUCATION

NSF is engaged in two primary lines of business—Research Activities and Education Activities. In FY 1998, on a full cost accounting basis as indicated on the Statement of Net Costs, Research Activities totaled \$2.7 billion and Education Activities totaled \$606 million.

Research activities include the support of research projects, centers and facilities. NSF supports individual investigators and small groups engaged in disciplinary research in traditional fields as well as in cross-disciplinary areas, including in areas of societal needs and national importance. Research centers address complex scientific and engineering questions through multi-disciplinary, long-term coordinated efforts of many researchers. Research facilities are characteristically complicated and expensive infrastructure that provide scientists and engineers access to state-of-the-art capabilities, including instruments that enable research at the cutting-edge of science and engineering as well as research opportunities in totally new directions.

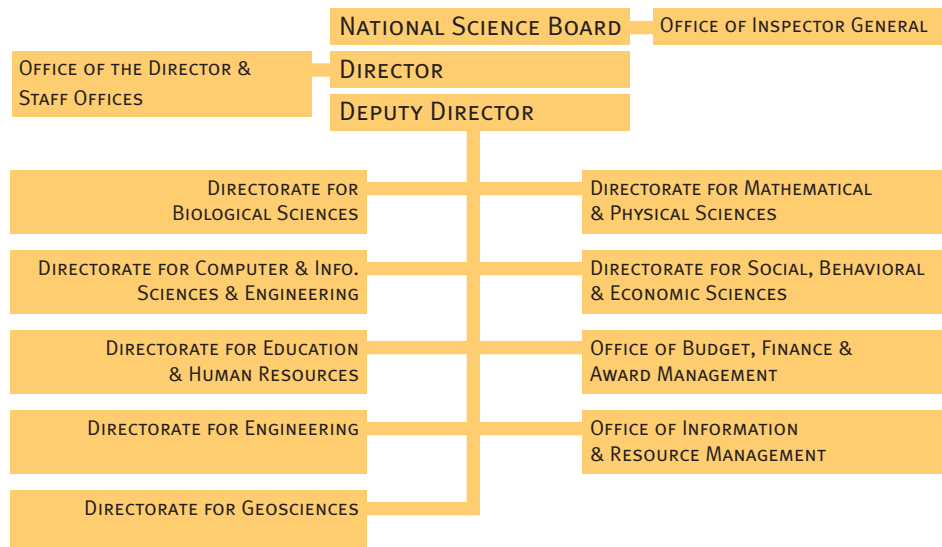
NSF supports education and training activities at all levels, from pre-kindergarten through career development, throughout the U.S. and its territories, to promote public science literacy and to help ensure that America maintains in the present and develops for the future a premier cadre of scientists, engineers and mathematicians. Focus is given to programs that encourage the participation and achievement of groups underrepresented in science and engineering. With limited resources, NSF's role is primarily as a catalyst for developing and instituting new initiatives and change; moreover, NSF is increasing its emphasis on partnerships with academic institutions based on the view that treating whole systems is the most effective way to make improvements in science and mathematics education. NSF-supported education and training programs encompass a broad spectrum—from supporting students and teachers to creating new ways of teaching and learning to assisting school districts forge greater gains in learning.

## NSF'S ORGANIZATIONAL STRUCTURE

In 1998, distinguished biologist Dr. Rita Colwell joined the National Science Foundation as its eleventh director. Dr. Colwell also has the distinction of being the first woman to head NSF. The Director is appointed by the President and confirmed by the U.S. Senate to serve a six-year term.

The National Science Board, comprised of 24 part-time members each appointed by the President with the advice and consent of the Senate to serve a six year term, oversees the policies and programs of the Foundation. One-third are appointed every two years. They are selected solely on the basis of established records of distinguished accomplishments. The Director is a member *ex officio* of the Board. The Board also serves the President and the Congress as an independent advisory body on policies affecting the health of U.S. science and engineering and on education in science and engineering.

*continued pg. 13*



# Research on Ice

## The Arctic ice pack changes dramatically every year.

In winter, the ice pack is about the size of the continental United States. In summer, it is half this size. To predict future climate change, scientists need to understand this freeze and meltdown cycle. The Arctic ice pack has been shrinking for the past 20 years, but nobody knows if this is normal variability or if it suggests a long-term trend.

To forecast the effects of climate change on the Arctic, scientists have to understand how snow and ice reflect solar radiation back into space. They also have to know what effect clouds have on the earth's temperature. Clouds can block the sun's radiation from reaching the earth's surface, which leads to cooling. But they can also trap heat, thereby increasing the earth's temperature

To understand these effects, NSF led an interagency and international science project featuring an ice station on floating arctic ice. This station, named the Surface Heat Budget of the Arctic Ocean (SHEBA), studied the Arctic ice pack for the past year. During its year of operation, SHEBA drifted 1,000 miles with the Arctic ice pack.

More than 170 scientists worked at SHEBA and a number of journalists visited the station. SHEBA developed a web site to share information with the public on climate, weather, and the pattern of the drifting ice. SHEBA scientists also frequently communicated with students while they were at the ice station and visited classrooms upon their return. SHEBA is creating a CD-ROM to give students the experience of planning a research expedition to the Arctic.

Using stands of instruments, meteorological towers, submarines, research aircraft, scanning lasers, and sensors, researchers from a wide range of disciplines documented how the clouds, snow, ice, and the ocean interact and exchange energy. SHEBA's research will provide better data for weather and global climate models. While most of SHEBA's data are still being analyzed, SHEBA oceanographers have already documented dramatic changes in the temperature and salinity of the water just beneath the arctic ice.



NSF is structured much like its academic clientele, with divisions delineated by various disciplines and fields of science and engineering, and for science, math, engineering and technology education. As indicated on the organizational chart, there are seven operating directorates and two management offices; more detailed information is provided in the Appendix, *Description of NSF Directorates and Management Offices*.

In the last decade, the Foundation's budget has doubled, to \$3.43 billion in FY 1998, while staffing has remained at about 1,200 FTE. The IPA (Intergovernmental Personnel Act) and Visiting Scientists, Engineers, and Educators (VSEE) programs have allowed the Foundation to recruit outstanding scientists, engineers and mathematicians for short term stints—typically two years—bringing with them new and innovative ideas that ensure NSF programs remain at the frontiers of the research enterprise.

As part of the ongoing effort to establish efficient, streamlined business and management practices, NSF is striving for a paperless environment. NSF has been recognized as a leader in the use of advanced information technologies to improve internal operations and business transactions with the research and education communities. NSF developed the FastLane system to enable the Foundation and its customer community to conduct and facilitate business transactions and exchange information electronically using the World Wide Web. Today, over 70 percent of NSF's grantees use FastLane.

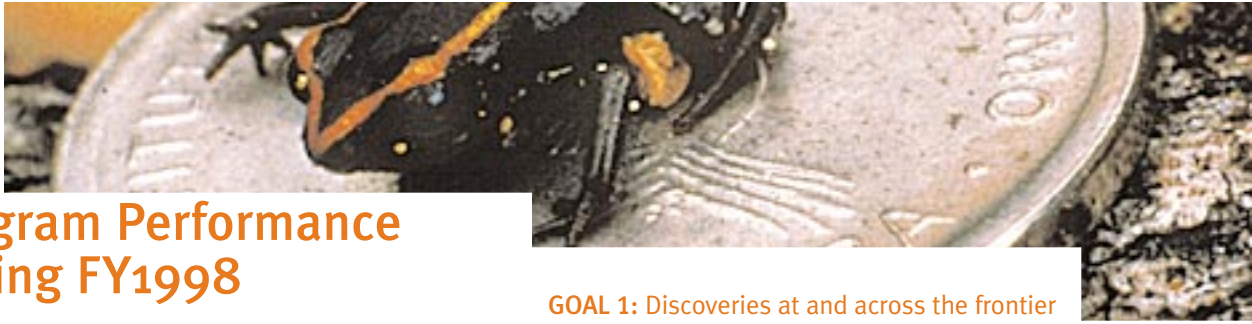
## NSF'S STRATEGIC PLAN AND GPRA IMPLEMENTATION

In 1995, NSF and the National Science Board published *NSF in a Changing World*, a strategic plan that has served as a touchstone for all NSF activities by providing an overarching sense of purpose and direction. In 1997, to comply with the Government Performance and Results Act of 1993 (GPRA), NSF developed a GPRA Strategic Plan to provide operational implementation of *NSF in a Changing World*, by including concrete outcome goals that tie to the results of NSF's grants for research and education in science and engineering. NSF's desired outcome goals are:

- ▶ Discoveries at and across the frontier of science and engineering;
- ▶ Connections between discoveries and their use in service to society;
- ▶ A diverse, globally-oriented workforce of scientists and engineers;
- ▶ Improved achievement in mathematics and science skills needed by all Americans; and
- ▶ Timely and relevant information on the national and international science and engineering enterprise.

In addition to outcome goals from the GPRA Strategic Plan, NSF's FY 1999 Performance Plan includes investment process goals that focus on the means and strategies NSF uses in support of its outcome goals and sets performance targets for the investment process by which NSF shapes its portfolio of awards. The FY 1999 Performance Plan also includes management goals that address the efficiency and effectiveness of the agency's administrative activities in support of the NSF mission.





## Program Performance During FY1998

During 1998, as preparation for producing NSF's first GPRA-mandated performance results report due March 2000, NSF staff piloted presentation of FY 1998 data within the framework of NSF's 1997 GPRA Strategic Plan and NSF's FY 1999 Annual Performance Plan. This exercise allowed the Foundation to verify and validate data sources and learn how to improve the collection and coordination of information within the agency.

The following discussion of NSF's FY 1998 program performance is extracted from preliminary information compiled in the pilot effort. This performance discussion consists of three sections: part one focuses on NSF's outcome goals; part two addresses NSF's investment process goals; and part three addresses NSF's management goals.

### PART 1. OUTCOME GOALS AND RESULTS

NSF's outcome goals address the Foundation's programmatic investments which relate to the agency's mission. The following discussion of NSF performance includes only a fraction of the noteworthy achievements reported by NSF programs in 1998. These examples of results and accomplishments, however, cover the full range of activities supported by NSF. In many instances, they reflect connections with other agencies or other countries. NSF program staff have identified these examples as particularly strong indicators of success.

In future years, the results of NSF-supported programmatic investments will be assessed according to the GPRA goals by external experts. The pilot effort has not yet gone through an external assessment process.

### GOAL 1: Discoveries at and across the frontier of science and engineering.

Discoveries important to the progress of science result from NSF's investments in research through individual and group project support, center support, and large, multi-user facility support, particularly in academic institutions. NSF supports cutting edge research that yields new discoveries over time. These discoveries help to maintain the nation's capacity to excel in science and engineering.

NSF's key strategy for generating new discoveries is support of the most promising ideas as identified through merit review of competitive proposals. Innovation and creativity, cooperative research through partnerships, and education and training are emphasized and encouraged.

NSF is successful when grantees make important discoveries; uncover new knowledge and techniques, both expected and unexpected, within and across traditional boundaries; and forge new high-potential links across those boundaries. The following examples of important discoveries reported in 1998 and awards given in 1998 that are based on work accomplished under NSF funding demonstrate the above criteria for success. Several of the examples reflect results that are relevant to the work of other agencies or that are obtained as part of international collaborations.

The scientific community recognizes the success of those receiving NSF support for their work in many ways. In 1998, two significant indicators of success from NSF investments were: (1) the prestigious Nobel Prize awards given to NSF-supported researchers, and (2) the first two of the top ten advances in science for 1998 as judged by *Science* magazine came from NSF-funded research projects.

*This one-centimeter long frog from Cuba poses on a Cuban 10-cent coin. This frog, the smallest in the Northern Hemisphere, was discovered as part of NSF's Biotic Surveys and Inventories Program. This program is unique in that its purpose is funding the discovery of species new to science.*

*Photo: M. Lammertink*



**Nobel Prizes Shared in Chemistry and Physics:** The Nobel Prize, awarded annually by the Royal Swedish Academy reflects recognition for major discoveries over the lifetime career of the individual and is a demonstration of the influence that the individual has had on his/her field. The 1998 Nobel Prize in Chemistry was shared by two Americans whose research received support from NSF over a 25-year period, resulting in the development of complex computational techniques to understand how bonds between atoms in molecules function. The techniques are now routinely used by academic and industrial chemists in planning and executing fundamental research. The 1998 Nobel Prize in Physics was shared by three Americans, two of whom received NSF support early in their careers, for research leading to the discovery of a new form of quantum fluid requiring very high magnetic fields and very low temperatures.

**NSF-Funded Research Heads *Science* magazine's Top Ten Advances of 1998:** NSF-supported research led to the two most important scientific advances in 1998, according to a recent *Science* magazine summary of the top ten discoveries of the year. Two independent teams of NSF-supported astronomers using NSF-funded National Optical Astronomy Observatory telescopes concluded that the expansion of the universe is accelerating. They were cited by *Science* as having made the top scientific research advance of 1998. *Science* also cited NSF-supported research in circadian rhythms, the built-in mechanism most organisms on Earth use to keep track of the 24-hour cycle between night and day, as the second most important discovery in 1998. Among other results, the work identified three genes in the simplest organisms known to have such "internal clocks" that react to night and day.

*By determining the plants to which beetles such as this one can adapt, NSF-funded evolutionary biologists expect to find some of the limits of evolution. Understanding how evolution works is one focus of NSF's Population Biology Program.*

*Photo: Douglas Futuyma*

**Insights from Microbial Evolution:** Through a project designed to explore the evolutionary consequences of particular mutations in bacteria over thousands of generations, NSF-supported researchers have learned how bacteria retain resistance to antibiotics, even when the drug is absent. The mutations that confer antibiotic resistance in bacteria are usually thought to impose a "cost" on the bacteria, measured as a reduction in population fitness through subsequent generations when the drug is removed from the environment. Researchers discovered compensatory changes in the metabolic machinery of bacteria that help reduce the "cost" of maintaining resistance, and help explain the retention of resistance factors over time even when the drug is no longer present.

**Highly Visible Prediction of Major Meteorological Phenomenon:** NSF-supported research has helped lead to the real time observation of the current state of the tropical upper Pacific Ocean and the successful prediction of the 1997-1998 El Niño and the Southern Oscillation several months in advance. This contribution depended upon the theoretical, observational and modeling studies supported jointly by NSF and other federal agencies, notably NOAA and NASA, as well as collaborations among U.S. and foreign scientists. NSF support has directly led to critical improvements in both atmospheric models and coupled ocean-atmosphere models.

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# What a Tangled Web We Weave

Today, millions of individuals around the world use the Internet to do research, exchange information, and conduct business transactions.

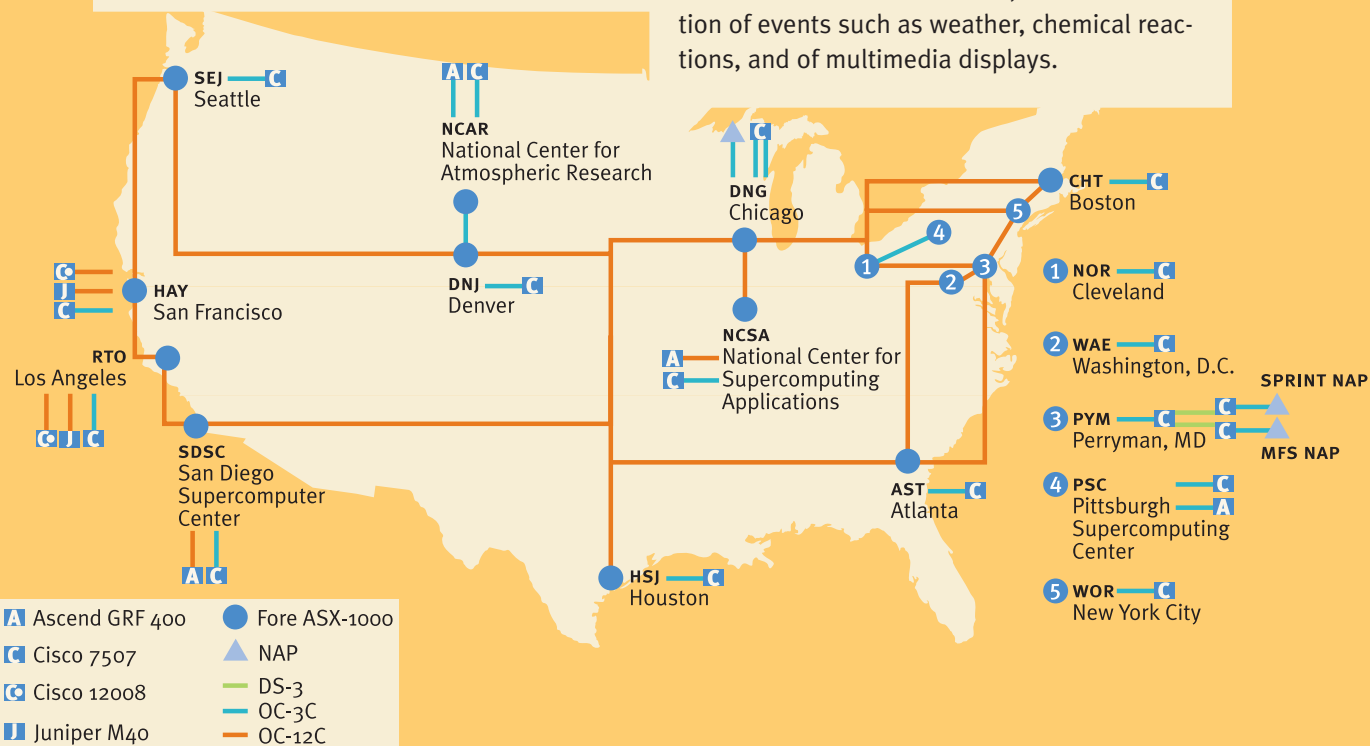
The Internet began in the mid 1980s as the NSFNet backbone, which was created to connect NSF's Super Computer Centers to universities. This research and education infrastructure included mechanisms for passing messages among networks and ensuring that messages reached their destination. Commercial internet service providers later used these capabilities to connect millions of customers around the world. A resounding commercial success, the Internet was transferred to commercial operation in April 1995.

The Internet is changing the way scientific research is conducted. For example, a new Institute for Environmental Catalysis, funded by NSF and the Department of Energy, provides real-time Internet-facilitated collaboration between students and researchers at universities, and scientists and engineers at government laboratories and five major chemical companies. Experiments, instruments, and laboratory notebooks will be linked electronically to allow these individuals to work together closely on ways to neutralize pollutants at their source.

The Internet is also changing the way students learn, allowing them access to vast new educational resources. Using images from the 4-meter Blanco Telescope at the NSF-supported

Cerro Tololo Interamerican Observatory in Chile, high school students in Northfield Mount Hermon School in Northfield, Massachusetts recently discovered a distant asteroid. This is one of just 72 objects that so far have been found beyond Neptune. Just like senior astronomers, the students obtained star-field images via computer. They then used visual inspection and special software—software developed by NSF's innovative "Hands-On-Universe" project specifically for educational purposes—to analyze them.

Since the inception of the Internet, NSF has worked to foster collaboration between universities and companies in developing and enhancing network capabilities and transferring cutting-edge technology to the private sector. NSF's efforts now focus on connecting research institutions both in the U.S. and around the world to the very high speed Backbone Network Service (vBNS). The vBNS is an extremely sophisticated telecommunications system that enables scientists nationwide to share powerful computing resources, once again pushing networking to the limits in support of academic research. Technology developed for this program is also likely to enhance future Internet operations. The vBNS permits collaboration, distributed computing, remote access to instruments, and visualization of events such as weather, chemical reactions, and of multimedia displays.



Work related to a new discovery frequently does not end with the discovery being made. Important outcomes of the NSF-sponsored work include new uses of discoveries in ways relevant to society, and development of new tools or technologies for use in other areas. NSF views the accessibility of results to potential users, partnerships between government, academia and industry, and how the NSF-generated knowledge base enables innovation as critical steps in the progress of science. These extensions of discoveries advance the health, prosperity and welfare of the nation. America's national security, economic competitiveness, health, environment and quality of life depend on taking advantage of discoveries.

NSF's key strategy for linking advances in science and engineering with their potential uses is through the support of collaborative research. Such collaborations may involve cooperative programs with other federal agencies and special prototypes for cooperative activities with state governments and the private sector.

NSF is successful in making progress toward this goal when, in the aggregate, the results of NSF-supported work are rapidly and readily available through publication and other interactions among researchers, educators and potential users; and when new applications are based on knowledge generated by NSF grantees.

The following examples of important connections reported in 1998 demonstrate that long-term funding of research leads to results of significant value to the American public. In addition, several of the examples presented below demonstrate the benefits of working with other agencies and researchers in other countries.

**Genetic Engineering of Cold Tolerance in Plants:** NSF-supported researchers recently succeeded in engineering plants that are more tolerant to cold temperatures. They first identified a master gene that coordinates the expression of a suite of cold-regulated genes and makes plants more tolerant of low temperatures. Usually, the suite of cold-responsive genes becomes active gradually, leading to damage in a sudden freeze. By modifying the master gene in the model plant *Arabidopsis thaliana*, the researchers engineered plants that are inherently cold-tolerant and can survive sudden temperature drops to as low as  $-8^{\circ}$  Celsius, four degrees colder than the normal killing temperature for the plant.

**Digital Libraries:** The FBI and one of the Digital Library Projects have begun a substantial collaborative effort to import digital library technology in order to help comply with Freedom of Information Act requests. The technology, based on effective organization and retrieval of scanned document images, is being considered for several applications at the FBI. A California Digital Library project has created new means to handle combined text, data and image information which will contain 11,000 pictures of California plants, taxonomic name records, and 350,000 records of plant locations. Users of the technology include the California Department of Transportation.

**Grant Opportunities for Academic Liaison with Industry (GOALI)/Control of Color Xerographic Process:** The GOALI program uses a variety of mechanisms to promote university-industry partnerships, and is an important example demonstrating one way NSF is able to achieve its connections goal. At the University of Michigan, students have collaborated with scientists at Xerox Corporation to develop new sensor-based feedback control algorithms that can significantly reduce the cost of color copies while producing accurate and consistent color images. The results are undergoing product testing at Xerox and have significant potential to impact the next development of xerographic process.

The competence and capabilities of the nation's science and engineering workforce keep America at the forefront of innovation and technological progress. A diverse science and engineering workforce that is representative of the American public and able to respond effectively to a global economy is vitally important to America's future.

Key investment strategies for improving the workforce include development of programs for the education and training of professionals who will become world leaders. This is accomplished through support of advanced training in science and engineering through fellowships, traineeships, and assistantships at the nation's universities and colleges, involving students at all levels and promoting models of education for a productive, globally-oriented workforce with skills needed for the 21st century.

NSF is successful when, in the aggregate, participants in NSF activities experience world-class professional practices in research and education, using modern technologies and incorporating international points of reference; when academia, government, business, and industry recognize their quality; and when the science and engineering workforce shows increased participation of underrepresented groups.

**International Collaborative Programs in Computer and Information Science and Engineering:** Three initiatives are in place to ensure a more international outlook for the research community: the CONACyT bilateral program with Mexico, the CNPq bilateral program with Brazil; and the ESPRIT cooperative activity with the European research community. CONACyT and CNPq allow collaborative research between U.S. and international researchers. ESPRIT provides for workshops on the topics of scientific databases, intelligent implants, and visual computation and interfaces, exposing students and scientists to world-class professional practices.

**Integrated Media Systems Center's Multimedia University Academy (MUA):**

The potential of the information revolution to benefit all Americans has been brought to light at the University of Southern California's Integrated Media Systems Center, an NSF-supported Engineering Research Center. The center is home to the Multimedia University Academy, which prepares Los Angeles area high school graduates for careers in the digital arts, computer graphics, and other multi-media industries. The Academy makes a special effort to attract a diverse student population, and many come from "at risk" backgrounds. The majority of its graduates have successfully obtained positions in the multimedia sector while also continuing to pursue their education.

**The Incorporated Research Institutions for Seismology (IRIS)** has recently embarked on an ambitious education and outreach program. The IRIS Education and Outreach program contributes to the Princeton Earth Physics Project, which puts seismometers of research value and associated web-based curricula in middle school and high school classrooms and provides workshops for teachers participating in the project. IRIS regularly conducts workshops for teachers on earthquakes, seismology and related Earth science either at national meetings such as the National Science Teachers Association or locally through IRIS member institutions. Public outreach materials include hard copy and web-based publications, in particular, a global earthquake viewer on the IRIS web site and an interactive public display on tour with the Franklin Institute's "Powers of Nature" exhibit, currently at the California Science Center in Los Angeles. Other activities include a partnership with Teach For America aimed at serving under-resourced schools.

**Improving Information Resources and Identifying Underrepresented groups:**

NSF produced the 1998 edition of its Congressionally mandated report, *Women, Minorities, and People with Disabilities in Science and Engineering*. This report represents a large body of data on the participation of these groups in the science enterprise. It has been widely used by policy makers addressing the problems of underrepresentation of these groups in the sciences and engineering.

Proficiency in essential skills and understanding of basic concepts in mathematics and science is critical to the earning power of individuals, to the nation's economic competitiveness, and to the quality of life in the 21st century. NSF is the only agency that directly aims at developing such proficiencies at all levels of education.

NSF's key investment strategies are designed to facilitate the development of essential skills in mathematics and science for all Americans through the promotion of broad-based or system-wide reforms in science, mathematics, engineering, and technology education that is based on national standards.

NSF has established linkages with other agencies, and supports the development of prototypes for cooperative activities involving state and local educational agencies and the private sector.

NSF is successful in making progress toward this goal when, in the aggregate, NSF programs lead to the development, adaptation, and adoption of successful models, products, and practices; train teachers in standards-based approaches that demonstrate capability to improve teaching and learning; stimulate faculty to develop expertise on effective learning environments and to pursue a vigorous combination of teaching and research; catalyze system-wide improvement; and facilitate improved student performance.

**Urban Systemic Initiative (USI):** The USI program was begun in 1993 to catalyze science and mathematics education reform in urban areas with the largest numbers of children in poverty. USI, now increasing access to high-quality education in 21 cities, benefits nearly 4,135 schools with student enrollment of nearly 3.4 million. Over 91,600 science and math teachers participate in USI-sponsored professional development. Preliminary data show that the program is having some impact on student achievement. For example, from 1994 to 1998, fourth grade students in Detroit Public Schools nearly doubled math proficiency on state assessments to 65 percent, while from 1996 to 1998 science proficiency of fifth grade students nearly doubled to 33 percent.

#### **Improved Teacher Preparation Leads to Improved Student Performance:**

One approach to quantifying the impact of Collaborative for Excellence in Teachers Preparation (CETP) trained teachers is to evaluate the performance of the K-12 students in their classrooms. Two geographically separated CETP groups compared science test scores of approximately 150 fourth grade students enrolled in six CETP-affiliated elementary schools with citywide scores. In CETP-affiliated elementary schools, both the classroom teachers and pre-service teachers participated in CETP workshops and courses. While average science scores increased citywide from Spring 1997 to Spring 1998, there was an increase in the percentage of students participating at grade level from 60 percent to 68 percent in CETP schools versus 49 percent to 54 percent citywide.

#### **High School Students Discover Distant Asteroid:**

High school students from Northfield Mount Hermon School in Northfield, Massachusetts discovered a previously unidentified celestial object in the Kuiper Belt using images from the NSF's 4-meter Blanco Telescope in Chile. Northfield Mount Hermon School is one of six Asteroid Search Teams participating in NSF's innovative Hands-On Universe project, which began in 1990 through support from the Education and Human Resources Activity, and is now based at the University of California-Berkeley. The asteroid was approximately 100 miles in diameter and is officially called 1998 FS144. Astronomy teacher Hughes Pack directed the students' search of computer images provided by Lawrence Berkeley National Lab's Supernova Cosmology Program. A collaborating team, students from Pennsylvania's Oil City Area High School, confirmed the location of 1998 FS 144 for their peers at Northfield Mount Hermon. The Oil City students were led by teacher Tim Spuck, a 1998 Pennsylvania Christa McAuliffe Fellow. For pictures of KBO 1998 FS144 see: <http://astronomy.geecs.org>. For more information on the Hands-On Universe project see: <http://hou.lbl.gov>.

*continued pg. 21*

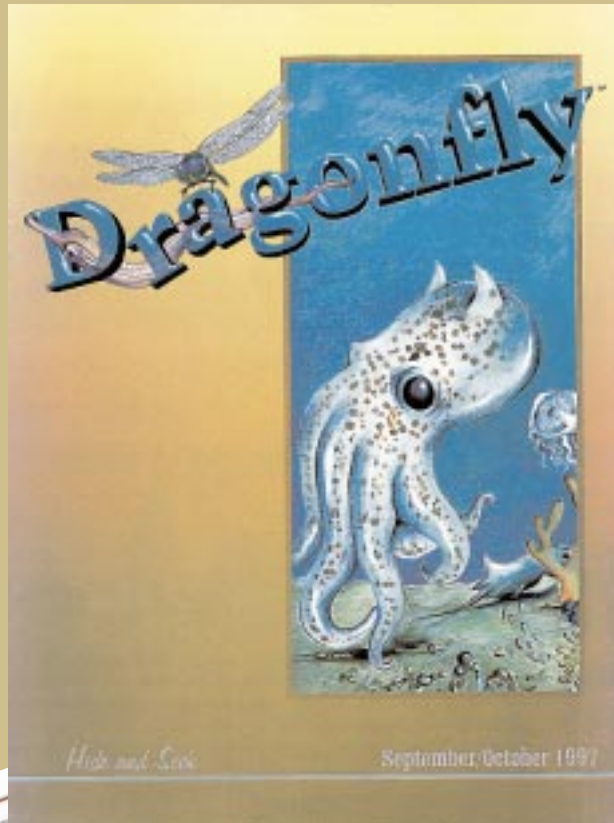


# Dragonfly, the Teachers' Pet

## Formal and informal education can work together effectively

Formal and informal education can work together effectively to engage K-12 students in the wonders of science. The highly successful *Dragonfly* magazine, funded through the Instructional Materials Development (IMD) and Informal Science Education (ISE) programs, celebrates science achievements of 8-12 year-olds by publishing their research, experiments, stories, artwork, and other creative expressions. Through its *Teacher's and Home Companions* edition, it offers curricular ideas for the classroom, as well as scientific explorations for the home. In 1998, ISE expanded the reach of this successful endeavor through two complementary efforts: the *Dragonfly* TV series where young investigators and adult scientists present their research and Dragon Quest, an inquiry-driven web site, that provides interactive educational experiences.

20



DRAGONFLY is a publication of the  
National Science Teachers  
Association

**GOAL 5: Timely and relevant information on the national and international science and engineering enterprise.**

NSF instituted management improvements in FY 1997 and FY 1998 to accomplish this goal. Preliminary data taken from several Science Resources Studies (SRS) surveys suggest that performance for FY 1999 will meet this goal. The baseline measure is a survey performed in 1996. A parallel survey will be taken in 1999 to determine whether improvement was achieved.

**PART 2. INVESTMENT PROCESS GOALS AND RESULTS**

NSF's investment process goals focus on the means and strategies the Foundation uses to make investment decisions in order to achieve its mission and its desired outcome goals. Investment process goals address various aspects of the Foundation's work. For example, several investment process goals set quantitative targets for NSF's customer service standards, e.g., the time it takes to process awards. The investment process goals that address NSF strategies set quantitative targets pertaining to issues such as the use of merit review and the support of new investigators. Also included in NSF's set of investment process goals are the federal-wide performance goals that focus on facilities oversight.

In the pilot results report exercise, FY 1998 data was applied to the FY 1999 annual performance plan goals in order to test the existing data systems and data collection procedures currently in place. Despite the obvious disconnect with applying FY 1998 data against FY 1999 goals, nevertheless, this exercise allowed NSF to conduct a data verification and validation test and provided useful preliminary performance results information. The following are selected performance goals and their results from the pilot exercise.

**Use of Merit Review:** NSF's investments are guided by a competitive, external merit review process, a means and strategy that is fundamental to achieving NSF's mission and its desired outcome goals. NSF's goal is to have at least 90 percent of appropriated funds (excluding administration, management and procurement funds) allocated to projects that have been reviewed by appropriate peers external to NSF and selected through a merit-based competitive process.

FY 1999 Goal: 90%  
FY 1998 Result: 90%

**Time to Prepare Proposals:** To ensure that the research community has adequate time to prepare proposals, NSF's goal is to have 95 percent of program announcements and solicitations be available at least three months prior to proposal deadline or target dates.

FY 1999 Goal: 95%  
FY 1998 Result: 66%

**Award Duration:** NSF tries to provide resources for a sufficient duration to ensure that investigators have adequate time to complete their research and write fewer proposals. NSF's goal for average duration of awards for research projects is at least 2.7 years.

FY 1999 Goal: 2.7 years  
FY 1998 Result: 2.7 years



# A Picture Is Worth 1,000 Words

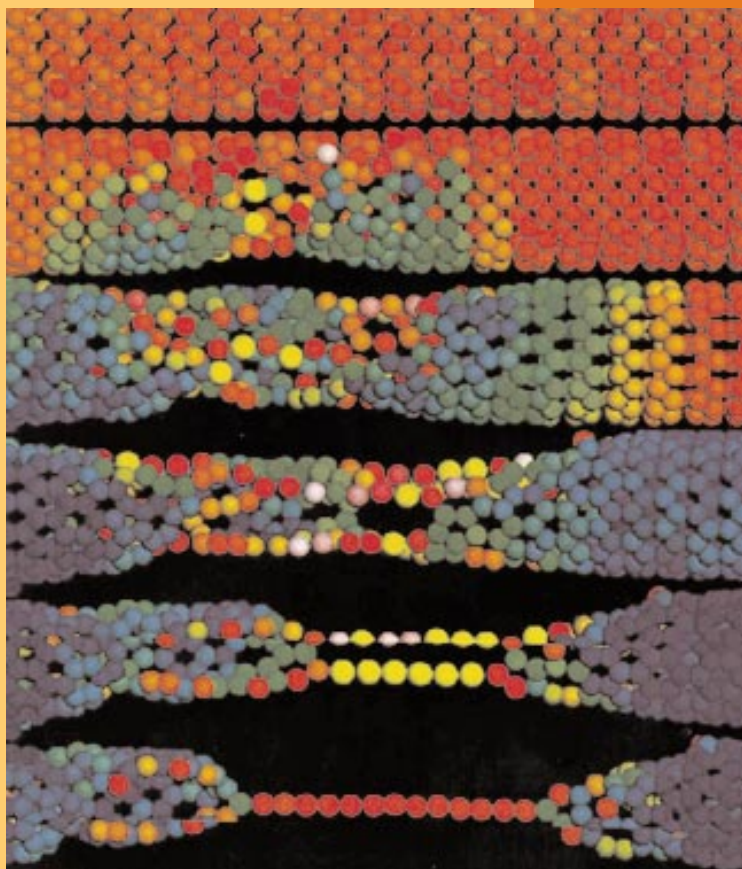
To scientists an image is a door to knowledge and unimagined possibilities.

The uses of imaging within NSF-funded programs have led to unprecedented advances in basic research and technology that are having a broad impact on society.

Optical, radio and infrared imaging technology developed for use in astronomy to yield increasingly detailed views of the universe, combined with innovative measurement techniques devised by physicists and chemists, have been applied in medicine to image the inaccessible. Most notably, these advances have led to the development of CATScan machines, scans for breast cancer and portable X-ray scanners for neonatology and clinics in developing countries.

The use of imaging technology in mathematics and the physical sciences has refined biomedical applications and prompted new arenas of scientific exploration. Current research in physics is extending the ability to “see” inside a living organism from X-ray imaging to new advances in Magnetic Resonance Imaging (MRI), including the use of rare gases for non-invasive imaging of “empty” spaces within the body. This technique has been used to observe, for the first time within a human lung, characteristic lung conditions caused by pulmonary diseases, such as asthma and emphysema. Mathematical image reconstruction techniques have been used to develop real-time MRI processing methods to follow brain activity during language processing. Advances in crystallography have led to the imaging of 3-D structures of proteins and other biological molecules, helping to unlock the secrets of how living systems work. The ability to image and view chemical reactivity in individual molecules is being applied to

the development of new microscopy techniques, such as in vivo imaging of biological processes at the cellular and subcellular level. In materials research, the expansion of classical microscopy and computer simulation techniques to better understand the behavior, character and properties of various materials is opening up new fields of investigation. Newly discovered forms of carbon, carbon “nanotubes” which exhibit remarkable electronic and mechanical properties and may be the strongest materials known, were visualized with new imaging techniques and emphasize the unimagined and unlimited potential of imaging in scientific research.



*New imaging techniques have allowed the visualization of carbon nanotubes, newly discovered forms of carbon that may be the strongest materials known. A computer shows a carbon nanotube progressing through the stages of a fracture.*

**Time to Decision:** Timely information and notification processes reflect a commitment to the proposing community by NSF to take expeditious action and provide feedback for both awards and especially declines. NSF's goal is to process 70 percent of proposals within six months of receipt.

FY 1999 Goal: 70%  
FY 1998 Result: 59%

**Maintaining Openness in the System:** Ensuring that the proposal and award process is open to new people and new ideas is critical to the NSF mission. NSF's goal is to have at least 30 percent of competitive research grants go to new investigators.

FY 1999 Goal: 30%  
FY 1998 Result: 27%

**Facilities Oversight:** NSF's facilities oversight goals deal with the cost and timing of construction projects as well as the management of facilities.

#### FY 1999 Goals

For all construction and upgrade projects initiated after 1996, keep total costs within 110% of estimates made at the initiation of construction.  
Keep operating time lost due to unscheduled downtime to less than 10% of the total scheduled possible operating time.

#### FY 1998 Results

In FY 1998, NSF began an effort to provide oversight of its facilities investment by developing an electronic template to capture NSF-wide data on cost and schedule performance of NSF-supported facilities. During FY 1999, software will be developed, user groups will be formed, "beta" testing will be completed and the template will be implemented.

## PART 3. MANAGEMENT GOALS AND PERFORMANCE

NSF's management goals address the efficiency and effectiveness of the agency's administrative activities, emphasizing issues such as the utilization of new information technologies and human resources development. Preliminary performance information from the pilot report exercise included the following:

**FastLane:** During FY 1998, NSF made significant progress toward full implementation of FastLane, a precedent-setting, web-based proposal and award management system which allows the submission of proposals and business transactions to be done electronically. NSF's FY 1999 goal—to receive and process at least 10 percent of full proposal submissions electronically—was exceeded a year ahead of schedule. Nearly 5,000 proposals (17 percent of all proposals submitted to NSF) were received through FastLane in FY 1998. Given the FY 1998 results, NSF has raised its FY 1999 target to 25 percent.

FY 1999 Goal: 10%  
FY 1998 Result: 17%

**Staff Diversity:** NSF's staff diversity goal directs the Foundation to ensure that recruiting mechanisms reach scientists and engineers from groups that are underrepresented in their fields. To that end, NSF has expanded its coordination of recruitment efforts for scientists and engineers, providing information on mechanisms that will reach underrepresented groups and facilitating their use. In FY 1998, NSF participated in eight job fairs, seven of which were targeted to underrepresented groups.

**Project Reporting:** In 1998, NSF developed a new, comprehensively redesigned, web-based project reporting system that allows investigators to submit final project reports, annual project reports and interim reports electronically. The FY 1999 performance goal is to have at least 70 percent of all project reports be submitted through the new Project Reporting System. During FY 1998, because the Project Reporting System was under development and available only in test mode, less than one percent of project reports were submitted through the new Project Reporting System.



## Discussion and Analysis of the Financial Statements

The National Science Foundation has a long record of success in managing the resources entrusted to it. NSF strives to enhance the credibility and accountability of our stewardship responsibilities to the Congress and taxpayers by preparing the accompanying financial statements in conformity with the hierarchy of accounting principles approved by the Federal Accounting Standards Advisory Board (FASAB) and then subjecting them to an independent audit to ensure their reliability and accuracy in assessing the performance of NSF.

### FY 1998 FINANCIAL STATEMENT AUDIT

The Chief Financial Officer's Act of 1990 (Public Law 101-576) requires that NSF prepare financial statements to be audited in accordance with Government Auditing Standards. The NSF Inspector General is statutorily responsible for the manner in which the audit of NSF's financial statements is conducted. KPMG LLP, an independent certified public accounting firm, was selected by the NSF Inspector General to perform the audit of NSF's FY 1998 financial statements.

In concurrence with the National Science Board Committee on Audit and Oversight and the NSF Chief Operating Officer, the NSF Inspector General and Chief Financial Officer established the NSF Audit Coordination Committee in 1998 to promote and encourage open communications to discuss audit issues. The Audit Coordination Committee, in coordination with both the Chief Financial Officer and the Inspector General, closely monitored the KPMG audit. The final audit report was issued and signed by both KPMG and the Inspector General and the results were presented to the Chair of the National Science Board and the NSF Director.

NSF received an unqualified opinion stating that the principal financial statements were fairly stated in all material respects. The independent auditors did not report any material weaknesses in internal control or material noncompliance with laws and regulations.

One reportable condition was identified during the audit of NSF's U.S. Antarctic Program's (USAP) property, plant and equipment (PP&E). PP&E physically located in Antarctica is under the custodial care of NSF's USAP contractor. During the audit, the contractor had difficulty in providing records, routinely recording and maintaining accountability over PP&E. It was determined that the current project management system used by the contractor does not have the functionality to readily provide accurate valuation and accounting information necessary to record PP&E in the NSF financial statements. Because of this, extensive testing by the auditors was required to substantiate the PP&E account balances as of September 30, 1998.

Currently, NSF is competing the USAP contract for renewal and will specifically address the NSF PP&E reporting requirements as part of the bidding process. NSF will require organizations that bid on the USAP contract to demonstrate their systems and level of expertise that will be utilized to control the USAP PP&E and accurately report account balances to NSF for financial statement presentation. NSF feels it will be able to satisfy this reportable condition as part of the requirements of the new USAP contract. The new USAP contract will be awarded by September 1999.

*Through computer imaging of topographical surfaces, mathematicians can test theories of how materials will change when stressed. The image is part of the work at NSF's Electronic Visualization Laboratory at the University of Illinois at Chicago. Photo: NSF Collection/ University of Illinois at Chicago*

## UNDERSTANDING THE FINANCIAL STATEMENTS

The following discussion is intended to provide an understanding of some significant balances or conditions that are reflected in each of the NSF financial statements.

**Balance Sheet:** The Balance Sheet presents amounts available for use by NSF (assets) against the amounts owed (liabilities) and amounts that comprise the difference (net position). Three major line items represent 99 percent of NSF's assets. Fund Balances with Treasury is funding available in the Department of Treasury accounts from which NSF is authorized to make expenditures and pay liabilities. Property, Plant and Equipment consists of capitalized property located at NSF Headquarters and NSF-owned property in New Zealand and Antarctica that support the United States Antarctic Program. Advances are funds advanced to NSF grantees and contractors as well a few advances made to employees for travel. All NSF's assets are considered entity assets, assets whose use is determined by NSF management. Intragovernmental assets are assets that are NSF claims against other federal government entities.

Accounts Payable and Advances from Others represent 93 percent of NSF's liabilities. Advances from Others are amounts advanced to NSF from other federal entities for the cross-service administration of grants on their behalf. NSF maintains the expertise and automated systems for the administration of grants, which other federal entities rely upon to assist in administering their grants. Accounts payable are liabilities to grantees for their unreimbursed expenses.

Liabilities covered by Budgetary Resources are liabilities whose resources are available to cover those existing as of September 30, 1998. Liabilities not covered by Budgetary Resources are liabilities that are not currently funded that will require an appropriation by Congress for payment in a future period.

**Statement of Net Costs:** This statement is intended to provide an understanding of the full cost of operating NSF programs. In FY 1998, 95.6 percent of all NSF costs incurred were directly related to support of NSF research and education programs, of which a small portion was for program support such as travel and the salaries of IPA employees. Costs incurred for the Foundation's general operations activities—e.g., salaries, training, support of activities related to the advancement of NSF information systems technology—including support for the Office of Inspector General, accounted for 4.4 percent of the total NSF cost. This illustrates NSF's commitment to efficiency and success in using financial resources for the direct promotion of the research and education mission of the agency.



*Representatives from NSF join the KPMG auditing team in Antarctica on a review expedition to examine NSF's Polar Program property. Standing at the southernmost point on Earth are (l to r): John Hummel, KPMG; Al Muhlbauer, NSF Deputy Chief Financial Officer; Mike Fullen, KPMG; and Ed Blansitt, NSF Office of the Inspector General.*

*Photo: NSF Collection*



**Statement of Changes in Net Position:** This statement is presented to explain those items that caused the net position of NSF to change from the beginning to the end of the reporting period. A significant item to note is the “Other Financing Sources” in the amount of \$62.2 million; this is a one-time collection of funds from a corporation that registered second-level Internet domain names under a NSF cooperative agreement. Prior period adjustments are primarily corrections of previous accounting errors.

**Statement of Budgetary Resources:** This statement provides information on how budgetary resources were made available for the year and what the status of budgetary resources was at year-end. NSF obligated 95.9 percent of all available budgetary resources for the year. Unobligated balances that are not available reflect budgetary resources that are available only to adjust or liquidate obligations from a prior year.

**Statement of Financing:** This statement provides reconciliation between NSF proprietary and budgetary accounting information. Imputed financing are pension and post-retirement benefit reconciliation paid by the Office of Personnel Management on behalf of NSF. A reduction in the amount of goods and services ordered but not yet received is related to the implementation of the electronic grantee Federal Cash Transaction Reports (FCTR) of expenditure reporting. More timely expenditure reporting has reduced the amount of undelivered grantee obligations.

**Stewardship Investments:** Stewardship investments are NSF investments that yield long term benefits to the public. These investments are shown as expenses in the financial statements. All NSF investments in research and education support NSF’s mission to promote the progress of science and contribute to the nation’s health, prosperity and welfare.

## BUDGETARY INTEGRITY: NSF RESOURCES AND HOW THEY ARE USED

NSF is funded through five Congressional appropriations, which in FY 1998 totaled \$3.43 billion. Together, these appropriations support the Foundation’s two primary lines of business, as indicated in the Statement of Net Cost—Research Activities and Education Activities. Research Activities are supported through the Research and Related Activities appropriation and the Major Research Equipment appropriation. Education activities are funded primarily through the Education and Human Resources appropriation, although given the integrative nature of research and education, NSF research activities often include an education and training component. The Office of Inspector General is funded under its own separate appropriation. Administrative support for the Foundation as a whole is provided by the Salaries and Expenses appropriation.

For FY 1999, Congress has provided total appropriations of \$3.74 billion. Specific areas of emphasis for NSF investments in FY 1999 include Knowledge and Distributed Intelligence (KDI), Life and Earth’s Environment (LEE) and Educating for the Future (EFF). KDI is a Foundation-wide effort that aims to improve our ability to discover, collect, represent, transmit and apply information. LEE encompasses a wide range of activities designed to foster research on the complex interdependencies among living organism and the environments that affect, sustain, and are modified by them. EFF includes a broad array of education and training efforts at all levels, from pre-kindergarten through career development, varying from teacher training to curriculum development to learning technologies.

## CURRENT AND FUTURE NSF DEMANDS AND TRENDS

Advances in grants management, use of technology, and human resource development are changing the way NSF does business and how NSF will do business in the future. Efforts are currently underway in each of these areas that will enhance efficiency and productivity and reduce costs for the Foundation, in both the near and long term.

**Grants Management with FastLane:** In an effort to move towards a more streamlined, paperless electronic administrative environment, NSF initiated the FastLane project in 1994. FastLane enables NSF and its customer community to conduct business transactions and exchange information electronically using the World Wide Web. Since its inception, FastLane has been tremendously successful. In FY 1998, NSF added the grantee report of expenditures, the Federal Cash Transaction Report (FCTR), to FastLane. The FCTR report is “downloadable” and can be accessed and updated by a grantee’s internal accounting system. The resulting report is then “uploaded” to FastLane and processed directly into NSF’s financial accounting system. The FastLane FCTR was introduced in December 1997; today over 70 percent of NSF’s grantees use the FastLane FCTR to report 92 percent of grantee expenditures.

**Technology Update:** Until recently, all of NSF’s financial and awards management systems have resided on a mainframe computer. NSF has committed to moving to a client/server environment by the end of FY 2000. A client/server system is designed so that specific functions or processes are divided between different machines, each of which is optimized to perform the assigned tasks. With easier access to data and reduced costs the Foundation will benefit from enhanced productivity.

NSF has established a standard client/server architecture that is being used today to develop individual systems. To date, five systems have been implemented and are fully functional in the client/server environment. Currently, NSF is working towards migrating our current financial accounting, awards management, and procurement and payroll systems to the client/server environment.

**Human Resource Development:** Investments in the professional development of agency personnel are essential in maintaining the level of technical, professional and managerial expertise required to keep pace with emerging technologies and more rigorous accountability standards and reporting requirements. NSF continues to recruit skilled personnel and provide formal classroom education, job training and rotational assignments to ensure staff are able to perform at the most efficient and effective levels. Future demands will require NSF to accomplish more than ever before. NSF will need to recruit highly knowledgeable and innovative individuals to meet new demands. In FY 1998, NSF participated in the CFO Council Fellows Program, a program developed by the CFO Council to provide career development opportunities for future leaders in the government financial management field. In keeping with the NSF commitment to lead change, NSF was one of the first federal agencies to both nominate and host an employee participant in the CFO Council Fellows Program.



*This computer image was generated through the mathematics of fractals. Fractals enable NSF-supported scientists and engineers to study such complex structures as the human circulatory system.  
Photo: NSF Collection*

## Management Integrity and Controls

The Federal Managers Financial Integrity Act requires annual reviews of the adequacy of program and activity management controls. The NSF Internal Controls Committee, chaired by the Chief Financial Officer, oversees the Foundation's management control program.

Individual assurance statements from each of NSF's Assistant Directors and Staff Office Directors serve as the primary basis for NSF's assurance that management controls are adequate, and that all NSF systems are in compliance with all applicable laws and administrative requirements, including OMB circulars A-123 and A-127.

During the FY 1998 certification process, the Internal Controls Committee did not identify any material weaknesses as defined by OMB guidance.

NSF also evaluated agency financial management systems for the fiscal year ending September 30, 1998. NSF management found internal accounting systems and administrative controls to be adequate to ensure transactions were executed in accordance with budgetary and financial law, and were recorded in accordance with federal accounting standards. It was also determined that assets were properly safeguarded.

During 1998, the Internal Controls Committee identified several areas that required careful management attention:

- ▶ The Independent Auditor's Report on the financial statements reported that the auditors were unable to plan and perform audit procedures to satisfy themselves about the fairness of NSF's reported Property, Plant, and Equipment balance. During FY 1998, NSF undertook steps to maintain effective inventory control and financial management systems over PP&E and received an unqualified opinion.
- ▶ Auditors identified several reportable conditions for recognizing certain liabilities for grants and contracts and recording accounts payable. In FY 1998, NSF resolved these reportable conditions.
- ▶ Auditors questioned NSF's development of systems to capture and report the data that would be necessary to produce NSF's first Performance Results Report as required by GPRA. How well NSF systems capture GPRA information is one of the objectives of an effort currently underway by NSF's GPRA Infrastructure Implementation Council. Preliminary results of this effort have been reported in this report in the section entitled, *Program Performance During FY 1998*.





*Researchers from around the world are using the unassuming mustard weed, Arabidopsis thaliana, to unlock the secrets of the plant world. With NSF support, biologists are now mapping all of the genes of this model organism. They have already made fundamental discoveries that may lead to the development of more beneficial crops and forest products.*

*Photo: NSF Collection*

## Other Reporting Requirements

### DEBT COLLECTION IMPROVEMENT ACT OF 1996

Net Accounts Receivable totaled \$892,000 at September 30, 1998. Of that amount, \$468,000 was receivable from other federal agencies. The remaining \$424,000 was receivable from the public. In FY 1998, NSF was accepted for participation in the Department of the Treasury Cross-Servicing Program. In accordance with the Debt Collection Improvement Act, this program allows NSF to refer debts that are delinquent more than 180 days to the Department of the Treasury for appropriate action to collect those accounts.

### CIVIL MONETARY PENALTY ACT

There were no Civil Monetary Penalties assessed by NSF during the relevant financial statement reporting period.

### PROMPT PAYMENT ACT

NSF continues to strive for the highest levels of electronic fund transfers (EFT) payments required by the Debt Collection Improvement Act. All payroll, vendor, and grantee payment transactions in 1998 were made by EFT. Only payments made to foreign banks and the Department of the Defense were made by paper check. Because of NSF's aggressive cash management initiatives related to EFT, no late payments requiring payment of interest were made in 1998.



*The radio telescopes and other astronomical facilities that NSF supports enable researchers to view the universe from multiple perspectives.  
Photo: NSF Collection*

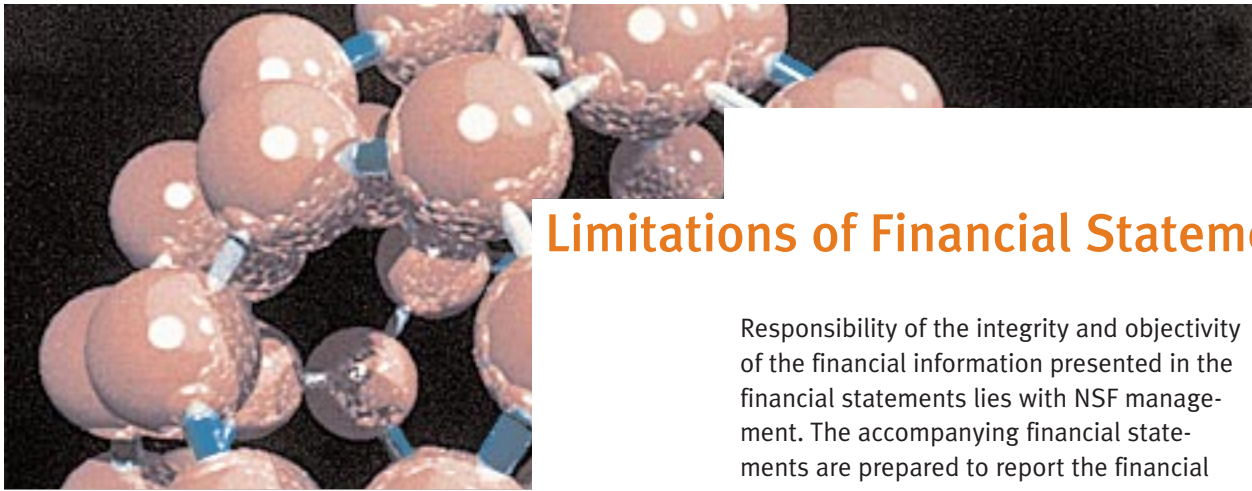


## Year 2000 Progress

NSF is making substantial and credible progress in achieving Y2K compliance. As of November 1998, fifteen of NSF's seventeen mission critical systems have been validated as Y2K compliant. Internal performance reports for mission critical systems are being verified by an independent verification and validation contractor. They have found no discrepancies between the reports and the actual status of the systems. The Foundation is on schedule for achieving Year 2000 compliance well before the turn of the century and it is expected that conversion will be completed by OMB's compliance deadline of March 1999. OMB has consistently classified NSF as making satisfactory progress (Tier 3 — the highest classification given) on its Y2K activities. In the summer of 1998, NSF received high marks from the House Committee on Government Reform and Oversight Subcommittee on Government Management, Information and Technology.

Analysis indicates that potential problems should be non-critical and remedied quickly. In most cases, the contingency plans already in effect for system problems would handle any Y2K issues. As of November 1998, NSF has incurred approximately \$1.3 million to address Y2K issues and expects to incur an additional \$100,000 until NSF is fully Y2K compliant.

NSF's Chief Information Officer (CIO) reports regularly to the Chief Operating Officer on the status of Y2K conversion. The Agency's Deputy Chief Information Officer represents NSF on the President's Council for the Year 2000 Conversion and the Year 2000 Subcommittee on the inter-agency CIO Council.



*The strong, flexible buckyball molecule has potential applications in material sciences and microengineering. In 1985, NSF-funded researchers Richard Smalley, Robert Curl, and Harold Kroto discovered that 60 carbon atoms can configure themselves into this soccer-ball-shaped molecule, named in honor of architect Buckminster Fuller. In 1996, Smalley, Curl, and Kroto were awarded the Nobel Prize in Chemistry. They credit NSF funding of basic research as instrumental in their discovery.*

*Photo: NSF Collection*

## Limitations of Financial Statements

Responsibility of the integrity and objectivity of the financial information presented in the financial statements lies with NSF management. The accompanying financial statements are prepared to report the financial position and results of the operations of NSF, pursuant to the requirements of Chapter 31 of the United States Code section 3515(b). While these statements have been prepared from the books and records of NSF in accordance with the formats prescribed in *Office of Management and Budget Bulletin 97-01, Form and Content of Agency Financial Statements*, these financial statements are in addition to the financial reports used to monitor and control budgetary resources which are prepared from the same books and records. The financial statements should be read with the realization that NSF is an agency of the executive branch of the United States Government, a sovereign entity. Accordingly, unfunded liabilities reported in the statements cannot be liquidated without the enactment of an appropriation, and ongoing operations are subjected to enactment of appropriations.

# FY1998 Consolidated Financial Statements



## *A NEW WINDOW INTO THE UNIVERSE*

*One of the NSF-supported construction projects underway in FY 1998 was the Laser Interferometer Gravitational Wave Observatory (LIGO), located in Hanford, WA. LIGO represents an extraordinary scientific opportunity coupled with an extraordinary technical challenge. Gravitational waves are an essential feature of our understanding of gravity and LIGO is designed to provide the first direct detection of these waves. New facilities such as LIGO offer scientists research opportunities in totally new directions. Photo: NSF Collection*

## National Science Foundation

**Balance Sheet**

As of September 30, 1998

(Amounts in Thousands)

**ASSETS****Entity Assets:****Intragovernmental**

Fund Balance With Treasury (Note 2)	\$ 3,969,904
Accounts Receivable, Net (Note 3)	469
<b>Total Intragovernmental Assets</b>	<u>3,970,373</u>

Accounts Receivable, Net (Note 3)	424
Advances (Note 4)	32,383
Cash	9,264
General Property, Plant and Equipment, Net (Note 5)	92,546
Other Assets	<u>59</u>

**Total Assets** \$ 4,105,049

**LIABILITIES****Liabilities Covered by Budgetary Resources:****Intragovernmental Liabilities:**

Advances From Others	\$ 71,076
Accounts Payable	215
Other Intragovernmental Liabilities (Note 6)	<u>735</u>
<b>Total Intragovernmental Liabilities</b>	<u>72,026</u>

Accounts Payable	140,279
Other Liabilities (Note 6)	<u>2,270</u>
<b>Total Liabilities Covered by Budgetary Resources</b>	<u>214,575</u>

**Liabilities Not Covered by Budgetary Resources:****Intragovernmental Liabilities:**

Employee Benefits (Note 7)	<u>231</u>
Lease Liabilities (Note 8)	277
Accrued Annual Leave	9,140
Employee Benefits (Note 7)	<u>726</u>
<b>Total Liabilities Not Covered by Budgetary Resources</b>	<u>10,374</u>

**Total Liabilities** 224,949

**Commitments and Contingencies (Notes 1 and 8)****NET POSITION**

Unexpended Appropriations (Note 9)	3,669,853
Cumulative Results of Operations	<u>210,247</u>

**Total Net Position** 3,880,100

**Total Liabilities and Net Position** \$ 4,105,049

*See accompanying notes to the financial statements.*



National Science Foundation  
**Statement of Net Cost**  
For The Year Ended September 30, 1998  
(Amounts in Thousands)

**Program Costs**

Research Programs: (Note 10)

Intragovernmental

Program Cost	\$	132,115
Salary and Expense and Inspector General Cost		43,225

Total Intragovernmental Cost		175,340
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With the Public

Program Cost		2,489,378
Salary and Expense and Inspector General Cost		83,477

Total Public Cost		2,572,855
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Total Research Program Cost		2,748,195
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Less: Earned Revenues		88,965
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Net Research Program Cost		2,659,230
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Education Programs: (Note 10)

Intragovernmental

Program Cost		4,062
Salary and Expense and Inspector General Cost		1,329

Total Intragovernmental Cost		5,391
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With the Public

Program Cost		584,096
Salary and Expense and Inspector General Cost		19,586

Total Public Cost		603,682
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Total Education Program Cost		609,073
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Less: Earned Revenues		3,393
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Net Education Program Cost		605,680
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**Deferred Maintenance (Note 11) (unaudited)**

<b>Net Cost of Operations</b>	<b>\$</b>	<b>3,264,910</b>
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*See accompanying notes to the financial statements.*

National Science Foundation  
**Statement of Changes in Net Position**  
 For The Year Ended September 30, 1998  
 (Amounts in Thousands)

<b>Net Cost of Operations</b>	\$	3,264,910
 <b>Financing Sources:</b>		
Appropriations Used		3,211,806
Donations		44,317
Interest and Penalties		1,108
Imputed Financing		5,739
Transfers in		477
Other Financing Sources		62,295
<b>Total Financing Sources</b>		3,325,742
<b>Net Results of Operations</b>		60,832
Prior Period Adjustments (Note 12)		39,812
Net Change in Cumulative Results of Operations		100,644
Increase in Unexpended Appropriations		174,410
<b>Change in Net Position</b>		275,054
<b>Net Position-Beginning of Period</b>		3,605,046
<b>Net Position-End of Period</b>	\$	3,880,100

*See accompanying notes to the financial statements.*



National Science Foundation  
**Statement of Budgetary Resources**  
 For The Year Ended September 30, 1998  
 (Amounts in Thousands)

**Budgetary Resources**

Budget Authority (Note 13)	\$	3,477,304
Unobligated Balances - Beginning of Period		74,400
Spending Authority from Offsetting Collections		136,755
Adjustments		<u>19,067</u>
<b>Total Budgetary Resources</b>	<b>\$</b>	<b><u>3,707,526</u></b>

**Status of Budgetary Resources:**

Obligations Incurred	\$	3,555,993
Unobligated Balances - End of Period - Available		48,469
Unobligated Balances - End of Period - Not Available		<u>103,064</u>
<b>Total, Status of Budgetary Resources</b>	<b>\$</b>	<b><u>3,707,526</u></b>

**Outlays**

Obligations Incurred	\$	3,555,993
Less: Spending Authority from offsetting Collections and Adjustments		173,443
Obligated Balance, Net - Beginning of Period		3,623,725
Less: Obligated Balance, Net - End of Period		<u>3,799,257</u>
<b>Total, Outlays</b>	<b>\$</b>	<b><u>3,207,018</u></b>

*See accompanying notes to the financial statements.*

National Science Foundation  
**Statement of Financing**  
 For the Year Ended September 30, 1998  
 (Amounts in Thousands)

**Obligations and Nonbudgetary Resources**

Obligations Incurred	\$	3,555,993
Less: Spending Authority for Offsetting Collections and Adjustments		(173,443)
Imputed Financing		5,739
Transfers In		477
Exchange Revenue Not in the Budget		57
Other Financing Sources		62,307
<b>Total Obligations and Nonbudgetary Resources</b>		<b>3,451,130</b>

**Resources That Do Not Fund Net Cost of Operations**

Changes in Amount of Goods, Services, and Benefits Ordered but not yet Received or Provided		(168,884)
Change in Unfilled Customer Orders		(17,474)
Cost Capitalized on the Balance Sheet		(22,205)
Financing Sources that fund Costs of Prior Periods		(689)
Prior Period Adjustments		15,600
<b>Total Resources That Do Not Fund Net Cost of Operations</b>		<b>(193,652)</b>

**Costs That Do Not Require Resources**

Depreciation and Amortization		6,363
Loss on Disposition of Assets		1,136
Gain on Disposition of Assets		(67)
<b>Total Costs that Do Not Require Resources</b>		<b>7,432</b>

<b>Net Costs of Operations</b>	<b>\$</b>	<b>3,264,910</b>
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*See accompanying notes to the financial statements.*

## NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### A. Basis of Presentation

These financial statements have been prepared to report the financial position and results of operations of the National Science Foundation (“NSF” or “Foundation”) as required by the Chief Financial Officers Act of 1990 and the Government Management Reform Act of 1994. They have been prepared from the books and records of NSF in accordance with the hierarchy of accounting principles and standards approved by the principals of the Federal Accounting Standards Advisory Board (FASAB), Office of Management and Budget (OMB) Bulletin 97-01, *Form and Content of Agency Financial Statements*, and the Foundation’s accounting policies which are summarized in this Note. These statements are therefore different from the financial reports, also prepared by NSF pursuant to OMB directives, that are used to monitor and control NSF’s use of budgetary resources.

The NSF applies accounting principles and standards and complies with operating policies and procedures established, issued, and implemented by the General Accounting Office (GAO), the OMB, and the Department of Treasury, as recommended by the FASAB. The accompanying financial statements have been prepared in accordance with the following hierarchy of accounting principles and standards, which constitutes an other comprehensive basis of accounting:

1. Statements of Federal Financial Accounting Standards (SFFAS) effective for 1998;
2. Interpretations related to the SFFASs issued by OMB in accordance with the procedures outlined in OMB Circular A-134, *Financial Accounting Principles and Standards*;
3. Form and Content requirements included in OMB Bulletin 97-01;
4. Accounting principles published by authoritative standard-setting bodies and other authoritative sources (1) in the absence of other guidance in the first three parts of this hierarchy, and (2) if the use of such accounting standards improves the meaningfulness of these financial statements.

39

### B. Reporting Entity

NSF is an independent federal agency created by the National Science Foundation Act of 1950 (P.L. 81-507). Its aim is to promote and advance scientific progress in the United States. The agency is responsible for the overall health of science and engineering across all disciplines. The Foundation is also committed to ensuring the Nation’s supply of scientists, engineers and science educators. NSF funds research and education in science and engineering by awarding grants and contracts to educational and research institutions in all parts of the United States. NSF, by law, cannot conduct research or operate research facilities. By award, NSF enters into relationships to fund the research operations conducted by the grantees.

**Notes to the Financial Statements**  
**For the year ended September 30, 1998**

NSF is led by a presidentially-appointed director and governed by the National Science Board (“The Board”). The Board is composed of 24 members, representing a cross section of American leadership in science and engineering research and education, appointed by the President for 6-year terms. The NSF Director is a member ex officio of The Board.

Also, NSF is authorized by the general authority of the Foundation as found in United States Code Title 42, Section 1870 (f), to receive and use funds donated by others, if such funds are donated without restriction other than they be used in the furtherance of the mission of the Foundation. These donations are non-appropriated funds received from foreign governments, private companies, academic institutions, non-profit foundations and individuals. Funds are accepted into the NSF donations account either as unrestricted or as earmarked contributions to specific NSF programs that the Foundation holds in trust for disbursement to its awardees. Foreign donations are deposited initially in a commercial bank as a convenient wire-transfer depository. When needed for program support purposes, they are transferred into an account at the U.S. Treasury. Interest earnings on the commercial bank deposits are used for the same purposes as the principal donations. Funds are not made available for obligation during the year of collection; rather, they accumulate and are made available for obligation as necessary to support NSF programs.

**C. Basis of Accounting**

The accompanying financial statements have been prepared on the accrual method in addition to recognizing certain budgetary transactions. Under the accrual method, revenues are recognized when earned and expenses are recognized when a liability is incurred, without regard to receipt or payment of cash. Budgetary accounting facilitates compliance with legal constraints and controls over the use of federal funds. NSF records its grant expenses from expenditure reports submitted by the grantees. Grantees may be on either an accrual or cash basis of accounting, and NSF records amounts as reported.

**D. Revenues and Other Financing Sources**

NSF receives the majority of its funding through Congressional appropriations. NSF receives both annual and multi-year appropriations that may be expended, within statutory limits. Additional amounts are obtained through reimbursements for services provided to other federal agencies and appropriation allocations from other government agencies, as well as the donations account. Also, NSF receives interest earned on overdue receivables and excess cash advances to grantees. The interest earned on overdue receivables is returned to the Treasury. Interest earned on excess cash advances to grantees is sent directly to the Department of Health and Human Services (HHS) in accordance with OMB Circular A-110.

Appropriations are recognized as a financing source at the time the related program or administrative expenses are incurred. Revenues from reimbursable agreements are recognized when the services are provided and the related expenditures are incurred. Donations are recognized as revenues when funds are received.

In October 1997, NSF received \$23 million from a corporation that registered second-level Internet domain names under an NSF cooperative agreement. Under the agreement, the corporation deposited thirty percent of the amounts charged for that service into a fund for NSF to use to preserve and enhance the “Intellectual Infrastructure of the Internet.” In October 1997, a class action lawsuit was filed in the U.S. District Court for the District of Columbia naming NSF and the corporation as defendants alleging that NSF had created an illegal monopoly in Internet registration services and lacked authority to permit the collection of fees for registration services. Consequently, a preliminary injunction was issued against the Foundation regarding the use of these funds until a federal court decision could be made.

In April 1998, the injunction was dismissed by the U.S. District Court for the District of Columbia in the Foundation’s favor, and NSF credited these funds to the NSF Research and Related Activities appropriation to assist with Next Generation Internet activities. NSF received the remaining balance of \$39.2 million in this fund for a total of \$62.2 million received in fiscal year 1998.

In September 1998, NSF transferred the authority to administer the cooperative agreement under which Internet domain name registration services are provided to the U.S. Department of Commerce.

#### **E. Fund Balance with the U.S. Treasury and Cash**

Cash receipts and disbursements are processed by the Treasury. The balances with Treasury are comprised primarily of appropriated funds that are available to pay current liabilities and finance authorized purchase commitments, but also include the Internet fees, and the trust fund.

NSF has also established commercial bank accounts to hold some donated funds in trust, in interest bearing accounts as permitted by the contributors. These funds are collateralized by the bank through the U.S. Treasury. All other donations account balances are held by the U.S. Treasury.

#### **F. Accounts Receivable**

Accounts Receivable consists of amounts due from governmental agencies, private organizations and individuals. NSF establishes an allowance for uncollectible accounts receivable from private sources, but regards amounts due from other federal agencies as 100 percent collectible. Due to the small number and dollar amount of the private receivables, NSF analyzes each account independently to assess collectability and the need for an offsetting allowance.



## G. Advances

Advances are composed of advances to grantees, contractors and employees. The advances are recorded as assets until the grantee submits a Federal Cash Transaction Report (FCTR). At that time, the used portions of the payments are reclassified as an expense. At year end, NSF posts an accounts payable accrual for the amount of unfunded grantee expenses, based on FCTRs.

## H. General Property, Plant and Equipment (PP&E)

NSF capitalizes acquisitions with costs exceeding \$25,000 and a useful life exceeding two years. Acquisitions not meeting these criteria are recorded as operating expenses. NSF currently reports capitalized PP&E at original acquisition cost; assets acquired from General Services Administration's (GSA) excess property schedules are recorded at the value assigned by the donating agency. Depreciation expense is calculated using the straight-line method. The economic life classifications for capitalized assets are as follows:

### Equipment

5 years	-	copiers, computers and peripheral equipment, fuel storage tanks, laboratory equipment, vehicles
7 years	-	communications equipment, office furniture and equipment, pumps and compressors
10 years	-	generators, DoD non-aircraft

### Aircraft

7 years	-	aircraft
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### Buildings and Structures

31.5 years	-	Buildings and structures placed in service prior to 1993
39 years	-	Buildings and structures placed in service after 1993

The FY 1998 PP&E balance consists of Equipment, Aircraft, Buildings and Structures, and Construction in Progress. These balances are comprised of PP&E maintained "in-house" by NSF to support agency operations and PP&E under the U.S. Antarctic Program (USAP). USAP property is currently the custodial responsibility of Antarctic Support Associates, the NSF contractor for the program.

The PP&E capitalization policy reflects agency specific guidance provided by FASAB in FY 1997, which stated that PP&E under the USAP should be capitalized, as NSF maintained "operational" responsibility for the support of science activities in Antarctica. FASAB agreed that PP&E used by awardees for research and development activities, which NSF is prohibited by statute from operating, should not be included in NSF asset balances. Although NSF retains title to the property to facilitate transfer to subsequent awardees, operations and control of

this PP&E are transferred to awardees responsible for coordinating, directing and conducting research utilizing the PP&E resources. Current standards do not fully address this situation. Until standards are developed to more fully address this issue, FASAB has issued interim guidance that considers NSF's ownership interest in this PP&E to be "limited in practice to an interest similar to a reversionary interest", and directed the agency to exclude these items from the balance sheet. Rather, costs incurred to acquire such PP&E are treated as expense and shown as costs and investments in research and development in the required supplemental stewardship information.

#### **I. Advances from Others**

Advances from Others are composed of amounts obligated and advanced by other federal entities for grant administration and other services to be furnished under reimbursable agreements.

#### **J. Accounts Payable**

Accounts Payable is composed of grant liabilities and liabilities to commercial vendors and other governmental agencies. Grant liabilities are grantee expenses not yet funded or reimbursed by NSF. At year-end, NSF posts an accrual for the amount of unfunded grant expenses and adjusts the advance account by the portion of the expenses that have already been funded through grant advances. Accounts payable to commercial vendors and other governmental agencies are expenses for goods and services received but not yet paid by NSF.

43

#### **K. Annual, Sick and Other Leave**

Annual leave is accrued as it is earned, and the accrual is reduced as leave is taken. Each year, the balance in the accrued annual leave account is adjusted to reflect current pay rates. To the extent current and prior-year appropriations are not available to fund annual leave earned but not taken, funding will be obtained from future Salaries and Expenses appropriations. Sick leave and other types of nonvested leave are expensed as taken.

#### **L. Employee Benefits**

A liability is recorded for estimated and actual future payments to be made for workers' compensation pursuant to the Federal Employees' Compensation Act (FECA). The liability consists of the net present value of estimated future payments calculated by the U.S. Department of Labor (DOL) and the actual unreimbursed cost paid by DOL for compensation paid to recipients under FECA. The actual costs incurred are reflected as a liability because NSF will reimburse DOL two years after the actual payment of expenses. Future Salaries and Expenses Appropriations will be used for DOL's estimated reimbursement.

### M. Cumulative Results of Operations

A net income or loss can result from operations for a period to the extent that donated revenues and other financing sources are earned in excess or shortage of expenses incurred. The net effect of these excesses and shortages over time is presented in Cumulative Results of Operations.

### N. Retirement Plan

In fiscal year 1998, approximately 48 percent of NSF employees participated in the Civil Service Retirement System (CSRS), to which NSF made matching contributions equal to 7 percent of pay. On January 1, 1987, the Federal Employees Retirement System (FERS) went into effect pursuant to the Federal Employees' Retirement System Act of 1986 (5 U.S.C. 8401-79). Most employees hired after December 31, 1983 are automatically covered by FERS and Social Security. Employees hired prior to January 1, 1984 can elect to either join FERS and Social Security or remain in CSRS. A primary feature of FERS is that it offers a savings plan to which NSF automatically contributes 1 percent of pay and matches employee contributions up to an additional 4 percent of pay. NSF also contributes the employer's matching share for Social Security for FERS participants.

Although NSF funds a portion of the benefits under FERS and CSRS relating to its employees and withholds the necessary payroll deductions, the agency has no liability for future payments to employees under these plans, nor does NSF report CSRS, FERS, or Social Security assets, or accumulated plan benefits, on its financial statements. Reporting such amounts is the responsibility of the Office of Personnel Management (OPM) and FERS. In 1998, NSF paid for the agency's contributions to CSRS and FERS of \$3,496,037 and \$4,061,034.

SFFAS No.5 requires employing agencies to recognize the cost of pensions and other retirement benefits during their employees' active years of service. OPM actuaries determine pension cost factors by calculating the value of pension benefits expected to be paid in the future, and communicate these factors to the agency for current period expense reporting. Information was also provided by OPM regarding the full cost of health and life insurance benefits. In fiscal year 1998, NSF recognized \$3,263,638 of pension expenses, \$2,460,717 of post-retirement health benefits expenses and \$ 15,062 of post-retirement life insurance expenses related to life insurance, beyond amounts actually paid. NSF recognized an offsetting revenue of \$5,739,417 as imputed financing sources for the extent of these intragovernmental expenses that will be paid by OPM.

## O. Contingencies

### Claims and Lawsuits

NSF has claims and lawsuits pending against it. In the opinion of management and legal counsel, none of these will materially affect the financial position or operations of the Foundation. When claims are expected to result in material payment whether from the Foundation's appropriations or the "Judgment Fund" administered by the Department of Justice under section 1304 of title 31 of the United States Code and the payment amounts can be reasonably estimated, NSF discloses and recognizes them in the financial statements.

Claims and lawsuits have also been made and filed against awardees of the Foundation by third parties. NSF is not a party to these actions and NSF believes there is no possibility that NSF will be legally required to satisfy such claims. Judgments or settlements of the claims against awardees that impose financial obligation on them may be claimed as costs under the applicable contract, grant, or cooperative agreement and thus may affect the allocation of program funds in future fiscal years. In the event that the likelihood of loss on such claims by awardees becomes probable, their amounts can be reasonably estimated and Foundation management determines that it will probably pay them, NSF will recognize these potential payments as expense.

## P. Deferred Maintenance

NSF performs periodic inspections of capitalized PP&E to determine if any maintenance needed to keep an asset in an acceptable condition or restore an asset to a specific level of performance has been deferred. NSF considers deferred maintenance to be any maintenance that is not performed on schedule, unless it is determined from the material condition of the asset that scheduled maintenance does not have to be performed. Also, deferred maintenance includes any other type of maintenance that, if not performed, would render the PP&E non-operational. Circumstances such as non-availability of parts or funding are considered reasons for deferring maintenance.

#### Q. Accounting Changes

NSF implemented SFFAS #4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*; SFFAS #6, *Accounting for Property Plant and Equipment*; SFFAS #7, *Accounting for Revenue and Other Financing Sources and Concepts for Reconciling Budgetary and Financial Accounting*; and SFFAS #8, *Supplemental Stewardship Reporting* in the current year.

SFFAS #4 establishes standards for providing reliable and timely information on the full cost of federal programs, their activities and outputs resulting in the Statement of Net Cost. The Statement of Net Cost reports the cost of NSF's programs based on the NSF strategic plan.

SFFAS #6 specifies accounting for federally owned property, plant and equipment (PP&E); deferred maintenance on PP&E; and cleanup costs. SFFAS #8 establishes standards for reporting on the federal government's stewardship over 1) certain resources entrusted to it, identified as stewardship PP&E and stewardship investments, and 2) certain responsibilities assumed by it, identified as the current service assessment. These resources and responsibilities do not meet the criteria for assets and liabilities that are required to be reported in the financial statements but are, nonetheless, important to an understanding of the operations and financial condition of the federal government.

SFFAS #7 provides standards for classifying, recognizing, and measuring all resource inflows, and how those inflows relate to costs incurred by the entity resulting in the Statement of Financing. SFFAS #7 establishes recognition, measurement, and disclosure standards for exchange revenue, other financing sources, prior period adjustments and budgetary information. SFFAS #7 requires the preparation of the Statement of Budgetary Resources and the Statement of Financing.

46

#### R. Use of Estimates

The preparation of the accompanying financial statements required management to make estimates and assumptions about certain amounts included in the financial statements. Actual results will invariably differ from those estimates.

#### S. Tax Status

NSF, as a federal agency, is not subject to federal, state, or local income taxes and, accordingly, no provision for income taxes is recorded.



**NOTE 2. FUND BALANCE WITH TREASURY**

Fund Balance with Treasury consisted of the following components as of September 30, 1998:

*(Amounts in Thousands)*

	Appropriated Fund	Trust Fund	Other Funds	Total
Obligated	\$3,772,562	\$21,907	\$23,000	\$3,817,469
Unobligated Available	38,295	10,154	753	49,202
Unobligated Unavailable	63,801	-	39,432	103,233
Total Fund Balance	<u>\$3,874,658</u>	<u>\$32,061</u>	<u>\$63,185</u>	<u>\$3,969,904</u>

“Other Funds” consists of \$62,200,000 received from a corporation that registered second-level Internet domain names under an NSF cooperative agreement and \$985,000 of nonexpenditure transfer authorizations, deposits, holdings, and miscellaneous receipt accounts. The nonexpenditure transfer authorizations are appropriation allocations from other government agencies and include 31,855,502 Indian rupees converted on September 30, 1998 to U.S. dollars at the prevailing Treasury rate of 42.33 rupees to \$1 US. Unavailable balances include recovered expired appropriations, other amounts related to expired authority and holdings which are unavailable for NSF use.

### NOTE 3. ACCOUNTS RECEIVABLE, NET

The Intragovernmental Accounts Receivable of \$468,350 consists of reimbursements and repayments due from other government agencies. The repayments represent amounts due for salaries and other expenses incurred by NSF employees on behalf of those agencies.

As of September 30, 1998, NSF recorded Accounts Receivable of \$424,055 due from public sources, net of allowances. This amount represents \$514,363 in Accounts Receivable and an allowance of \$90,308 for amounts that are anticipated to be uncollectible.

The following presents a reconciliation of Accounts Receivable that are anticipated to be uncollectible for Fiscal Year 1998:

Beginning Balance as of 10/1/97	\$ 113,000
Added in FY 1998	-
Written-off in FY 1998	<u>22,692</u>
Ending Balance at 9/30/98	\$ <u>90,308</u>

### NOTE 4. ADVANCES

As of September 30, 1998, Advances consisted of the following components:

*(Amounts in Thousands)*

Advances to Grantees	\$ 31,496
Advances to Contractors	884
Advances to Employees	<u>3</u>
Total Advances	\$ <u>32,383</u>

**NOTE 5. GENERAL PROPERTY, PLANT AND EQUIPMENT, NET**

The components of Property, Plant and Equipment as of September 30, 1998 were:

*(Amounts in Thousands)*

	Acquisition Cost	Accumulated Depreciation	Net Book Value
Equipment	\$46,970	\$41,186	\$5,784
Aircraft	71,526	50,462	21,064
Buildings & Structures	76,470	28,475	47,995
Construction in Progress	17,703	-	17,703
Total PP&E	<u>\$212,669</u>	<u>\$120,123</u>	<u>\$92,546</u>

**NOTE 6. OTHER LIABILITIES**

Other Liabilities represent current accrued employer contributions for payroll and benefits, disbursements in transit, accrued payroll and benefits and various employee related liabilities for payroll and benefit deductions. As of September 30, 1998, Other Liabilities consisted of:

49

*(Amounts in Thousands)*

**Intragovernmental**

Employer Contributions for Payroll and Benefits	\$ 720
Disbursements in Transit	15
Total Other Intragovernmental Liabilities	<u>735</u>
Accrued Payroll and Benefits	2,038
State and Other Income Taxes Withheld	226
Employee Deductions for U.S. Savings Bonds	6
Total Other Liabilities	<u>\$2,270</u>

**NOTE 7. EMPLOYEE BENEFITS**

Employee Benefits consisted of the following components as of September 30, 1998:

*(Amounts in Thousands)*

Intragovernmental: Unreimbursed Actual Costs	\$ 231
Estimated Liability	726
Total Workers' Compensation Benefits	<u>\$ 957</u>

These amounts represent \$230,762 of unreimbursed cost to the Department of Labor (DOL) for actual compensation paid to recipients under FECA and \$726,000 of estimated non current actuarial liability for future workers compensation calculated by DOL.

The estimated liability for future worker's compensation is calculated by the DOL and includes the expected liability for death, disability, medical, and miscellaneous costs for approved compensation cases. The liability is determined using a method that utilizes historical benefit payment patterns related to a specific incurred period and annual benefit payments discounted to present value using OMB's economic assumptions for 10 year Treasury notes and bonds. To account for the effects of inflation on the liability, wage and medical inflation factors are applied to the calculation of future benefits.

**NOTE 8. LEASE LIABILITIES**

In FY 1998, NSF acquired three copiers under Lease to Ownership plans. The lease periods range from four to five years. Future payments under this lease for FY 1998 are:

*(Amounts in Thousands)*

<b>Future Lease Payments:</b>	
Fiscal Year 1999	\$ 83
Fiscal Year 2000	83
Fiscal Year 2001	82
Fiscal Year 2002	82
Fiscal Year 2003	34
<b>Total</b>	<u>364</u>
<b>Less: Imputed Interest</b>	87
<b>Total Capital Lease Liability</b>	<u>\$ 277</u>

**NOTE 9. UNEXPENDED APPROPRIATIONS**

Unexpended Appropriations consisted of the following components at September 30, 1998:

*(Amounts in Thousands)*

<b>Unexpended Appropriations</b>	
<b>Unobligated:</b>	
Available	\$ 39,048
Unavailable	64,033
<b>Undelivered Orders</b>	<u>3,566,772</u>
<b>Total Unexpended Appropriations</b>	<u>\$ 3,669,853</u>

The Undelivered Orders balance does not include the Undelivered Orders balances of the donations account, reimbursable agreements with other agencies, and other funds.



## NOTE 10. STATEMENT OF NET COST—MAJOR PROGRAM DESCRIPTIONS

NSF's primary business is to make merit-based grants and cooperative agreements to individual researchers and groups, in partnership with colleges, universities, and other institutions, public, private, state, local, and federal, throughout the U.S. By providing these resources, NSF contributes to the health and vitality of the U.S. research and education system, which enables and enhances the nation's capacity to sustain growth and prosperity. These grants are managed through eight programmatic organizations within NSF that review and evaluate competitive proposals submitted by the science and engineering community for its consideration. The NSF organizations are Biological Sciences; Computer and Information Science and Engineering; Engineering; Geosciences; Mathematical and Physical Sciences; Social, Behavioral and Economic Sciences; and the Office of Polar Programs.

These NSF organizations make investments in science and engineering in two functional program areas: research projects and related programs and education programs. Approximately 95 percent of NSF's costs are directly related to these investments. A third investment is made to support management and administration activities of NSF.

Research programs provide investments in cutting edge research that yields new discoveries. These investments help to maintain the nation's capacity to excel in science and engineering, particularly in academic institutions. The store of knowledge produced by NSF funded research provides a rich foundation for broad and useful applications of knowledge and development of new technologies. NSF provides support for large, multi-user research facilities that meet the need of access to state-of-the-art research facilities that otherwise would be unavailable to academic scientists, and for staff and support personnel to assist scientists and engineers in conducting research at facilities.

Education programs help ensure that an adequate, well-prepared workforce of scientists and engineers can maintain leadership in science and technology, both now and in the future and help all students to achieve the mathematics and science skills needed to thrive in an increasingly technological society. NSF's programs produce scientist and engineers knowledgeable about the most increasingly technological society. These highly educated people then reach every sector of society and actively disseminate and use that knowledge in the service of innumerable social goals. They also provide well-prepared teachers and instructional materials and technologies that influence mathematics and science education at all levels.

Salary and Expenses and Inspector General (IG) investments provide for salaries and benefits of persons employed at the NSF; general operating expenses, including key activities to advance the NSF information systems technology and to enhance staff training; and audit and IG activities. Non-production costs such as depreciation of NSF assets are also included. These cost are allocated to the two functional program investments to more accurately reflect the full costing of these programs.

In accordance with OMB Bulletin 97-01, cost incurred for services provided to other federal entities are reported in the full cost of NSF programs and are identified as "intragovernmental".

**NOTE 10 (CONTINUED)**

Earned revenues are funding sources provided through reimbursable agreements with other federal entities. Earned revenues are recognized when the related program or administrative expenses are incurred. Earned revenues are deducted from the full cost of the programs to arrive at the net cost of operating NSF's programs .

All gross cost and earned revenue for the National Science Foundation are classified under the Budget Functional Classification 250, titled General Science, Space and Technology.

**NOTE 11. DEFERRED MAINTENANCE (UNAUDITED)**

NSF has considered whether any scheduled maintenance necessary to keep fixed assets of the agency in an acceptable condition was deferred at the end of Fiscal Year 1998. NSF has determined that \$74,000 of scheduled maintenance was not completed in Fiscal Year 1998 and was put off or delayed for a future period.

**NOTE 12. PRIOR PERIOD ADJUSTMENTS**

The prior period adjustments presented on the Statement of Changes in Net Position reflect the following:

- ▶ Reclassification of a closing entry. In 1997, excess revenue over expenses in the amount of \$23,823,456 was closed into GL 3100 (Unexpended Appropriations) instead of GL 3310 (Cumulative Results).
- ▶ Conversion of beginning balances. During 1998, conversions were made in the general ledger to comply with April, 1998 changes in the 1998 standard general ledger, including the establishment of beginning balances of new general ledger accounts. Adjustments were made to distinguish between the establishment of beginning balances and 1998 general ledger activity.
- ▶ Correction of errors. NSF corrected certain USAP and in-house PP&E balances, and related accumulated depreciation, reported in 1997.

The cumulative effect of these items resulted in the following:

*(Amounts in Thousands)*

Reclassification of Closing Entry	\$	23,823
Conversion		388
Correction of Fixed Assets		15,601
<b>Total</b>	<b>\$</b>	<b><u>39,812</u></b>

**NOTE 13. BUDGET AUTHORITY**

The Budget Authority balance includes \$44,812,961 held in the donations account.

**Required Supplementary Information**  
For the year ended September 30, 1998

54

# Stewardship Reporting

National Science Foundation  
**Stewardship Investments**  
**Research and Human Capital**  
For the Year Ended September 30, 1998  
(Amounts in Thousands)

<b>Research and Human Capital Activities</b>	
Basic Research	\$ 2,411,774
Applied Research	209,719
Education and Training	588,158
Non-Investment Activities	147,617
<b>Total Research and Human Capital Activities</b>	<b>\$ 3,357,268</b>

**Outputs and/or Outcomes -  
Research and Human Capital Activities**

<u>Investments in:</u>	
Universities	\$ 2,215,535
Industry	151,064
Federal Agencies	163,101
Small Business	105,247
Others	722,321
	<b>\$ 3,357,268</b>

<u>Support to:</u>	
Scientists	\$ 352,513
Postdoctoral Programs	120,862
Graduate Students	322,298
	<b>\$ 795,673</b>

<u>Outcomes:</u>	
<u>Number of:</u>	
Awards	17,994
Years of Scientist Support	5,056
Scientists Supported	23,213
Postdoctorals Supported	4,459
Graduate Students Supported	19,517

NSF's role in achieving performance goals in science and engineering leads to investments in integrative research and human capital activities to enhance the potential for important discoveries or new knowledge with expected future benefits to our society. Because of the close connections between the investments in performing research and building a research base of skilled scientists and engineers through academic and training opportunities, expenses incurred by NSF are presented as overall stewardship investments for NSF for performance measurement. In Fiscal Year 1998, the outputs of NSF investments in the research and academic community resulted in a number of grants awarded and scientists and students supported.

**Required Supplementary Information**

For the year ended September 30, 1998

56

**Budgetary Resources**

In the following table NSF budgetary information for the fiscal year ended September 30, 1998, as presented in the Statement of Budgetary Resources, is disaggregated for each one of NSF's major budgetary accounts



Combining Statement of Budgetary Resources  
 FOR THE YEAR ENDED SEPTEMBER 30, 1998

(Amounts in Thousands)

	Research and Related	Education	Major Research Equipment	OLG and Salary and Expense	Total
<b>Budgetary Resources</b>					
Budget Authority	\$ 2,593,988	632,516	109,000	141,800	\$ 3,477,304
Unobligated Balances - Beginning of Period	47,641	21,026	3,874	1,859	74,400
Spending Authority from Offsetting Collections	127,272	5,671	-	3,812	136,755
Adjustments	10,740	8,176	-	151	19,067
<b>Total Budgetary Resources</b>	<b>\$ 2,779,641</b>	<b>667,389</b>	<b>112,874</b>	<b>147,622</b>	<b>\$ 3,707,526</b>
<b>Status of Budgetary Resources</b>					
Obligations Incurred	\$ 2,691,199	640,795	78,206	145,793	\$ 3,555,993
Unobligated Balances - End of Period	13,001	697	34,668	103	48,469
Unobligated Balances - Not Available	75,877	25,606	1	1,580	103,064
<b>Total Status of Budgetary Resources</b>	<b>\$ 2,780,077</b>	<b>667,098</b>	<b>112,875</b>	<b>147,476</b>	<b>\$ 3,707,526</b>
<b>Outlays</b>					
Obligations Incurred	\$ 2,691,199	640,795	78,206	145,793	\$ 3,555,993
Less: Spending Authority from offsetting Collections and adjustments	148,279	20,087	-	5,077	173,443
Obligated Balance, Net - Beginning of Period	2,678,947	815,300	109,063	20,415	3,623,725
Less: Obligated Balances, Net - End of Period	2,852,457	859,127	71,938	15,735	3,799,257
<b>Total Outlays</b>	<b>\$ 2,369,410</b>	<b>576,881</b>	<b>115,331</b>	<b>145,396</b>	<b>\$ 3,207,018</b>



# Auditors' Report



59

*When cells replicate, they move genetic information in the form of messenger ribonucleic acid to areas where proteins are made from specific genes. The photograph, taken by a team of researchers at the University of Massachusetts Medical Center, illustrates the power of a new microscopic imaging technique developed with NSF funding. This technique makes it possible for scientists to see details of cellular structures that were previously obscured. Photo: Fredric Fay, University of Massachusetts Medical Center.*

**NATIONAL SCIENCE FOUNDATION**  
4201 WILSON BOULEVARD  
ARLINGTON, VIRGINIA 22230



OFFICE OF  
INSPECTOR GENERAL

## **Overview of Independent Auditors' Reports on NSF's FY 1998 Financial Statements**

Dr. Eamon M. Kelly  
Chairman, National Science Board:

Dr. Rita R. Colwell  
Director, National Science Foundation:

The Independent Auditors' Reports on NSF's financial statements for the fiscal year ending September 30, 1998, are attached. The NSF Inspector General is statutorily responsible for the manner in which the audit of NSF's financial statements is conducted. The Office of Inspector General chose to carry out this responsibility by performing the audit in conjunction with KPMG LLP, an independent certified public accounting firm. The final audit reports were issued and signed by both KPMG LLP and the Acting Inspector General.

In 1998, with concurrence from the National Science Board Committee on Audit and Oversight and the NSF Chief Operating Officer, the Acting Inspector General and the Chief Financial Officer established the NSF Audit Coordination Committee to promote and encourage an open dialogue and exchange of information concerning audit issues. The Audit Coordination Committee closely monitored the audit of NSF's financial statements and facilitated the resolution of issues as they arose during the audit.

The three auditors' reports are the Report on the Financial Statements, the Report on Compliance with Laws and Regulations, and the Report on Internal Controls over Financial Reporting.

The Report on Financial Statements expresses our unqualified opinion that the principal financial statements (including the notes to the principal statements) fairly represent the financial position of the NSF as of September 30, 1998, and are free of material misstatements.

The Report on Compliance with Laws and Regulations explains that tests were performed to determine whether NSF complied with all legal requirements that could have a direct and material affect on the financial statements and explains that NSF's financial management systems are substantially consistent with federal financial

management systems requirements, federal accounting standards, and the U.S. Standard General Ledger.

The Report on Internal Controls over Financial Reporting explains that tests were performed to determine the extent to which the Foundation's internal controls are effective and can be relied upon to detect and deter errors and irregularities that could materially affect the financial statements. The specific tests performed did not identify any material weaknesses in the internal controls systems but identified one reportable condition.

The reportable condition concerns property, plant, and equipment used in NSF's Antarctic program. NSF, through a contractor, maintains research facilities in New Zealand and Antarctica where over 95 percent of NSF's capital assets reside. The audit identified weaknesses in the valuation and classification of real property, accountability over equipment, accuracy of equipment records, and valuation of equipment. We recommend that NSF require the contractor to implement a system that properly and consistently values and classifies buildings, construction in progress, and capital projects and records full costs in the proper period. We are advised that the Chief Financial Officer agrees with our recommendations.

We gratefully acknowledge the substantial contributions of the Audit Coordination Committee, Office of Budget Finance and Awards Management, Office of Information and Resource Management, and Office of Polar Programs.

  
Acting Inspector General

February 26, 1999

Attachments



2001 M Street, N.W.  
Washington, DC 20036

## NATIONAL SCIENCE FOUNDATION



OFFICE OF  
INSPECTOR GENERAL

### Independent Auditors' Report on Financial Statements

Dr. Eamon M. Kelly  
Chairman, National Science Board:

Dr. Rita R. Colwell  
Director, National Science Foundation:

We have audited the balance sheet and related statements of net cost, changes in net position, budgetary resources, and financing of the National Science Foundation as of and for the year ended September 30, 1998. These financial statements are the responsibility of NSF's management. Our responsibility is to express an opinion on the financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*. Those standards require that we plan and perform the audit to obtain reasonable assurance that the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures relating to the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

As described in Note 1, these financial statements were prepared in conformity with the hierarchy of accounting principles and standards recommended by the Federal Accounting Standards Advisory Board. This hierarchy is a comprehensive basis of accounting other than generally accepted accounting principles.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of NSF, as of September 30, 1998 and its net costs, changes in net position, budgetary resources, and reconciliation of net costs to budgetary obligations for the year then ended in conformity with the basis of accounting described in Note 1.



As discussed in Note 1 to the financial statements, NSF implemented Statements of Federal Financial Accounting Standards No. 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*; No. 6, *Accounting for Property, Plant and Equipment*; No. 7, *Accounting for Revenue and Other Financing Sources and Concepts for Reconciling Budgetary and Financial Accounting*; and No. 8, *Supplemental Stewardship Reporting*, effective October 1, 1997.

In accordance with *Government Auditing Standards*, we have also issued reports dated January 29, 1999, on our consideration of NSF's internal controls over financial reporting and our tests of its compliance with certain provisions of laws and regulations.

Our audit was conducted for the purpose of forming an opinion on the NSF's financial statements taken as a whole. The information in *Management's Discussion and Analysis* and the required supplementary information sections is not a required part of the financial statements but is supplementary information required by OMB Bulletin No. 97-01, *Form and Content of Agency Financial Statements*. Regarding *Management's Discussion and Analysis*, we have considered whether this information is materially inconsistent with the balance sheet. In our tests, we did not identify any inconsistencies. Regarding required supplementary information, we have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and presentation of the supplementary information. However, we did not audit the *Management's Discussion and Analysis* and required supplementary information and accordingly, we express no opinion on it. The performance information included in *Management's Discussion and Analysis* is addressed in our Independent Auditors' Report on Internal Control over Financial Reporting, in accordance with OMB Bulletin No. 98-08.

63

KPMG LLP

KPMG LLP

January 29, 1999



Acting Inspector General



2001 M Street, N.W.  
Washington, DC 20036

NATIONAL SCIENCE FOUNDATION



OFFICE OF  
INSPECTOR GENERAL

## Independent Auditors' Report on Compliance with Laws and Regulations

Dr. Eamon M. Kelly  
Chairman, National Science Board:

Dr. Rita R. Colwell  
Director, National Science Foundation:

64 We have audited the financial statements of the National Science Foundation (NSF) as of and for the year ended September 30, 1998, and have issued our report thereon dated January 29, 1999. Our report refers to NSF's change in accounting principles relating to managerial cost accounting; property, plant and equipment; revenues and other financing sources; and supplementary stewardship reporting. We conducted our audit in accordance with generally accepted auditing standards; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*.

The management of NSF is responsible for complying with laws and regulations applicable to the agency. As part of obtaining reasonable assurance about whether the NSF's financial statements are free of material misstatement, we performed tests of NSF's compliance with certain provisions of laws and regulations, noncompliance with which could have a direct and material effect on the determination of the financial statement amounts, and certain other laws and regulations specified in OMB Bulletin 98-08, including the requirements referred to in the Federal Financial Management Improvement Act (FFMIA) of 1996. However, providing an opinion on compliance with certain provisions of laws and regulations was not an objective of our audit, and, accordingly, we do not express such an opinion.

The results of our tests of compliance with the laws and regulations described in the second paragraph of this report disclosed no instances of noncompliance that are required to be reported herein under *Government Auditing Standards* or OMB Bulletin No. 98-08.

Under FFMIA, we are required to report whether the agency's financial management systems substantially comply with (1) federal financial management systems requirements, (2) federal accounting standards, and (3) the United States standard general ledger at the transaction level. To meet this requirement, we performed tests of compliance using the implementation guidance for FFMIA included in Appendix D of OMB Bulletin 98-08.

The results of our tests disclosed no instances in which NSF's financial management systems did not substantially comply with the requirements discussed in the preceding paragraph.

We noted other matters involving compliance with laws and regulations that we do not consider to be material noncompliance, that we have reported to the management of NSF in a separate letter dated January 29, 1999.

This report is intended solely for the information and use of the NSF's management, the NSF Office of Inspector General, OMB, and Congress and is not intended to be and should not be used by anyone other than those specified parties.

KPMG LLP



KPMG LLP

Acting Inspector General

January 29, 1999



2001 M Street, N.W.  
Washington, DC 20036

NATIONAL SCIENCE FOUNDATION



OFFICE OF  
INSPECTOR GENERAL

**Independent Auditors' Report on Internal Controls over Financial Reporting**

Dr. Eamon M. Kelly  
Chairman, National Science Board:

Dr. Rita R. Colwell  
Director, National Science Foundation:

We have audited the financial statements of the National Science Foundation (NSF) as of and for the year ended September 30, 1998, and have issued our report thereon dated January 29, 1999. Our report refers to NSF's change in accounting principles relating to managerial cost accounting; property, plant and equipment; revenues and other financing sources; and supplementary stewardship reporting. We conducted our audit in accordance with generally accepted auditing standards; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 98-08, *Audit Requirements for Federal Financial Statements*.

66

The management of NSF is responsible for establishing and maintaining internal controls over financial reporting. In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of internal control policies and procedures. The objectives of internal control over financial reporting are to provide management with reasonable, but not absolute, assurance that (1) transactions are executed in accordance with laws governing the use of budget authority and other laws and regulations that could have a direct and material effect on the financial statements or required supplementary stewardship information, and certain other laws, regulations, and government-wide policies identified by the OMB as applicable to the NSF; (2) assets are safeguarded against loss from unauthorized acquisition, use, or disposition; (3) transactions are properly recorded, processed, and summarized to permit the preparation of financial statements in accordance with applicable accounting principles described in Note 1 to the financial statements, and (4) transactions and other data that support reported performance measures are properly recorded, processed, and summarized to permit preparation of performance information in accordance with criteria stated by management.

Because of inherent limitation in internal control, fraud may nevertheless occur and not be detected. Also, projection of any evaluation of internal controls over financial reporting to future periods is subject to the risk that internal control procedures may become inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

In planning and performing our audit, we considered the NSF's internal control over financial reporting by obtaining an understanding of the agency's significant internal controls, determined whether these internal controls had been placed in operation, assessed control risk, and performed tests of controls in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements and not to provide assurance on the internal control over financial reporting. Consequently, we do not provide an opinion on internal controls.

In addition, we considered NSF's internal control over required supplementary stewardship information (RSSI) by obtaining an understanding of the agency's controls, determining whether these internal controls had been placed in operation, assessing control risk, and performing tests of controls as required by OMB Bulletin 98-08. Our objective was not to provide assurance on these internal controls. Accordingly, we do not provide assurance on such controls.

Our consideration of internal control over financial reporting and RSSI would not necessarily disclose all matters in the internal control over financial reporting and RSSI that might be reportable conditions, under standards issued by the American Institute of Certified Public Accountants and OMB Bulletin No. 98-08 and, accordingly, would not necessarily disclose all reportable conditions that are material weaknesses. Reportable conditions are matters coming to our attention relating to significant deficiencies in the design or operation of the internal controls that, in our judgment, could adversely affect the NSF's ability to record, process, summarize, and report financial data consistent with the assertions by management in the financial statements. Material weaknesses are reportable conditions in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements, in amounts that would be material in relation to the financial statements being audited, may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We noted certain matters involving the internal control over property and equipment that we consider to be a reportable condition. Exhibit I presents the reportable condition, which is not believed to be a material weakness.

With respect to internal controls related to performance measures determined by management to be key and reported in *Management's Discussion and Analysis*, we obtained an understanding of the design of significant internal controls relating to the existence and completeness assertions, as required by OMB Bulletin 98-08. Our procedures were not designed to provide assurance on internal control over reported performance measures, and, accordingly, we do not provide an opinion on such controls.

We also noted other matters involving internal controls and their operation that we have reported to the management of the NSF in a separate letter dated January 29, 1999.

This report is intended solely for the information and use of NSF's management, the NSF Office of Inspector General, OMB, and Congress and is not intended to be and should not be used by anyone other than those specified parties.

KPMG LLP



KPMG LLP

Acting Inspector General

January 29, 1999



## Reportable Condition

We found that the National Science Foundation (NSF) had difficulty accounting for United States Antarctic Program real property and equipment. NSF, through its contractor, maintains research facilities in New Zealand and Antarctica where over 95 percent of NSF's capital assets reside. We identified weaknesses in the valuation and classification of real property, the accountability over equipment, accuracy of equipment records, and valuation of equipment.

We performed extensive testing and proposed material adjustments, which NSF recorded, in order to substantiate the property, plant, and equipment balance at September 30, 1998.

### Real Property

The contractor's project management accounting system does not adequately account for capital project costs. This system does not support proper cut-off of costs at fiscal year end or proper classification between construction in progress and completed buildings. The manual process to determine the proper classification and cut-off of real property costs is labor-intensive and prone to inaccuracy.

We noted inconsistent valuation methods for existing buildings. The contractor estimated values for buildings constructed before 1991 but did not use the established valuation method for all buildings. In addition, for buildings after 1991, the contractor did not consistently use its project management accounting system.

We believe that as a result of these conditions, the contractor can not routinely record accurate costs associated with buildings and construction in progress in the proper fiscal year.

*Recommendation 1.* We recommend that NSF require the contractor to use:

- A project management accounting system that properly values and classifies buildings, construction in progress, and capital projects and records costs in the proper period
- Consistent valuation methods

### Equipment

The contractor does not consistently record the full cost of equipment or record the equipment in the proper fiscal year as required by Statement of Federal Financial Accounting Standards (SFFAS) No. 6, *Accounting for Property, Plant, and Equipment*. The contractor's valuation procedures used requisition information instead of full cost which should include the invoice price, transportation costs, and modification costs incurred to install the asset in Antarctica.



The procedures also did not ensure that the contractor recorded equipment in the proper fiscal year when it received items in the current year and installed the items in Antarctica the next fiscal year. As a result of these weaknesses, NSF could be misstating its assets and related expenses.

As a result of our audit testwork and recommendations, the contractor established procedures to value equipment based on the final invoice and, where possible, it adjusted existing equipment items to the final invoice value. Also, NSF required the contractor, through a fiscal year 1999 contract modification, to report real property and equipment in accordance with SFFAS No. 6.

*Recommendation 2.* We recommend that NSF ensure that the contractor implements the property reporting requirements and records all costs incurred to bring assets to a form and location suitable for intended use in the proper fiscal year in accordance with SFFAS No. 6.

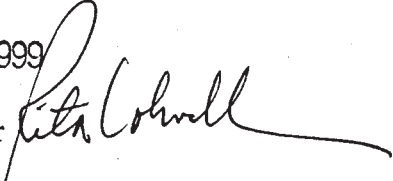
# Management's Response

70

*Hog Island, Virginia, is one of NSF's Long-Term Ecological Research Program sites. The Federal Emergency Management Administration and NSF have joined forces to find out why barrier islands such as this one seem to be rapidly eroding. NSF-funded researchers discovered that these islands are not necessarily shrinking; instead they are moving and changing shape.*

*Photo: Bruce Hayden, University of Virginia*

# MEMORANDUM

**DATE:** MAR 4 1999  
**FROM:** NSF Director   
**SUBJ:** Comments on the Audit Reports on the National Science Foundation's Financial Statements for Fiscal Year 1998  
**TO:** Acting Inspector General


This memorandum is in response to the audit reports pertaining to the Foundation's financial statements, effectiveness of internal controls, and compliance with laws and regulations for Fiscal Year 1998. We have reviewed the reports and generally agree with all the findings and recommendations.

There was one reportable condition identified in the audit reports. PP&E physically located in Antarctica is under the custodial care of NSF's USAP contractor. During the audit, the contractor had difficulty in providing records, routinely recording and maintaining accountability over PP&E. It was determined that the current project management system used by the contractor does not have the functionality to readily provide accurate valuation and accounting information necessary to record PP&E in the NSF financial statements. Because of this, extensive testing by the auditors was required to substantiate the PP&E account balances as of September 30, 1998.

NSF is currently re-competing the USAP contract. We are requiring organizations submitting proposals to specifically address systems that will monitor USAP PP&E and accurately report those costs to NSF for financial statement presentation. We will continue to work with you to correct this reportable condition as quickly as possible.

We also welcome your concurrence that NSF's financial management systems are substantially consistent with federal financial management systems requirements and that the financial statements fairly represent the financial position of NSF as of September 30, 1998.

NSF appreciates the opportunity to comment on your audit reports and looks forward to continued progress in 1999. If you have any questions on our comments, please contact Albert A. Muhlbauer, Deputy Chief Financial Officer on 306-1280.

  
Rita R. Colwell

# Appendix



73

*An NSF-funded team of climate researchers uncovered a stunning evolutionary secret in Africa's Lake Victoria. The scientists discovered that the more than 300 species of cichlid fishes found in the lake evolved in the unthinkable short span of about 12,000 years. Prior to this discovery, biologists had not imagined that a species could evolve so quickly.*  
*Photo: Thomas Johnson, Large Lakes Observatory of the University of Minnesota*

## Description of NSF Directorates and Management Offices

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**THE DIRECTORATE FOR BIOLOGICAL SCIENCES (BIO)** supports research programs ranging from the study of the structure and dynamics of biological molecules, such as proteins and nucleic acids, through cells, organs and organisms, to studies of populations and ecosystems. It encompasses processes that are internal to the organism as well as those that are external, and includes temporal frameworks ranging from measurements in real time through individual life spans, to the full scope of evolutionary times. Among the research programs BIO supports is research that will advance understanding of the structure, organization and function of plant genomes.

**THE DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCES AND ENGINEERING (CISE)** supports research on the theory and foundations of computing, system software and computer system design, human-computer interaction, as well as prototyping, testing and development of cutting-edge computing and communications systems to address complex research problems. CISE also provides the advanced computing and networking capabilities needed by academic researchers for cutting-edge research in all science and engineering fields. Among programs supported by CISE is the Partnerships for Advance Computational Infrastructure (PACI), a program that focuses on developing and providing the most advanced computing capabilities.

**THE DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES (EHR)** supports a cohesive and comprehensive set of activities which encompass every level of education and every region of the country. EHR promotes public science literacy as well as plays a major role in the Foundation's long-standing commitment to developing our nation's human resources for the science and engineering workforce of the future. Focus is given to programs that encourage the participation and achievement of groups underrepresented in science and engineering. NSF-supported education and training programs cover a broad spectrum—from supporting students and teachers to creating new ways of teaching and learning to assisting school districts and other systems for greater gains in learning.

**THE DIRECTORATE FOR ENGINEERING (ENG)** supports research and education activities that spur new technological innovations and create new products and services and more productive enterprises. ENG also makes critical investments in facilities, networks and people to assure diversity and quality in the nation's infrastructure for engineering education and research. Funding is included within ENG to meet the mandated level for the Foundation-wide Small Business Innovation Research program.

**THE DIRECTORATE FOR GEOSCIENCES (GEO)** supports research in the atmospheric, earth and ocean sciences. Basic research in the Geosciences advances our scientific knowledge of the Earth and advances our ability to predict natural phenomena of economic and human significance, such as climate changes, weather, earthquakes, fish-stock fluctuations, and disruptive events in the solar-terrestrial environment. GEO also supports the operation of national user facilities.

**THE DIRECTORATE FOR MATHEMATICAL AND PHYSICAL SCIENCES (MPS)** supports research and education in astronomical sciences, chemistry, materials research, mathematical sciences and physics. Major equipment and instrumentation such as telescopes and particle accelerators are provided to support the needs of individual investigators. MPS also supports state-of-the-art facilities that enable research at the cutting edge of science and research opportunities in totally new directions.

**THE DIRECTORATE FOR SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES (SBE)** supports research to build fundamental scientific knowledge about human characteristics and behavior. SBE also supports the Foundation's international activities, providing U.S. scientists and engineers with access to centers of excellence in science and engineering research and education throughout the world. To improve understanding of the science and engineering enterprise, SBE provides informal tools for tracking the human and institutional resources that make up the nation's science and engineering infrastructure.

**THE OFFICE OF POLAR PROGRAMS (OPP)**, which includes the U.S. Polar Research Programs and U.S. Antarctic Logistical Support Activities, supports multi-disciplinary research in Arctic and Antarctic regions. The polar regions are geographic frontiers which provide premier natural laboratories and unique research opportunities, ranging from studies of the earth, ice and oceans to research in atmospheric sciences and astronomy.

**THE OFFICE OF BUDGET, FINANCE AND AWARD MANAGEMENT (BFA)** is headed by the Chief Financial Officer who has responsibility for budget, financial management, grants administration and procurement operations and related policy. Budget responsibilities include the development of the Foundation's annual budget, long range planning and budget operations and control. BFA's financial, grants and other administrative management systems ensure that the Foundation's resources are well-managed and that efficient, streamlined business and management practices are in place. NSF has been acknowledged as a leader in the federal research administration community, especially in its pursuit of a paperless environment that provides more timely, efficient awards administration. BFA is also custodian of FinanceNet ([www.financenet.gov](http://www.financenet.gov)), the federal government's Internet website for financial management information originally developed by NSF.

**THE OFFICE OF INFORMATION AND RESOURCE MANAGEMENT (OIRM)** provides information systems, human resource management, and general administrative and logistic support functions to the NSF community of scientists, engineers, and educators as well as to the general public. OIRM is responsible for supporting staffing and personnel service requirements for staff members including visiting scientists; NSF's physical infrastructure; dissemination of information about NSF programs to the external community; and administration of NSF's sophisticated technological infrastructure, providing the hardware, software and support systems necessary to manage the Foundation's grant making process and to maintain advance financial and accounting systems.



# Executive Staff

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Dr. Marta Cehelsky, Executive Officer

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**OFFICE OF BUDGET, FINANCE  
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**OFFICE OF INFORMATION  
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Ms. Linda P. Massaro

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## List of Acronyms

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BFA	Office of Budget, Finance and Award Management
BIO	Directorate for Biological Sciences
CETP	Collaborative for Excellence in Teachers Preparation
CFO	Chief Financial Officer
CIO	Chief Information Officer
CISE	Directorate for Computer and Information Science and Engineering
EFF	Educating for the Future
EFT	Electronic Funds Transfers
EHR	Directorate for Education and Human Resources
ENG	Directorate for Engineering
FASAB	Federal Accounting Standards Advisory Board
FCTR	Federal Cash Transaction Reports
FTE	Full-Time Equivalent (employee)
GEO	Directorate for Geosciences
GPRA	Government Performance and Results Act of 1993
IPA	Intergovernmental Personnel Act
IRIS	Incorporated Research Institutions for Seismology
K-12	Kindergarten through Grade 12
KDI	Knowledge and Distributed Intelligence
LEE	Life and Earth's Environment
MPS	Directorate for Mathematical and Physical Sciences
MUA	Multimedia University Academy at the University of Southern California
NSF	National Science Foundation
OIRM	Office of Information and Resource Management
OMB	Office of Management and Budget
OPP	Office of Polar Programs
PP&E	Property, Plant and Equipment
SBE	Directorate for the Social, Behavioral and Economic Sciences
SRS	Science Resources Studies
USAP	United States Antarctic Program
USI	Urban Systemic Initiative
VSEE	Visiting Scientists, Engineers, and Educators Program
Y2K	Year 2000

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79

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