# Science Program Direction

## Program Mission

This program provides the Federal staffing and associated funding required to provide overall direction of activities carried out under the following programs in the Office of Science (SC): High Energy Physics, Nuclear Physics, Biological and Environmental Research, Basic Energy Sciences, Fusion Energy Sciences, Computational and Technology Research, Multiprogram Energy Laboratories-Facilities Support, and Energy Research Analyses. This funding also provides the necessary support to the Director of SC to carry out SC's responsibilities under the Department of Energy (DOE) Organization Act (P.L. 95-91) and as mandated by the Secretary. These responsibilities include providing advice on the status and priorities of the Department's overall research and development programs and on the management of the Department's multipurpose laboratories; developing research and development plans and strategies; and supporting university and science education. This program also provides program-specific staffing resources at the Chicago, Oakland, and Oak Ridge Operations Offices directly involved in executing SC programs.

Program direction has been divided into four categories: salaries and benefits, travel, support services, and other related expenses, the latter including the Working Capital Fund. “Support Services” refers to support services contracts that provide necessary support functions to the Federal staff, such as technical support, computer systems development, travel processing, and mailroom activities. “Other related expenses” refers to other administrative costs of maintaining Federal staff, such as building and facility costs and utilities in the field, information technology expenses, and training. The Working Capital Fund includes centrally provided goods and services at Headquarters, such as supplies, rent and utilities.

Also included in Program Direction are several specific education related activities. For over 50 years, the Department of Energy and its predecessor agencies (Atomic Energy Commission and the Energy Research and Development Administration) has supported science and engineering education programs involving university faculty as well as pre-college teachers and students. The Department has provided support for university students, pre-college teachers and college faculty through hands-on research experiences at the Department’s National Laboratories and research facilities.

The involvement of the Energy Department’s National Laboratories in faculty/student research is perhaps the most distinguishing feature of the agency’s participation over the years in science and engineering education. No other Federal agency has the extensive network of research laboratories and facilities as DOE with its unique physical and human resources. These laboratories and facilities have been key to the Department’s contribution over time to the Nation’s science and engineering education goals.

The funds appropriated for science education will support activities that utilize the Department’s scientific and technical resources to enhance the development of a diverse, well-educated and scientifically literate workforce.

In addition to the science education program in this science program direction budget, other mission oriented education activities are funded within science research programs. Below is a table identifying the programs and the allocation of funds. The funds will allow university faculty and student teams at the

undergraduate level to participate on long-term research projects at DOE laboratories. Pre-college science and math teachers will be provided with research appointments to improve their knowledge and skills of scientific discovery and enhance their ability to apply them in a classroom environment. Through these investments, the Department will make major contributions towards fulfilling several national priorities: enhancing the diversity of the technical workforce; supporting systemic reform of undergraduate education; and attracting, retaining, and graduating students in fields of interest to DOE and others in the public and private sectors. The funds will also allow the Department to encourage educators to participate directly in the ongoing science research of its laboratories. By joining teams of researchers, educators will experience directly the cutting-edge development of the Science Laboratories, and will better understand the process of scientific investigation. Funds provided will pay for faculty/student and pre-college teachers' stipends, travel, and housing and will subsidize laboratory scientists' time for this activity.

(dollars in thousands)

| | FY 1998 | FY 1999 | FY 2000 |
|---|---|---|---|
| Basic Energy Sciences | 0 | 0 | 1,947 |
| Computational Technology Research | 0 | 0 | 1,947 |
| Biological and Environmental Research | 0 | 0 | 1,947 |
| High Energy Physics | 0 | 0 | 2,921 |
| Nuclear Physics | 0 | 0 | 973 |
| Total | 0 | 0 | 9,735 |

## Program Goal

To fund the staff and related expenses that are necessary to provide overall management direction of SC's basic and fundamental scientific research programs funded in the Science appropriation; and to enable the Director of SC to serve as the Department's science advisor for formulation and implementation of basic and fundamental research policy.

For science education the goal is to ensure that the Department effectively utilizes and leverages the resources of its laboratory-based system to support its energy, science and math education mission.

## Program Objectives

- To develop, direct and administer a complex and broadly diversified program of mission-oriented basic and applied research and development designed to support the development of new and improved energy, environmental and health technologies.
- To manage the design, construction and operation of forefront scientific research facilities for use by the Nation's scientific community, including the Spallation Neutron Source Project.
- To conduct independent technical assessments, peer reviews and evaluations of research proposals, programs and projects.

- To enhance international collaboration to leverage the U.S. investment in research and development.
- To review, analyze and, where appropriate, champion the recommendations of the Office of Science's Federally chartered advisory committees including the Fusion Energy Sciences Advisory Committee, High Energy Physics Advisory Panel, Nuclear Science Advisory Committee, Basic Energy Sciences Advisory Committee, and Biological and Environmental Research Advisory Committee.
- To provide opportunities and effective mechanisms for students and faculty to participate at the Department's laboratories in hands-on research experiences, with a focus on undergraduates.
- To enhance departmental outreach activities in science, technology, engineering and mathematics education at our R&D facilities in order to increase the awareness and understanding of the general public of the Department's science programs.

## Performance Measures

- Responsiveness to national science policy and major science initiatives.
- Improvement in environment, safety and health compliance.
- Provision for new and enhanced research facilities and equipment within scope and budget and on schedule.
- Continued improvement in the utilization of staffing, travel and support contractor funds.
- Continuance of improved levels of facility operating time.
- Expansion of international collaborative efforts.
- Cost sharing and leveraging of program resources with other agencies on a one-to-one basis to multiply the program's impact.
- Increase the flow of underrepresented students up to 50 percent into science and math programs/careers achieved.

## Significant Accomplishments and Program Shifts

### Program Direction

- The Office of Science continues to achieve technical excellence in its programs despite managing one of the largest, most diversified and most complex basic research portfolios in the Federal Government with a relatively small Federal and support contractor staff compared to other programs both within and outside the Department.
- Increased productivity at U.S. scientific research facilities as part of the Scientific Facilities Utilization initiative.

- Concluded the international agreement for U.S. participation in the Large Hadron Collider project. Signatories included the Secretary of Energy and the Director of the National Science Foundation. Execution of the program has begun.
- Initiated operation of the William R. Wiley Environmental Molecular Sciences Laboratory at Pacific Northwest National Laboratory.
- At Fermilab, complete construction of the C-Zero Experimental Hall within scope and budget, and on schedule (FY 1999 completion); and complete the Main Injector within scope and budget, and on schedule (FY 1999 initial operation).
- Complete the B-factory and its detector at the Stanford Linear Accelerator Center within scope and budget, and on schedule (FY 1999 initial operation).
- Continue construction of the Relativistic Heavy Ion Collider and its detectors at Brookhaven National Laboratory within scope and budget, and on schedule (FY 2000 initial operation).
- Enhance the scientific capabilities for experiments at the Thomas Jefferson National Accelerator Facility (TJNAF) to provide new opportunities for researchers. Three TJNAF experimental halls will be fully operational.
- Carrying out experiments at the Radioactive Ion Beam facility at Oak Ridge National Laboratory.
- Continue pilots in FY 1999 for transfer of management responsibility from Environmental Management to Science for newly generated wastes at the Stanford Linear Accelerator Center (SLAC) and Fermilab.
- Manage the Joint Genome Institute and the Atmospheric Radiation Measurement sites using the National Laboratories as an integrated system.
- Strengthen integrated safety management and infrastructure management at the National Laboratories.
- Operate the state-of-the-art National Energy Research Scientific Computing and Energy Science Network for the benefit of SC and DOE.
- Plan and manage a complex, scientific R&D program to establish the knowledge base needed for an attractive fusion energy science.
- Continue and refine framework of appropriate international arrangements needed to carry out SC programs in a most cost-effective manner.
- Continue to improve environmental, safety and health performance at the Brookhaven National Laboratory through aggressive implementation of the DOE Action Plan for Improved Management of the Laboratory.
- Continue enhancement of neutron science capability at the Los Alamos Neutron Science Center and the High Flux Isotope Reactor at Oak Ridge.
- Continue design and construction of the Neutrinos at the Main Injector (NuMI) project.

- Establishment of the Spallation Neutron Source Project Office at the Oak Ridge Operations Office in FY 2000.
- Implement the Scientific Simulation Initiative to rapidly develop and deploy a national terascale computing infrastructure and apply it to complex civilian science and engineering problems of national importance.

**Science Education**

- The Science Undergraduate Laboratory Fellowship Program has implemented an innovative, interactive Internet system to receive and process hundreds of student applications for summer and semester research appointments at 11 participating DOE Laboratories. The automated system is virtually paperless and provides an excellent example of how the Internet can be used to streamline the operation of the Department's research participation programs.
- Through special recruitment efforts, the Science Undergraduate Laboratory Research Fellowship Program has attracted a diverse group of students using the electronic application. Nearly 20 percent of those submitting applications represented under represented ethnic groups. About 40 percent of the applications were female, and more than 25 percent were from low-income families. More than 400 summer 1998 appointments were made through the new application process with additional appointments expected in the fall.

# Funding Profile

(dollars in thousands)

| | FY 1998 Current Appropriation | FY 1999 Original Appropriation | FY 1999 Adjustments | FY 1999 Current Appropriation | FY 2000 Request |
|---|---|---|---|---|---|
| Science Program Direction | | | | | |
| Program Direction | 37,600 | 45,300 | 0 | 45,300 | 47,860 |
| Science Education | 0 | 4,500 | 0 | 4,500 | 4,500 |
| Total, Science Program Direction | 37,600 [a] | 49,800 | 0 | 49,800 | 52,360 |
| Staffing (FTEs) | | | | | |
| Headquarters (FTEs) | 220 | 269 | 0 | 269 | 274 |
| Field (FTEs) | 34 | 49 | 0 | 49 | 51 |
| Total, FTEs | 254 [a] | 318 | 0 | 318 | 325 |

**Public Law Authorization:**

Public Law 95-91, "Department of Energy Organization Act"

[a] In FY 1998 $6,900,000 was appropriated for 52 FTEs in the Energy Supply Research and Development Fusion Energy Sciences program now funded in Science Program Direction.

## Funding by Site

(dollars in thousands)

| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
|---|---|---|---|---|---|
| Chicago Operations Office | | | | | |
| Ames Laboratory | 0 | 250 | 250 | 0 | 0.0% |
| Argonne National Laboratory | 0 | 525 | 525 | 0 | 0.0% |
| Brookhaven National Laboratory | 0 | 525 | 525 | 0 | 0.0% |
| Fermi Nat'l Accel. Laboratory | 0 | 225 | 225 | 0 | 0.0% |
| Princeton Plasma Physics Laboratory | 0 | 275 | 275 | 0 | 0.0% |
| Total, Chicago Operations Office | 0 | 1,800 | 1,800 | 0 | 0.0% |
| Golden Field Office | | | | | |
| Nat'l Renewable Energy Laboratory | 0 | 225 | 225 | 0 | 0.0% |
| Oakland Operations Office | | | | | |
| Lawrence Berkeley Nat'l Laboratory | 0 | 475 | 475 | 0 | 0.0% |
| Stanford Linear Accel. Center | 0 | 225 | 225 | 0 | 0.0% |
| Total, Oakland Operations Office | 0 | 700 | 700 | 0 | 0.0% |
| Oak Ridge Operations Office | | | | | |
| Oak Ridge Inst. For Science & Education | 0 | 400 | 400 | 0 | 0.0% |
| Oak Ridge Nat'l Laboratory | 0 | 475 | 475 | 0 | 0.0% |
| Thomas Jeff. Nat'l Accel. Facility | 0 | 225 | 225 | 0 | 0.0% |
| Total, Oak Ridge Operations Office | 0 | 1,100 | 1,100 | 0 | 0.0% |
| Richland Operations Office | | | | | |
| Pacific Northwest Nat'l Laboratory | 0 | 475 | 475 | 0 | 0.0% |
| All Other Sites | 37,600 | 45,500 | 48,060 | +2,560 | +5.6% |
| Total | 37,600 | 49,800 | 52,360 | +2,560 | +5.1% |

## Site Description

## Ames Laboratory

Ames Laboratory is a Multiprogram Laboratory located on 10 acres in Ames, Iowa. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Argonne National Laboratory

Argonne National Laboratory (ANL) in Argonne, Illinois, is a Multiprogram Laboratory located on a 1,700 acre site in suburban Chicago. ANL has a satellite site located in Idaho Falls, Idaho. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Brookhaven National Laboratory

Brookhaven National Laboratory is a Multiprogram Laboratory located on a 5,200 acre site in Upton, New York. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Fermi National Accelerator Laboratory

Fermi National Accelerator Laboratory is a program-dedicated laboratory (High Energy Physics) located on a 6,000 acre site in Batavia, Illinois. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Lawrence Berkeley National Laboratory

Lawrence Berkeley National Laboratory is a Multiprogram Laboratory located in Berkeley, California. The Laboratory is on a 200 acre site adjacent to the Berkeley campus of the University of California. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate

on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## National Renewable Energy Laboratory

National Renewable Energy Laboratory is a program-dedicated laboratory (Solar) located on 300 acres in Golden, Colorado. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Oak Ridge National Laboratory

Oak Ridge National Laboratory is a Multiprogram Laboratory located on a 24,000 acre site in Oak Ridge, Tennessee. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Oak Ridge Institute for Science and Education

Oak Ridge Institute for Science and Education is located on a 150 acre site in Oak Ridge, Tennessee. Educational activities are in support of the national laboratory participation program which provides hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry.

## Pacific Northwest National Laboratory

Pacific Northwest National Laboratory is a Multiprogram Laboratory located on 640 acres at the Department's Hanford site in Richland, Washington. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate

their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Princeton Plasma Physics Laboratory

Princeton Plasma Physics Laboratory is a program-dedicated laboratory (Fusion Energy Sciences) located on 72 acres in Princeton, New Jersey. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Stanford Linear Accelerator Center

Stanford Linear Accelerator Center is a program-dedicated laboratory (High Energy Physics) located on 426 acres in Menlo Park, California. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

## Thomas Jefferson National Accelerator Facility

Thomas Jefferson National Accelerator Facility is a program-dedicated laboratory (Nuclear Physics) located on 273 acres in Newport News, Virginia. Educational activities supported at the laboratory are directed towards providing hands-on research experiences for undergraduate student and science teacher participants on state-of-the-art equipment while engaging them on important issues at the forefront of scientific inquiry. Teachers, utilizing the Department's extensive computational and communications technology expertise, will also concentrate on developing tools and materials to translate their research experiences into computerized learning tools that can be used to take advantage of the universal availability of the Internet as a teaching medium.

# Program Direction

## Mission Supporting Goals and Objectives

Program Direction provides the Federal staffing resources and associated costs required to provide overall direction and execution of Office of Science program and advisory responsibilities. Science Program Direction supports staff in the High Energy Physics, Nuclear Physics, Basic Energy Sciences, Biological and Environmental Research, Fusion Energy Sciences, Computational and Technology Research, Multiprogram Energy Laboratories-Facilities Support, and Energy Research Analyses programs, including management and technical support staff. This program also supports staff at the Chicago, Oakland, and Oak Ridge Operations Offices directly involved in program execution. The staff includes scientific and technical personnel as well as program support personnel in the areas of budget and finance, general administration, grants and contracts, information resource management, policy review and coordination, infrastructure management, construction management, and environment, safety and health.

The FY 2000 request includes Working Capital Fund resources of $3,285,000 to cover the costs of centrally provided goods and services at Headquarters, such as supplies, rent, and utilities.

## Funding Schedule

(dollars in thousands, whole FTEs)

| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
|---|---|---|---|---|---|
| Chicago Operations Office | | | | | |
| Salaries and Benefits | 1,949 | 3,054 | 3,345 | +291 | +9.5% |
| Travel | 93 | 187 | 190 | +3 | +1.6% |
| Support Services | 5 | 198 | 160 | -38 | -19.2% |
| Other Related Expenses | 84 | 124 | 166 | +42 | +33.9% |
| Total, Chicago Operations Office | 2,131 | 3,563 | 3,861 | +298 | +8.4% |
| Full-Time Equivalents | 20 | 32 | 32 | 0 | 0.0% |
| Oakland Operations Office | | | | | |
| Salaries and Benefits | 695 | 867 | 889 | +22 | +2.5% |
| Travel | 20 | 51 | 51 | 0 | 0.0% |
| Support Services | 0 | 0 | 0 | 0 | 0.0% |
| Other Related Expenses | 35 | 39 | 39 | 0 | 0.0% |
| Total, Oakland Operations Office | 750 | 957 | 979 | +22 | +2.3% |
| Full-Time Equivalents | 6 | 10 | 10 | 0 | 0.0% |

| | (dollars in thousands, whole FTEs) | | | | |
|---|---|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
| Oak Ridge Operations Office | | | | | |
| Salaries and Benefits | 633 | 634 | 833 | +199 | +31.4% |
| Travel | 35 | 40 | 70 | +30 | +75.0% |
| Support Services | 0 | 0 | 52 | +52 | +100.0% |
| Other Related Expenses | 32 | 68 | 117 | +49 | +72.1% |
| Total, Oak Ridge Operations Office | 700 | 742 | 1,072 | +330 | +44.5% |
| Full-Time Equivalents | 8 | 7 | 9 | +2 | +28.6% |
| | | | | | |
| Headquarters | | | | | |
| Salaries and Benefits | 23,343 | 28,409 | 30,180 | +1,771 | +6.2% |
| Travel | 1,015 | 1,240 | 1,420 | +180 | +14.5% |
| Support Services | 4,690 | 5,146 | 5,120 | -26 | -0.5% |
| Other Related Expenses | 4,971 | 5,243 | 5,228 | -15 | -0.3% |
| Total, Headquarters | 34,019 | 40,038 | 41,948 | +1,910 | +4.8% |
| Full-Time Equivalents | 220 | 269 | 274 | +5 | +1.9% |
| | | | | | |
| Total Science | | | | | |
| Salaries and Benefits | 26,620 | 32,964 | 35,247 | +2,283 | +6.9% |
| Travel | 1,163 | 1,518 | 1,731 | +213 | +14.0% |
| Support Services | 4,695 | 5,344 | 5,332 | -12 | -0.2% |
| Other Related Expenses | 5,122 | 5,474 | 5,550 | +76 | +1.4% |
| Total, Science Program Direction | 37,600 | 45,300 | 47,860 | +2,560 | +5.7% |
| Full-Time Equivalents | 254 | 318 | 325 | +7 | +2.2% |

## Detailed Program Justification

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 |
| **Salaries and Benefits** | | | |
| Staff funded in this decision unit monitor and evaluate over 3,500 grants and contracts at more than 225 institutions, including universities, industry and other government agencies, in addition to monitoring and evaluating the programs at 13 National and single-purpose Laboratories. SC also manages the Department-wide Small Business Innovation Research and Small Business Technology Transfer programs. Our reengineering efforts have eliminated unnecessary and non-value added work from the system where possible. In FY 2000, SC will also support the Spallation Neutron Source Project Office in Oak Ridge and the Scientific Simulation Initiative. . . . . | 26,620 | 32,964 | 35,247 |
| **Travel** | | | |
| The FY 2000 estimate reflects escalation of costs for airfare, lodging, etc. This increase only reflects a two percent increase over FY 1999. Alternatives to travel such as teleconferencing will be utilized when possible. . . . . | 1,163 | 1,518 | 1,731 |
| **Support Services** | | | |
| Provide necessary mailroom, travel services, environment, health and safety support, computer systems development, SBIR program support, security and hardware and software installation, configuration, and maintenance activities. Emphasis in FY 1999 and FY 2000 will be placed on continued implementation of an information architecture for Science to establish integrated business management systems, consistent with the provisions of the Clinger-Cohen Act (Information Technology Management Reform Act) of 1996. This is essential to take work out of the system and to meet workload demands. SC is widely acknowledged as being the most efficient and conservative user of support services contracts in the Department. . . . . | 4,695 | 5,344 | 5,332 |

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 |
| **Other Related Expenses** | | | |
| Acquire computer hardware and software in FY 1999 and FY 2000 necessary to accomplish corporate systems development and networking upgrades. The FY 1999 and FY 2000 estimates include $3,243,000 and $3,285,000, respectively, to cover Headquarters Working Capital Fund charges. . . . . | 5,122 | 5,474 | 5,550 |
| Total, Program Direction . . . . . | 37,600 | 45,300 | 47,860 |

## Explanation of Funding Changes from FY 1999 to FY 2000

| | FY 2000 vs. FY 1999 ($000) |
|---|---|
| **Salaries and Benefits** | |
| ■ Increase of $2,283,000 in salaries and benefits is due to two additional FTE's for the Spallation Neutron Source Project Office in Oak Ridge, five additional FTEs for the Scientific Simulation Initiative, and the impact of cost of living, locality pay, within grades, promotions, lump sum payments, and awards. . . . . | +2,283 |
| **Travel** | |
| ■ Increase of $213,000 in travel provides a partial offset for escalation of travel costs, airfare, lodging, and miscellaneous expenses due to inflation . . . . . | +213 |
| **Support Services** | |
| ■ Decrease of $12,000 in support services provides the minimum level of support services needed to provide for SC's needs. . . . . | -12 |
| **Other Related Expenses** | |
| ■ Increase of $76,000 in Other Related Expenses provides the minimum amount of funds to cover hardware/software acquisitions, infrastructure technology upgrades, field training, and the Working Capital Fund. . . . . | +76 |
| Total Funding Change, Science Program Direction . . . . . | +2,560 |

## Support Services

(dollars in thousands)

| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
|---|---|---|---|---|---|
| Technical Support Services | | | | | |
| Economic and Environmental Analysis | 1,488 | 1,488 | 1,325 | -163 | -11.0% |
| Test and Evaluation Studies | 0 | 160 | 100 | -60 | -37.5% |
| Total, Technical Support Services | 1,488 | 1,648 | 1,425 | -223 | -13.5% |
| Management Support Services | | | | | |
| Management Studies | 207 | 207 | 110 | -97 | -46.9% |
| Training and Education | 58 | 63 | 40 | -23 | -36.5% |
| ADP Support | 2,282 | 2,376 | 2,847 | +471 | 19.8% |
| Administrative Support Services | 660 | 1,050 | 910 | -140 | -13.3% |
| Total, Management Support Services | 3,207 | 3,696 | 3,907 | +211 | 5.7% |
| Total, Support Services | 4,695 | 5,344 | 5,332 | -12 | -0.2% |

## Other Related Expenses

(dollars in thousands)

| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
|---|---|---|---|---|---|
| Training | 60 | 71 | 76 | +5 | 7.0% |
| Working Capital Fund | 2,679 | 3,243 | 3,285 | +42 | 1.3% |
| Printing and Reproduction | 0 | 33 | 11 | -22 | -66.7% |
| Rental Space | 0 | 26 | 0 | -26 | -100.0% |
| Software Procurement/Maintenance Activities/Capital Acquisitions | 2,383 | 2,101 | 2,172 | +71 | 3.4% |
| Other | 0 | 0 | 6 | +6 | +100.0% |
| Total, Other Related Expenses | 5,122 | 5,474 | 5,550 | +76 | 1.4% |

# Science Education

## Mission Supporting Goals and Objectives

For over 50 years, the Department of Energy and its predecessor agencies (the Atomic Energy Commission and the Energy Research and Development Administration) has supported science and engineering education programs involving university faculty as well as pre-college teachers and students. The Department has provided support for university students, pre-college teachers and college faculty through hands-on research experiences at the Department's National Laboratories and research facilities.

The involvement of the Energy Department's national laboratories in faculty/student research is perhaps the most distinguishing feature of the agency's participation over the years in science and engineering education. No other Federal agency has the extensive network of research laboratories and facilities as DOE with its unique physical and human resources. These laboratories and facilities have been the key to the Department's contribution over time to the Nation's science and engineering education goals.

As we approach the new century, the Nation continues to face important challenges related to the recruitment and retention into science and engineering of students who have historically been under represented (e.g., women, disabled persons, African Americans, Hispanic Americans and Native Americans) in these fields. Guided by recent reports such as the National Research Council on Undergraduate Education Achievement Trends in Science and Engineering, the Department will continue to design, through the Office of Science, an undergraduate research fellowship program that couples academic study with extensive hands-on research experiences in a variety of DOE national laboratory settings. This program is intended to enhance the likelihood that underrepresented students will successfully complete their undergraduate studies and move on to graduate school. Historically, over two-thirds of undergraduates who have participated in DOE programs such as this have gone on to graduate school in disciplines directly relevant to the DOE science and technology missions.

In addition to the science education program in this science program direction budget, $9,734,000 of other mission oriented education activities are funded within science research programs. Below is a table identifying these programs and the allocation of funds. The funds will allow university faculty and student teams at the undergraduate level to participate on long-term research projects at DOE laboratories. Pre-college science and math teachers will be provided with research appointments to improve their knowledge and skills of scientific discovery and enhance their ability to apply them in a classroom environment. Through these investments, the Department will make major contributions towards fulfilling several national priorities: enhancing the diversity of the technical workforce; supporting systemic reform of undergraduate education; and attracting, retaining, and graduating students in fields of interest to DOE and others in the public and private sectors. The funds will also allow the Department to encourage educators to participate directly in the ongoing science research of its laboratories. By joining teams of researchers, educators will experience directly the cutting-edge development of the Science Laboratories, and will better understand the process of scientific investigation. Funds provided will pay for

faculty/student and pre-college teachers' stipends, travel, and housing and will subsidize laboratory scientists' time for this activity.

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 |
| Basic Energy Sciences | 0 | 0 | 1,947 |
| Computational Technology Research | 0 | 0 | 1,947 |
| Biological and Environmental Research | 0 | 0 | 1,947 |
| High Energy Physics | 0 | 0 | 2,921 |
| Nuclear Physics | 0 | 0 | 973 |
| Total | 0 | 0 | 9,735 |

## Funding Schedule

| | (dollars in thousands) | | | | |
|---|---|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 | $ Change | % Change |
| Undergraduate SC Laboratory Fellowship Program | 0 | 3,900 | 3,900 | 0 | 0.0% |
| National Science Bowl Program | 0 | 400 | 400 | 0 | 0.0% |
| Albert Einstein Distinguished Educator Fellowship Program | 0 | 200 | 200 | 0 | 0.0% |
| Total, Science Education | 0 | 4,500 | 4,500 | 0 | 0.0% |

## Detailed Program Justification

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 |
| **Undergraduate SC Laboratory Fellowship Program** | | | |
| The Science Undergraduate Laboratory Research Fellowship Program is a key component of the SC Science Education Program to enable students to focus their research interests on solving current scientific problems and prepare for meeting the challenge of DOE's future energy science mission requirements. The program will also ensure a steady flow of students with technical expertise into the Nation's pipeline of workers in both academia and industry. | 0 | 3,900 | 3,900 |

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 1998 | FY 1999 | FY 2000 |
| **National Science Bowl Program** | | | |
| In addition, the Office of Science will manage and support the "National Science Bowl" for high school students from across the country. Since its inception, more than 50,000 high school students have participated in this event. The National Science Bowl is a highly publicized academic competition among teams of high school students who answer questions on scientific topics in astronomy, biology, chemistry, mathematics, physics, earth, computer, and general science. In 1991, DOE developed the National Science Bowl to encourage high school students from across the nation to excel in math and science and to pursue careers in those fields. It provides the students and teachers who have prepared them a forum to receive national recognition for their talent and hard work. We are planning to invest $400,000 into the National Science Bowl to manage both regional and national competitions. | 0 | 400 | 400 |
| **Albert Einstein Distinguished Educator Fellowship Program** | | | |
| The Albert Einstein Fellowship Awards for High School Teachers continues to be a strong pillar of the program for bringing real classroom experiences to our education programs and outreach activities. This congressional initiative, established by the Albert Einstein Distinguished Educator Fellowship Act of 1994, has enabled the Department to maintain an enriching relationship with the National Triangle Coalition that serves the Federal Government as the clearinghouse for selecting the teachers. We plan to invest $200,000 in the Einstein Fellowship Awards which will allow us to place teachers at the Department and in the U.S. Congress. . . . . | 0 | 200 | 200 |
| Total, Science Education . . . . . | 0 | 4,500 | 4,500 |

## Explanation of Funding Changes from FY 1999 to FY 2000

| | FY 2000 vs. FY 1999 ($000) |
|---|---|
| ■ No funding changes from FY 1999 to FY 2000 for Science Education. | 0 |
| Total Funding Change, Science Education . . . . . | 0 |