DEPARTMENT OF ENERGY
FY 1999 CONGRESSIONAL BUDGET REQUEST
SCIENCE
(Tabular dollars in thousands, Narrative in whole dollars)

UNIVERSITY AND SCIENCE EDUCATION

PROGRAM MISSION

The Department of Energy is a major component of the nations scientific and technical community, and one of the largest supporters of science and technology in the Federal Government. The scientific and technical challenges of the Department's science and defense missions demand an adequate supply of scientists, engineers, and technicians. While the Department of Education and the National Science Foundation are the lead Federal agencies for supporting math and science education, the science and technology mission agencies -- including the Department of Energy -- make significant contributions. The Department, at its major national laboratories, has unique physical and intellectual resources available to support the nation's efforts to prepare the next generation of scientists and engineers to meet the challenges of the 21st century. The proposed University and Science Education (USE) program will support activities that utilize these scientific and technical resources to enhance the development of a diverse, well-educated and scientifically literate workforce.

The Department can continue to play a significant role in supporting science, technology, engineering, and math education at its laboratories. It will not duplicate the efforts of other organizations, but will focus its resources in those areas in which it can make unique contributions. By opening its laboratories to students and teachers, giving them hands-on research opportunities, and using it's technical expertise to develop Internet and other technical tools to enhance educational experiences and opportunities, DOE fills an important gap in the nation's efforts in science and math education.

The USE program is responsible for providing leadership and program support necessary to use and leverage the resources of the Department's laboratories to help replenish the overall pool of well-trained, diverse scientists and engineers of the future, and to achieve significant, long-term improvements in their scientific and technological skills.

The GOAL of the University and Science Education Program is:

To ensure that the Department effectively utilizes and leverages the resources of its laboratory-based system to support its mathematics and science education mission.

PROGRAM MISSION - UNIVERSITY AND SCIENCE EDUCATION (Cont'd)

The OBJECTIVES related to this goal are:

1. 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.

2. To encourage increased participation of underrepresented populations in science and engineering through research participation opportunities.

3. To utilize DOE laboratory technical resources, in partnership with other science and technology agencies, to develop Internet-based education technologies.

4. To ensure increased attraction and retention in the educational pipeline by supporting a diversity of students and teachers.

5. To enhance community outreach activities in science, technology, engineering and mathematics education at our R&D facilities and sites.

PERFORMANCE MEASURES:

Performance measures for the University and Science Education program are both qualitative and quantitative. The quality of the program is measured by improvements in the efficiency and effectiveness of the DOE Laboratory Science Education Programs. The program performance measures are:

1. Enhanced opportunities at DOE laboratories to improve students/faculty understanding of science and mathematics.

2. Increased flow of underrepresented students into science and math programs/careers achieved.

3. Cost sharing and leveraging of program resources with other agencies will multiply the program's impact.

4. Success of program activities as measured by evaluation criteria related to student retention, enhancement, and impact of the program on participants' future career decisions.

PROGRAM MISSION - UNIVERSITY AND SCIENCE EDUCATION (Cont'd)

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

- Through the National Undergraduate Laboratory Research Fellowship subprogram, (formerly known as the Laboratory Cooperative program), undergraduate students and faculty will spend summers and academic terms working side-by-side with scientists at DOE's national laboratories. In addition to gaining valuable research experience, these participants support DOE scientists in advancing their ongoing research.

- According to the most current Participant Activity Report System (PARS) data, in FY 1995 the demographics of the postsecondary participants in the Department's research participation programs are as follows: 34% female, 66% male. Of this total, approximately 14% were African American, 10% Asian/Pacific Island Americans, 7% Hispanic, 3% Native American, 56% were White Americans and 10% unidentified. This is indicative of the significant impact that the program is having on increasing the participation of non-traditional individuals in research.

- In accordance with Congressional direction in FY 1996, the University and Science Education program has been restructured to concentrate the education effort in the national laboratories. The new activities build upon and enhance our core strength of providing state-of-the-art, real world, hands-on experience to students and faculty, and extend the unique "state-of-the-art" capability of our laboratories in to the educational technology arena.

- No direct funding was appropriated for this program in FY 1997. No funds were requested for this activity in the FY 1998 President's budget. However, a modest amount of Energy Research program funding was provided to maintain a minimum Laboratory Cooperative program in FY 1997, consistent with Congressional report language.

UNIVERSITY AND SCIENCE EDUCATION
PROGRAM FUNDING PROFILE
(Dollars in thousands)

Subprogram	FY 1997 Current Appropriation	FY 1998 Original Appropriation	FY 1998 Adjustments	FY 1998 Current Appropriation
Research Fellowship	$0	$0	$0	$0
Educational Technology	0	0	0	0
Minority Institutional Development	0	0	0	0
Community Outreach	0	0	0	0
Subtotal, University and Science Education	0	0	0	0
Adjustment	-10 a/	0	0	0
Total, USE	-$10	$0	$0	$0

a/ Share of FY 1997 emergency flood supplemental rescission.

Public Law Authorization:
Pub. Law 95-91, DOE Organization Act

FY 1999 Request
$6,000
5,000
2,000
2,000
15,000
0
$15,000

UNIVERSITY AND SCIENCE EDUCATION
(Dollars in thousands)

PROGRAM FUNDING BY SITE

Field Offices/Sites	FY 1997 Current Appropriation	FY 1998 Original Appropriation	FY 1998 Adjustments	FY 1998 Current Appropriation	FY 1999 Budget Request
Albuquerque Operations Office					
Los Alamos National Laboratory	$0	$0	$0	$0	$340
Sandia National Laboratory	0	0	0	0	480
Chicago Operations Office					
Ames Laboratory	0	0	0	0	640
Argonne National Laboratory	0	0	0	0	1,335
Brookhaven National Laboratory	0	0	0	0	985
Fermi National Accelerator Laborat	0	0	0	0	530
Princeton Plasma Physics Laborator	0	0	0	0	530
Golden Field Office					
National Renewable Energy Labora	0	0	0	0	500
Idaho Operations Office					
Idaho National Engineering Laborat	0	0	0	0	520
Oakland Operations Office					
Lawrence Berkeley National Labora	0	0	0	0	937
Lawrence Livermore National Labo	0	0	0	0	240
Stanford Linear Accelerator Center	0	0	0	0	530
Oak Ridge Operations Office					
Thomas Jefferson National Accelera	0	0	0	0	540
Oak Ridge Institute for Science and	0	0	0	0	300
Oak Ridge National Laboratory	0	0	0	0	1,105
Richland Operations Office					
Pacific Northwest National Laborat	0	0	0	0	890
Savannah River Operations Office					
Savannah River Ecology Laboratory	0	0	0	0	100
All other sites a/	0	0	0	0	4,498
Subtotal	0	0	0	0	15,000
Adjustment	-10 b/	0	0	0	0

Field Offices/Sites	FY 1997 Current Appropriation	FY 1998 Original Appropriation	FY 1998 Adjustments	FY 1998 Current Appropriation	FY 1999 Budget Request
TOTAL	-$10	$0	$0	$0	$15,000

a/ Funding provided to universities, industry, other federal agencies and contractors.
b/ Share of FY 1997 emergency flood supplemental rescission.

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UNIVERSITY AND SCIENCE EDUCATION

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PROGRAM MISSION - UNIVERSITY AND SCIENCE EDUCATION (Cont'd)

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- No direct funding was appropriated for this program in FY 1997. No funds were requested for this activity in the FY 1998 President's budget. However, a modest amount of Energy Research program funding was provided to maintain a minimum Laboratory Cooperative program in FY 1997, consistent with Congressional report language.

UNIVERSITY AND SCIENCE EDUCATION
(Tabular dollars in thousands, narrative in whole dollars)

I. **Mission Supporting Goals and Objectives:** Activities supported by the University and Science Education program help ensure the effective utilization of DOE's laboratory system in support of the Department's mathematics and science education mission by enhancing the capabilities of faculty and students through hands-on research experiences at DOE national laboratories; increasing the diversity of the scientific workforce; utilizing laboratory resources to contribute to improved science education instruction and providing the necessary infrastructure for the Department's laboratory-based science education programs.

Research Fellowship

The National Undergraduate Laboratory Research Fellowship subprogram is the Department's primary vehicle for providing access to its national laboratories, by faculty and students, from every state and region in the United States. The program provides participants, from both small colleges (including predominantly minority institutions) and large universities, with access to state-of-the-art scientific equipment, techniques and ideas that enable them to further develop their critical thinking and analytical skills. The laboratory-based institutional support provided by this subprogram ensures effective participant placement across all of DOE's research and technical program areas and monitors the quality of their research experiences. Minority students and faculty are particularly sought out and encouraged to participate in the program. From the many thousands of applications the program receives annually, it is clear that DOE's research participation appointments are highly regarded and that these opportunities, along with industry internships and appointments at research centers of other federal agencies, play an important role in the science education program of the country. Program support ranges from 8 weeks to a full semester.

Educational Technology

The Educational Technology subprogram supports development of Internet based education technologies for students and faculty. Utilizing DOE's extensive experience and expertise in the area of computational and communications technology, the Department in partnership with NASA, the National Science Foundation and the Department of Education will focus its efforts on developing tools and materials, consistent with National Academy of Science Education Standards, that will help students and teachers take advantage of the capabilities of the Internet. An example of this is developing tutorials in energy sciences using rubics, visualization, simulation and modeling.

UNIVERSITY AND SCIENCE EDUCATION

I. Mission Supporting Goals and Objectives (Cont'd):

Minority Institutional Development

One principle purpose of the Department's educational initiative is to encourage development of a more diverse science and technology workforce. Historically a major source of minority talent has been predominately minority institutions. Activities under this subprogram will support collaborative efforts between these institutions and the National laboratories to enhance their mathematics, science and technology programs. Also supported under this subprogram will be collaborations between these universities, associations, federal agencies and National laboratories to develop a framework to ensure these diverse interests are aware of the tools, technologies and research opportunities that are available. Consortia, cost-shares and partnerships will be the main mechanisms for accomplishing this goal.

Community Outreach

Activities under the Community Outreach subprogram support the Department's efforts to continue reaching out to the communities in which its laboratories and facilities are located. This outreach will continue to include education-related activities highlighted by the volunteer efforts of DOE and Laboratory employees, such as online mentoring (in collaboration with organizations such as the National Science Teachers Association), school visits and learning workshops. These efforts are intended to enhance DOE's efforts to continue to meet its goal of being a good corporate citizen.

II. Funding Schedule:

Program Activity	FY 1997	FY 1998	FY 1999	$ Change	% Change
Research Fellowship	$0 *	$0 *	$ 6,000	$+ 6,000	--%
Educational Technology	0	0	5,000	+ 5,000	--%
Minority Institutional Development	0	0	2,000	+ 2,000	--%
Community Outreach	0	0	2,000	+ 2,000	--%
Total University and Science Education	$0	$0	$15,000	$+15,000	--%

* A modest program was supported using program funds in accordance with direction in congressional report language.

III. Performance Summary-Accomplishments

	FY 1997	FY 1998	FY 1999
Research Fellowship			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. In FY 1999 this program will provide summer and semester research participation activities to address the research needs of the large, predominately undergraduate, college and university community.	$0	$0	$5,800
SBIR/STTR Funding			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. The FY 1999 amount is the estimated requirement for the continuation of these programs.	0	0	200
Total Research Fellowship	$0	$0	$6,000

III. Performance Summary-Accomplishments (Cont'd):

	FY 1997	FY 1998	FY 1999
Educational Technology			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. In FY 1999 this program will apply the Department's extensive experience and expertise in the area of computational and computer networking technology -- in partnership with NASA, the NSF and the Department of Education -- to developing tools and materials that will help students and teachers take advantage of the capabilities of the Internet.	$0	$0	$4,802
SBIR/STTR Funding			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. The FY 1999 amount is the estimated requirement for the continuation of these programs.	0	0	198
Total Educational Technology	$0	$0	$5,000
Minority Institutional Development			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. In FY 1999 this program will support efforts designed to address the special needs of the predominantly non-research minority college and university community, including collaborative initiatives with the National Science Foundation to support programs to encourage members of nontraditional groups to pursue energy-related scientific and technical careers.	0	0	2,000

III. Performance Summary-Accomplishments (Cont'd):	FY 1997	FY 1998	FY 1999
Community Outreach			
No activities were supported by the University and Science Education program in FY 1997 and FY 1998 under this category. In FY 1999 this program will support the Department's efforts to continue reaching out to the communities in which its laboratories and facilities are located. This includes education-related activities intended to enhance DOE's efforts to continue to meet its goal of being a good corporate citizen.	0	0	2,000
Total University and Science Education	$ 0	$ 0	$15,000

EXPLANATION OF FUNDING CHANGES FROM FY 1998 TO FY 1999:

This program was terminated in FY 1997 by Congress and therefore no funds were requested for it in the FY 1998 President's budget. The FY 1999 request is to support a revitalized educational initiative restructured in accordance with Congressional instructions, responsive to its concerns, consistent with Presidential initiatives (such as the Call to Action for American Education, and Expanding Access to Internet-Based Educational Resources for Children, Teachers, and Parents), and concentrated in the national laboratories. The refocused initiative builds upon and enhances the Departments' core strength of providing state-of-the-art, hands on experience to students and faculty at the laboratories. Funding is requested for support of:

A National Undergraduate Research Fellowship program to provide summer and semester research participation activities to address the research training needs of the large, predominately undergraduate, college and university community.	$+5,800,000
An Educational Technology program to support development of Internet based education technologies for students and faculty.	+4,802,000

UNIVERSITY AND SCIENCE EDUCATION

EXPLANATION OF FUNDING CHANGES FROM FY 1998 TO FY 1999 (Cont'd):

A Minority Institutional Development program to support collaborative efforts between these institutions and the National laboratories to enhance their mathematics, science and technology programs.	+ 2,000,000
A Community Outreach initiative to support the Department's efforts to continue reaching out to the communities in which its laboratories and facilities are located.	+ 2,000,000
SBIR/STTR assessment.	+ 398,000
Total Funding Changes, University and Science Education	$+15,000,000