ADVANCED TECHNOLOGICAL EDUCATION PROGRAM

1998 AWARDS AND ACTIVITIES

ADVANCED TECHNOLOGICAL EDUCATION

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
Division of Undergraduate Education
Division of Elementary, Secondary, and Informal Education

NATIONAL SCIENCE FOUNDATION

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants for research and education in the sciences, mathematics and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Web site at:

http://www.nsf.gov

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information (NSF Information Center):** (703) 306-1234
- **TDD (for the hearing-impaired):** (703) 306-0090
- **To Order Publications or Forms:**

  Send an e-mail to: pubs@nsf.gov

  or telephone: (301) 947-2722

- **To Locate NSF Employees:** (703) 306-1234

ADVANCED TECHNOLOGICAL EDUCATION PROGRAM

1998 AWARDS AND ACTIVITIES

ADVANCED TECHNOLOGICAL EDUCATION

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
Division of Undergraduate Education
Division of Elementary, Secondary, and Informal Education

NATIONAL SCIENCE FOUNDATION

For the latest information about projects supported by the Division of Undergraduate Education, visit the Division's **Project Information Resource System** on the Web at

http://www.ehr.nsf.gov/PIRStart/

Through this system, you can access award abstracts and additional information that is provided and maintained by individual principal investigators.

Division of Undergraduate Education

Division of Elementary, Secondary, and Informal Education

ADVANCED TECHNOLOGICAL EDUCATION (ATE) PROGRAM AWARDS AND ACTIVITIES

Fiscal Year 1998

TABLE OF CONTENTS

I. Overview 1

II. Abstracts of New Awards 5

Centers of Excellence 5

Projects 7

Special Projects 21

Projects Managed by Other NSF Programs and Co-Funded by ATE 23

III. Maps 25

New Awards 25

Centers of Excellence 26

Distribution of Active and New Awards by State 27

IV. Indexes 29

Active and New Awards by Field of Technology 29

Active and New Awards by State 35

Principal Investigators 41

V. ATE Program Staff 47

NATIONAL SCIENCE FOUNDATION

ADVANCED TECHNOLOGICAL EDUCATION (ATE)

OVERVIEW

The Advanced Technological Education (ATE) program promotes exemplary improvement in technological education at the national and regional levels through support of curriculum development and program improvement at the undergraduate and secondary school levels, especially for technicians being educated for the high-performance workplace at two-year colleges. Guided by a vision for technician education, ATE projects and centers not only prepare students to enter the technical workforce but also provide a solid foundation for continued higher education.

ATE centers of excellence focus on systemic approaches to technician education, usually within a specific discipline (such as manufacturing, information technology, telecommunications, semiconductor manufacturing, environmental technology, or biotechnology) and are expected to have a broad impact on two-year colleges and secondary schools within a region or across the nation. *ATE projects* focus on specific aspects of technician education, such as the development or adaptation of educational materials, courses, and curricula; professional development opportunities for college faculty and secondary teachers; technical experiences for students; or laboratory development. All centers and most projects have extensive partnerships with business and industry, and also with other two-year colleges, four-year colleges and universities, and secondary schools. Cooperative efforts among projects and centers assure that the ATE program is having a national impact. NSF and the American Association of Community Colleges (AACC) act as partners by holding annual ATE Principal Investigator (PI) conferences and supporting efforts that encourage networking and joint activities.

In FY1998, the ATE program supported 11 centers of excellence and 158 projects. During the first five years of the program's operation, centers have accounted for 27% of fund allocation ($32.6 million of $120 million), and projects for 66% ($79.6 million).

A. ATE Centers

In FY1998, the ATE program funded one new center of excellence and extended funding for three centers that were initially funded for a three-year term in 1995. The San Francisco Community College District is coordinating activities for the new center, *Bio-Link: A National Advanced Technological Education Center for Biotechnology*. Working with six regional partners, the center acts as a clearinghouse for biotechnology in two-year colleges. Working closely with industry and R&D laboratories, primary objectives of the center include curriculum development, professional development for faculty and teachers, and student recruitment and retention through internships and other work-related activities.

The following table lists the awardee institutions and areas of focus of all 11 ATE centers.

ATE Center	Focus	Year Founded
Eastern Iowa CC District	Environmental Technology	1994
Texas State Tech. College, Sweetwater	Distance Learning	1994
Sinclair CC (OH)	Manufacturing	1994
Bellevue CC (WA)	Information Technology	1995
Middlesex County College (NJ)	Engineering Technology	1995
Chemeketa CC (OR)	Natural Resources Management	1995
S.C. Technical College System	Engineering Technology	1996
Maricopa County CC District (AZ)	Semiconductor Manufacturing	1996
Springfield Technical CC (MA)	Telecommunications	1997
Monterey Peninsula College (CA)	Marine Technology	1997
San Francisco CC District (CA)	Biotechnology	1998

B. ATE Projects

In FY1998, the ATE program funded 38 new projects and continued to support 120 projects started in previous years. Official cost-sharing in the program is about 35% of NSF funds; however, project reports show that institutions are leveraging NSF funds with other funds better than 1:1.

The following table shows the broad disciplinary categories across which projects are distributed.

ATE Project Distribution by Focus Area	Continuing	New
Science-related technologies, including biotechnology, chemical technology, agriculture, Geographic Information Systems, and environmental technology	38	10
Engineering and computer technologies, including manufacturing, electronics, aerospace technology, etc.	46	17
Core courses and skills for technical studies, including mathematics, physics, and interdisciplinary	36	11
Total ATE-managed projects	*120*	*38*

Some examples of the new projects are:

- *Science-related technologies:* Catonsville Community College in Maryland is developing and implementing a statewide system focused on bioscience technician education at the community college and secondary levels. Alabama Southern Community College is collaborating with Auburn University to develop an industry-responsive pulp, paper, and chemical process education curriculum.
- *Engineering and computer technologies:* Evergreen Valley College in California is developing and delivering a rigorous, transferable associate degree program in computer and information technology. York Technical College in South Carolina is providing curriculum development and faculty enhancement in alternative energy transportation.
- *Core courses and skills for technical studies:* New Hampshire Technical College is developing, testing, and disseminating application-oriented, integrated curriculum soft-

ware for introductory physics. Cypress College in California is organizing and providing Geographic Information Systems (GIS) training to high school teachers and community college and university faculty in five locations around the country.

- *Special projects:* Phi Theta Kappa, the honor society for community colleges, is conducting a multi-component faculty enhancement and curriculum development project for 21 community colleges to strengthen science, mathematics, engineering, and technology education through replication of seven model ATE projects. J. Sargeant Reynolds Community College and Virginia Commonwealth University are cooperating with NSF to examine the role of two-year colleges in the science, mathematics, and technology preparation of future teachers.

C. Awards Won by ATE Projects and Centers

As one indication of the success of center and project activities, over 25% of ATE-supported projects and centers report that they received special recognition awards in FY1998. The South Carolina Advanced Technological Education Center won the National Leadership Forum Achievement Award sponsored by Jobs for the Future. The Advanced Technology Environmental Education Center (in Iowa) won a national award for faculty development for its Fellows Program. Johns Hopkins University was a finalist for the Bellwether Award in Instructional Programs and Services. The Maricopa and New Jersey centers and Intelecom won national awards for their video products. A PI at Piedmont Technical College won the South Carolina award for most innovative educator because of her work on the South Carolina ATE Exemplary Faculty project. Prince George's Community College was one of six recipients—and the only two-year college winner—of the Hesburgh Award.

D. Program Issues

Core content and skill and academic standards: Industries recognize a need for technicians with greater capability in science, mathematics, and technology. Several ATE projects and centers are using or developing skill standards or competencies for their areas. Other projects use existing standards in the creation of materials and professional development for teachers. For example, the American Chemical Society is developing both high school and community college instructional materials based on Voluntary Industry Standards and National Science Education Standards.

Recruitment, retention, and placement of students, including technical experiences for students and parental involvement: A universal challenge is to encourage students to enter technical programs and retain them through the associate degree. Many educational consortia currently link Tech Prep-fostered state and local consortia and School-to-Work programs with ATE projects. Cleveland State University and three two-year colleges are cooperating with schools to provide technical experiences that attract and prepare students for technical careers. Working with Washington State Tech Prep consortia, Bellevue Community College is developing information technology Tech Prep curricula, providing professional development for current teachers, building student recruitment models that involve parents, and improving student access to assessment, tutoring, mentoring, and internships.

Professional development for college faculty and secondary teachers: In many technical fields, the knowledge required by technicians in industry is changing rapidly. Several ATE projects and

centers provide professional development opportunities for faculty and teachers. Consortia of two-year colleges and industry collaborate on professional development so that students can be educated for the needs of local industries.

Adaptation and implementation: Projects' and centers' high-quality educational materials, novel degree programs, effective educational practices, and thriving partnerships must be disseminated, adapted, and implemented to meet needs in other institutional settings. Projects and centers work with disciplinary professional societies, publishers, and regional and local consortia in faculty development and dissemination of products and methods. A new component in the FY2000 ATE program announcement will be support for institutions to adapt and implement exemplary curricula or programs developed by other ATE projects, or exemplary curricula developed in other programs that can be adapted to technological education. Through a Phi Theta Kappa project, developers of ATE materials are mentoring the implementation of these materials in other community colleges.

E. For More Information

For more information about the ATE program or awards, visit one of the Web sites listed below or contact one of the lead program directors for the ATE program:

Dr. Elizabeth J. Teles
Division of Undergraduate Education
National Science Foundation
4201 Wilson Blvd., Rm. 835
Arlington, VA 22230
Phone: 703-306-1666
Fax: 703-306-0445
Email: eteles@nsf.gov

Dr. Gerhard L. Salinger
Division of Elementary, Secondary, and Informal Education
National Science Foundation
4201 Wilson Blvd., Rm. 885
Arlington, VA 22230
Phone: 703-306-1620
Fax: 703-306-0412
Email: gsalinge@nsf.gov

NSF Web Sites of Interest

Directorate for Education and Human Resources ..... http://www.ehr.nsf.gov/
Division of Undergraduate Education ..... http://www.ehr.nsf.gov/EHR/DUE/
Division of Elementary, Secondary, and Informal Education ... http://www.ehr.nsf.gov/EHR/ESIE/
Award Abstracts ..... http://www.nsf.gov/verity/srchawd.htm
Project Information Resource System ..... http://www.ehr.nsf.gov/PIRstart/
ATE Centers of Excellence ..... http://www.ehr.nsf.gov/EHR/DUE/web/ate/atelist.htm

CENTERS OF EXCELLENCE

New and Renewed Awards (1998)

One new ATE center was established in 1998; and three others, established in 1995, were awarded funding for a second three-year term. The map on page 26 shows all 11 ATE centers that were active in 1998.

Award No. 9813444
Middlesex County College

New Jersey Center for Advanced Technological Education

Award: $2,000,001
(FY1998 $810,804; FY1999 $647,771; FY2000 $541,426)

Engineering Technology

Jack L. Waintraub *waintrau@email.njin.net*
Middlesex County College (908) 906-2584
Dept. of Physics and Electrical Engineering Technology
Edison, NJ 08818-3050

This award provides renewed funding for the New Jersey Center for Advanced Technological Education (NJCATE), which was originally established under Award No. 9553749.

During its first three years, NJCATE has made substantial progress in reshaping technology education, broadening awareness of the role technicians play in the global economy, and expanding partnerships in center activities. Through the development of the Mecomtronics Engineering Technology Program, NJCATE has produced a model that provides a unique approach to the creation of curriculum for technician programs. The NJCATE curriculum model provides a process and the procedures for the creation of integrated, interdisciplinary engineering technology programs. The development of the new Mecomtronics Engineering Technology program was the vehicle for the design and testing of the curriculum development model which is transferable to all other engineering and science technology disciplines.

NJCATE will continue serving as a resource and catalyst for the continuous renewal and improvement of technician education to prepare graduates for successful employment in a globally competitive marketplace. This will be accomplished by creating and disseminating innovative curricula and instructional materials, and providing high-quality professional development programs for academic and industry personnel and technical assistance services to the educational community. Over the next three years, a major focus of center activities will be to position NJCATE as a national provider of quality educational products and services, moving the center toward an increasing level of self-sufficiency. Working with a business consultant, NJCATE staff have analyzed potential markets for NJCATE products and services, identified and described products and services, and developed a series of strategies to move NJCATE forward.

Award No. 9813445
Chemeketa Community College

Northwest Center for Sustainable Resources

Award: $1,996,949
(FY1998 $834,688; FY1999 $697,932; FY2000 $464,329)

Natural Resources Management

Wynn W. Cudmore *wync@chemek.cc.or.us*
Chemeketa Community College (503) 399-6514
Dept. of Science
4000 Lancaster Dr.
P.O. Box 14007
Salem, OR 97309-7070

This award provides renewed funding for the Northwest Center for Sustainable Resources, which was originally established under Award No. 9553760.

This center is a collaborative effort of partners from Oregon, Washington, and Northern California, including high schools, community colleges, four-year colleges and universities, private industries, government agencies, and Native American tribes. Its mission is to improve curricula and produce national models for high school and technical natural resource and environmental science programs, as well as to provide an information network for the region and the nation. The center is developing natural resource technology programs which incorporate higher levels of mathematics and science, using an ecosystems-based approach which emphasizes sustainable methods for resource use. Key objectives for the center include (1) curriculum development and dissemination by five "lead site" colleges and six "test site" colleges with natural resource-based associate degree programs; (2) faculty and teacher enhancement institutes which are field- and laboratory-based for teachers from all levels of education around the country, faculty tours of world-class research sites, and other professional development activities; and (3) promotion and dissemination activities including presentations at key national and regional conferences and symposia, distribution of promotional products including a videotape and a report entitled "Visions for Natural Resource Education and Ecosystem Science for the 21st Century," and development of an electronic clearinghouse.

Award No. 9813446
Bellevue Community College

NorthWest Center for Emerging Technologies

Award: $1,999,941
(FY1998 $799,999; FY1999 $699,972; FY2000 $499,970)

Information Technology

Neil R. Evans *nevans@bcc.ctc.edu*
Bellevue Community College (425) 373-4227
NorthWest Center for Emerging Technologies
3000 Landerholm Circle, SE, N258
Bellevue, WA 98007-6484

This award provides renewed funding for the NorthWest Center for Emerging Technologies (NWCET), which was originally established under Award No. 9553727.

NWCET continues its work to be the leader in determining the needs of information technology (IT) employers and students. Partnerships with leadership organizations representing corporations, professional societies, and educational institutions provide direction, development, and implementation of IT skill standards, IT curricula, instructional materials, and professional development of faculty. The center is establishing articulation agreements with four year colleges and with high schools and Tech Prep consortia to ensure seamless transitions for students. The four major goals of the center are (1) to advance model partnerships linking business, education, and government to promote IT education; (2) to provide student pathways to new IT programs and new advanced technology degrees; (3) to develop, test and disseminate IT curricula, curriculum products, and teaching and learning resources; and (4) to contribute to national leadership through dissemination of "best practices" in IT education. The center has established working relationships with the Gartner Group, Harcourt Brace, and the Education Development Center to disseminate materials and professional development workshops. The American Electronics Association is validating the center's IT skill standards.

Award No. 9850325
City College of San Francisco

Bio-Link: A National Advanced Technological Education Center for Biotechnology

Award: $2,999,995
(FY1998 $999,999; FY1999 $1,000,000; FY2000 $999,996)

Biotechnology

Elaine Johnson *ejohnson@ccsf.cc.ca.us*
City College of San Francisco (415) 550-4377
Dept. of Biology
50 Phelan Ave., S-54
San Francisco, CA 94112

Bio-Link, a new ATE center established in 1998, is working with six regional centers, baccalaureate institutions, high schools, national laboratories, and industry. Each region is spearheading a specific element, such as identifying and testing instructional materials; implementing new programs; identifying methods for recruiting and retaining underrepresented minorities; creating student assessment tools; linking to high schools and baccalaureate institutions; strengthening basic mathematics, science, and critical thinking skills; and increasing work-based learning opportunities for students. By relying on the expertise of individuals around the nation, the center is addressing a wide range of issues in biotechnology education.

It will sponsor an annual ten-day summer intensive workshop for 30 fellows across the nation. In addition, each regional center will hold an annual workshop for 30 participants in its region. These professional development activities will include hands-on laboratory training; discussion of legal, ethical, and social issues; industry tours; and pedagogical tools. Each region will also identify paid instructor internships. The center is creating an online network that will provide an opportunity for all interested people to communicate and to evaluate materials, strategies, and issues. In a rapidly changing field such as biotechnology, the ability to communicate quickly speeds the integration of new knowledge and materials into the curriculum. To enhance student learning, the center is also making use of multimedia programs, virtual learning and virtual libraries, CD-ROM materials, and distance learning. The lasting effect is to bring stimulating, cutting-edge, and practical educational programs to the students who will make up the nation's future workforce.

PROJECTS
New Awards (1998)

Most projects have a duration of two or three years; many of these receive all their funds during the first year (FY1998). The anticipated expiration date for the awards can be found in the index of active and new awards by field of technology, which begins on page 29.

Award No. 9850244
Capital Community Technical College

National Aeronautics and Space Administration–American Mathematical Association of Two-Year Colleges Project Coalition

Award: $125,000

Mathematics

John S. Pazdar *pazdar@commnet.edu*
Capital Community Technical College (860) 520-7851
Dept. of Science and Mathematics
61 Woodland St.
Hartford, CT 06105-2354

This project focuses on the challenge of increasing two-year college students' level of learning and participation in mathematics. The overarching goal is to provide, in both the near and long term, two-year college faculty and students with a range of classroom materials that foster students' mathematical learning within a context of authentic applications. The project is a collaboration among the National Aeronautics and Space Administration (NASA), the American Mathematical Association of Two-Year Colleges (AMATYC), and Capital Community-Technical College.

Twenty two-year college faculty, grouped in two-person teams, will collaborate with Kennedy Space Center scientists and engineers to produce ten Laboratory Technical Activities (LTAs) and twenty "spin-offs." The LTAs are complete learning units that expose two-year college students to the interdependence of technology and mathematics within the framework of the Reform Principles expressed by AMATYC's *Crossroads in Mathematics*. The spin-offs range from class-ready learning units to vignettes connecting snapshots of the technological world with mathematics. The development process begins with a 1998 summer workshop at the Kennedy Space Center, extends through four drafting stages with associate reviews, and culminates with dissemination. Dissemination will include presentations at meetings organized by professional associations and will also occur via a Web-based electronic book project.

Award No. 9850247
Athens Area Technical Institute

Chemical Technology Contextual Learning Curriculum Development Project

Award: $733,372

Chemical Technology

Carol L. White *white@admin1.athens.tec.ga.us*
Athens Area Technical Institute (706) 355-5033
Dept. of Health Sciences
Athens, GA 30610

This project focuses on the implementation of an educational context for students to develop a meaningful set of competencies recently defined by the American Chemical Society (ACS). These competencies are collectively known as the Voluntary Standards for the Chemical Process Industries Technical Workers. These standards, described in "Foundations for Excellence in the Chemical Process Industries," identify eight major work areas comprising 564 industry-based competencies related to actual tasks performed by laboratory technicians. The new curriculum at Athens Area Technical Institution in chemical technology integrates industry-based competencies into a workplace context for the education of chemical technicians. Specifically, the project is working with (1) Athens Waterworks and Olin Chemical Company to develop a basic scenario on the chemistry of aqueous systems; (2) Hoechst Celanese to develop a quality and process control laboratory associated with polymer synthesis; (3) Athens Waterworks and Olin Chemical Company to develop a quality and process control laboratory for metal recovery; and (4) Hoechst Celanese to develop a quality control laboratory associated with a pharmaceutical company. Three of the four fully developed scenarios are being tested with students at Athens Area Technical Institution. The project is mapping a complete two-year program that includes outlines of seven workplace scenarios with their associated competencies.

Award No. 9850249
Johns Hopkins University

Associate Degree for Manufacturing Technicians: Institutionalizing Change in Technician Education by Expanding a "Work in Progress"

Award: $1,009,041

Manufacturing

Arnold H. Packer *packer@jhu.edu*
Johns Hopkins University (410) 516-4556
Institute for Policy Studies
Wyman Park Bldg., 5th Floor
3400 North Charles St.
Baltimore, MD 21218-2696

Johns Hopkins Institute for Policy Studies, in partnership with five consortia of community colleges across the nation, have established a nationwide effort to equip faculty with the tools they need to teach generic manufacturing workplace competencies to community college students. The outcome has been the development of five CD-ROM modules based on the SCANS competencies. The second phase of this project will bring the now-tested concept to reality in a self-sustaining manner through extensive faculty development, assessment, and extension and enhancement of the CD-ROMs. The model of technician education being used to guide the project is integrated (or blended), project-based, collaborative, assessment-guided, and technology-intensive. While the ATE program has been funding models of technician training with some or all of these characteristics, and these models have begun to change community college teaching in selected institutions, four challenges remain: (1) refining the models, (2) institutionalizing the models so that the changes are sustained, (3) building an expanding network of colleges that will use the results not only of this project but of the ATE program's other successful projects as well, and (4) connecting the network to high schools (via Tech Prep), other colleges, and employers.

Award No. 9850257
Bay Shore Union Free School District

Sciences of the Environment and Advanced Technology Education Consortium (SEATEC)

Award: $86,724

Multidisciplinary

Brian Brachio (516) 968-1159
Dept. of Technology
Bay Shore High School
155 Third Ave.
Bay Shore, NY 11706

This is a project to establish a "2+2" program to improve the preparation of technicians and technologists in a broad range of technology and science disciplines. This will be done through intensive summer programs, conferences, and internships. The program begins with an integrated course of study in 11th grade. It will continue with a context-based, interdisciplinary mathematics–sciences–technology learning environment in grades 11 and 12. It will feature a five-week summer program for students during the summer between their senior year in high school and their freshman year in college. This summer workshop will emphasize integrating technology training with workforce skill development. SEATEC also will hold a summer conference for students, educators, and industry representatives. SEATEC will provide internships for students and training for teachers in technology, process education, and integrated learning. Phase I planning will focus on data collection and designing project procedures.

Award No. 9850258
Alabama Southern Community College

A Model for Technical Training in the Pulp and Paper and Chemical Process Industries

Award: $870,000
(FY1998 $360,000; FY1999 $310,000; FY2000 $200,000)

Chemical Technology

Christie C. Prout *cprout@ascc.edu*
Alabama Southern Community College (334) 575-3156
Dept. of Academic Affairs
P.O. Box 2000
Monroeville, AL 36461

This project represents a collaborative effort by Alabama Southern Community College; the Center for Excellence in Forestry, Paper, and Chemical Technology; the Chemical Engineering Department of Auburn University; and the Pulp and Paper Research Education Center at Auburn University. The goal of the project is to develop an industry-responsive pulp, paper, and chemicals process training curriculum focused on chemistry and processes laboratories and industry-based student experiences. The project integrates components from four associate degree programs in technology offered by Alabama Southern: Paper and Chemical Technologies, Electrical Technology, Electronics and Instrumentation, and Industrial Maintenance. The Center for Excellence also facilitates use of project instructional materials for continuing workforce development by making project educational modules available to technicians and operators throughout the nation.

Award No. 9850269
York Technical College

Alternative Transportation Energy Education System Technology (ATEEST)

Award: $500,000
(FY1998 $200,000; FY1999 $200,000; FY2000 $100,000)

Transportation Technology

Robert Kosak *kosak@york.tec.sc.us*
York Technical College (803) 325-2865
Dept. of Alternative Energy Transporation
452 S. Anderson Rd.
Rock Hill, SC 29730

Project ATEEST is providing curriculum development and faculty enhancement in alternative energy transportation. Curriculum development activities include an electric vehicle technician two-year certificate program, modules on alternative fuel vehicle environmental applications, secondary school electric vehicle technology materials, and laboratory experiments in electric vehicle technology. Faculty enhancement activities include workshops for secondary teachers and workshops to prepare two-year college faculty to implement the new curriculum.

Award No. 9850273
University of Chicago

Exploring Antarctic Technology Through Industrial Design, Engineering Mentorships, and Problem-Based Learning

Award: $574,699

Multidisciplinary

Randall H. Landsberg *randy@oddjob.uchicago.edu*
University of Chicago (773) 702-7783
Dept. of Astronomy and Astrophysics
5640 S. Ellis Ave.
Chicago, IL 60637

This is a three-year project involving students from Gateway Technical College in Wisconsin, Triton College in River Grove, Illinois, and the Art Institute of Pittsburgh in Pennsylvania. Partners in this collaboration also include the Center for Astrophysical Research in Antarctica (CARA), Trek Bicycle Corporation, and Antarctica Support Associates (ASA). The project will promote a technologically advanced workforce, develop an innovative technology curriculum, and form strong linkages among artists, scientists, and technicians. Using problem-based learning, it will combine collaborative student design and fabrication projects with classroom curricula based on real problems presented by the extreme conditions at Amundson-Scott South Pole Station. The long-range impact of the project is to provide a better working environment for technicians working in extreme environments. Students will hone their high-tech skills through apprenticeships, which will involve Gateway and Triton students working under the direction of polar engineers at the Yerkes Observatory. The project will involve 150 students yearly, including 10 apprentices. Students may earn three academic credits for their participation.

Award No. 9850282
Henry Ford Community College

Maintenance Engineering Technology Program (METPRO)

Award: $500,000
(FY1998 $300,000; FY1999 $200,000)

Maintenance Engineering Technology

James Martini *jmartini@mail.henryford.cc.mi.us*
Henry Ford Community College (313) 845-6453
Dept. of Energy Technology
5101 Evergreen Rd.
Dearborn, MI 48128-2407

The two-year METPRO project at Henry Ford Community College consolidates resources from education, government, business, and industry to prepare persons to enter, upgrade, or enhance their position in maintenance engineering technology. This program will focus on (1) developing and implementing a national standard and certification system and a related curriculum at the secondary school and community college levels, and connecting these programs with related university programs; (2) ensuring that basic mathematics, science, communications, and SCANS (Secretary's Commission on Achieving Necessary Skills) considerations are addressed in maintenance engineering technology programs; (3) providing enhanced vision of the maintenance engineering technology field for high school teachers and college and university faculty; (4) providing direct links through partnerships with business and industry to ensure workplace experiences and competencies that allow the smooth transition of graduates into the workplace; and (5) addressing the upgrade training needs of experienced workers with ease of access to METPRO courses and its certification system.

Award No. 9850283
Cuesta College

The California Regional Consortium for Engineering Advances in Technological Excellence (CREATE)

Award: $82,444

Engineering Technology

Christopher Akelian *cakelian@bass.cuesta.cc.ca.us*
San Luis Obispo County Schools (805) 546-3264
Dept. of Engineering/Technology
Highway One
P.O. Box 8106
San Luis Obispo, CA 93403-8105

This is a project to develop a regional approach to the preparation and training of engineering technicians. These include technicians for the engineering technology fields of robotics, computer servicing and networking, manufacturing, and electronic technologies. The two/three-year program begins with the development of a common core curriculum in engineering technology at the seven community colleges that comprise the CREATE consortium. Each campus will then offer at least one of ten advanced technological specialties. Students from any one of the participating colleges will be able to transfer to any other college in the consortium. In Phase I of the project, planning and pilot work will be done.

Award No. 9850287
Western Wisconsin Technical College

Collaborative Training of Secondary, Postsecondary, and Returning Workers in Telemedical Technologies

Award: $420,000
(FY1998 $210,000; FY1999 $210,000)

Telemedical Technology

Glen Skewes *skewesg@email.western.tec.wi.us*
Western Wisconsin Technical College (608) 785-9279
Dept. of Biomedical Electronics
304 6th St., North
P.O. Box C-908
La Crosse, WI 54602-0908

Western Wisconsin Technical College (WWTC) will introduce telemedical technology support training at three levels. First, it will provide high school students online (Internet and videoconferencing) first-year electronics courses, for which they will receive credit toward high school graduation and advanced standing toward an associate degree in biomedical electronics. Second, the associate degree program in biomedical electronics will be modified to include telemedical technology in its curriculum and to bridge the gap between information systems and biomedical technology. And last, WWTC will offer an Advanced Technical Certificate to update skills of technicians already in the field. Curricula and instructional materials will be developed and offered to the high school students, and high school faculty will be offered a summer workshop on core electronics instruction to prepare them to assist students who are taking courses via videoconferencing and the Internet. Existing biomedical electronics curricula will be modified to include telemedicine, and an Advanced Technical Certificate–Telebiomedical Technician curriculum will be developed for updating technicians on advances in telemedicine. All curricula and teaching materials will be placed on an intranet/Internet. A model telemedicine laboratory at WWTC will be equipped with videoconferencing capabilities, facilitating the delivery of instruction to rural sites.

Award No. 9850288
Cleveland State University

Project TEAM (Technical Education for Advanced Manufacturing)

Award: $206,026

Manufacturing

Frederick C. Schoenig *f.schoenig@csuohio.edu*
Cleveland State University (216) 687-6970
Advanced Manufacturing Center
1751 East 23rd St.
Cleveland, OH 44115

This project continues the efforts of Project TEAM (Technical Education for Advanced Manufacturing). The partners in Project TEAM include Cleveland State University and its Advanced Manufacturing Center; the Cleveland Advanced Manufacturing Program; Cuyahoga, Lakeland, and Lorain County community colleges and their respective Tech Prep consortia; Youth Opportunities Unlimited; and the 102 manufacturing companies that have sponsored projects. The activities focus on the concept of a teaching factory, called the Manufacturing Learning Center (MLC), that provides hands-on learning for participants who work on industry-sponsored projects. The overarching goals of Project TEAM are to stimulate interest in all phases of manufacturing in the Northern Ohio region and to create a well-educated manufacturing workforce through the development of a continuum of manufacturing education and training programs that will allow multiple entry and exit points. The specific goals are (1) to ensure the sustainability of the newly established MLC locations at Lakeland and Lorain County community colleges as laboratories for hands-on manufacturing learning; (2) to support innovative teaching methods among secondary mathematics, science, and technology teachers and engineering and technology faculty in the community colleges and universities; (3) to support student success in manufacturing-related technology education programs; and (4) to ensure systemic educational reforms by fully integrating curricula additions and revisions into each partner institution.

Award No. 9850289
Catonsville Community College

The Consortium for Statewide Biotechnology Education

Award: $499,897

Biotechnology

Diane A. Jones *wrjones1@concentric.net*
Catonsville Community College (410) 455-6948
Dept. of Biology
Catonsville, MD 21228-5317

This project focuses on the development of a coordinated response to the statewide need in Maryland for programs to prepare students at the community college level for technician careers in biotechnology, one of the most rapidly growing industries in the state. Catonsville Community College will coordinate the development of a powerful consortium comprised of four community colleges with their articulated high school Tech Prep partners, four University of Maryland Biotechnology Institutes, and statewide biotechnology industry representatives. This consortium will provide community college teaching faculty and their high school teacher partners with rich opportunities to upgrade skills, increase their depth of scientific background, and acquire computer technology skills in order to infuse biotechnology into existing bioscience programs at their schools or develop a comprehensive biotechnician training program. A three-year phased implementation plan ensures a viable model for replication and provides structured opportunities to customize the program to meet the needs of the individual educational institutions. Effective components resulting from the project will be nationally disseminated as models for integrated yet differentiated curricula and training programs preparing the future workforce for jobs in the biotechnology industry.

Award No. 9850291
Hillsborough Community College

HCC Interdisciplinary Live Rock Project

Award: $297,906

Multidisciplinary

William W. Falls *falls@hcc.cc.fl.us*
Hillsborough Community College (813) 253-7781
Dept. of Environmental Programs
1206 N. Park Rd.
Plant City, FL 33566

The purpose of this project is to create a practical, hands-on learning experience for students enrolled in courses in aquaculture, environmental science technology (EST), economics and business, and humanities. This experience will involve students, under the direction of participating faculty, in the research on the culture of aquarium live rock, the environmental monitoring of live rock culture and harvesting activities, the aesthetics of live rock presentation, and the economics and marketing of live rock aquaculture. Recent federal and state restrictions have constrained the collection of natural live rock (a $10,000,000-per-year business) in all state and federal waters. Only aquaculture offers a viable solution to revitalizing this business in the continental United States.

Students and faculty, with the assistance of partners, will work in three teams (aquaculture, environmental, and marketing) over a three-year period to address the research concerns mentioned above. Students working in each team will not only gain applied experience in the particular team discipline but will have the opportunity to transfer what they learn in the classroom to an applied project. They will gain not only the knowledge and skills of the other team areas but also interpersonal and teamwork skills by working closely with partners and the members of the other teams. Evaluation of the project will be accomplished by traditional and alternative assessment measures of student achievement, such as grades, project assignments, field assignments, and testing; student satisfaction surveys; responses to research questions and reports; and yearly reviews by the HCC Aquaculture and EST advisory committees and by the project partners. Knowledge gained from the results of this project will be made available to the aquaculture industry, the regulatory community, and the educational community through workshops, reports, and other publications.

Award No. 9850299
Education Development Center

Building A National Employer-Based Technical Education System

Award: $274,667

Electronics

Monika Aring *monikaa@edc.org*
Education Development Center (617) 969-7100
Dept. of Workforce Development
55 Chapel St.
Newton, MA 02158-1060

Technician education for the electronics industry at community colleges in the United States faces multiple challenges, including inadequately prepared high school graduates, the need for more and higher-quality business–education partnerships, and rapidly changing industry requirements. All of these would be improved by activities which would build a system from the many fragmented programs and projects currently in place. With the support of industry associations such as the American Electronics Association and the National Coalition for Advanced Manufacturing, as well as many educational organizations, the Education Development Center (EDC) will work in collaboration with two community colleges and their feeder high schools at the Siemens Youth Partnership sites in

Alpahretta, Georgia, to improve the education of electronics technicians. With partner schools and Siemens experts, EDC will be responsible for producing curriculum modules in a standardized format for dissemination. Teams of industry experts and secondary and postsecondary educators at the sites will develop curriculum materials. Instructional strategies, teacher guides, and staff development activities will also be developed to support implementation of the new curriculum materials. The products and processes developed in this project will be useful in technician education projects throughout the United States. Finally, the project will offer a new and exciting model for collaboration between a multinational employer and public schools and community colleges.

Award No. 9850304
CUNY Bronx Community College

Environmental Technology Program

Award: $700,000
(FY1998 $300,000; FY1999 $200,000; FY2000 $200,000)

Environmental Technology

James A. Fahey *FaheyChem@aol.com*
Bronx Community College (718) 289-5184
Dept. of Chemistry/Social Sciences
University Ave. and West 181st St.
Bronx, NY 10453

The Environmental Technology (ET) program establishes an A.A.S. degree in ET at Bronx Community College (BCC)—the first of its kind in the City University of New York (CUNY) system—and a series of continuing education certificate courses in occupational health and safety. The program addresses a critical employment and public health need throughout the Bronx and other inner-city neighborhoods for trained environmental technicians. It is designed to provide new career pathways for minority students and other individuals and will establish greater awareness of the link between the environment and public health within inner-city neighborhoods. To accomplish these primary goals, the following objectives will be addressed: (1) development of a minimum of 15 partnerships with industrial, private, and public employers; (2) implementation of six new specialized courses in ET; (3) development of summer training institutes and ongoing workshops for ET high school and college faculty; (4) recruitment and enrollment of a first cohort of 24-30 ET degree students; (5) implementation of 13 to 15 field work sites for job observations, job shadowing, and internships; (6) an 80% graduation rate of all ET students in the A.A.S. program; (7) effective job placement of 80% of ET graduates in related fields; (8) enrollment of 200-300 men and women in continuing education certificate courses in ET; (9) full articulation agreements between BCC's ET program, Bronx High School's ET program, and senior colleges throughout CUNY that have environmental science/health programs. The A.A.S. degree curriculum is tied to secondary school Tech Prep and School-to-Work programs in the Bronx and to related bachelor's degree programs in CUNY and other colleges; in this way, the program links an environmental technology educational corridor from high school to associate and bachelor's degrees to graduate school.

Award No. 9850306
Cypress College

GIS ACCESS—Geographic Information Sciences Curriculum Clearinghouse and Faculty Enhancement Project

Award: $799,906
(FY1998 $417,020; FY1999 $382,886)

Geographic Information Systems

Leslie A. Doak *doakl@nocccd.cc.ca.us*
Cypress College (714) 826-2220 x185
Dept. of Social Science and Geography
9200 Valley View
Cypress, CA 90630-5805

Interest in Geographic Information Systems (GIS) advanced technology education has broadened to the point where exciting, innovative applications are being developed at many levels in schools and colleges. However, the broad applications of GIS and the rapid growth of the field have led to a lack of coordination and awareness among practitioners and educators. Cypress College, a two-year, state-funded community college, is providing GIS training to high school teachers and community college and university faculty in five locations around the nation. These summer workshops are providing technical upgrading, facilitating communication and collaboration, promoting creative teaching, and fostering effective learning environments.

Award No. 9850307
Nashville State Technical Institute

Southeast Advanced Technological Education Project for Communications Technology

Award: $1,629,004
(FY1998 $597,889; FY1999 $516,763; FY2000 $514,352)

Multidisciplinary

Collin T. Ballance *ballance_c@nsti.tec.tn.us*
Nashville State Technical Institute (615) 353-3278
Dept. of Technologies
120 White Bridge Rd.
Nashville, TN 37209

This project involves a consortium of five two-year colleges in Tennessee with their associated school districts, along with four-year universities and communications industries that have already worked together to develop and implement case studies. The goals of the project are (1) to provide national leadership in the development and implementation of case studies for technological education; (2) to provide professional development for participating faculty; (3) to evaluate the effectiveness of the case study method in teaching technology-related content; and (4) to disseminate, nationally, information about the case studies and the outcomes of their use. The project will assemble experts in case studies and their use from different disciplines to inform the project. The case studies, which mirror real-world workplace problems from industry, are created by interdisciplinary faculty teams from science, mathematics, engineering and computer technologies, and communications, with input from the industry. Professional development for faculty includes field trips, three-week internships in the communications industry to keep abreast of recent developments, and workshops to learn to teach using cases. Dissemination includes professional development for faculty in two-year colleges in other areas of the nation, and publication of the case studies and the proceedings of forums on the case studies.

Award No. 9850309
CUNY Borough of Manhattan Community College

BMCC ATE Partnership in Multimedia Programming and Design

Award: $550,000

Multimedia Technology

Alice Cohen *bmacdmac@cunyvm.cuny.edu*
Manhattan Community College (212) 346-8450
Dept. of Computer Information Systems
199 Chambers St.
New York, NY 10007

The Borough of Manhattan Community College (BMCC) is developing a cohesive and unified curriculum in multimedia programming and design, in partnership with Murry Bergtraum High School and industry representatives. Courses are being developed or redesigned to include the use of collaborative learning and multimedia instructional technology. The curriculum will allow students to move efficiently from secondary education into an associate degree program in multimedia programming and design. In addition, the project provides faculty development, focusing on the use and integration of advanced multimedia technology instruction and collaborative learning, for full-time faculty and high school instructors from the New York City region.

Award No. 9850310
University of New Mexico

Cross-Training Technicians and Engineers for Semiconductor Manufacturing

Award: $900,000
(FY1998 $469,051; FY1999 $430,949)

Semiconductor Manufacturing

John E. Wood *wood@me.unm.edu*
University of New Mexico (505) 272-7150
Manufacturing Engineering Program
Suite 235, MTTC Bldg.
800 Bradbury Dr., SE
Albuquerque, NM 87106

As the technical and role demands for semiconductor technicians increase, their core knowledge in the areas of statistics and unit-process operations increasingly overlaps that of engineers in a semiconductor plant. Conversely, new engineers, who may become responsible for technician oversight in a factory setting, need to better understand the job scope of technicians, as well as receive more hands-on training during their academic program. It is thus advantageous to cross-train semiconductor engineers and technicians in shared factory-like settings for selected equipment-intensive courses, without artificially forcing complete articulation between respective curricula. Such side-by-side training, broken into unit modules, decreases per-student lab costs, and thus training costs, while also facilitating (1) cross-training of existing factory technicians and engineers for lifelong learning, (2) cross-training community college and university faculty, and (3) academic migration of technicians who later choose to pursue engineering careers.

A consortium of three universities and three community college systems in three contiguous states (each of which has semiconductor manufacturing as an economic backdrop) is implementing side-by-side training of technicians and engineers through the development, utilization, and evaluation of computer-aided curriculum modules that are integrated into factory-like labs and related courses. These modules will cover semiconductor unit processes and their facility demands from both technician and engineering perspectives. The

multimedia modules are being designed to function either independently or coupled to a multilevel manufacturing simulator package. They can serve training needs in real, mock, or virtual factory-like labs, or they can be used for assessment.

Award No. 9850311
TERC

Networking Communities

Award: $695,924
(FY1998 $347,200; FY1999 $348,724)

Information Technology

Deborah Muscella *deborah_muscella@terc.edu*
TERC (617) 547-0430
2067 Massachusetts Ave.
Cambridge, MA 02140

This project addresses the critical need for a well-trained workforce with diverse skills in computer network technologies. Two Massachusetts community colleges are teaming with high school and industry partners (1) to develop and implement a nationally replicable model for infusing computer networking curricula into existing programs; (2) to demonstrate a model for joint professional development of in-school information technology expertise, where high school and community college faculty are assisted by industry; (3) to provide hands-on technical experiences for students, with special emphasis on the creation of school network "tech support" teams and work experiences at local businesses and community organizations; and (4) to encourage timely, widespread replication through national dissemination. At the community college level, the curriculum is specifically designed to conform to the industry-validated "network specialist" skill standards developed by the ATE-funded NorthWest Center for Emerging Technologies. At the high school level, students learn the basics of network technology as part of a school-to-work "career pathway" in information technology.

Award No. 9850313
University of Kentucky Lexington Community College

A Network Systems Administration Program for Kentucky

Award: $849,995
(FY1998 $350,000; FY1999 $300,000; FY2000 $199,995)

Information Technology

Lillie R. Crowley *lillie@pop.uky.edu*
Lexington Community College (606) 257-2797
Dept. of Mathematics
138 Moloney Bldg., Cooper Dr.
Lexington, KY 40506-0235

Lexington Community College, in collaboration with other colleges in the University of Kentucky Community College System, leads this project to develop an A.A.S. degree in network systems administration. The group is also collaborating with high schools, regional universities, businesses and industries in Kentucky, and other telecommunications and network systems degree programs being developed around the country. The project modernizes and upgrades the core science and mathematics courses required for the degree. It develops the degree-specific courses from a combination of (1) existing courses in science, mathematics, engineering technology, and computer information systems; (2) new courses; and (3) hybrids of engineering technology and computer information system courses. The courses specific to the program are modularized to ensure flexibility and ease of revision. The program targets both traditional and nontraditional students, targets students from underrepresented groups, and recruits students from the Student Technology Leadership and Tech Prep programs. It uses a combination of traditional delivery systems and distance learning via the Internet and interactive video, and it includes student internships and cooperative work-study programs with local businesses and industries.

Award No. 9850317
Mount Wachusett Community College

A Program to Educate Technicians for the Wood Products Industry

Award: $200,000

Woodworking

Nicholas Weidhaas *n_weidhaas@mwcc.mass.edu*
Mount Wachusett Community College (978) 632-6600 x320
Dept. of Forest and Wood Products
444 Green St.
Gardner, MA 01440-1337

The Advisory Board of the Forest and Wood Products Institute at Mount Wachusett Community College (MWCC) and the Wood Products Manufacturers Association (WPMA), a 650-member organization, recognize the pressing need for more technicians and skilled workers in the U.S. wood products industry. This project is developing technician certificate, continuing education, and contract training programs that will efficiently provide employers with productive and well-trained employees. This pilot is resulting in the design and development of a unique certificate program for woodworking technicians at MWCC, with the ultimate goal the creation of an associate degree program. Both the certificate and associate degree programs will be linked to regional high school and vocational school programs, and to regional universities and colleges, particularly the Building Materials and Wood Technology Program at the University of Massachusetts. One of the unique components of this program is the creation of a "Corps of Craftsmen," which consists primarily of retired per-

sons who, through their vast experience, are bringing hands-on instruction and mentoring to this educational effort. The program consists of a combination of in-plant, classroom, and multimedia/distance learning. The program initially targets companies and students primarily located in rural areas of the Northeast, in cooperation with the WPMA, with national dissemination to follow the evaluation of the results of this pilot program. The project also serves as a model for application in other industrial sectors, such as the plastics and metalworking industries.

Award No. 9850318
Cape Cod Community College

Southeastern Massachusetts Advanced Technological Education Project in Environmental Technology Education

Award: $232,179

Environmental Technology

Mary J. Curran *mjcetech@capecod.net*
Cape Cod Community College (508) 362-2131 x4392
Dept. of Natural Sciences
2240 Iyanough Rd.
West Barnstable, MA 02668-1599

Since 1994, three higher-education institutions, Cape Cod Community College (CCCC), Massachusetts Maritime Academy, and the University of Massachusetts at Dartmouth, have collaborated to offer students an environmental technology career path that includes a four-year degree, a two-year degree, and three year-long certificate programs. Now CCCC and Upper Cape Cod Regional Technical School are completing this environmental technology education career ladder with an articulated environmental curriculum at the secondary level. The high school students will acquire college credit through Tech Prep courses that will be co-developed by high school and college faculty. These students will have the opportunity to continue their education at CCCC within an A.S. degree program or a transfer concentration that will articulate with a four-year program at Massachusetts Maritime Academy or the University of Massachusetts at Dartmouth. The project will also develop a mentor–mentee program, which will pair the college and high school students as they receive the field experiences recommended by employers. This mentoring program will be built upon CCCC's well-established internship program, which emerged through the strong support and commitment of local industry representatives. The final project component will be a summer institute and follow-up workshops for other secondary teachers in southeastern Massachusetts, which will allow them to receive the mentor–mentee training and curricula for implementation at their high schools.

Award No. 9850319
Austin Community College

Foundation Skills—Phase II

Award: $144,947

Physics

Stephen B. Rodi *srodi@austin.cc.tx.us*
Austin Community College (512) 223-3300
Dept. of Mathematics and Science
1212 Rio Grande St.
Austin, TX 78701-1785

The project implements a sequence of dissemination and teacher training activities over 20 months for instructional materials developed under a previous ATE grant (Award No. 9553689). The materials form a comprehensive two-semester course in physics for technicians and other audiences. The materials emphasize conceptual understanding of fundamental ideas (as opposed to routine application of formulas to template problems) and active learning by students (which makes ideas vivid to the senses, not just leaving ideas as abstract concepts). The course contributes to the core education of technicians, making them more thoughtful in their work, more flexible within their companies, and more adaptable throughout their careers. The dissemination and teacher training activities include a teacher's manual to guide instructors in the use of the materials; modularization to make the material usable in a custom publishing format and as stand-alone demonstrations; summer workshops to train pairs of community college and high school teachers in use of the materials; "Science Saturdays" conducted in Austin by the development team and by the summer teacher pairs who return home to become "teachers teaching teachers"; workshops at major professional meetings (of the International Technology Education Association, American Vocational Association, National Science Teachers Association, American Association of Physics Teachers, and statewide directors of Tech Prep programs); expansion of a Web site to include a listserv/chat room format in which teachers can share ideas and ask questions; and continued interaction with major publishers.

Award No. 9850324
Oklahoma State University at Okmulgee

Preparing High-Performance Technicians in Distinctive Manufacturing: An Innovative Approach

Award: $650,000

Manufacturing

Rick R. Allison *ralison@okway.okstate.edu*
Oklahoma State University at Okmulgee (918) 756-6211
Dept. of Manufacturing Technology
1801 E. Fourth St.
Okmulgee, OK 74447

Today's global economy is increasingly more complex, technological, flexible, entrepreneurial, and competitive. Many firms are turning to distinctive manufacturing, in which designers, engineers, and production workers collaborate in seamless teams to ensure that products and services meet consumer requirements, that new technologies are applied quickly, and that operations run at optimum efficiency to maximize return on investment. The catalyst is a new type of high-performance technician who employs "buffering and brokering" skills. A team of advanced technological firms, educational institutions, national resource organizations, and minority alliances is re-engineering the failing traditional approach to preparing high-performance technicians for distinctive manufacturing by changing the paradigm from "providing instruction" to "producing learning." The project is also pioneering a comprehensive strategy to recruit and retain underrepresented populations and others who typically overlook advanced technological career opportunities. This innovative program (1) infuses the content of a 90-semester-hour-equivalent A.A.S. degree into interdisciplinary projects set in a real-world manufacturing environment that employs facilitators rather than instructors in a personalized, holistic program of learning; (2) demands mastery of rigorous competencies in workplace effectiveness and personal productivity, as well as in communications, mathematics, science, and technology; (3) ensures that faculty, tutors, and employer-based resource persons are competent in new roles of planning, facilitating, coaching, assessing, and documenting learning; (4) recruits and empowers members of underrepresented groups; and (5) communicates the project's deliverables and lessons learned.

Award No. 9850326
New Hampshire Technical College at Berlin

Project COMPACT (Career-Oriented Materials for Physics and Contemporary Technology)

Award: $238,270

Physics

Doyle V. Davis *d_davis@tec.nh.us*
New Hampshire Technical College at Berlin (603) 752-1113
Dept. of Physics
2020 Riverside Dr.
Berlin, NH 03570

Project COMPACT will develop, test, and disseminate a new type of application-oriented, integrated curriculum software for introductory physics. This material will be designed to address a wide audience including (1) two-year college students enrolled in science, technology, and engineering programs; (2) non-science majors seeking scientific and technology literacy in anticipation of workplace demands; and (3) high school students taking physics—particularly those in Tech Prep or vocational education programs. The software will have a multilevel structure and flexible format to accommodate students with poor backgrounds in science and mathematics, those with some knowledge of algebra and geometry, as well as advanced students. The project materials, developed from existing prototypes, employ a "learning situation-focused" approach rather than a conventional domain-centered approach to involve students of various backgrounds and abilities in learning physics, science, and technology. The goal is to engage students in exploring learning situations associated with their career goals. Each lesson will start with an exploration phase where students will see a real-world example of applied physics. They will then enter a theory phase where they will be presented with the underlying physics concepts and laws related to the example. The learning cycle will be completed with an "application" phase where they will learn a systematic, expert-like approach to solving scientific and technical problems. The initial software packages will focus on three broad career-oriented themes and will include eight interconnected components. Teachers can modify and expand an open-ended collection of problems, solution plans, tests, queries, and leading questions using their own experience or incorporating diverse curriculum resources, including those available on the Web.

Award No. 9850327
University of Illinois at Chicago

A Bridge to Advanced Technological Education

Award: $968,187
(FY1998 $363,966; FY1999 $311,219; FY2000 $293,002)

Multidisciplinary

Davis Jenkins *davis@uic.edu*
University of Illinois at Chicago (312) 996-8059
Great Cities Institute
322 S. Green St., Suite 108
Chicago, IL 60607

The University of Illinois at Chicago and Wayne State University are leading teams of community colleges, community-based organizations, universities, and industry groups in Chicago and Detroit to develop curricula for programs designed to provide a bridge to advanced technological education for adults who lack the requisite basic skills and knowledge. An "Advanced Technology Bridge" program that prepares educationally disadvantaged adults for two-year college certificate and associate degree programs in manufacturing technology has been piloted in Chicago. The groundwork has been laid for a similar program in Detroit. This ATE project builds on these two efforts. The project's specific objectives are (1) to develop a model Bridge curriculum suitable for national dissemination; (2) to produce multimedia instructional software to enhance learning of the fundamentals of technical literacy by ESL students; (3) to pilot a curriculum for training Bridge program instructors; and (4) to publish a Bridge program implementation guide. Formative evaluation of the project is being carried out by advisors from industry and from community college and university manufacturing and engineering technology programs, who will ensure that the Bridge curriculum provides the foundation for career-long learning both in postsecondary technical education and in the workplace. A nationally known evaluation organization will be commissioned to conduct a summative evaluation of the project's outcomes and impacts. Dissemination is integral to the project, which will adapt, for Detroit, a model initially developed in Chicago and will facilitate knowledge sharing between the "Bridge-building" efforts in the two cities. The funds requested from NSF for curriculum development will leverage more than $2.6 million already raised by the project partners for piloting of the Bridge curriculum and other program operations.

Award No. 9850334
Westark College

Western Arkansas Advanced Manufacturing Project

Award: $314,278

Manufacturing

Sidney G. Connor *sconnor@systema.westark.edu*
Westark College (501) 788-7764
Dept. of Business
P.O. Box 3649
Fort Smith, AR 72913-3649

This project is developing and delivering manufacturing instruction at the bachelor's degree level which is founded in the contextual application of mathematics, science, and technology principles and which builds on the associate degree program already in place at Westark. Collaboration with local public high schools is providing a pipeline for sharing project innovations with high school faculty. A pilot program, the Ford Academy of Manufacturing Sciences (FAMS), will provide high school students a foundation from which to enter the manufacturing technology program. The result is a seamless "2+2+2" program which has strong industrial backing in the community and which can be a national model. The program is developing curricula based upon manufacturer-identified competencies, and focuses on learning rather than teaching. Both high school graduates and current manufacturing employees are target audiences. The project includes development of learning modules that are both self-paced and team-based, with a focus on outcome competencies rather than "seat time." Pre-assessment tools for proper placement and the awarding of advanced credit upon demonstrated competency are components of the project. Small clusters of employer-identified competencies will be delivered as self-paced learning modules that include authenticating activities allowing students to experience the manufacturing applications. Also supported is an advanced manufacturing laboratory, in which many of the authenticating activities are taking place.

Award No. 9850337
Evergreen Valley College

Advanced Information Technology Project

Award: $375,000

Information Technology

Henry Estrada *hestrada@sjeccd.cc.ca.us*
Evergreen Valley College (408) 274-7900 x6582
Dept. of Computer Science
3095 Yerba Buena Rd.
San Jose, CA 95135

In response to industry need, this project is developing and delivering a rigorous, transferable curriculum for an associate degree in computer and information technology (IT). This program serves as a school-to-work model for community colleges, meets the needs of students seeking entry-level jobs and IT professionals seeking to upgrade their technical skills, and provides the necessary foundation for students who decide to transfer to four-year institutions. In particular, the project is developing and validating certification standards for entry-level positions in high-performance companies. IT representatives are selected from industry, academia, and the public sector to identify the needed skill sets; soft skills are incorporated into the curriculum; internship experiences are made available to students; and certifications of skill acquisition are to be based upon industry standards. The new curriculum is being delivered via technology-mediated learning (interactive CD and the Internet). The target audiences for this project include students in high schools, community colleges, and universities, particularly Latino students; IT workers retraining for jobs in emerging high-tech fields; and faculty at high schools and community colleges. Collaborators in the project include Evergreen Valley College, East Side Union High School District, Foothill–De Anza Community College District, San Jose State University, Workforce Silicon Valley, Sun Microsystems, Oracle Corporation, CBT Systems, and Waite Group Press.

Award No. 9850341
East Los Angeles College

Los Angeles Bioscience Project (LAB-Pro)

Award: $305,000

Biotechnology

Carcy L. Chan *chancl@laccd.edu*
East Los Angeles College (213) 265-8602
Dept. of Chemistry
1301 Cesar Chavez Ave.
Monterey Park, CA 91754

LAB-Pro represents a partnership of East Los Angeles College (ELAC), a community college; California State University, Los Angeles (CSLA), a comprehensive public university; two public high schools, Wilson High School and Roosevelt High School; four bioscience companies; and the Southern California Biomedical Council, an association of bioscience companies). The project will achieve two complementary goals: (1) to provide direction and career opportunities for minority community college students, many of whom never complete their studies, and (2) to help meet the employment needs of the booming bioscience industry, which has more openings than it can fill with qualified personnel. LAB-Pro has been designed as a multifaceted program that is achieving its goals in three primary ways. First, it is preparing high school and community college students for technical careers in bioscience by exposing them to career opportunities in the field and giving them the skills and practical experience needed to succeed in those careers. Second, it is enhancing the knowledge of high school science teachers and community college instructors in bioscience. Finally, it is establishing a pipeline of qualified bioscience technicians, primarily from underrepresented minority groups, to fill the numerous jobs available within the growing bioscience field in Southern California.

Award No. 9850343
University of Hawaii Maui Community College

Transporting Science, Computer, and Engineering Curricula to Rural Minority Students Through Telecourses and Internet

Award: $137,893

Distance Learning

G. Robert Converse *Bob.Converse@mauicc.hawaii.edu*
Maui Community College (808) 984-3447
Learning Center
310 Kaahumanu Ave.
Kahului, HI 96732

This project is delivering an Electronics and Computer Engineering Technology (ECET) curriculum to Maui Community College (MCC) outreach students on Molokai, Lanai, and Hana. Extending efforts of an earlier award, this project focuses on the implementation and evaluation of the distance learning delivery system for the curriculum. Development of multimedia modules will continue. In addition, the project will develop practical online resources that illustrate electronics and computing principles. These resources will include a weather station and student-designed software. A workshop on the development of self-paced laboratory courses will be offered for Maui County science and mathematics teachers in March 1998.

Award No. 9850344
Houston Community College

GIS/GPS Laboratory Exercises Using Workplace Data Sets

Award: $394,318
(FY1998 $160,555; FY1999 $148,573; FY2000 $85,190)

Geographic Information Systems

Osborne B. Nye *nye_o@hccs.cc.tx.us*
Houston Community College (713) 718-7773
Dept. of Math/Science/Technology
P.O. Box 7849
Houston, TX 77270-7849

Houston Community College System (HCCS) is producing an instructor's guide and a package of Geographic Information Systems/Global Positioning System laboratory exercises using workplace data sets for the PC environment. These interactive laboratory exercises may be accessed on the HCCS Web site <http://www.hccs.cc.tx.us> and also on CD-ROM. Project materials incorporate interactive features with workplace data sets and objectives into the laboratory exercises. The laboratory exercises enhance available instructional resources based upon currently available curriculum guidelines. Six collaborating community colleges in six states have agreed to test the interactive exercises prior to the final external evaluation. After field-testing, the CD-ROMs will be available for use by community colleges and four-year institutions.

Award No. 9850350
Ohio University

The Teacher Empowerment for Success in Technology Project

Award: $90,135

Multidisciplinary

Martha A. Kline *klinem2@ohiou.edu*
Ohio University, Lancaster Branch (614) 654-6711
Dept. of Tech Prep
c/o Leigh Trapp
1570 Granville Pike
Lancaster, OH 43130

This project will enable a core of high school teachers currently engaged in the delivery of technical education to enhance classroom instruction based on cutting-edge technology. During Phase I, pilot work for the professional development will be done. The professional development will have four components: (1) teacher in-service development through formal graduate course work, (2) industrial work site experiences with emerging technologies, (3) dissemination that uses electronic networking, and (4) improvement of equity and diversity in the future workforce. Initial dissemination will be through several high schools, all part of the Heart of Ohio Tech Prep Consortium. The long range goal is to recruit teams of four teachers from the consortium high schools; the ideal team would include a science teacher, a mathematics teacher, a communications skills teacher, and a technical education teacher. Work site experiences will be bracketed with active-learning, project-based college courses and other workshops.

Award No. 9850351
Southern Illinois University at Carbondale

Advanced Technological Education Program in Composite Manufacturing

Award: $284,800

Manufacturing

Serge Abrate *abrate@engr.siu.edu*
Southern Illinois University at Carbondale (618) 453-7826
Dept. of Technology
College of Engineering
Carbondale, IL 62901-6603

Focusing on the composite manufacturing industry, which is both new and economically important in southern Illinois, two community colleges—John A. Logan College (JALC) and Rend Lake College (RLC)—and Southern Illinois University (SIU) are engaging in activities designed to promote technology and improve technological education in the region. RLC is introducing high school students and teachers to state-of-the-art composite manufacturing processes used in the boat-building industry. This is done in a modern facility recently developed with major industrial support. Participants in the courses gain hands-on experience with these processes. Teachers receive kits and instructions to be used in their classes the following year. JALC is promoting technical careers in secondary schools using modem, interactive, audio, video, and computer communication facilities. JALC is offering summer camps for students and summer courses for teachers in computer-aided drafting, robotics, and electronics. These topics are directly relevant to the overall theme of the project, since most products are designed on computers, manufacturing processes are highly automated, and sensors and computer data acquisition systems are used extensively to monitor manufacturing processes. High school teachers are developing lesson plans to incorporate what they learn into their own teaching the following year. SIU is promoting this project and technological education from high school, through two-year programs at community colleges, to four-year programs and master's degree programs at the university level. This is being accomplished through several means, including presentations using a distance learning facility that provides two-way audio and video interactive communication with virtually every high school in southern Illinois. SIU is also offering summer camps for high school students, short courses for high school teachers, and a course for SIU students.

Award No. 9850353
Diné College

Information Engineering Technology Program

Award: $819,994
(FY1998 $369,877; FY1999 $236,915; FY2000 $213,202)

Information Technology

Charles Coffey *ccoffey@crystal.ncc.cc.nm.us*
Diné College (520) 724-6718
Dept. of Mathematics and Science
Tsaile, AZ 86556

The Diné College Information Engineering Technology Program (IETP) is designed to prepare students to enter the high-tech workforce addressing the need on the Navajo Nation for computer technicians and network specialists. Close collaborations with existing ATE programs ensure that Diné College faculty and support personnel have the skills necessary to offer training consistent with national skills standards. IETP students have the option of either achieving vendor-specific certification to enter the workforce or continuing with a four-year engineering program. Partnerships with Navajo Nation programs, Arizona and New Mexico school districts, and regional high-tech industry guarantee that the course content remains sensitive to regional employers and that the program remains consistent with, and linked to, other regional initiatives.

Award No. 9850355
Amarillo College

Technical Sciences Academy: A Partnership Model

Award: $200,000

Multidisciplinary

Therese A. Jones *tjones@actx.edu*
Amarillo College (806) 371-5091
Dept. of Sciences and Engineering
P.O. Box 447
Amarillo, TX 79178-0447

The Technical Sciences Academy (TSA) was established through an ATE grant in 1994. TSA has resulted in a highly successful partnership between Amarillo College (AC), Amarillo Independent School District (AISD), and leading area industries. This new project will build on the solid foundation of the 1994–1997 project in the following ways: it will develop a new biotechnology program, strengthen articulation agreements with partner institutions, upgrade TSA's technology resources, and enhance the faculty development program. These activities will elevate TSA to a regional or national model. Dual credit agreements between AC and AISD will be augmented. Articulation agreements will be negotiated among TSA, AC, and regional universities to further a seamless education from the 9th grade through the baccalaureate degree. Collaborative faculty development efforts, directed toward pre-service and rural in-service teachers, will be implemented. Activities emphasizing technology applications will be available on-site and via ITV. The education–industry partnership procedures now implemented at TSA will be refined into a system and distributed through various means, including consultancies, on-site workshops, and distance learning applications.

SPECIAL PROJECTS

New Awards (1998)

Award No. 9811926
Phi Theta Kappa Headquarters

Improving Science and Technology Education at Community Colleges—Round II

Award: $307,847

Multidisciplinary

Rod A. Risley *rod.risley@ptk.org*
Phi Theta Kappa Headquarters (601) 957-2241
Office of the Executive Director
1625 Eastover Dr.
Jackson, MS 39211

Phi Theta Kappa, the honor society for community colleges, in cooperation with the American Association of Community Colleges (AACC), will conduct a second round of its ATE-supported, multi-component curriculum development and faculty enhancement project. The objective of the project is to improve and strengthen the teaching of science, mathematics, engineering, and technology (SMET) at the nation's community colleges. As in the project's first round (1996–1998), this objective will be accomplished through a set of activities that extend, for replication, the knowledge, experience, and quality materials achieved by seven exemplary NSF-supported projects, first to twenty-one competitively selected colleges, and ultimately to community, technical, and junior colleges nationwide. Activities will include (1) the establishment of a core group of seven mentors—experienced SMET educators in the following areas: GIS (Patricia Cunniff, Prince George's Community College), mathematics (Alan Jacobs, Scottsdale Community College), precision agriculture (Terry Brase, Hawkeye Community College), biotechnology (Kathy Frame, National Association of Biology Teachers), image processing and using technology in the classroom (Melanie Magisos, Center for Image Processing in Education), computer networking technology (Catherine Cotten, Jones County Junior College), and engineering technology "mecomtronics" (Jack Waintraub, Middlesex County College); (2) a national competition to select twenty-one colleges; (3) National Science and Technology Education Conferences, at which mentors and their selected college teams will develop action plans; (4) mentoring services, including site visits, throughout the project; (5) networking newsletters to report on the progress of the selected colleges; (6) a case study monograph for distribution to presidents, academic deans, and science faculty; and (7) a broad range of other dissemination activities though Phi Theta Kappa and AACC conferences and publications.

Award No. 9814210
Consortium for Oceanographic Research and Education

Articulation of the Marine Advanced Technology Education (MATE) Program with the Oceanographic Research Community

Award: $70,598

Marine Technology

Richard W. Spinrad *spinrad.richard@hq.navy.mil*
U.S. Naval Observatory (202) 762-1000
3450 Massachusetts Ave., NW
Washington, DC 20392-5421

The Consortium for Oceanographic Research and Education (CORE) and the NSF Marine Advanced Technology Education (MATE) Center in Monterey are coordinating a series of activities designed to target articulation between MATE and the community of research universities and institutions involved in oceanographic science and technology. These universities and other institutions represent a current and future employer for the graduates of marine technology programs. The project is identifying opportunities, tools, and mechanisms for establishing and maintaining a long-term relationship among the oceanographic basic research community and the network of community colleges involved in the MATE program.

Marine technicians who are the primarily beneficiaries of two-year college marine technology education programs work in a wide variety of jobs and represent a major portion of the workforce at the oceanographic research universities and institutes in the United States. Three primary areas involving marine technicians are being addressed in the project: demographics, curriculum development, and infrastructure and management of the workforce. The workshop organized by CORE will use a multifaceted approach to address issues in these areas. Activities will include (1) surveying the research community to establish baseline data on duties, responsibilities, and education of marine technicians, (2) bringing together a steering committee to define the structure of, and final questions to be addressed in, the workshop, (3) organizing and convening the workshop itself, and (4) developing and widely disseminating products relating to workshop activities.

PROJECTS MANAGED BY OTHER NSF PROGRAMS AND CO-FUNDED BY ATE

New Awards (1998)

In 1998 the ATE program contributed funds to several proposals that were submitted to and funded through other programs. The ATE co-funding will ensure that these projects make the education of technicians a priority. Below, the ATE contribution is listed in parentheses after the estimated total award.

Award No. 9752688
Erie Community College

GIS Curriculum Development

Award: $126,000 (ATE: $25,000)

Geographic Information Systems

Jason L. Steinitz *steinitz@nstaff.sunyerie.edu*
Erie Community College (716) 851-1305
Dept. of Social Sciences
6205 Main St.
Williamsville, NY 14221-7095

As technology diffuses through local government agencies and industries, the need for trained Geographic Information Systems (GIS) technicians and analysts continues to expand. So does the need for individuals in other fields to become aware of GIS and how it applies to their workplace. This project, developed jointly by Erie Community College (ECC) and the State University of New York at Buffalo's Geography Department, addresses these needs using a two-pronged approach. First, the GIS Curriculum Development Project will create a GIS certificate program for students to complete either as part of their two-year degree program or as a stand-alone certificate. The project will develop a core of three GIS-specific courses and a three-credit-hour internship to provide students with a field experience component in their GIS studies. Second, this project will establish a GIS infusion program to train faculty in a variety of curricula to use GIS in their own courses. This will allow ECC students to develop experience and awareness of GIS and to learn how GIS technology relates to their own fields of study. The GIS infusion program will also develop a process for supplying GIS output directly to faculty for use in their classrooms. This will allow GIS technology to reach a broader audience. Two leading GIS educational institutions, the State University of New York at Buffalo and the University of California at Santa Barbara, have agreed to lend their expertise in GIS technology, curriculum development, and faculty training to this project. The National Center for Geographic Information and Analysis at the University of Buffalo will be also serve as project site for ECC students enrolled in the newly created GIS courses.

Award No. 9752787
Sinclair Community College

Instrumentation Workshop for Two-Year College Chemistry Faculty

Award: $185,000 (ATE: $23,000)

Chemical Technology

Richard F. Jones *rjones@sinclair.edu*
Sinclair Community College (937) 226-7907
Dept. of Chemistry
444 W. Third St.
Dayton, OH 45402

In recent years, advances in electronics have posed a challenge to undergraduate chemistry faculty to incorporate modern chemical instrumentation into undergraduate laboratories. To meet this challenge, undergraduate faculty members must use and understand the capabilities of modern instrumentation. This project will update the chemical instrumentation skills of two-year college chemistry faculty who teach in university transfer and chemical technology courses. Sinclair Community College, George Mason University, the University of Dayton, and Western Washington University will sponsor a series of one-week chemistry instrumentation workshops. Participants will be selected from two-year colleges across the United States, with an emphasis on attracting women and minority faculty members. Instruction will focus on instrument applications in undergraduate general and organic chemistry, introduction to instrumental analysis, associate degree chemical technology course applications, and applications of environmental chemistry. Participants will select instruction in the following areas: Fourier-transform infrared, gas chromatography/mass spectroscopy, vapor phase and high performance liquid chromatography, computerized data acquisition and treatment, multimedia approaches to chemical education, and environmental chemistry.

Award No. 9814135
National Academy of Sciences

Making the Case for Technological Literacy

Award: $600,000 (ATE: $35,000)

General Technology

William A. Wulf *wwulf@nae.edu*
National Academy of Engineering (202) 334-3200
National Academy of Sciences
2101 Constitution Ave., NW, Suite 218
Washington, DC 20418

The National Academy of Engineering and the National Research Council's Center for Science, Mathematics, and Engineering Education are increasing public awareness for the need for technological literacy. They are sponsoring three workshops and a symposium to define technological literacy, its importance to the nation, and how it is best achieved. The workshops and commissioned papers on "Teaching," "Tools and Resources," and "Implementing Technological Literacy" will facilitate constructive dialogue and information exchange among the principal stakeholders—teachers and educators in K-16, instructional materials developers, businesses, and foundations. The four interconnected challenges to achieving technological literacy are (1) increasing the public understanding of technology; (2) infusing K-12 teaching with technology-relevant curricula, materials, assessments, and teacher resources; (3) creating stronger and more meaningful links among educators, policymakers, industry leaders, and foundations; and (4) effectively integrating educational technology into the classroom. The outcome will be a widely disseminated, visible, well-supported document that "makes the case" for technological literacy and a plan for achieving it.

Award No. 9816812
Illinois State University

PI Conference for NSF Projects in Technology Education

Award: $40,879 (ATE: $9,145)

Multidisciplinary

Franzie Loepp (309) 438-2620
Illinois State University
CeMaST
Normal, IL 61761

The goal of the Principal Investigators conference for NSF projects related to technology education is to create and enhance linkages among ATE, Instructional Materials Development (IMD), and Teacher Enhancement (TE) programs. The conference was held in Washington, D.C., on November 18 and 19, 1998. Approximately 40 PIs had an opportunity to showcase their projects. Selected leaders from the ATE and technology education communities were invited to participate as well. NSF program officers discussed relationships among ATE, IMD, and TE projects. Panels of three PIs addressed issues such as developing standards-based curricula, strategies for enhancing the impact of projects, and working with publishers. A "rapporteur" made reflective comments concerning the issues addressed. The rapporteur also made recommendations for further research. Based on the rapporteur's report, the panelists' one-page comments and reports, and the conference evaluations, a manuscript is being prepared for submission to a national journal.

Award No. 9851385
Lakeland Community College

Lakeland Bioscience Technology Laboratory Improvement

Award: $60,000 (ATE: $30,000)

Biotechnology

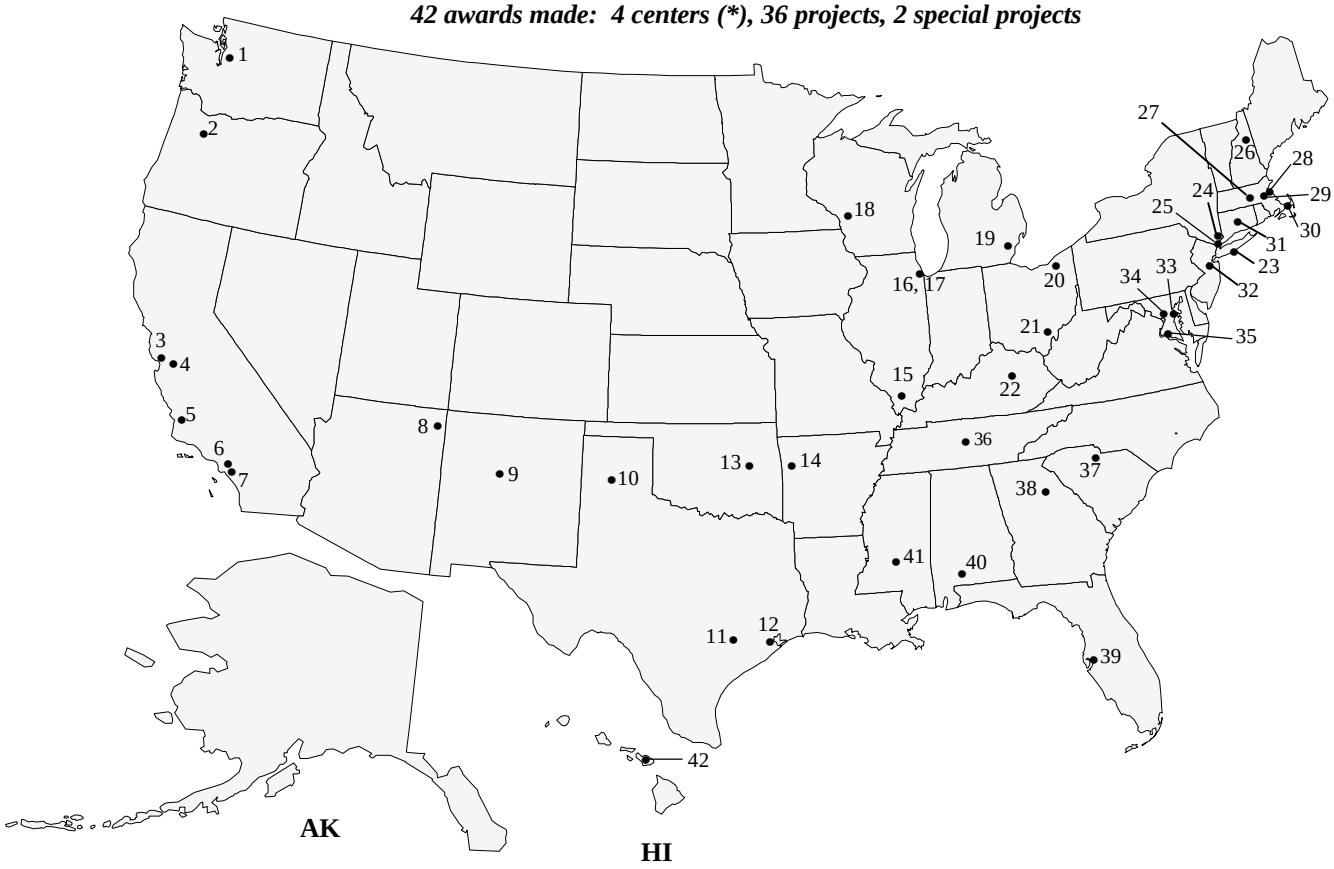
Joseph C. Deak *jdeak@lakeland.cc.oh.us*
Lakeland Community College (440) 975-4766
Dept. of Bioscience Technology
7700 Clocktower Dr.
Kirtland, OH 44094

Lakeland Community College's Bioscience Technology Program, developed in response to the growing demand for bioscience technicians in the region, is the only associate degree biotechnology program in northern Ohio. The program is being developed in a joint effort by scientists in the biotechnology industry and researcher–educators in academic institutions. The curriculum provides students with the fundamental scientific knowledge and practical experience necessary to function as competent bioscience technicians. This laboratory improvement project impacts bioscience majors, science majors and non-majors, as well as health science students. It (1) provides state-of-the-art equipment to train and retrain bioscience technicians, (2) establishes a summer institute for college and high school faculty, (3) effects systemic changes in high school and college science curricula, (4) conducts biotechnology workshops for high school students, and (5) develops a biotechnology Tech Prep program. Programs and laboratory exercises developed within this project are being made available to the scientific community through the Internet and public discussion.

NEW ATE AWARDS
FY1998

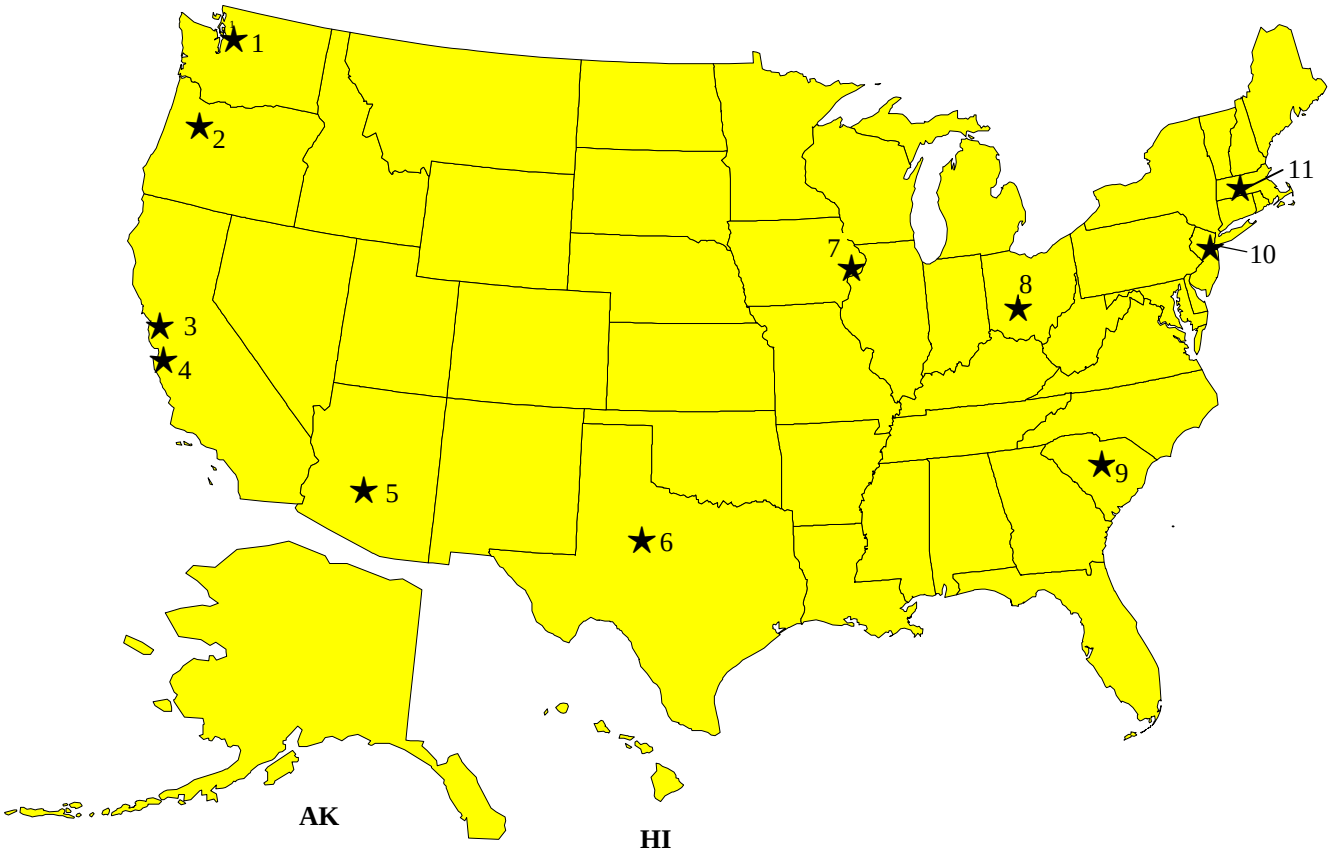
(excluding ATE-supported awards managed by other programs)

127 proposals received
42 awards made: 4 centers (*), 36 projects, 2 special projects



1. Bellevue CC* (Bellevue, WA)
2. Chemeketa CC* (Salem, OR)
3. City College of San Francisco* (San Francisco, CA)
4. Evergreen Valley College (San Jose, CA)
5. Cuesta College (San Luis Obispo, CA)
6. East Los Angeles College (Monterey Park, CA)
7. Cypress College (Cypress, CA)
8. Diné College (Tsaile, AZ)
9. U. of New Mexico (Albuquerque, NM)
10. Amarillo College (Amarillo, TX)
11. Austin CC (Austin, TX)
12. Houston CC (Houston, TX)
13. Oklahoma State U. at Okmulgee (Okmulgee, OK)
14. Westark College (Fort Smith, AR)
15. Southern Illinois U. at Carbondale (Carbondale, IL)
16. University of Chicago (Chicago, IL)
17. University of Illinois at Chicago (Chicago, IL)
18. Western Wisconsin Technical College (La Crosse, WI)
19. Henry Ford CC (Dearborn, MI)
20. Cleveland State U. (Cleveland, OH)
21. Ohio U. (Athens, OH)
22. U. of Kentucky Lexington CC (Lexington, KY)
23. Bay Shore Union Free School District (Bay Shore, NY)
24. CUNY Bronx CC (Bronx, NY)
25. CUNY Borough of Manhattan CC (New York, NY)
26. New Hampshire Technical College at Berlin (Berlin, NH)
27. Mount Wachusett CC (Gardner, MA)
28. TERC (Cambridge, MA)
29. Education Development Center (Newton, MA)
30. Cape Cod CC (West Barnstable, MA)
31. Capital Community Technical College (Hartford, CT)
32. Middlesex County College* (Edison, NJ)
33. Johns Hopkins U. (Baltimore, MD)
34. Catonsville CC (Catonsville, MD)
35. Consortium for Oceanographic Research and Ed. (Washington, DC)
36. Nashville State Technical Institute (Nashville, TN)
37. York Technical College (Rock Hill, SC)
38. Athens Area Technical Institute (Athens, GA)
39. Hillsborough CC (Tampa, FL)
40. Alabama Southern CC (Monroeville, AL)
41. Phi Theta Kappa Headquarters (Jackson, MS)
42. U. of Hawaii Maui CC (Kahului, HI)

ATE CENTERS OF EXCELLENCE



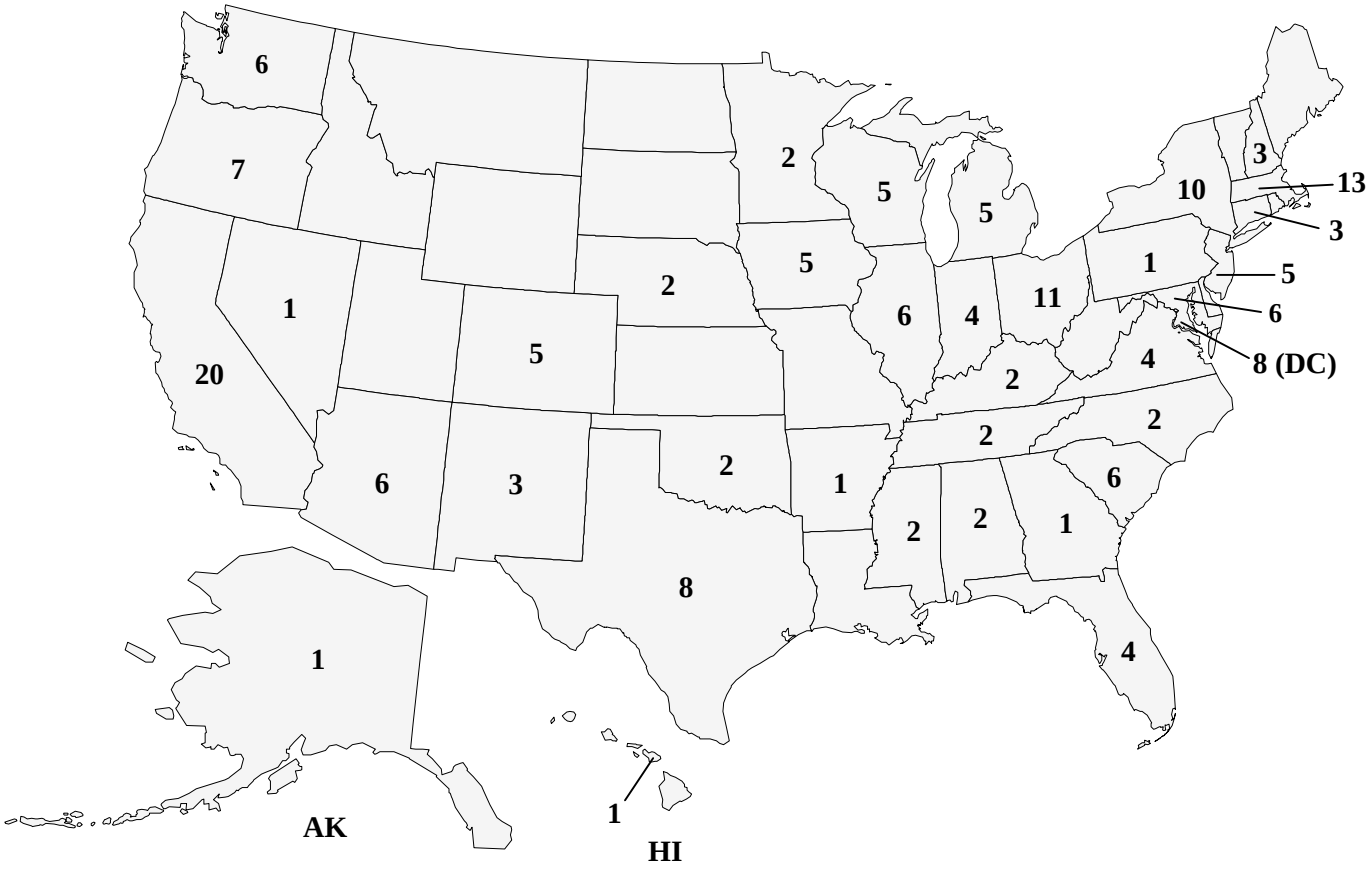
1. NorthWest Center for Emerging Technologies (Bellevue, WA)
2. Northwest Center for Sustainable Resources (Salem, OR)
3. Bio-Link: A National Advanced Technological Education Center for Biotechnology (San Francisco, CA)
4. Marine Advanced Technology Education Center (Monterey, CA)
5. Maricopa Advanced Technology Education Center (Tempe, AZ)
6. Southwest Center for Advanced Technological Education (Sweetwater, TX)
7. Advanced Technology Environmental Education Center (Bettendorf, IA)
8. National Center of Excellence for Advanced Manufacturing Education (Dayton, OH)
9. South Carolina Advanced Technological Education Center (Columbia, SC)
10. New Jersey Center for Advanced Technological Education (Edison, NJ)
11. Northeast Center for Telecommunications Technologies (Springfield, MA)

DISTRIBUTION OF ACTIVE AND NEW ATE AWARDS BY STATE

FY1998

(excluding ATE-supported awards managed by other programs)

Total number of awards: 175



ACTIVE AND NEW ATE AWARDS

FY1998

(excluding ATE-supported awards managed by other programs)

The following list includes new awards made during FY1998, as well as awards made during previous years but still active during FY1998. The list includes only awards managed by the ATE program, not awards which are managed by other programs but which also received a contribution from the ATE program. Award data have been compiled from the NSF main database.

The awards are arranged by the field of technology or science that is their primary focus; however, many projects embrace multiple fields or focus on general education in mathematics or science. ATE centers are denoted by an asterisk (*). The "Abstract Location" column gives the NSF publication number of the *Awards and Activities* book in which an award's abstract can be found.

Abstracts and other award data are also available through the NSF's World Wide Web site <http://www.nsf.gov/> and the Division of Undergraduate Education's Web-based Project Information Resource System <http://www.ehr.nsf.gov/PIRstart/>.

FIELD OF TECHNOLOGY Institution	State	PI	Award No.	$ Total	Effective Date	Expiration Date	Abstract Location
AGRICULTURE							
Hawkeye CC	IA	Brase	9553751	200,000	08/01/95	07/31/98	NSF 97-50, p. 51
Hawkeye CC	IA	Brase	9752081	700,000	08/01/97	07/31/00	NSF 98-110, p. 18
Kings River CC	CA	Clark	9752106	49,433	08/01/97	07/31/98	NSF 98-110, p. 22
U. of New Hampshire	NH	Giles	9752053	74,954	07/01/97	12/31/98	NSF 98-110, p. 15
AQUACULTURE							
New England Board of Higher Ed.	MA	Stewart	9752050	449,975	07/01/97	06/30/00	NSF 98-110, p. 15
BIOTECHNOLOGY							
Catonsville CC	MD	Jones	9850289	499,897	06/01/98	05/31/01	This book, p. 11
City Coll. of San Francisco*	CA	Johnson	9850325	2,999,995	09/01/98	08/31/01	This book, p. 6
Cold Spring Harbor Lab.	NY	Micklos	9752037	599,825	08/01/97	07/31/00	NSF 98-110, p. 14
De Anza Coll.	CA	Schroeder	9553708	225,305	09/01/95	02/28/99	NSF 97-50, p. 49
East Los Angeles Coll.	CA	Chan	9850341	305,000	07/15/98	12/31/99	This book, p. 18
Ed. Development Ctr.	MA	Leff	9752051	406,660	09/01/97	08/31/99	NSF 98-110, p. 15
Foothill Coll.	CA	Carter	9752090	599,983	09/01/97	08/31/00	NSF 98-110, p. 20
Georgetown U.	DC	Chirikjian	9553661	250,000	09/01/95	08/31/98	NSF 97-50, p. 43
Madison Area Tech. Coll.	WI	McMillan	9454555	1,000,000	10/01/94	09/30/98	NSF 97-50, p. 55
Madison Area Tech. Coll.	WI	McMillan	9752027	360,000	10/01/97	09/30/99	NSF 98-110, p. 13
Middlesex CC	MA	Werner	9454642	1,132,394	01/01/95	06/30/99	NSF 97-50, p. 58
Nat l Assn. of Biology Teachers	VA	Frame	9553720	499,239	10/01/95	09/30/99	NSF 97-50, p. 50
Rutgers U. Cook Coll.	NJ	Ward	9602356	350,000	07/15/96	06/30/99	NSF 97-50, p. 29
SUNY Stony Brook	NY	Bynum	9602450	450,000	08/15/96	07/31/98	NSF 97-50, p. 39
Vista Coll.	CA	Des Rochers	9454657	209,074	10/01/94	09/30/98	NSF 97-50, p. 59
CHEMICAL TECHNOLOGY							
Alabama Southern CC	AL	Prout	9850258	870,000	06/01/98	05/31/01	This book, p. 8
Athens Area Tech. Inst.	GA	White	9850247	733,372	06/15/98	05/31/00	This book, p. 7
Edmonds CC	WA	O Brien	9602403	399,470	08/01/96	01/31/00	NSF 97-50, p. 36
Harry S. Truman Coll.	IL	Soucek	9602443	210,081	09/01/96	08/31/99	NSF 97-50, p. 39
Miami U. Middletown	OH	Sarquis	9454518	1,200,000	10/01/94	09/30/98	NSF 97-50, p. 54
Miami U. Middletown	OH	Sarquis	9751993	825,720	10/01/97	09/30/99	NSF 98-110, p. 9
Michigan Technological U.	MI	Fisher	9553671	499,996	09/01/95	08/31/98	NSF 97-50, p. 44
Southeast CC	NE	Kenkel	9553674	191,590	01/01/96	12/31/98	NSF 97-50, p. 44

FIELD OF TECHNOLOGY Institution	State	PI	Award No.	$ Total	Effective Date	Expiration Date	Abstract Location
CHEMICAL TECHNOLOGY *(continued)*							
Southeast CC	NE	Kenkel	9751998	398,479	07/15/97	06/30/99	NSF 98-110, p. 10
U. of Cincinnati	OH	Kryman	9602437	1,098,276	09/01/96	08/31/99	NSF 97-50, p. 38
DISTANCE LEARNING							
Daytona Beach CC	FL	Williams	9752054	551,106	09/01/97	08/31/00	NSF 98-110, p. 16
Texas State Tech. Coll., Sweetwater*	TX	Musgrove	9454643	1,766,637	10/01/94	03/31/98	NSF 97-50, p. 24
Texas State Tech. Coll., Sweetwater*	TX	Johnson	9714435	1,253,697	10/01/97	09/30/00	NSF 98-110, p. 7
U. of Hawaii Maui CC	HI	Converse	9850343	137,893	10/01/98	09/30/99	This book, p. 18
ELECTRONICS, INSTRUMENTATION, LASER AND FIBER OPTICS							
Broward CC	FL	Sanders	9602383	250,000	08/01/96	07/31/99	NSF 97-50, p. 33
CUNY Queensborough CC	NY	Lieberman	9752061	600,000	09/01/97	08/31/00	NSF 98-110, p. 17
Ed. Development Ctr.	MA	Aring	9850299	274,667	10/01/98	09/30/00	This book, p. 11
Front Range CC	CO	Braun	9553685	301,783	09/01/95	08/31/99	NSF 97-50, p. 45
New England Board of Higher Ed.	MA	Massa	9553762	365,100	08/01/95	01/31/98	NSF 97-50, p. 52
North Seattle CC	WA	Eyres	9553726	600,000	09/01/95	08/31/98	NSF 97-50, p. 51
Piedmont Tech. Coll.	SC	Campbell	9454536	123,904	09/01/94	08/31/98	NSF 96-54, p. 35
U. of Connecticut	CT	Roychoudhuri	9752092	267,000	10/01/97	09/30/99	NSF 98-110, p. 20
Western Wisconsin Tech. Coll.	WI	Skewes	9850287	420,000	07/01/98	06/30/00	This book, p. 10
ENGINEERING TECHNOLOGY (GENERAL)							
Cuesta Coll.	CA	Akelian	9850283	82,444	07/01/98	06/30/99	This book, p. 10
Keene State Coll.	NH	Simoneau	9553767	548,260	09/01/95	08/31/98	NSF 97-50, p. 52
Middlesex County Coll.*	NJ	Waintraub	9553749	2,966,472	09/01/95	08/31/98	NSF 97-50, p. 23
Middlesex County Coll.*	NJ	Waintraub	9813444	2,000,001	09/01/98	08/31/01	This book, p. 5
New Mexico State U.	NM	Smolleck	9602430	169,177	08/15/96	01/31/99	NSF 97-50, p. 37
S.C. Bd for Tech. & Comprehensive Ed.*	SC	Craft	9602440	2,100,000	09/01/96	08/31/99	NSF 97-50, p. 21
ENVIRONMENTAL TECHNOLOGY							
Cape Cod CC	MA	Curran	9850318	232,179	06/01/98	05/31/01	This book, p. 15
Chemeketa CC*	OR	Cudmore	9553760	2,998,443	10/01/95	09/30/99	NSF 97-50, p. 24
Chemeketa CC*	OR	Cudmore	9813445	1,996,949	10/01/98	09/30/01	This book, p. 5
CUNY Bronx CC	NY	Fahey	9850304	700,000	07/01/98	06/30/01	This book, p. 12
Hazardous Materials Training & Res. Ctr.*	IA	Kabat	9454638	2,999,866	10/01/94	09/30/98	NSF 97-50, p. 25
Hazardous Materials Training & Res. Ctr.*	IA	Kabat	9714425	2,000,000	09/15/97	08/31/00	NSF 98-110, p. 6
Intelecom Intelligent Telecommunications	CA	Beaty	9454521	1,499,966	09/01/94	08/31/98	NSF 97-50, p. 55
Intelecom Intelligent Telecommunications	CA	Beaty	9751988	986,000	09/01/97	08/31/99	NSF 98-110, p. 9
Mesa State Coll.	CO	Topper	9454633	399,778	10/01/94	09/30/99	NSF 97-50, p. 57
Mount Hood CC	OR	Jackman	9751983	169,158	07/15/97	06/30/00	NSF 98-110, p. 8
Northwest Indian Coll.	WA	Burns	9752076	775,049	09/01/97	08/31/00	NSF 98-110, p. 18
Partnership for Environmental Tech. Ed.	CA	Dickinson	9602365	600,000	10/01/96	03/31/99	NSF 97-50, p. 31
Pima County CC	AZ	Ogden	9602368	330,000	10/01/96	09/30/99	NSF 97-50, p. 31
Stark Tech. Coll.	OH	Cramer	9553768	516,219	09/01/95	08/31/99	NSF 97-50, p. 53
Trident Tech. Coll.	SC	Almquist	9553696	267,965	09/01/95	08/31/98	NSF 97-50, p. 47
U. of Alaska Southeast, Sitka	AK	Carnegie	9553680	600,000	10/01/95	09/30/99	NSF 97-50, p. 45
U. of Minnesota, Duluth	MN	Munson	9752017	656,576	07/01/97	06/30/00	NSF 98-110, p. 11
U. of Nevada Desert Research Inst.	NV	Wetzel	9602351	450,000	10/01/96	09/30/99	NSF 97-50, p. 28
GENERAL or MULTIDISCIPLINARY							
Amarillo Coll.	TX	Jones	9454651	630,000	09/01/94	08/31/98	NSF 97-50, p. 59
Amarillo Coll.	TX	Jones	9850355	200,000	09/15/98	08/31/00	This book, p. 20
Amer. Assn. of Community Colleges	DC	Mahoney	9552975	273,110	09/01/95	02/28/98	NSF 97-50, p. 61

FIELD OF TECHNOLOGY Institution	State	PI	Award No.	$ Total	Effective Date	Expiration Date	Abstract Location
GENERAL or MULTIDISCIPLINARY *(continued)*							
Amer. Assn. of Community Colleges	DC	Barnett	9713868	416,261	08/01/97	01/31/00	NSF 98-110, p. 23
Amer. Chemical Society	DC	Lavallee	9454564	1,500,000	09/01/94	08/31/98	NSF 97-50, p. 56
Amer. Chemical Society	DC	Ware	9752102	639,696	09/01/97	08/31/99	NSF 98-110, p. 21
Austin CC	TX	Rodi	9553689	318,715	09/01/95	12/31/98	NSF 97-50, p. 46
Bay Shore Union Free School District	NY	Brachio	9850257	86,724	05/15/98	04/30/00	This book, p. 8
Colorado CC & Occupational Ed. System	CO	Goodwin	9553706	298,464	09/01/95	08/31/98	NSF 97-50, p. 49
Colorado State U.	CO	James	9602376	75,000	08/01/96	07/31/98	NSF 97-50, p. 33
Harold Washington Coll.	IL	DeSombre	9702044	84,427	02/01/97	07/31/98	NSF 98-110, p. 23
Harvard Coll. Observatory	MA	Sadler	9602404	373,927	01/01/97	12/31/98	NSF 97-50, p. 36
Hillsboro School District 1J	OR	Miller	9752025	205,224	10/01/97	09/30/00	NSF 98-110, p. 12
Hillsborough CC	FL	Falls	9850291	297,906	04/01/98	03/31/01	This book, p. 11
Illinois State U.	IL	Meier	9752083	450,000	09/01/97	08/31/99	NSF 98-110, p. 19
Itasca CC	MN	Wenger	9752084	445,961	06/01/97	12/31/99	NSF 98-110, p. 19
Mission Coll.	CA	Behm	9602345	500,000	01/01/97	12/31/99	NSF 97-50, p. 27
MPR Associates	CA	Hoachlander	9752036	399,913	08/15/97	07/31/00	NSF 98-110, p. 14
Nashville State Tech. Inst.	TN	Ballance	9850307	1,629,004	10/01/98	09/30/01	This book, p. 13
Nat l Alliance of Business	DC	Joyce	9602352	399,972	09/01/96	08/31/99	NSF 97-50, p. 28
Ohio U.	OH	Kline	9850350	90,135	07/01/98	06/30/99	This book, p. 19
Phi Theta Kappa	DC	Risley	9602459	239,912	09/01/96	08/31/98	NSF 97-50, p. 41
Phi Theta Kappa	MS	Risley	9811926	307,847	09/01/98	08/31/00	This book, p. 21
Piedmont Tech. Coll.	SC	Mack	9553740	1,419,128	09/01/95	08/31/99	NSF 97-50, p. 51
Purdue U.	IN	Depew	9602355	1,348,391	08/01/96	07/31/01	NSF 97-50, p. 29
Rose-Hulman Inst. of Technology	IN	Brown	9553705	475,000	09/01/95	08/31/98	NSF 97-50, p. 48
Sinclair CC	OH	Anderson	9752015	100,000	08/01/97	07/31/99	NSF 98-110, p. 11
U. of Chicago	IL	Landsberg	9850273	574,699	07/01/98	06/30/01	This book, p. 9
U. of Illinois, Chicago	IL	Jenkins	9850327	968,187	06/15/98	05/31/01	This book, p. 17
West Valley-Mission CC District	CA	Behm	9454513	300,000	12/01/94	11/30/97	NSF 97-50, p. 54
Wytheville CC	VA	Tice	9602397	299,694	09/15/96	08/31/99	NSF 97-50, p. 35
GEOGRAPHIC INFORMATION SYSTEMS							
Cypress Coll.	CA	Doak	9850306	799,906	09/01/98	08/31/99	This book, p. 12
Geological Society of America	CO	Geary	9602408	614,684	10/01/96	09/30/99	NSF 97-50, p. 37
Henry Ford CC	MI	Waddell	9752086	1,200,000	09/01/97	08/31/00	NSF 98-110, p. 20
Houston CC	TX	Nye	9850344	394,318	06/01/98	05/31/01	This book, p. 19
Indiana State U.	IN	Dando	9553694	306,250	09/01/95	08/31/98	NSF 97-50, p. 46
Prince George s CC	MD	Cunniff	9553662	694,941	09/01/95	08/31/99	NSF 97-50, p. 43
U. of California, Santa Barbara	CA	Goodchild	9602348	188,469	07/01/96	06/30/98	NSF 97-50, p. 27
GRAPHICS and MULTIMEDIA TECHNOLOGY							
Ctr. for Image Processing in Ed.	AZ	Magisos	9454520	1,361,831	01/01/95	04/30/98	NSF 97-50, p. 55
Ctr. for Image Processing in Ed.	AZ	Magisos	9752101	708,968	10/01/97	09/30/99	NSF 98-110, p. 21
CUNY Borough of Manhattan CC	NY	Cohen	9850309	550,000	07/01/98	06/30/01	This book, p. 13
John C. Calhoun State CC	AL	Mitchell	9752014	96,959	09/01/97	02/28/99	NSF 98-110, p. 11
Pasadena City Coll.	CA	Carter	9752096	380,000	09/01/97	08/31/00	NSF 98-110, p. 21
Piedmont Virginia CC	VA	Pittman	9752021	600,000	06/15/97	05/31/00	NSF 98-110, p. 12
INFORMATION TECHNOLOGY, TELECOMMUNICATIONS							
Bellevue CC*	WA	Evans	9553727	3,017,054	09/01/95	12/31/98	NSF 97-50, p. 23
Bellevue CC*	WA	Evans	9813446	1,999,941	09/01/98	08/31/01	This book, p. 6
CUNY Queensborough CC	NY	Mohr	9454613	513,000	09/15/94	06/30/98	NSF 97-50, p. 56
CUNY Queensborough CC	NY	Mohr	9602369	600,000	09/15/96	08/31/99	NSF 97-50, p. 32
Diné Coll.	AZ	Coffey	9850353	819,994	07/01/98	06/30/01	This book, p. 20

FIELD OF TECHNOLOGY Institution	State	PI	Award No.	$ Total	Effective Date	Expiration Date	Abstract Location
INFORMATION TECHNOLOGY, TELECOMMUNICATIONS *(continued)*							
Evergreen Valley Coll.	CA	Estrada	9850337	375,000	06/15/98	11/30/99	This book, p. 18
Jones County Junior Coll.	MS	Cotten	9752060	1,082,122	05/15/97	04/30/00	NSF 98-110, p. 16
Middlesex County Coll.	NJ	Beyer	9602375	309,983	10/01/96	09/30/98	NSF 97-50, p. 33
Nashville State Tech. Inst.	TN	Rogers	9602401	449,594	10/01/96	05/31/99	NSF 97-50, p. 35
San Jose State U.	CA	Ibrahim	9752004	199,944	07/15/97	06/30/99	NSF 98-110, p. 10
Springfield Tech. CC*	MA	Masi	9751990	3,000,000	09/01/97	08/31/00	NSF 98-110, p. 5
Springfield Tech. CC	MA	Mullett	9602433	400,000	10/01/96	09/30/98	NSF 97-50, p. 38
TERC	MA	Muscella	9850311	695,924	06/15/98	05/31/00	This book, p. 14
U. of Kentucky Lexington CC	KY	Crowley	9850313	849,995	07/01/98	06/30/01	This book, p. 14
MACHINE TOOL TECHNOLOGY, METROLOGY							
Madison Area Tech. Coll.	WI	Anderegg	9752032	299,900	09/01/97	08/31/99	NSF 98-110, p. 13
Texas State Tech. Coll., Waco	TX	Pelton	9553716	1,550,000	09/01/95	08/31/99	NSF 97-50, p. 50
MANUFACTURING and INDUSTRIAL TECHNOLOGY							
Camden County Coll.	NJ	Roberts	9454538	160,000	09/15/94	08/31/98	NSF 95-6, p. 27
Cleveland State U.	OH	Schoenig	9602457	608,756	09/01/96	08/31/99	NSF 97-50, p. 40
Cleveland State U.	OH	Schoenig	9850288	206,026	09/01/98	02/29/00	This book, p. 10
Edison Industrial Systems Ctr.	OH	Sully	9602431	1,200,000	09/01/96	12/31/99	NSF 97-50, p. 38
Henry Ford CC	MI	Martini	9850282	500,000	07/01/98	06/30/00	This book, p. 9
Indiana U. Purdue U. Indianapolis	IN	Cooney	9553699	297,475	10/01/95	03/31/98	NSF 97-50, p. 47
Iowa State U.	IA	Schmerr	9602370	673,705	10/01/96	09/30/99	NSF 97-50, p. 32
Johns Hopkins U.	MD	Packer	9553664	1,344,676	09/01/95	08/31/98	NSF 97-50, p. 43
Johns Hopkins U.	MD	Packer	9850249	1,009,041	09/01/98	08/31/01	This book, p. 8
Mount Wachusett CC	MA	Weidhaas	9850317	200,000	07/01/98	06/30/00	This book, p. 14
N.C. State Board of Community Colleges	NC	Girardeau	9553709	139,450	10/01/95	09/30/99	NSF 97-50, p. 49
Norfolk State U.	VA	Jacobs	9751987	66,900	10/01/97	03/31/99	NSF 98-110, p. 9
Oklahoma State U., Okmulgee	OK	Allison	9602390	600,000	07/01/96	12/31/98	NSF 97-50, p. 35
Oklahoma State U., Okmulgee	OK	Allison	9850324	650,000	07/01/98	06/30/01	This book, p. 16
Pennsylvania State U.	PA	Weston	9751984	600,735	08/15/97	07/31/99	NSF 98-110, p. 8
Sinclair CC*	OH	Harrison	9454571	3,000,000	01/01/95	12/31/97	NSF 97-50, p. 25
Sinclair CC*	OH	Harrison	9714424	2,000,000	01/01/98	12/31/00	NSF 98-110, p. 6
Southern Illinois U., Carbondale	IL	Abrate	9850351	284,800	08/15/98	07/31/00	This book, p. 19
Trident Tech. Coll.	SC	Whipple	9752062	240,000	09/01/97	08/31/99	NSF 98-110, p. 17
U. of Washington	WA	Stoebe	9602360	221,174	01/01/97	12/31/00	NSF 97-50, p. 30
Waukesha County Tech. Coll.	WI	Timmer	9752082	700,000	08/01/97	07/31/00	NSF 98-110, p. 19
Wayne State U.	MI	Rathod	9752024	450,000	09/01/97	08/31/00	NSF 98-110, p. 12
Westark Coll.	AR	Connor	9850334	314,278	07/01/98	12/31/99	This book, p. 17
MARINE TECHNOLOGY							
Consortium for Oceanographic Res. & Ed.	DC	Spinrad	9814210	70,598	09/01/98	08/31/99	This book, p. 21
Monterey Peninsula Coll.*	CA	Crane	9752028	2,997,246	09/15/97	08/31/00	NSF 98-110, p. 5
MATHEMATICS							
Adirondack CC	NY	Patrick	9553765	234,194	09/01/95	08/31/99	NSF 97-50, p. 52
Capital Community Tech. Coll.	CT	Pazdar	9602456	259,914	09/01/96	08/31/99	NSF 97-50, p. 40
Capital Community Tech. Coll.	CT	Pazdar	9850244	125,000	04/01/98	03/31/00	This book, p. 7
CUNY Bronx CC	NY	Forman	9713869	187,459	09/01/97	08/31/99	NSF 98-110, p. 24
Lane CC	OR	Shellabarger	9752058	262,800	10/01/97	09/30/00	NSF 98-110, p. 16
Maricopa County CC District	AZ	Jacobs	9602386	353,235	09/01/96	08/31/99	NSF 97-50, p. 34
Mount Hood CC	OR	Curtis	9454627	469,923	09/01/94	08/31/98	NSF 97-50, p. 57
U. of Kentucky	KY	Newberry	9454585	799,991	10/01/94	06/30/98	NSF 97-50, p. 56

FIELD OF TECHNOLOGY Institution	State	PI	Award No.	$ Total	Effective Date	Expiration Date	Abstract Location
MATHEMATICS *(continued)*							
Wake Tech. CC	NC	Kimball	9752038	119,999	09/01/97	08/31/99	NSF 98-110, p. 14
Wentworth Inst. of Technology	MA	Simundza	9553704	492,392	09/01/95	08/31/99	NSF 97-50, p. 48
PHYSICS							
Amer. Assn. of Physics Teachers	MD	Monroe	9450160	1,185,405	03/15/95	02/29/00	NSF 97-50, p. 62
Amer. Inst. of Physics	MD	Neuschatz	9453180	385,680	07/01/95	06/30/99	NSF 97-50, p. 61
Austin CC	TX	Rodi	9850319	144,947	01/01/99	12/31/00	This book, p. 15
Concord Consortium	MA	Tinker	9454575	432,743	10/01/94	12/31/97	NSF 97-50, p. 56
Henry Ford CC	MI	Eshelman	9454620	146,738	09/01/94	08/31/98	NSF 96-54, p. 39
New Hampshire Tech. Coll., Berlin	NH	Davis	9850326	238,270	05/15/98	04/30/00	This book, p. 16
Seminole CC	FL	Dickison	9553665	429,521	10/01/95	09/30/99	NSF 97-50, p. 44
SEMICONDUCTOR MANUFACTURING							
Albuquerque Tech. Vocational Inst.	NM	Willis	9602349	421,318	10/01/96	09/30/99	NSF 97-50, p. 27
Maricopa County CC District*	AZ	de los Santos	9602373	2,713,446	09/01/96	08/31/99	NSF 97-50, p. 21
Portland CC	OR	Hata	9454589	200,000	11/01/94	10/31/97	NSF 96-54, p. 38
U. of New Mexico	NM	Wood	9850310	900,000	07/01/98	06/30/01	This book, p. 13
TRANSPORTATION							
Coll. of the Desert	CA	Pulliam	9602448	299,980	08/01/96	12/31/98	NSF 97-50, p. 39
York Tech. Coll.	SC	Kosak	9850269	500,000	10/01/98	09/30/01	This book, p. 9

STATE INDEX

Active and New Awards (1998)

Institution	PI	Award No.	Abstract Location
Alabama			
Alabama Southern CC	Prout	9850258	This book, p. 8
John C. Calhoun State CC	Mitchell	9752014	NSF 98-110, p. 11
Alaska			
U. of Alaska Southeast, Sitka	Carnegie	9553680	NSF 97-50, p. 45
Arizona			
Ctr. for Image Processing in Ed.	Magisos	9454520	NSF 97-50, p. 55
"	"	9752101	NSF 98-110, p. 21
Diné Coll.	Coffey	9850353	This book, p. 20
Maricopa County CC District	de los Santos	9602373	NSF 97-50, p. 21
"	Jacobs	9602386	NSF 97-50, p. 34
Pima County CC	Ogden	9602368	NSF 97-50, p. 31
Arkansas			
Westark Coll.	Connor	9850334	This book, p. 17
California			
City Coll. of San Francisco	Johnson	9850325	This book, p. 6
Coll. of the Desert	Pulliam	9602448	NSF 97-50, p. 39
Cuesta Coll.	Akelian	9850283	This book, p. 10
Cypress Coll.	Doak	9850306	This book, p. 12
De Anza Coll.	Schroeder	9553708	NSF 97-50, p. 49
East Los Angeles Coll.	Chan	9850341	This book, p. 18
Evergreen Valley Coll.	Estrada	9850337	This book, p. 18
Foothill Coll.	Carter	9752090	NSF 98-110, p. 20
Intelecom Intelligent Telecommunications	Beaty	9454521	NSF 97-50, p. 55
"	"	9751988	NSF 98-110, p. 9
Kings River CC	Clark	9752106	NSF 98-110, p. 22
Mission Coll.	Behm	9602345	NSF 97-50, p. 27
Monterey Peninsula Coll.	Crane	9752028	NSF 98-110, p. 5
MPR Associates	Hoachlander	9752036	NSF 98-110, p. 14
Partnership for Environmental Technology Ed.	Dickinson	9602365	NSF 97-50, p. 31
Pasadena City Coll.	Carter	9752096	NSF 98-110, p. 21
San Jose State U.	Ibrahim	9752004	NSF 98-110, p. 10
U. of California, Santa Barbara	Goodchild	9602348	NSF 97-50, p. 27
Vista Coll.	Des Rochers	9454657	NSF 97-50, p. 59
West Valley–Mission CC District	Behm	9454513	NSF 97-50, p. 54
Colorado			
Colorado CC and Occupational Ed. System	Goodwin	9553706	NSF 97-50, p. 49
Colorado State U.	James	9602376	NSF 97-50, p. 33
Front Range CC	Braun	9553685	NSF 97-50, p. 45
Geological Society of America	Geary	9602408	NSF 97-50, p. 37
Mesa State Coll.	Topper	9454633	NSF 97-50, p. 57

Institution	PI	Award No.	Abstract Location
Connecticut			
Capital Community Tech. Coll.	Pazdar	9602456	NSF 97-50, p. 40
"	"	9850244	This book, p. 7
U. of Connecticut	Roychoudhuri	9752092	NSF 98-110, p. 20
District of Columbia			
Amer. Assn. of Community Colleges	Barnett	9713868	NSF 98-110, p. 23
"	Mahoney	9552975	NSF 97-50, p. 61
Amer. Chemical Society	Lavallee	9454564	NSF 97-50, p. 56
"	Ware	9752102	NSF 98-110, p. 21
Consortium for Oceanographic Research and Ed.	Spinrad	9814210	This book, p. 21
Georgetown U.	Chirikjian	9553661	NSF 97-50, p. 43
Nat'l Alliance of Business	Joyce	9602352	NSF 97-50, p. 28
Phi Theta Kappa, Washington Office	Risley	9602459	NSF 97-50, p. 41
Florida			
Broward CC	Sanders	9602383	NSF 97-50, p. 33
Daytona Beach CC	Williams	9752054	NSF 98-110, p. 16
Hillsborough CC	Falls	9850291	This book, p. 11
Seminole CC	Dickison	9553665	NSF 97-50, p. 44
Georgia			
Athens Area Tech. Inst.	White	9850247	This book, p. 7
Hawaii			
U. of Hawaii Maui CC	Converse	9850343	This book, p. 18
Illinois			
City Colleges of Chicago Harold Washington Coll.	DeSombre	9702044	NSF 98-110, p. 23
City Colleges of Chicago Harry S. Truman Coll.	Soucek	9602443	NSF 97-50, p. 39
Illinois State U.	Meier	9752083	NSF 98-110, p. 19
Southern Illinois U., Carbondale	Abrate	9850351	This book, p. 19
U. of Chicago	Landsberg	9850273	This book, p. 9
U. of Illinois, Chicago	Jenkins	9850327	This book, p. 17
Indiana			
Indiana State U.	Dando	9553694	NSF 97-50, p. 46
Indiana U.–Purdue U. Indianapolis	Cooney	9553699	NSF 97-50, p. 47
Purdue U.	Depew	9602355	NSF 97-50, p. 29
Rose-Hulman Inst. of Technology	Brown	9553705	NSF 97-50, p. 48
Iowa			
Hawkeye CC	Brase	9553751	NSF 97-50, p. 51
"	"	9752081	NSF 98-110, p. 18
Hazardous Materials Training and Research Ctr.	Kabat	9454638	NSF 97-50, p. 25
"	"	9714425	NSF 98-110, p. 6
Iowa State U.	Schmerr	9602370	NSF 97-50, p. 32

Institution	PI	Award No.	Abstract Location
Kentucky			
U. of Kentucky	Newberry	9454585	NSF 97-50, p. 56
U. of Kentucky Lexington CC	Crowley	9850313	This book, p. 14
Maryland			
Amer. Assn. of Physics Teachers	Monroe	9450160	NSF 97-50, p. 62
Amer. Inst. of Physics	Neuschatz	9453180	NSF 97-50, p. 61
Catonsville CC	Jones	9850289	This book, p. 11
Johns Hopkins U.	Packer	9553664	NSF 97-50, p. 43
"	"	9850249	This book, p. 8
Prince George's CC	Cunniff	9553662	NSF 97-50, p. 43
Massachusetts			
Cape Cod CC	Curran	9850318	This book, p. 15
Concord Consortium	Tinker	9454575	NSF 97-50, p. 56
Ed. Development Ctr.	Aring	9850299	This book, p. 11
"	Leff	9752051	NSF 98-110, p. 15
Harvard Coll. Observatory	Sadler	9602404	NSF 97-50, p. 36
Middlesex CC	Werner	9454642	NSF 97-50, p. 58
Mount Wachusett CC	Weidhaas	9850317	This book, p. 14
New England Board of Higher Ed.	Massa	9553762	NSF 97-50, p. 52
"	Stewart	9752050	NSF 98-110, p. 15
Springfield Tech. CC	Masi	9751990	NSF 98-110, p. 5
"	Mullett	9602433	NSF 97-50, p. 38
TERC	Muscella	9850311	This book, p. 14
Wentworth Inst. of Technology	Simundza	9553704	NSF 97-50, p. 48
Michigan			
Henry Ford CC	Eshelman	9454620	NSF 96-54, p. 39
"	Martini	9850282	This book, p. 9
"	Waddell	9752086	NSF 98-110, p. 20
Michigan Technological U.	Fisher	9553671	NSF 97-50, p. 44
Wayne State U.	Rathod	9752024	NSF 98-110, p. 12
Minnesota			
Itasca CC	Wenger	9752084	NSF 98-110, p. 19
U. of Minnesota, Duluth	Munson	9752017	NSF 98-110, p. 11
Mississippi			
Jones County Junior Coll.	Cotten	9752060	NSF 98-110, p. 16
Phi Theta Kappa Headquarters	Risley	9811926	This book, p. 21
Nebraska			
Southeast CC	Kenkel	9553674	NSF 97-50, p. 44
"	"	9751998	NSF 98-110, p. 10
Nevada			
U. of Nevada Desert Research Inst.	Wetzel	9602351	NSF 97-50, p. 28

Institution	PI	Award No.	Abstract Location
New Hampshire			
Keene State Coll.	Simoneau	9553767	NSF 97-50, p. 52
New Hampshire Tech. Coll., Berlin	Davis	9850326	This book, p. 16
U. of New Hampshire	Giles	9752053	NSF 98-110, p. 15
New Jersey			
Camden County Coll.	Roberts	9454538	NSF 95-6, p. 27
Middlesex County Coll.	Beyer	9602375	NSF 97-50, p. 33
"	Waintraub	9553749	NSF 97-50, p. 23
"	"	9813444	This book, p. 5
Rutgers U. Cook Coll.	Ward	9602356	NSF 97-50, p. 29
New Mexico			
Albuquerque Tech. Vocational Inst.	Willis	9602349	NSF 97-50, p. 27
New Mexico State U.	Smolleck	9602430	NSF 97-50, p. 37
U. of New Mexico	Wood	9850310	This book, p. 13
New York			
Adirondack CC	Patrick	9553765	NSF 97-50, p. 52
Bay Shore Union Free School District	Brachio	9850257	This book, p. 8
Cold Spring Harbor Lab.	Micklos	9752037	NSF 98-110, p. 14
CUNY Borough of Manhattan CC	Cohen	9850309	This book, p. 13
CUNY Bronx CC	Fahey	9850304	This book, p. 12
"	Forman	9713869	NSF 98-110, p. 24
CUNY Queensborough CC	Lieberman	9752061	NSF 98-110, p. 17
"	Mohr	9454613	NSF 97-50, p. 56
"	"	9602369	NSF 97-50, p. 32
SUNY Stony Brook	Bynum	9602450	NSF 97-50, p. 39
North Carolina			
N.C. State Board of Community Colleges	Girardeau	9553709	NSF 97-50, p. 49
Wake Tech. CC	Kimball	9752038	NSF 98-110, p. 14
Ohio			
Cleveland State U.	Schoenig	9602457	NSF 97-50, p. 40
"	"	9850288	This book, p. 10
Edison Industrial Systems Ctr.	Sully	9602431	NSF 97-50, p. 38
Miami U. Middletown	Sarquis	9454518	NSF 97-50, p. 54
"	"	9751993	NSF 98-110, p. 9
Ohio U.	Kline	9850350	This book, p. 19
Sinclair CC	Anderson	9752015	NSF 98-110, p. 11
"	Harrison	9454571	NSF 97-50, p. 25
"	"	9714424	NSF 98-110, p. 6
Stark Tech. Coll.	Cramer	9553768	NSF 97-50, p. 53
U. of Cincinnati	Kryman	9602437	NSF 97-50, p. 38
Oklahoma			
Oklahoma State U., Okmulgee	Allison	9602390	NSF 97-50, p. 35
"	"	9850324	This book, p. 16

Institution	PI	Award No.	Abstract Location
Oregon			
Chemeketa CC	Cudmore	9553760	NSF 97-50, p. 24
"	"	9813445	This book, p. 5
Hillsboro School District 1J	Miller	9752025	NSF 98-110, p. 12
Lane CC	Shellabarger	9752058	NSF 98-110, p. 16
Mount Hood CC	Curtis	9454627	NSF 97-50, p. 57
"	Jackman	9751983	NSF 98-110, p. 8
Portland CC	Hata	9454589	NSF 96-54, p. 38
Pennsylvania			
Pennsylvania State U.	Weston	9751984	NSF 98-110, p. 8
South Carolina			
Piedmont Tech. Coll.	Campbell	9454536	NSF 96-54, p. 35
"	Mack	9553740	NSF 97-50, p. 51
S.C. State Board for Tech. and Comprehensive Ed.	Craft	9602440	NSF 97-50, p. 21
Trident Tech. Coll.	Almquist	9553696	NSF 97-50, p. 47
"	Whipple	9752062	NSF 98-110, p. 17
York Tech. Coll.	Kosak	9850269	This book, p. 9
Tennessee			
Nashville State Tech. Inst.	Ballance	9850307	This book, p. 13
"	Rogers	9602401	NSF 97-50, p. 35
Texas			
Amarillo Coll.	Jones	9454651	NSF 97-50, p. 59
"	"	9850355	This book, p. 20
Austin CC	Rodi	9553689	NSF 97-50, p. 46
"	"	9850319	This book, p. 15
Houston CC	Nye	9850344	This book, p. 19
Texas State Tech. Coll., Sweetwater	Johnson	9714435	NSF 98-110, p. 7
"	Musgrove	9454643	NSF 97-50, p. 24
Texas State Tech. Coll., Waco	Pelton	9553716	NSF 97-50, p. 50
Virginia			
Nat'l Assn. of Biology Teachers	Frame	9553720	NSF 97-50, p. 50
Norfolk State U.	Jacobs	9751987	NSF 98-110, p. 9
Piedmont Virginia CC	Pittman	9752021	NSF 98-110, p. 12
Wytheville CC	Tice	9602397	NSF 97-50, p. 35
Washington			
Bellevue CC	Evans	9553727	NSF 97-50, p. 23
"	"	9813446	This book, p. 6
Edmonds CC	O'Brien	9602403	NSF 97-50, p. 36
North Seattle CC	Eyres	9553726	NSF 97-50, p. 51
Northwest Indian Coll.	Burns	9752076	NSF 98-110, p. 18
U. of Washington	Stoebe	9602360	NSF 97-50, p. 30

Institution	PI	Award No.	Abstract Location
Wisconsin			
Madison Area Tech. Coll.	Anderegg	9752032	NSF 98-110, p. 13
"	McMillan	9454555	NSF 97-50, p. 55
"	"	9752027	NSF 98-110, p. 13
Waukesha County Tech. Coll.	Timmer	9752082	NSF 98-110, p. 19
Western Wisconsin Tech. Coll.	Skewes	9850287	This book, p. 10

PRINCIPAL INVESTIGATOR INDEX

PI	Institution	Award No.	Abstract Location
A			
Abrate, Serge	Southern Illinois U., Carbondale	9850351	This book, p. 19
Akelian, Christopher	Cuesta Coll.	9850283	This book, p. 10
Allison, Rick	Oklahoma State U., Okmulgee	9602390	NSF 97-50, p. 35
"	"	9850324	This book, p. 16
Almquist, Catharine	Trident Tech. Coll.	9553696	NSF 97-50, p. 47
Anderegg, Barbara	Madison Area Tech. Coll.	9752032	NSF 98-110, p. 13
Anderson, Shepherd	Sinclair CC	9752015	NSF 98-110, p. 11
Aring, Monika	Ed. Development Ctr.	9850299	This book, p. 11
B			
Ballance, Collin	Nashville State Tech. Inst.	9850307	This book, p. 13
Barnett, Lynn	Amer. Assn. of Community Colleges	9713868	NSF 98-110, p. 23
Beaty, Sally	Intelecom Intelligent Telecommunications	9454521	NSF 97-50, p. 55
"	"	9751988	NSF 98-110, p. 9
Behm, Charlotte	Mission Coll.	9454513	NSF 97-50, p. 54
"	"	9602345	NSF 97-50, p. 27
Beyer, David	Middlesex County Coll.	9602375	NSF 97-50, p. 33
Brachio, Brian	Bay Shore Union Free School District	9850257	This book, p. 8
Brase, Terry	Hawkeye CC	9553751	NSF 97-50, p. 51
"	"	9752081	NSF 98-110, p. 18
Braun, Christopher	Front Range CC	9553685	NSF 97-50, p. 45
Brown, Buck	Rose-Hulman Inst. of Technology	9553705	NSF 97-50, p. 48
Burns, Dan	Northwest Indian Coll.	9752076	NSF 98-110, p. 18
Bynum, R. David	SUNY Stony Brook	9602450	NSF 97-50, p. 39
C			
Campbell, Gordon	Piedmont Tech. Coll.	9454536	NSF 96-54, p. 35
Carnegie, John	U. of Alaska Southeast, Sitka	9553680	NSF 97-50, p. 45
Carter, Bruce	Pasadena City Coll.	9752096	NSF 98-110, p. 21
Carter, Celeste	Foothill Coll.	9752090	NSF 98-110, p. 20
Chan, Carcy	East Los Angeles Coll.	9850341	This book, p. 18
Chirikjian, Jack	Georgetown U.	9553661	NSF 97-50, p. 43
Clark, David	Kings River CC	9752106	NSF 98-110, p. 22
Coffey, Charles	Dine Coll.	9850353	This book, p. 20
Cohen, Alice	CUNY Borough of Manhattan CC	9850309	This book, p. 13
Connor, Sidney	Westark Coll.	9850334	This book, p. 17
Converse, Robert	U. of Hawaii Maui CC	9850343	This book, p. 18
Cooney, Elaine	Indiana U.–Purdue U. Indianapolis	9553699	NSF 97-50, p. 47
Cotten, Catherine	Jones County Junior Coll.	9752060	NSF 98-110, p. 16
Craft, Elaine	S.C. State Board for Tech. and Comprehensive Ed.	9602440	NSF 97-50, p. 21
Cramer, Jeffrey	Stark Tech. Coll.	9553768	NSF 97-50, p. 53
Crane, Nicole	Monterey Peninsula Coll.	9752028	NSF 98-110, p. 5
Crowley, Lillie	U. of Kentucky Lexington CC	9850313	This book, p. 14
Cudmore, Wynn	Chemeketa CC	9553760	NSF 97-50, p. 24
"	"	9813445	This book, p. 5
Cunniff, Patricia	Prince George's CC	9553662	NSF 97-50, p. 43
Curran, Mary	Cape Cod CC	9850318	This book, p. 15
Curtis, Catherine	Mount Hood CC	9454627	NSF 97-50, p. 57

PI	Institution	Award No.	Abstract Location
D			
Dando, William	Indiana State U.	9553694	NSF 97-50, p. 46
Davis, Doyle	New Hampshire Tech. Coll., Berlin	9850326	This book, p. 16
Deak, Joseph	Lakeland CC	9851385	This book, p. 24
de los Santos, Alfredo	Maricopa County CC District	9602373	NSF 97-50, p. 21
Depew, Dennis	Purdue U.	9602355	NSF 97-50, p. 29
Des Rochers, Barbara	Vista Coll.	9454657	NSF 97-50, p. 59
DeSombre, Nancy	City Colleges of Chicago Harold Washington Coll.	9702044	NSF 98-110, p. 23
Dickinson, Paul	Partnership for Environmental Technology Ed.	9602365	NSF 97-50, p. 31
Dickison, Alexander	Seminole CC	9553665	NSF 97-50, p. 44
Doak, Leslie	Cypress Coll.	9850306	This book, p. 12
E			
Eshelman, Robert	Henry Ford CC	9454620	NSF 96-54, p. 39
Estrada, Henry	Evergreen Valley Coll.	9850337	This book, p. 18
Evans, Neil	Bellevue CC	9553727	NSF 97-50, p. 23
"	"	9813446	This book, p. 6
Eyres, Davene	North Seattle CC	9553726	NSF 97-50, p. 51
F			
Fahey, James	CUNY Bronx CC	9850304	This book, p. 12
Falls, William	Hillsborough CC	9850291	This book, p. 11
Fisher, Edward	Michigan Technological U.	9553671	NSF 97-50, p. 44
Forman, Susan	CUNY Bronx CC	9713869	NSF 98-110, p. 24
Frame, Kathleen	Nat'l Assn. of Biology Teachers	9553720	NSF 97-50, p. 50
G			
Geary, Edward	Geological Society of America	9602408	NSF 97-50, p. 37
Giles, Brian	U. of New Hampshire	9752053	NSF 98-110, p. 15
Girardeau, Carolyn	N.C. State Board of Community Colleges	9553709	NSF 97-50, p. 49
Goodchild, Michael	U. of California, Santa Barbara	9602348	NSF 97-50, p. 27
Goodwin, Don	Colorado CC and Occupational Ed. System	9553706	NSF 97-50, p. 49
H			
Harrison, David	Sinclair CC	9454571	NSF 97-50, p. 25
"	"	9714424	NSF 98-110, p. 6
Hata, David	Portland CC	9454589	NSF 96-54, p. 38
Hoachlander, Gareth	MPR Associates	9752036	NSF 98-110, p. 14
I			
Ibrahim, Nabil	San Jose State U.	9752004	NSF 98-110, p. 10
J			
Jackman, Andrew	Mount Hood CC	9751983	NSF 98-110, p. 8
Jacobs, Alan	Maricopa County CC District	9602386	NSF 97-50, p. 34
Jacobs, James	Norfolk State U.	9751987	NSF 98-110, p. 9
James, Keith	Colorado State U.	9602376	NSF 97-50, p. 33
Jenkins, Davis	U. of Illinois, Chicago	9850327	This book, p. 17
Johnson, Clay	Texas State Tech. Coll., Sweetwater	9714435	NSF 98-110, p. 7
Johnson, Elaine	City Coll. of San Francisco	9850325	This book, p. 6

PI	Institution	Award No.	Abstract Location
Jones, Diane	Catonsville CC	9850289	This book, p. 11
Jones, Richard	Sinclair CC	9752787	This book, p. 23
Jones, Therese	Amarillo Coll.	9454651	NSF 97-50, p. 59
"	"	9850355	This book, p. 20
Joyce, Peter	Nat'l Alliance of Business	9602352	NSF 97-50, p. 28
K			
Kabat, Ellen	Hazardous Materials Training and Research Ctr.	9454638	NSF 97-50, p. 25
"	"	9714425	NSF 98-110, p. 6
Kenkel, John	Southeast CC	9553674	NSF 97-50, p. 44
"	"	9751998	NSF 98-110, p. 10
Kimball, Robert	Wake Tech. CC	9752038	NSF 98-110, p. 14
Kline, Martha	Ohio U.	9850350	This book, p. 19
Kosak, Robert	York Tech. Coll.	9850269	This book, p. 9
Kryman, Fritz	U. of Cincinnati	9602437	NSF 97-50, p. 38
L			
Landsberg, Randall	U. of Chicago	9850273	This book, p. 9
Lavallee, David	Amer. Chemical Society	9454564	NSF 97-50, p. 56
Leff, Judith	Ed. Development Ctr.	9752051	NSF 98-110, p. 15
Lieberman, David	CUNY Queensborough CC	9752061	NSF 98-110, p. 17
Loepp, Franzie	Illinois State U.	9816812	This book, p. 24
M			
Mack, Lynn	Piedmont Tech. Coll.	9553740	NSF 97-50, p. 51
Magisos, Melanie	Ctr. for Image Processing in Ed.	9454520	NSF 97-50, p. 55
"	"	9752101	NSF 98-110, p. 21
Mahoney, James	Amer. Assn. of Community Colleges	9552975	NSF 97-50, p. 61
Martini, James	Henry Ford CC	9850282	This book, p. 9
Masi, James	Springfield Tech. CC	9751990	NSF 98-110, p. 5
Massa, Nicholas	New England Board of Higher Ed.	9553762	NSF 97-50, p. 52
McMillan, Joy	Madison Area Tech. Coll.	9454555	NSF 97-50, p. 55
"	"	9752027	NSF 98-110, p. 13
Meier, Ronald	Illinois State U.	9752083	NSF 98-110, p. 19
Micklos, David	Cold Spring Harbor Lab.	9752037	NSF 98-110, p. 14
Miller, Alan	Hillsboro School District 1J	9752025	NSF 98-110, p. 12
Mitchell, Sue	John C. Calhoun State CC	9752014	NSF 98-110, p. 11
Mohr, Bernard	CUNY Queensborough CC	9454613	NSF 97-50, p. 56
"	"	9602369	NSF 97-50, p. 32
Monroe, Mary Beth	Amer. Assn. of Physics Teachers	9450160	NSF 97-50, p. 62
Mullett, Gary	Springfield Tech. CC	9602433	NSF 97-50, p. 38
Munson, Bruce	U. of Minnesota, Duluth	9752017	NSF 98-110, p. 11
Muscella, Deborah	TERC	9850311	This book, p. 14
Musgrove, Robert	Texas State Tech. Coll., Sweetwater	9454643	NSF 97-50, p. 24
N			
Neuschatz, Michael	Amer. Inst. of Physics	9453180	NSF 97-50, p. 61
Newberry, Anthony	U. of Kentucky	9454585	NSF 97-50, p. 56
Nye, Osborne	Houston CC	9850344	This book, p. 19

PI	Institution	Award No.	Abstract Location
O			
O'Brien, Mary	Edmonds CC	9602403	NSF 97-50, p. 36
Ogden, Gregory	Pima County CC	9602368	NSF 97-50, p. 31
P			
Packer, Arnold	Johns Hopkins U.	9553664	NSF 97-50, p. 43
"	"	9850249	This book, p. 8
Patrick, Alfred	Adirondack CC	9553765	NSF 97-50, p. 52
Pazdar, John	Capital Community Tech. Coll.	9602456	NSF 97-50, p. 40
"	"	9850244	This book, p. 7
Pelton, Wallace	Texas State Tech. Coll., Waco	9553716	NSF 97-50, p. 50
Pittman, Edward	Piedmont Virginia CC	9752021	NSF 98-110, p. 12
Prout, Christie	Alabama Southern CC	9850258	This book, p. 8
Pulliam, James	Coll. of the Desert	9602448	NSF 97-50, p. 39
R			
Rathod, Mulchand	Wayne State U.	9752024	NSF 98-110, p. 12
Risley, Rod	Phi Theta Kappa	9602459	NSF 97-50, p. 41
"	"	9811926	This book, p. 21
Roberts, Melvin	Camden County Coll.	9454538	NSF 95-6, p. 27
Rodi, Stephen	Austin CC	9553689	NSF 97-50, p. 46
"	"	9850319	This book, p. 15
Rogers, Sydney	Nashville State Tech. Inst.	9602401	NSF 97-50, p. 35
Roychoudhuri, Chandra	U. of Connecticut	9752092	NSF 98-110, p. 20
S			
Sadler, Philip	Harvard Coll. Observatory	9602404	NSF 97-50, p. 36
Sanders, Sandra	Broward CC	9602383	NSF 97-50, p. 33
Sarquis, Arlyne	Miami U. Middletown	9454518	NSF 97-50, p. 54
"	"	9751993	NSF 98-110, p. 9
Schmerr, Lester	Iowa State U.	9602370	NSF 97-50, p. 32
Schoenig, Frederick	Cleveland State U.	9602457	NSF 97-50, p. 40
"	"	9850288	This book, p. 10
Schroeder, Richard	De Anza Coll.	9553708	NSF 97-50, p. 49
Shellabarger, David	Lane CC	9752058	NSF 98-110, p. 16
Simoneau, Robert	Keene State Coll.	9553767	NSF 97-50, p. 52
Simundza, Gary	Wentworth Inst. of Technology	9553704	NSF 97-50, p. 48
Skewes, Glen	Western Wisconsin Tech. Coll.	9850287	This book, p. 10
Smolleck, Howard	New Mexico State U.	9602430	NSF 97-50, p. 37
Soucek, Donald	City Colleges of Chicago Harry S. Truman Coll.	9602443	NSF 97-50, p. 39
Spinrad, Richard	Consortium for Oceanographic Research and Ed.	9814210	This book, p. 21
Steinitz, Jason	Erie CC	9752688	This book, p. 23
Stewart, Lance	New England Board of Higher Ed.	9752050	NSF 98-110, p. 15
Stoebe, Thomas	U. of Washington	9602360	NSF 97-50, p. 30
Sully, Lionel	Edison Industrial Systems Ctr.	9602431	NSF 97-50, p. 38
T			
Tice, John	Wytheville CC	9602397	NSF 97-50, p. 35
Timmer, William	Waukesha County Tech. Coll.	9752082	NSF 98-110, p. 19
Tinker, Robert	Concord Consortium	9454575	NSF 97-50, p. 56
Topper, Karl	Mesa State Coll.	9454633	NSF 97-50, p. 57

PI	Institution	Award No.	Abstract Location
W			
Waddell, Stuart	Henry Ford CC	9752086	NSF 98-110, p. 20
Waintraub, Jack	Middlesex County Coll.	9553749	NSF 97-50, p. 23
"	"	9813444	This book, p. 5
Ward, William	Rutgers U. Cook Coll.	9602356	NSF 97-50, p. 29
Ware, Sylvia	Amer. Chemical Society	9752102	NSF 98-110, p. 21
Weidhaas, Nicholas	Mount Wachusett CC	9850317	This book, p. 14
Wenger, Aaron	Itasca CC	9752084	NSF 98-110, p. 19
Werner, Barry	Middlesex CC	9454642	NSF 97-50, p. 58
Weston, Timothy	Pennsylvania State U.	9751984	NSF 98-110, p. 8
Wetzel, Melanie	U. of Nevada Desert Research Inst.	9602351	NSF 97-50, p. 28
Whipple, Bruce	Trident Tech. Coll.	9752062	NSF 98-110, p. 17
White, Carol	Athens Area Tech. Inst.	9850247	This book, p. 7
Williams, Bob	Daytona Beach CC	9752054	NSF 98-110, p. 16
Willis, Mary Jane	Albuquerque Tech. Vocational Inst.	9602349	NSF 97-50, p. 27
Wood, John	U. of New Mexico	9850310	This book, p. 13
Wulf, William	Nat'l Academy of Sciences	9814135	This book, p. 24

ATE PROGRAM STAFF
FY1998

Division of Undergraduate Education (DUE)
Division of Elementary, Secondary, and Informal Education (ESIE)

Division Directors	***Primary Field***
Margaret B. Cozzens, ESIE (through June 1998)	Mathematics
Hyman H. Field, ESIE (Acting DD after June 1998)	Psychology
Norman L. Fortenberry, DUE	Engineering
ATE Lead Program Directors	
Gerhard L. Salinger, ESIE	Physics
Elizabeth J. Teles, DUE	Mathematics
ATE Program Directors and Program Consultants	
Lowell Bethel, ESIE	Biology
Michael R. Haney, ESIE	Technology Education
Jack G. Hehn, DUE (ORISE*)	Physics
Daniel Householder, ESIE	Technology Education
Thomas H. Howell, DUE	Engineering and Computer Science
Donald E. Jones, ESIE	Chemistry
Duncan E. McBride, DUE	Physics
Joseph G. Pelliccia, DUE	Biology
Herbert H. Richtol, DUE	Chemistry
Robert W. Ridky, DUE	Geosciences
Frank A. Settle, DUE	Chemistry
Joseph V. Stewart, ESIE	Technology Education
Wayne W. Sukow, ESIE	Physics
Frank Wattenberg, DUE	Mathematics
Margaret D. (Peggie) Weeks, DUE	Engineering
ATE Science Education Analyst	
R. Corby Hovis, DUE	Physics and Astronomy

ATE Administrative Staff

William C. Aigner, Senior Program Assistant, DUE
Melissa M. Lee, Senior Program Assistant, ESIE
Daphne Marshall, Senior Program Assistant, ESIE
Johnnie Riser, Program Assistant, DUE

DUE Contractor Support Staff

Michelle A. Raynesford, Information Specialist, Friday Systems Services
Karen Warfield, Consultant Staff Assistant, ORISE*

---

* Oak Ridge Institute for Science and Education (ORISE)

Notices from the National Science Foundation

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to compete fully in its programs. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

Catalog of Federal Domestic Assistance: CFDA 47.076

NATIONAL SCIENCE FOUNDATION
ARLINGTON, VA 22230

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

RETURN THIS COVER SHEET TO ROOM P35 IF YOU DO NOT WISH TO RECEIVE THIS MATERIAL, OR IF A CHANGE OF ADDRESS IS NEEDED. INDICATE THE CHANGES, INCLUDING ZIP CODE, ON THE LABEL (DO NOT REMOVE LABEL).

NSF 99-113
(Replaces NSF 98-110)