

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

NSF's Directorate for Education and Human Resources (EHR) provides national leadership in the effort to improve science, technology, engineering, and mathematics (STEM) education at all levels, from pre-Kindergarten to grade 12, and undergraduate through graduate.

The EHR Directorate supports programs and activities through the following:

- [Math and Science Partnership \(MSP\)](#)
- [Division of Educational System Reform \(ESR\)](#)
- [Division of Elementary, Secondary, and Informal Education \(ESIE\)](#)
- [Division of Graduate Education \(DGE\)](#)
- [Division of Human Resource Development \(HRD\)](#)
- [Division of Research, Evaluation, and Communication \(REC\)](#)
- [Division of Undergraduate Education \(DUE\)](#)
- [Experimental Program to Stimulate Competitive Research \(EPSCoR\)](#)



For More Information

Visit the EHR Directorate home page, <http://www.ehr.nsf.gov/>.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Math and Science Partnership

The underlying philosophy of NSF's Math and Science Partnership (MSP) is that collaborations of school systems, higher education, and other partners will increase the capacity of preK-12 educational systems to provide requisites for learning to high standards in science and mathematics. NSF developed the MSP in conjunction with the President's "No Child Left Behind" education initiative. The MSP seeks to ensure the future strength of the Nation by supporting the preparation of the next generation of scientists, engineers, science and math educators, and a science-literate citizenry.

The strategic focus of the Math and Science Partnership is to engage the nation's higher education institutions, local, regional, and State school districts, and other partners in preK-12 reform by calling for a significant commitment by colleges and universities to improving the quality of science and mathematics instruction in the schools and by investing in the recruitment, preparation, and professional development of highly competent science and mathematics teachers. MSP, as a major national effort, is an investment intended to serve all students so that learning outcomes can no longer be predicted based on race/ethnicity, socioeconomic status, gender, or disability.

MSP will support the development, implementation, and sustainability of exemplary partnerships to improve student outcomes in high-quality mathematics and science by all students in all preK-12 levels. The partnerships will be expected to contribute to increases in student achievement across the board, as well as reductions in achievement gaps in mathematics and science education among diverse student populations differentiated by race/ethnicity, socioeconomic status, gender, or disability.



For More Information

Further information, including the MSP program announcement and information for prospective proposers is available at <http://www.ehr.nsf.gov/msp/mathandsciencepp.asp>.

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Division of Educational System Reform

The Division of Educational System Reform (ESR) manages a portfolio of programs that encourage and facilitate coordinated approaches to systemic, standards-based reform of science, mathematics, and technology (SMT) education.

Systemic reform relies on partnerships to identify needs, articulate visions, and develop goals, strategies, and activities for improvement of targeted areas. Although each systemic initiative is unique in its approach, all must begin as a collaborative effort among individuals and organizations that are committed to requiring high expectations for all students through challenging educational opportunities. Systemic initiatives catalyze change and cultivate coordination within cities, states, rural areas, school systems, and other organizations involved with education. They result in a comprehensive impact on curricula (inclusive of content, instruction, and assessment), policy, professional development, convergence of intellectual and fiscal resources, broad-based stakeholder support, and student performance.

The ESR Division supports improvement in K-12 SMT education through 84 active projects, supported by the following programs:

1. Urban Systemic Program
2. Rural Systemic Initiatives

Note: There will be no competitions for either the Urban Systemic Program or the Rural Systemic Initiatives in fiscal year 2003.

For More Information

Write to the Division of Educational System Reform, National Science Foundation, 4201 Wilson Boulevard, Room 875, Arlington, VA 22230; or contact by telephone, 703-292-8690; or visit the ESR home page, <http://www.ehr.nsf.gov/ehr/esr/>.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Division of Elementary, Secondary, and Informal Education

Science, mathematics, and technology (SMT) education, preK through grade 12 (preK-12), lays the foundation of knowledge and skills needed by future researchers, educators, and technologists; students pursuing post-secondary education in other disciplines; and individuals directly entering the technological workforce. The Division of Elementary, Secondary, and Informal Education (ESIE) supports the National Science Foundation's mission of providing leadership and promoting development of the infrastructure and resources needed to improve preK-12 SMT education throughout the United States.

ESIE's comprehensive and coherent research-based program portfolio develops the nation's capacity to support high quality SMT education. Innovative instructional materials and student assessments as well as new models for the delivery of teacher professional development, contribute to SMT classroom environments that enable all students to achieve their full potential. Moreover, ESIE's informal learning opportunities via media, exhibit, and community-based programs increase scientific and technological literacy, as well as develop life-long learning skills that benefit students of all ages. All ESIE programs contribute to development of a knowledge base that informs practice and partnerships that leverage expertise and other resources of major education stakeholders nationwide, including higher education, state and local education agencies, school districts, informal science education institutions, and industry.

ESIE supports the following programs:

1. [Teacher Enhancement](#)
2. [Centers for Learning and Teaching](#)
3. [Instructional Materials Development](#)
4. [Informal Science Education](#)
5. [Information Technology Experiences for Students and Teachers](#)
6. [Presidential Awards for Excellence in Mathematics and Science Teaching](#)
7. [Advanced Technological Education](#)

For More Information

Write to the Division of Elementary, Secondary, and Informal Education, National Science Foundation, 4201 Wilson Boulevard, Room 885, Arlington, VA 22230; or contact by telephone, 703-292-8620; or by e-mail, ehr-esi-info@nsf.gov; or visit the ESIE home page, <http://www.ehr.nsf.gov/ehr/esie/>.

1. Teacher Enhancement (TE)

The TE Program develops models for strengthening the teacher workforce by expanding and deepening understanding of content, pedagogy, and instructional technologies; by heightening awareness and deepening understanding of the diverse learning needs of students; by grounding continued professional development in the context of school structure and organization; and by developing a cadre of teachers and administrators who can effectively lead the reform of SMT education.

Eligibility Requirements for TE

The TE Program has special eligibility requirements beyond the standard NSF requirements. For more information, see program solicitation and guidelines [NSF 01-60](#).

2. Centers for Learning and Teaching (CLT)

The CLT's address critical issues and national needs of the science, technology, engineering, and mathematics (STEM) instructional workforce through meaningful partnerships among educational stakeholders, especially Ph.D.-granting institutions, school systems, and informal education organizations. Its goals are to rebuild and diversify the national infrastructure for STEM education; enhance the content knowledge and instructional skills of K-16 STEM educators; and provide substantial opportunities for research into the nature of learning and teaching.

Eligibility Requirements for CLT

The CLT Program has special eligibility requirements beyond the standard NSF requirements. For more information, see program solicitation [NSF 02-038](#).

3. Instructional Materials Development (IMD)

The IMD Program develops high quality, research-based instructional and assessment materials for students that enhance knowledge, thinking skills, and problem-solving abilities of all students, as well as incorporate recent advances in disciplinary content, research on teaching and learning, and instructional technologies. IMD materials are intended to be implemented nationwide and address learning in diverse settings.

Eligibility Requirements for IMD

The IMD Program has special eligibility requirements beyond the standard NSF requirements. For more information, see program solicitation and guidelines [NSF 02-067](#).

4. Informal Science Education (ISE)

The ISE Program provides stimulating experiences for SMT learning outside of formal classroom environments through media, exhibits, and community-based programming. Its goals are to increase the understanding of and participation in SMT disciplines by individuals of all ages; establish linkages between informal and formal education; and stimulate parents and others to support their children's SMT learning endeavors and become informed proponents for high-quality, universally available SMT education.

Eligibility Requirements for ISE

The ISE Program has special eligibility requirements beyond the standard NSF requirements. For more information, see program solicitation and guidelines [NSF 01-60](#).

5. Information Technology Experiences for Students and Teachers (ITEST)

The ITEST Program seeks to increase the opportunities for students and teachers to learn about, experience, and use information technologies within the context of STEM, including information technology (IT) courses. It responds directly to concern about shortages of technology workers in the United States and builds on the earlier NSF program for youth titled After School Centers for Exploration and New Discovery (ASCEND). Supported projects are intended to provide opportunities for both middle- and high-school students, for their teachers to build the skills and knowledge needed to advance their study, and to function and contribute in a technologically rich society.

Eligibility Requirements for ITEST

The ITEST Program has special eligibility requirements beyond the standard NSF requirements. For more information, see program solicitation and guidelines [NSF 02-147](#).

6. Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)

The PAEMST Program, which was established in 1983 by The White House and managed by NSF, identifies outstanding science and mathematics teachers--in kindergarten through 12th grade--in each state and four U.S. jurisdictions. It is the nation's highest honor for K-12 science and mathematics teachers.

Eligibility Requirements for PAEMST

The PAEMST Program has special eligibility requirements beyond the standard NSF requirements. For complete information, visit the PAEMST web site, https://www.ehr.nsf.gov/pres_awards/.

7. Advanced Technological Education (ATE)

The ESIE Division and the Division of Undergraduate Education jointly manage the ATE Program. ATE promotes improvement in the education of technicians in science and engineering related fields at the undergraduate and secondary school levels. It particularly targets 2-year colleges and encourages collaboration among 2-year colleges, 4-year colleges, universities, secondary schools, business, industry, and government. Proposals are solicited in three major tracks:

- **Projects**—Activities may include the design and implementation of new courses, laboratories, and educational materials; the adaptation and implementation of exemplary curricula and programs in new educational settings; the preparation and professional development of college faculty and secondary school teachers; internships and field experience for students, faculty, and teachers; or national conferences, workshops, and similar activities that focus on issues in technological education.
- **Centers**—ATE Centers are comprehensive national or regional resources that provide models and leadership for other projects and act as clearinghouses for educational materials and methods. National Centers of Excellence engage in the full range of activities described above for projects. Regional Centers for manufacturing or information technology education pursue comprehensive approaches that focus on reforming academic programs, departments, and systems to produce a highly qualified workforce to meet industry's needs within a particular geographic region.
- **Articulation Partnerships**—These projects focus on enhancing either of two important educational pathways for students between 2-year colleges and 4-year colleges and universities. One type of Articulation Partnership focuses on strengthening the SMT preparation of prospective K-12 teachers who are enrolled in preprofessional programs at 2-year colleges. The other type of

Articulation Partnership targets 2-year college programs for students to continue their education in 4-year STEM programs, especially programs that have a strong technological basis.

Proposals in all three tracks must show evidence of a coherent vision of technological education—a vision that recognizes the needs of the modern workplace; of students as lifelong learners; and for articulation of educational programs at different levels.



For More Information

Visit the ATE program web site,
<http://www.ehr.nsf.gov/ehr/duet/programs/ate/>.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Division of Graduate Education

NSF provides support to individual graduate students, postdoctoral fellows, and institutions to improve graduate and postdoctoral education and to promote strength, diversity, and vitality in the science and engineering workforce. The Division of Graduate Education (DGE) provides the Foundation's focus to promote strong and innovative graduate education that will develop the nation's future leadership in all the science, technology, engineering, and mathematics (STEM) fields supported by NSF.

DGE manages the following programs, maintaining close connections with programs funded through other NSF directorates:

1. [Graduate Research Fellowships \(GRF\)](#)
2. [Graduate Teaching Fellowships in K-12 Education \(GK-12\)](#)
3. [Integrative Graduate Education and Research Traineeships \(IGERT\)](#)
4. [NSF-NATO Postdoctoral Fellowships in Science and Engineering \(NATO\)](#)
5. [Travel Grants for NATO Advanced Study Institutes \(ASI\)](#)

For More Information

Write to the Division of Graduate Education, National Science Foundation, 4201 Wilson Boulevard, Room 907, Arlington, VA 22230; or contact by telephone, 703-292-8630; or by e-mail, graded@nsf.gov. For information such as program announcements and application guidelines for the programs in this division, visit the DGE home page, <http://www.ehr.nsf.gov/ehr/dge/>. The DGE homepage also provides links to graduate and postdoctoral programs managed by other NSF directorates.

1. Graduate Research Fellowships (GRF)

GRFs promote the strength and diversity of the Nation's science and engineering base and offer recognition and three years of support for advanced study to approximately 900 outstanding graduate students annually in all fields of science, mathematics, and engineering supported by NSF. To be eligible for this nationwide merit competition, an individual must be a citizen, national, or permanent resident of the United States, and be at or near the beginning of graduate study.

For More Information

Oak Ridge Associated Universities (ORAU) manages the annual application and review process for the NSF Graduate Research Fellowship Program. Write to ORAU at NSF Graduate Research Fellowship Program, P.O. Box 3010, Oak Ridge, TN 37831-3010; or contact ORAU by telephone, 865-353-0905 (toll-free); or by e-mail, nsfgrfp@orau.gov.

Individuals are expected to apply through FastLane at <http://www.fastlane.nsf.gov/>. Application forms and instructions are also available on the GRF web site, <http://www.nsf.gov/grfp/>.

2. Graduate Teaching Fellowships in K-12 Education (GK-12)

In order to strengthen K-12 science and mathematics education, provide pedagogical training and experience for graduate students, and enhance links between K-12 and higher education levels, NSF initiated the GK-12 Program in 1999. GK-12 projects support graduate and advanced undergraduate science, mathematics, engineering, and technology (STEM) students as content resources for K-12 teachers. These fellows assist teachers in the science and mathematics content of their teaching; demonstrate key science and mathematics concepts; and gain the pedagogical skills necessary at all education levels. The activity links the acknowledged excellence of U.S. graduate education with the excitement and critical needs of K-12 learning and teaching, and promotes interest in teaching and learning practices among graduate level institutions.

Only academic institutions that grant master's or doctoral degrees in STEM fields may submit proposals. GK-12 fellows are selected by awardee institutions and must (a) be citizens, nationals, or permanent residents of the United States; and (b) be graduate students enrolled in STEM programs or advanced undergraduate STEM majors who have demonstrated a strong proficiency in mathematics and science.

For More Information

Visit the GK-12 Program web site, <http://www.nsf.gov/home/crssprgm/gk12/>.

3. Integrative Graduate Education and Research Traineeships (IGERT)

The NSF places high priority on the preparation of Ph.D.s who are equipped with the multidisciplinary background and the technical, professional, and personal skills essential to address the career demands of the future. To meet these needs, NSF created IGERT, an agency-wide graduate education program. Unlike Graduate Fellowships, for which individuals apply, IGERT considers only proposals from institutions that offer doctoral degrees.

The primary goal of the IGERT Program is to enable the development of innovative graduate education activities that are research-based and that will produce scientists and engineers who are well prepared for a broad spectrum of career opportunities. IGERT integrates research and education with emphasis on experimentation to yield a variety of new models for a paradigm shift in graduate education. Projects supported should incorporate the following features:

- a comprehensive, doctorate-level multidisciplinary research theme that serves as the foundation for graduate education activities;
- activities that integrate the multidisciplinary research theme with innovative educational opportunities, including training in the responsible conduct of research and interactions between students and faculty;
- an educational environment that exposes students to state-of-the-art research instrumentation and methodologies;
- an institutional strategy and operation plan for student recruitment, with special consideration for efforts aimed at members of groups underrepresented in science and engineering, to ensure preparation of a diverse science and engineering workforce; and
- a well-defined strategy for assessment of project performance.

For More Information

Visit the IGERT Program web site, <http://www.nsf.gov/igert/>.

4. NSF-NATO Postdoctoral Fellowships in Science and Engineering (Including Special Fellowship Opportunities for Scientists from NATO Partner Countries)

At the request of the U.S. Department of State, NSF administers a program of NATO Postdoctoral Fellowships to promote a closer collaboration among scientists and engineers of member and NATO partner countries. Approximately 25 awards are made each year to U.S. institutions on behalf of scientists and engineers from NATO partner countries to enable them to conduct research at institutions in the United States.

Eligibility Requirements for NSF-NATO Fellowships

Scientists and engineers from NATO partner countries who are within five years of their doctoral degree are eligible to be nominated by a scientific advisor at a U.S. institution.



For More Information

Send an inquiry via e-mail to nsf-nato@nsf.gov; or visit the program's web site, <http://www.ehr.nsf.gov/dge/programs/nato/>.

5. Travel Grants for NATO Advanced Study Institutes (ASI)

NSF awards travel grants of \$1,000 each to enable U.S. science and engineering graduate students and junior postdocs to attend NATO Advanced Study Institutes held in NATO member or partner countries of Europe. These 2- to 3-week instructional courses, which are conducted by noted scientists and engineers, are scheduled throughout the year, although the majority of them are held during the summer.

Eligibility Requirements for NATO Advanced Study Institutes

The director of a NATO Advanced Study Institute may nominate a U.S. citizen, national, or permanent resident who is a graduate student or who has received a Ph.D. within the past 3 years and has been accepted at a NATO institute.



For More Information

Send an inquiry via e-mail to nato-asi@nsf.gov; or visit the program's web site, <http://www.ehr.nsf.gov/dge/programs/asi/>.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Division of Human Resource Development

The Division of Human Resource Development (HRD), located in the Directorate for Education and Human Resources, serves as a focal point for NSF's agency-wide commitment to enhance the quality and excellence of science, technology, engineering, and mathematics (STEM) education and research by broadening the participation of underrepresented groups and institutions. HRD's programs aim to increase the participation and advancement of underrepresented minorities and minority-serving institutions, women and girls, and persons with disabilities at every level of the science and engineering enterprise. By doing so, these programs contribute to the development of a diverse, internationally competitive, and globally engaged workforce of scientists, engineers, and well-prepared citizens.

In order to maximize the preparation of a well-trained scientific and instructional workforce for the new millennium, HRD programs focus strongly on partnerships and collaborations, and are aligned with their respective target populations:

- [Minorities and Minority-Serving Institutions](#)
- [Women and Girls](#)
- [Persons with Disabilities](#)
- [Crosscutting Initiatives](#)

All HRD programs seek to encourage access to and equity within STEM education. Thematically, these goals are realized via:

- education research and demonstration;
- enhancement of institutional education capacity;
- enhancement of institutional research capacity;
- large-scale implementation; and
- recognition and dissemination.

For More Information

Write to the Division of Human Resource Development, National Science Foundation, 4201 Wilson Boulevard, Room 815, Arlington, VA 22230; or contact by phone, 703-292-8640; or by fax, 703-292-9018; or visit the HRD home page, <http://www.ehr.nsf.gov/hrd/>.

HRD Programs According to Theme and Population

	Minorities and Minority-Serving Institutions	Women And Girls	Persons with Disabilities
Education Research and Demonstration		PGE	PPD
Enhancement of Institutional Education Capacity	HBCU-UP, TCUP	PGE	PPD
Enhancement of Institutional Research Capacity	CREST		
Large-scale Implementation	LSAMP, AGEP		
Recognition and Dissemination	PAESMEM	PAESMEM, PGE	PAESMEM, PPD

• Minorities And Minority Serving Institutions

Minority groups underrepresented in science, technology, engineering, and mathematics (STEM) disciplines include American Indians/Alaskan Natives (Native Americans), African Americans, Hispanic Americans, and Native Pacific Islanders. The Division of Human Resource Development (HRD) supports efforts that are focused on two major objectives: (1) supporting student activities and (2) strengthening the research capabilities of minority institutions. HRD programs represent a coherent effort to stimulate organizational and institutional change; markedly improve the quality of education opportunities available to minority and other students; and increase the quality and quantity of those students who are pursuing degrees in STEM disciplines.

HRD programs that specifically support minorities and minority-serving institutions are:

1. Alliances for Graduate Education and the Professoriate (AGEP)
2. Centers of Research Excellence in Science and Technology (CREST)
3. Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP)
4. Louis Stokes Alliances for Minority Participation (LSAMP)
5. Tribal Colleges and Universities Program (TCUP)

For More Information

Write to the Division of Human Resource Development, National Science Foundation, 4201 Wilson Boulevard, Room 815, Arlington, VA 22230; or contact by telephone, 703-292-8640; or by fax, 703-292-9018; or visit the HRD home page, <http://www.ehr.nsf.gov/hrd/>.

1. Alliances for Graduate Education and the Professoriate (AGEP)

The AGEP Program seeks to significantly increase the number of American Indian/Alaskan Native (Native American), African American, Hispanic American, and Native Pacific Islander students receiving doctoral degrees in science, technology, engineering, and mathematics (STEM) fields customarily supported by NSF. The lack of role models and mentors in the professoriate constitutes a significant barrier to producing minority STEM doctoral graduates. NSF is particularly interested in increasing the number of minorities who will enter the professoriate in these disciplines.

Specific objectives of AGEP are to (1) develop and implement innovative models for recruiting, mentoring, and retaining minority students in STEM doctoral programs and (2) develop effective strategies for identifying and supporting underrepresented minorities who want to pursue academic careers.

The AGEP Program also supports a research effort to identify major factors that promote the successful transition of minority students from (1) undergraduate through graduate study; (2) course-taking in the early years of the graduate experience to independent research required for completion of a dissertation; and (3) the academic environment to the STEM workplace. To accomplish this, the research component will be informed by a portfolio of federal and private efforts in this arena in order to identify factors underlying exemplary as well as unsuccessful efforts.

Eligibility Requirements for AGEP

Alliances that consist of STEM doctoral degree-granting institutions are eligible to apply to the program. One institution must be designated as the lead institution for the project. Institutions in the United States and its territories that have documented success in graduating minority students at the Ph.D. level are strongly encouraged to participate. Alliances are encouraged to establish partnerships with minority-serving undergraduate institutions to enhance recruitment efforts, where appropriate.



For More Information

Visit the HBCU-UP web site, <http://www.ehr.nsf.gov/ehr/hrd/agep.asp>.

2. Centers of Research Excellence in Science and Technology (CREST)

NSF recognizes that academic institutions with significant minority student enrollments play a vital role in conducting the research that contributes to our knowledge base in all disciplines and in educating minority students who go on to careers in science, technology, engineering, and mathematics (STEM) fields.

The CREST Program makes substantial resources available to upgrade the capabilities of the most research-productive minority institutions. The program develops outstanding research centers through the integration of education and research. In addition, it serves to promote the production of new knowledge; increase the research productivity of individual faculty; and expand a diverse student presence in STEM disciplines. CREST projects enhance the effectiveness of related science and engineering activities within the project's area of research focus.

Eligibility Requirements for CREST

Institutions eligible to participate in CREST Research Infrastructure Improvement (RII) awards must have the following:

- Enrollments of 50 percent or more members of minority groups underrepresented in advanced levels of science and engineering (e.g., Alaskan Natives [Eskimo or Aleut], American Indian, African American, Native Pacific Islanders [Polynesian or Micronesian], Hispanic or Latino);
- Graduate programs in NSF-supported fields of science or engineering;
- Demonstrated strengths in NSF-supported fields, as evidenced by an existing or developing capacity to offer doctoral degrees in one or more science and engineering disciplines;
- A willingness and capacity to serve as a resource center in one or more research thrust areas;
- A demonstrated commitment and track record in enrolling and graduating minority scientists and engineers; and
- Strong collaborations in the proposed field of research.



For More Information

Visit the CREST web site, <http://www.ehr.nsf.gov/ehr/hrd/crest.asp>.

3. Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP)

HBCU-UP seeks to enhance the quality of undergraduate science, technology, engineering, and mathematics (STEM) education at Historically Black Colleges and Universities as a means to broaden participation in the Nation's STEM workforce. The program provides support for the implementation of comprehensive institutional strategies to strengthen STEM teaching and learning in ways that will improve the access and retention of underrepresented groups in STEM. Typical project implementation strategies include STEM course and curricular reform and enhancement; faculty professional development; supervised research and other active learning experiences for STEM undergraduates; student support; scientific instrumentation to improve STEM instruction; and other activities that meet institutional needs.

Eligibility Requirements

Historically Black Colleges and Universities that currently offer associate, baccalaureate, or graduate degrees in STEM fields are eligible.



For More Information

Visit the HBCU-UP web site, <http://www.ehr.nsf.gov/ehr/hrd/hbcu.asp>.

4. Louis Stokes Alliances for Minority Participation (LSAMP)

The LSAMP Program is designed to develop the comprehensive strategies necessary to strengthen the preparation and increase the number of minority students who successfully complete baccalaureates in science, technology, engineering, and mathematics (STEM) fields. This objective facilitates the long-term goal of increasing the production of doctorates in STEM fields, with an emphasis on entry into faculty positions.

The LSAMP Program requires each awardee to establish meaningful partnerships among academic institutions and encourages the inclusion of government agencies and laboratories, industry, and professional organizations. It is expected that successful partnerships will enable the development of approaches tailored to the institutional setting for achievement of program goals in STEM undergraduate education. Activities supported include student enrichment such as collaborative learning, skill development, and mentoring; academic enrichment, such as curricular and instructional improvement; and direct student support, such as summer activities.

Eligibility Requirements

With justification, nonprofit organizations may serve as members of the partnership. Academic institutions with a track record of educating underrepresented minority students in STEM disciplines are eligible to apply to the LSAMP Program.



For More Information

Visit the LSAMP web site, <http://www.ehr.nsf.gov/ehr/hrd/amp.asp>.

5. Tribal Colleges and Universities Program (TCUP)

TCUP provides awards to enhance the quality of science, technology, engineering, and mathematics (STEM) instruction and outreach programs, with an emphasis on the leveraged use of information technologies at Tribal Colleges and Universities, Alaskan Native-serving institutions, and Hawaiian Native-serving institutions. Support is available for the implementation of comprehensive institutional approaches to strengthen STEM teaching and learning in ways that improve access to, retention within, and graduation from STEM programs, particularly those that have a strong technological foundation. Through this program, assistance is provided to eligible institutions in their efforts to bridge the "digital divide" and prepare students for careers in information technology, science, mathematics, and engineering fields.

Proposed activities should be the result of careful analysis of institutional needs, address institutional and NSF goals, and have the potential to result in significant, sustainable improvement in STEM program offerings.

Typical TCUP project implementation strategies include curriculum enhancement, faculty professional development, undergraduate research and community service, academic enrichment, infusion of technology to enhance STEM instruction, collaborations, and other activities that meet institutional and community needs.

Eligibility Requirements for TCUP

Organizations that are eligible include Tribal Colleges and Universities, Alaskan Native-serving institutions, and Native Hawaiian-serving institutions.



For More Information

Visit the TCUP web site, <http://www.ehr.nsf.gov/ehr/hrd/tcup.asp>.

- **Women and Girls**

Program for Gender Equity in Science, Technology, Engineering, and Mathematics (PGE)

All of the divisions within NSF's Directorate for Education and Human Resources encourage projects that will increase the participation of women and girls in science, technology, engineering, and mathematics (STEM) fields. Because women are underrepresented in many disciplines, HRD supports research on focused interventions that are directed toward increasing the number of women as full participants in the mainstream of the Nation's scientific and technological enterprise. PGE specifically supports the following activities:

- **Research**—This area seeks to enhance the multidisciplinary understanding of gender differences in human learning—behavioral, cognitive, affective, and social aspects—through socio-psychological, ethnographic, statistical, anthropological, economic, and organizational studies. The efforts in this area provide a research foundation for educational approaches, curriculum materials, and technological tools that are already developed or can be developed in the future. Emphasis is also placed on bridging research and educational practice in settings such as classrooms, informal learning sites, and technological learning environments. Results of PGE research projects should be cumulative, reproducible, sustainable, and scalable, supporting sustained improvement in educational practice.
- **Demonstration or "Model" Projects**—This area employs evaluation methods to determine the effectiveness of new learning tools, pedagogies, professional development, or student programs and services. Demonstration projects apply research findings about girls' learning preferences in the design of new curriculum materials, services, pedagogy, or instructor development programs. Successful or "model" projects may be institutionalized and replicated. Teacher and faculty development demonstrations test new ways to integrate the understanding and awareness of gender-inclusive practices into preservice and in-service programs and into professional standards and policies. It is anticipated that participants in demonstration projects will directly benefit from the learning experience and assimilate new behaviors.
- **Information Dissemination Activities**—This area of PGE supports projects focusing on the dissemination of research results or strategies for reducing the barriers for women and girls in STEM fields. Supported activities include media (e.g., videotapes and brochures), conferences, teleconferences, symposia, and workshops that bring together experts to discuss issues, projects, policies, and research related to the participation and achievement of women and girls in STEM. Dissemination projects take exemplary models and materials to a significant national audience.



For More Information

Visit the PGE web site, <http://www.ehr.nsf.gov/ehr/hrd/pge.asp>.

• Persons With Disabilities

Program for Persons with Disabilities (PPD)

PPD is dedicated to increasing the number of people with disabilities employed in the nation's science, engineering, mathematics, and technology workforce. To accomplish this, PPD supports projects designed to:

- bring about needed changes in academic and professional climates;\
- increase awareness and recognition of the needs and capabilities of students with disabilities;
- promote accessibility and appropriateness of instructional materials, media, and educational technologies; and
- increase availability of student enrichment resources, including mentoring activities.

PPD investments help alter the factors that prevent persons with disabilities from accessing STEM education opportunities and subsequent workforce participation.



For More Information

Visit the PPD web site at <http://www.ehr.nsf.gov/ehr/hrd/ppd.asp>.

• Crosscutting Initiatives

Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM)

The White House established the PAESMEM Program to recognize the importance of role models and mentors in the academic, professional, and personal development of students underrepresented in science, technology, engineering, and mathematics (STEM) fields. PAESMEM identifies outstanding mentors and mentoring programs that enhance the experiences of underrepresented students in the sciences, mathematics, and engineering. At the individual and the institutional levels, PAESMEM awardees have been exemplary in their demonstration of the idea that the Nation must fully develop its human resources in STEM disciplines through the support of increased access by, and inclusion of, diverse populations.

Nominees, both individual and institutional, must have served as mentors or facilitated mentoring services for at least 5 years. Awards are made to: (1) individuals who have demonstrated outstanding and sustained mentoring and effective guidance to a significant number of students at the K-12, undergraduate, or graduate level of education; and (2) institutions that have, through their programming, enabled a substantial number of students from groups traditionally underrepresented in science, mathematics, and engineering to pursue and complete relevant degree programs successfully. At the postsecondary level, these efforts must show that students have completed either a baccalaureate, masters, or doctoral degree.



For More Information

Visit the PAESMEM web site at:

<http://www.ehr.nsf.gov/ehr/hrd/paesmem.asp>

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES**Division of Research, Evaluation, and Communication**

The Division of Research, Evaluation, and Communication (REC) provides a research-based foundation for teaching and learning in science, technology, engineering, and mathematics (STEM), using the results of research in technology utilization, content, pedagogy, assessment, and policy-oriented studies and indicators. The REC Division supports projects that investigate the learning process and integrate research with educational practices, including those that provide the groundwork for the effective use of technology. The division provides support for NSF's participation in the Interagency Education Research Initiative (IERI); various international comparative studies such as the Third International Mathematics and Science Study (TIMSS); and the EHR Directorate's participation in the agency-wide Faculty Early Career Development Program (see the CAREER home page, <http://www.nsf.gov/home/crssprgm/career/>). Through periodic program evaluations, REC activities also analyze the development, implementation, and impact of science and mathematics programming across the EHR Directorate.

The REC Division supports the following programs and activities:

1. [Research on Learning and Education](#)
2. [Interagency Education Research Initiative](#)
3. [Evaluation](#)

 For More Information

Write to the Division of Research, Evaluation, and Communication, National Science Foundation, 4201 Wilson Boulevard, Room 855, Arlington, VA 22230; or contact the division by telephone, 703-292-8650; or by e-mail, REC@nsf.gov; or visit the REC home page, <http://www.ehr.nsf.gov/ehr/rec/>.

1. Research on Learning and Education (ROLE)

The ROLE Program is a comprehensive education research program sponsored by the REC Division that supports the knowledge base that undergirds improvement in math and science instruction; provides more efficient use of educational technologies; and develops a more effective math and science instructional workforce. The ROLE Program supports research in several domains, including basic research in neural and cognitive sciences; teaching, learning, and institutional change processes; exploratory development of new instructional approaches; materials and implementation models whose impact can be systematically evaluated; studies of systemic factors in implementing educational innovations; policy studies; and collaborative research and development proposals on new and evolving information technologies.

2. Interagency Education Research Initiative (IERI)

The REC Division sponsors NSF's participation in the Interagency Education Research Initiative IERI. IERI is a joint program of the U.S. Department of Education, the National Institutes for Child Health and Development (NICHD), and the NSF. The initiative supports research in the adaptation and scaling-up of proven K-12 science, mathematics, and reading interventions.

3. Evaluation

The Evaluation Program provides support for the assessment of NSF education and training programs and coordinates the evaluation of similar initiatives in other federal agencies. The overall purpose of this assessment is program improvement, accountability, and a generation of new knowledge for the education community at large. Evaluations are usually supported through competitively awarded contracts to outside organizations. Additionally, the program solicits proposals for evaluative studies of NSF or other national science and mathematics programs of interest. The program accepts proposals for the development of innovative techniques, approaches, and methodologies for the general improvement of education evaluation.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Division of Undergraduate Education

The Division of Undergraduate Education (DUE) serves as the focal point for NSF's efforts in undergraduate education. Whether preparing students to participate as citizens in a technological society; enter the workforce with 2- or 4-year degrees; continue their formal education in graduate school; or further their education in response to new career goals or workplace expectations, undergraduate education provides the critical link between the Nation's secondary schools and a society increasingly dependent on science and technology.

DUE's programs and leadership efforts aim to strengthen the vitality of undergraduate science, technology, engineering, and mathematics (STEM) education for all students, including STEM majors, prospective teachers of grades preK through 12, students preparing for the technical workplace, and students in their role as citizens in society at large.

Proposals submitted to programs in DUE are encouraged to incorporate as appropriate, features that address one or more of the following four themes that have been targeted for special emphasis: (1) teacher preparation, (2) professional development for faculty, (3) increasing diversity within STEM fields, and (4) integrating technology in education. Although the activities described below are expected to constitute the majority of projects supported through DUE, proposals that address other mechanisms for improving undergraduate STEM education will be considered.

DUE supports the following programs and activities:

1. [Advanced Technological Education](#)
2. [Assessment of Student Achievement in Undergraduate Education](#)
3. [Computer Science, Engineering, and Mathematics Scholarships](#)
4. [Course, Curriculum, and Laboratory Improvement](#)
5. [Federal Cyber Service: Scholarship for Service](#)
6. [NSF Director's Award for Distinguished Teaching Scholars](#)
7. [National Science, Technology, Engineering, and Mathematics Education Digital Library](#)
8. [Noyce Scholarships](#)
9. [Science, Technology, Engineering, and Mathematics Talent Expansion Program](#)
10. [Science, Technology, Engineering, and Mathematics Teacher Preparation](#)

For More Information

Write to the Division of Undergraduate Education, National Science Foundation, 4201 Wilson Boulevard, Room 835, Arlington, VA 22230; or contact the division by telephone, 703-292-8670; or by e-mail, undergrad@nsf.gov; or visit the DUE home page, <http://www.ehr.nsf.gov/ehr/duel/>.

1. Advanced Technological Education (ATE)

The ATE Program is managed jointly by DUE and the Division of Elementary, Secondary, and Informal Education. The program promotes improvement in the education of technicians in science and engineering related fields at the undergraduate and secondary school levels. It particularly targets two-

year colleges and encourages collaboration among 2-year colleges, 4-year colleges, universities, secondary schools, business, industry, and government. Proposals are solicited in the following three tracks:

- **Projects**—Activities may include the development of educational materials, courses, curricula, and laboratories; the preparation and professional development of college faculty and secondary school teachers; internships and field experiences for students and educators; and the dissemination of exemplary educational materials, curricula, and pedagogical practices designed by previously funded ATE centers and projects.
- **Centers**—Centers are comprehensive national or regional resources that provide models and leadership for other projects and act as clearinghouses for educational materials and methods. National Centers of Excellence engage in the full range of activities described above for projects. Regional Centers for manufacturing or information technology education pursue comprehensive approaches that focus on reforming academic programs, departments, and systems to produce a highly qualified workforce to meet industry's needs within a particular geographic region.
- **Articulation Partnerships**—Focus on enhancing either of two important educational pathways for students between 2-year colleges and 4-year colleges and universities. One type of Articulation Partnership focuses on strengthening the science, technology, and mathematics preparation of prospective K-12 teachers who are enrolled in preprofessional programs at 2-year colleges. The other type of partnership targets 2-year college programs for students to continue their education in 4-year science, technology, engineering, and mathematics programs, especially programs that have a strong technological basis.

Proposals in all three tracks must show evidence of a coherent vision of technological education--a vision that recognizes the needs of the modern workplace, the needs of students as lifelong learners, and the need for articulation of educational programs at different levels. Whenever feasible, projects are expected to utilize and innovatively build from successful educational materials, courses, curricula, and methods that have been developed through other ATE grants, as well as other exemplary resources that can be adapted to technological education.



For More Information

Visit the ATE Program web site,
<http://www.ehr.nsf.gov/ehr/ate/programs/ate/>.

2. Assessment of Student Achievement (ASA) in Undergraduate Education

The ASA Program supports the development and dissemination of assessment practices, materials (tools), and measures to guide efforts that improve the effectiveness of courses, curricula, programs of study, and academic institutions in promoting student learning in science, technology, engineering, and mathematics (STEM). ASA seeks to support the use of assessment practices by STEM faculty, STEM departments, and institutional administrators seeking to measure student achievement in courses, curricula, programs of study, and the cumulative undergraduate experience embodying some STEM learning.

To help ensure that project results will effectively serve the STEM community, at least one investigator (principal investigator or co-principal investigator) in a project must be a STEM faculty member.

Projects can focus on one or more of the following broad areas:

- Development of new and adapting extant assessment materials that can be used to improve STEM courses and curricula in order to achieve explicit learning objectives;
- Development of methods to assess student achievement resulting from a group of courses that constitute a minor or major field of study;

- Assessment of the impact on student achievement of interdisciplinary learning experiences, student teams, co-curricular activities (e.g., service learning), increased laboratory and field experiences, and other forms of learning enrichment; and
- Development of indicators of student learning within certain domains, and measures of institutional program quality.



For More Information

Visit the ASA Program web site,
<http://www.ehr.nsf.gov/ehr/duet/programs/asa/>.

3. Computer Science, Engineering, and Mathematics Scholarships (CSEMS)

The CSEMS Program provides institutions with funds to support scholarships for talented but financially disadvantaged students in computer science, computer technology, engineering, engineering technology, or mathematics degree programs. Through support from this program, grantee institutions establish scholarships that promote full-time enrollment and completion of degrees in higher education in the above fields. NSF established the program in accordance with the American Competitiveness and Workforce Improvement Act of 1998 (Public Law 105-277). The Act reflects the Nation's need to increase substantially the number of graduates from associate, baccalaureate, and graduate degree programs in these fields. The goals of this program are to:

- improve education for students in the stated disciplines;
- increase retention of students to degree completion;
- improve professional development, employment, and further higher education placement of participating students; and
- strengthen partnerships between institutions of higher education and related employment sectors.

The eligibility criteria for a CSEMS scholarship recipient include the following:

- show status as a U.S. citizen, national, refugee alien, or permanent resident alien at the time of application;
- be enrolled full-time in a computer science, computer technology, engineering, engineering technology, or mathematics degree program at the associate, baccalaureate, or graduate level;
- demonstrate academic potential or ability; and
- demonstrate financial need, defined for undergraduates as financial eligibility under U.S. Department of Education rules for Federal financial aid, and defined for graduate students as eligibility for Graduate Assistance in Areas of National Need.

CSEMS proposers must be institutions of higher education that grant degrees in computer science, computer technology, engineering, engineering technology, or mathematics.



For More Information

Visit the CSEMS Program web site,
<http://www.ehr.nsf.gov/ehr/duet/programs/csems/csems.htm>.

4. Course, Curriculum, and Laboratory Improvement (CCLI)

The CCLI Program supports projects that are expected to improve undergraduate science, technology, engineering, and mathematics (STEM) education by increasing the availability and use of high-quality educational materials and the employment of effective pedagogical strategies. Proposals that address all levels of undergraduate education are encouraged. Proposals to improve introductory level courses, curricula, and laboratories are especially welcome.

The CCLI Program invites proposals to improve undergraduate STEM education in a broad spectrum of institutions including 2-year colleges, 4-year colleges, and universities. Projects may involve a single institution, a collaborative effort among several institutions, or a collaboration with business and industry partners. The CCLI Program has three major tracks:

- **Educational Materials Development Track**—Projects are expected to produce innovative materials that incorporate effective educational practices to improve student learning of STEM. Projects to develop textbooks, software, or laboratory materials for commercial distribution are appropriate. Two types of projects will be supported: (1) those that intend to demonstrate the scientific and educational feasibility of an idea, a "proof of concept," or a prototype and (2) those that are based on prior experience with a prototype that intend to fully develop the product or practice. Such materials are expected to be disseminated nationally for adoption and adaptation.
- **Adaptation and Implementation Track**—Projects are expected to result in improved education in STEM at academic institutions through the adaptation and implementation of exemplary materials, laboratory experiences, and educational practices that have been developed and tested at other institutions. Proposers may request funds in any category normally supported by NSF, or funds for the purchase of instrumentation only. Matching is required on equipment and instrumentation but not on non-instrumentation items. The program invites proposals for projects that enable a group of faculty to explore strategies for overcoming identified challenges and barriers to curricular reform.
- **National Dissemination Track**—Projects are expected to provide faculty with professional development opportunities that will enable them to introduce new content into undergraduate courses and laboratories and explore effective educational practices. Projects should be designed to offer workshops, short courses, or similar activities on a national scale in single or multiple disciplines.



For More Information

Visit the CCLI Program web site,
<http://www.ehr.nsf.gov/ehr/duel/programs/ccli/>.

5. Federal Cyber Service: Scholarship for Service (SFS)

The SFS Program seeks to increase the number of qualified students entering the fields of information assurance and computer security and increase the capacity of higher education enterprise in the United States to continue producing professionals in these fields. The program consists of the following scholarship and capacity-building tracks:

- **Scholarship**—Provides funding to colleges and universities to award scholarships in information assurance and computer security fields. Scholarship recipients will become part of the Federal Cyber Service of information technology specialists who ensure the protection of the U.S. Government's information infrastructure. After their 2-year scholarships, the recipients will be required to work for a Federal agency for 2 years as their Federal Cyber Service commitment.
- **Capacity Building**—Seeks to increase the national capacity for producing trained information assurance professionals by providing support to colleges and universities interested in building programs, individually or in partnership.



For More Information

Visit the SFS Program web site,
<http://www.ehr.nsf.gov/ehr/duel/programs/sfs/>.

6. NSF Director's Award for Distinguished Teaching Scholars (DTS)

The purpose of the DTS Program is to recognize individuals who have demonstrated excellence and promise for future success in both scientific research and the education of undergraduates in science, technology, engineering, and mathematics (STEM). The program promotes the continued and expanded efforts of individuals with a history of impact on both (a) the research in a STEM discipline or on STEM educational research and (b) the STEM education of undergraduates, including those who are not STEM majors. The Director's Award is the highest honor bestowed by the NSF for excellence in both teaching and research in STEM fields, or in educational research related to these disciplines.



For More Information

Visit the DTS Program web site,
<http://www.ehr.nsf.gov/ehr/duel/programs/dts/>.

7. National Science, Technology, Engineering, and Mathematics Education Digital Library (NSDL)

The goal of the NSDL Program is to support the creation and development of a national digital library for science, technology, engineering, and mathematics (STEM) education. The resulting virtual facility--learning environments and resources network for STEM education--is intended to meet the needs of students and teachers at all levels: K-12, undergraduate, graduate, and lifelong learning, in both individual and collaborative settings. The NSDL Program builds on work supported under the multiagency Digital Libraries Initiative (see <http://www.dli2.nsf.gov/>) and represents a synergistic collaboration of research and education efforts.

The NSDL Program is currently supporting a Core Integration effort that coordinates and manages the digital library's holdings and services. To complement and further expand this Core Integration capacity, the NSDL Program accepts proposals in the following tracks:

- **Collections**—Projects are expected to aggregate and manage a subset of the library's content within a coherent theme or specialty.
- **Services**—Projects are expected to develop services that will support users, collection providers, and the Core Integration effort, as well as enhance the impact, efficiency, and value of the library.
- **Targeted Research**—Projects are expected to explore specific topics that have immediate applicability to one of the other two tracks, or the Core Integration effort discussed above.



For More Information

Visit the NSDL Program web site,
<http://www.ehr.nsf.gov/ehr/duel/programs/nsdl/>.

8. Noyce Scholarships

The Noyce Program provides funding for colleges and universities to award scholarships designed to recruit and prepare K-12 mathematics and science teachers. Institutions are expected to provide the programming and support to enable scholarship recipients to become successful elementary or secondary teachers. Scholarships may be designated for juniors or seniors, or career-changing professionals in STEM fields seeking to become K-12 teachers.



For More Information

For specific information on eligibility, visit the Noyce Program web site, <http://www.ehr.nsf.gov/ehr/duet/programs/noyce/>.

9. Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP)

The STEP Program seeks to increase the number of students (U.S. citizens or permanent residents) pursuing and receiving associate or baccalaureate degrees in established or emerging fields within science, technology, engineering, and mathematics (STEM). The program is open to institutions of higher education in the United States and its territories and to consortia of such institutions, offering either associates degrees or baccalaureate degrees in science, technology, engineering, and mathematics (STEM).



For More Information

Visit the STEP Program web site, <http://www.ehr.nsf.gov/ehr/duet/programs/step/>.

10. Science, Technology, Engineering, and Mathematics Teacher Preparation (STEMTP)

The STEMTP Program supports efforts to develop exemplary science and mathematics preK-12 teacher preparation models through partnerships involving science, mathematics, engineering, technology, and education faculty at 2- and 4-year institutions of higher education and local school districts. The goals of the program are:

- to increase significantly the number of preK-12 teachers who are certified and well qualified to teach mathematics and science; and
- to improve the quality of preservice education, induction, and continued professional growth in mathematics and science for preK-12 teachers.

Projects must address local needs for increased numbers of teachers who are well qualified to teach mathematics and science by providing strategies for recruiting and retaining teachers in the workforce. The STEMTP Program offers the following two areas of focus:

- **Baccalaureate and 5-Year Programs**—Projects are expected to include strategies for ensuring that preservice students acquire STEM content and pedagogical knowledge and skills for successful teaching.
- **Alternative Pathways to Teaching**—Projects are expected to design and implement alternative credentialing programs for STEM professionals and recent STEM graduates in order to facilitate their entry into the teaching profession.



For More Information

Visit the STEMTP Program web site,
<http://www.ehr.nsf.gov/ehr/duo/programs/stemtp/>.

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Experimental Program to Stimulate Competitive Research

The Experimental Program to Stimulate Competitive Research (EPSCoR) increases the research and development (R&D) competitiveness of 21 States and the Commonwealth of Puerto Rico. The States are Alabama, Alaska, Arkansas, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming.

EPSCoR offers two types of funding to improve research and development competitiveness in eligible jurisdictions. They are:

1. **EPSCoR Research Infrastructure Improvement Awards**—These grants provide up to \$9 million for 36 months to support infrastructure improvements in science and technology areas selected by the state's EPSCoR governing committee as being important to the state's future R&D competitiveness and economic development. A 50 percent non-federal match, up to \$4.5 million, is required.
2. **EPSCoR Co-funding**—This investment provides partial support for proposals that have undergone merit review and are at or near the cutoff for funding by regular programs and special initiatives throughout NSF.

EPSCoR Outreach

EPSCoR outreach investment provides financial support for visits by NSF staff to acquaint EPSCoR researchers and their institutions with NSF priorities, programs, and policies, as well as acquaint NSF staff more fully with the R&D resources residing in EPSCoR jurisdictions. Procedures for institutional outreach visits are located on the EPSCoR web site.

**For More Information**

Write to EPSCoR, Directorate for Education and Human Resources, National Science Foundation, 4201 Wilson Boulevard, Room 875, Arlington, VA 22230; or contact the program by telephone, 703-292-8683; or by e-mail, jhoehn@nsf.gov; or visit the EPSCoR home page, <http://www.ehr.nsf.gov/epscor/>.