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Advanced Technological Education (ATE)

Program Solicitation

NSF-02-035

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
DIVISION OF ELEMENTARY, SECONDARY, AND INFORMAL EDUCATION
DIVISION OF UNDERGRADUATE EDUCATION

PRELIMINARY PROPOSAL DUE DATES(S) (*optional*): April 24, 2002

FULL PROPOSAL DEADLINE(S): October 16, 2002

NATIONAL SCIENCE FOUNDATION

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Advanced Technological Education (ATE)

Synopsis of Program: This program promotes improvement in technological education at the undergraduate and secondary school levels by supporting curriculum development; the preparation and professional development of college faculty and secondary school teachers; internships and field experiences for faculty, teachers, and students; and other activities. With an emphasis on two-year colleges, the program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The program also promotes articulation between programs at two-year colleges and four-year colleges and universities--in particular, articulation between two-year and four-year programs for prospective teachers (with a focus on activities and disciplines that have a strong technological foundation) and between two-year and four-year programs in science, technology, engineering, and mathematics (also with a focus on disciplines that have a strong technological foundation).

Cognizant Program Officer(s):

- Dr. Elizabeth J. Teles, Division of Undergraduate Education, telephone: 703-292-4643, e-mail: ejteles@nsf.gov.
- Dr. Gerhard L. Salinger, Division of Elementary, Secondary, and Informal Education, telephone: 703-292-5116, e-mail: gsalinge@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.076 --- Education and Human Resources

ELIGIBILITY INFORMATION

- **Organization Limit:** None
- **PI Eligibility Limit:** An individual may serve as the Principal Investigator (PI) on no more than one proposal submitted for each deadline date, but may serve as a co-PI on multiple proposals.
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 70
- **Anticipated Funding Amount:** $39 million in FY2003, subject to the availability of funds

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Preliminary Proposals:** Submission of Preliminary Proposals is optional. Please see the full program announcement/solicitation for further information.
- **Full Proposals:** Supplemental Preparation Guidelines
    - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is Specialized. Please see the full program solicitation for further information.
- **Indirect Cost (F&A) Limitations:** In *planning grants* for ATE centers, indirect costs may not exceed 10 percent of modified total direct costs.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full program announcement/solicitation for further information.

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** April 24, 2002
- **Full Proposal Deadline Date(s):** October 16, 2002

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
    - Ms. Antoinette Allen, Division of Undergraduate Education, telephone: 703-292-4646, e-mail: duefl@nsf.gov.
    - FastLane Help Desk, telephone: 1-800-673-6188, e-mail: fastlane@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full program announcement/solicitation for further information.

I. INTRODUCTION

The Advanced Technological Education (ATE) program promotes improvement in the education of science and engineering technicians at the undergraduate and the secondary school levels. Proposals to the program may aim to affect either specialized technology courses or core science, mathematics, and technology courses that serve as prerequisites or corequisites for specialized technology courses. The curricular focus and the activities of all projects should demonstrably contribute to the ATE program's central goals: producing more science and engineering technicians to meet workforce demands, and improving the technical skills and the general science, technology, engineering, and mathematics (STEM) preparation of these technicians and the educators who prepare them.

The ATE program focuses on two-year colleges and expects two-year colleges to have a leadership role in all projects. Effective technological education programs should involve partnerships between two-year colleges, four-year colleges and universities, secondary schools, business, industry, and government, and should respond to industry's need for well-prepared workers having adaptable skills.

Fields of technology supported by the ATE program include, but are not limited to, agricultural technology, biotechnology, chemical technology, civil and construction technology, computer and information technology, electronics, environmental technology, geographic information systems, manufacturing and engineering technology, marine technology, multimedia technology, telecommunications, and transportation technology. The ATE program generally does not support projects that focus primarily on students who will become health or medical technicians.

The nation's economic prosperity hinges on the fields served by the ATE program. Many of these fields also play a vital role in national security. For example, information technology specialists and telecommunications technicians confront threats to computer, information, and Internet security and contribute to intelligence gathering; environmental technicians measure air, water, and ground quality for adulteration by chemical and biological agents; biotechnicians, agricultural technicians, and chemical technicians monitor and thwart biological and chemical threats and threats to the nation's food supply; and process technicians develop, enforce, and improve the security of manufacturing processes, including safeguarding materials and data.

Activities undertaken in ATE projects may include:

- the adaptation of exemplary educational materials, courses, and curricula in new educational settings;
- the design and implementation of new educational materials, courses, laboratories, and curricula;
- the preparation and professional development of college faculty and secondary school teachers;

- internships and field experiences for students, faculty, and teachers; and
- the broad dissemination of exemplary educational materials and pedagogical strategies that have been developed through previously funded ATE awards.

Activities may have either a national or a regional focus, but not a purely local one. All projects must be guided by 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. The program especially encourages efforts that give prospective technicians insight into real-world work environments; serve the needs of not only first-time students but also returning students and workers wishing to acquire new skills; implement the national science, mathematics, technology, and industry standards in education; use information technology and other educational technologies to improve learning and teaching; and link educators and educational programs in two-year colleges, four-year colleges and universities, secondary schools, and industry.

The ATE program also specifically welcomes proposals for developing comprehensive articulation agreements between two-year and four-year institutions either to strengthen the technological knowledge and skills and the science and mathematics preparation of K-12 teachers or to facilitate the transition of students from STEM associate's degree programs to related bachelor's degree programs, especially those having a strong technological basis.

This year the ATE program again invites proposals for National Centers of Excellence in all technological fields supported by the program, as well as Regional Centers in information technology and manufacturing education, two areas of technology that have been identified for special emphasis.

II. PROGRAM DESCRIPTION

A. PROGRAM TRACKS

The ATE program supports proposals in three major tracks: *ATE Projects*, *ATE Centers*, and *Articulation Partnerships.* Although these tracks are expected to encompass most of the activities supported by the program, people who have ideas for other activities are invited to contact an ATE program officer to explore whether those ideas might be appropriate for funding by the program.

Proposals in all tracks should demonstrate a thorough awareness of previous relevant ATE grants. Whenever feasible, projects should utilize and innovatively build from successful educational materials, courses, curricula, strategies, and methods that have been developed through other ATE grants, as well as other exemplary resources (including those not supported by NSF) that can be adapted to technological education. Usually proposers should contact the Principal Investigators (PIs) of exemplary projects to explore the possibilities for adapting materials, evaluating materials, receiving guidance, or collaborating in other ways.

1. ATE Projects

While ATE Centers are comprehensive in scope, ATE Projects focus more narrowly on one or more of the five activities described below. Multifaceted projects that cut across these activity categories are especially encouraged. For all activities, proposers should thoroughly explore possibilities for adapting and implementing proven materials and methods. Grants for ATE Projects range from $25,000 to $300,000 per year and have a duration of up to three years.

Curriculum and Educational Materials Development (for National Dissemination): Proposed activities should result in textbooks, laboratory experiments and manuals, software, CD-ROMs, videos, or other courseware that will be published for national distribution to colleges, secondary schools, or industry. The focus may range from the innovative adaptation of existing educational materials to the creation of entirely new ones; from a few modules at a single educational level to a comprehensive curriculum for multiple years; and from a single subject to the integration of several disciplines. Products may be pilot-tested locally but must be field-tested in diverse locations. The evaluation should include data on student achievement of stated learning goals and mastery of content. Educational materials and curricula that offer students innovative, high-quality learning experiences through distance education are encouraged.

Program Improvement: Proposed activities should enhance a curriculum in multiple ways, producing a coherent sequence of classes, laboratories, and work-based educational experiences that revitalize the learning environment, course content, and experience of instruction for students preparing to be science and engineering technicians. The resulting program should constitute a *model* that will be disseminated broadly. Components of the program improvement process might include, for example, integrating industry standards and workplace competencies into the curriculum; adapting educational materials or courses developed elsewhere; adding rigorous STEM content to courses; adding work-based experiences; modernizing equipment; incorporating appropriate pedagogical approaches; providing professional development for educators; developing articulation between programs at different levels (secondary school, two-year college, and four-year college or university); and improving the recruitment and retention of students. The improved program leads students to an appropriate degree, certification, or occupational competency point and provides industry with a larger pool of skilled technicians. Innovative programs that provide faster tracks to demonstrated competencies are encouraged--for example, programs that restructure courses and curricula into modules, tracks, or blocks to provide students a step-wise approach to a two-year degree, with multiple exit and reentry points defined by certifications or competency assessments.

Professional Development for Educators: The ATE program supports projects that provide current secondary school teachers and college faculty with opportunities for continued professional growth in areas that directly impact advanced technological education. These projects should be designed to enhance the educators' disciplinary capabilities, teaching skills (including skills in using information technology and other educational technologies to enhance instruction), vitality, and understanding of current technologies and practices. Activities typically include workshops, intensive seminars, industrial internships, or a combination of these.

Such activities typically last from a few days to several weeks and are usually conducted in the summer, with follow-up activities during the academic year. To effect long-term change, these projects should normally span at least two academic years. The program particularly encourages activities that involve secondary school teachers and two-year college faculty working together.

Technical Experiences: Well-designed technical experiences typically allow educators or students to get hands-on exposure to applications of science, mathematics, engineering, and technology; interact closely with working scientists, mathematicians, engineers, and technicians; engage in the actual practice and thought processes of science, engineering, and technology (formulating problems and questions, designing appropriate models, troubleshooting, and using technological tools); and become acquainted with the environments of two-year colleges and other academic institutions, businesses and industries, government laboratories, and other research organizations. Projects ideally should provide a balance of classroom, laboratory, and field experiences and should foster collaboration among peers. Student-faculty teams are particularly encouraged to participate in technical experiences and to translate those experiences into meaningful classroom activities that introduce other students to the role of technicians in the workplace.

Laboratory Development: The ATE program supports the development of innovative methods for using laboratory and field exercises to improve students' understanding of basic principles and for using modern instrumentation, new technologies, or applications of instruments that extend their instructional capability. The program also encourages the establishment of equipment-sharing arrangements through consortia or ATE centers. For some proposals, instrumentation-only requests might be appropriate; however, innovative laboratory development usually entails the concurrent adaptation or development of educational materials. courses, or programs. Proposals whose primary rationale is financial need or the replacement of equipment at the same level of capability are not appropriate.

2. ATE 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. They are typically cooperative efforts involving two-year colleges, four-year colleges and universities, secondary schools, business, industry, and government. Proposals for centers must clearly articulate a vision of technological education for the future and must describe a workable plan for achieving that vision during the period of NSF funding and for sustaining it afterwards.

Proposals for ATE centers should be based on a three-pronged alliance of support from (1) NSF, (2) the proposing educational institution or consortium, and (3) businesses, industries, and government agencies or laboratories.

Depending on the quality of proposals received and the availability of funds, the ATE program anticipates making awards of the following sizes and durations:

- *National Centers of Excellence*: up to two new awards for up to $5 million (each) spread over four years, with the possibility of renewal (at a lower level of funding) for an additional three years.

- *Regional Centers* for manufacturing or information technology education: up to four new awards for up to $3 million (each) spread over four years.

- *Resource Centers*: up to four new awards for up to $1.5 million (each) spread over four years.

(Within the total proposed budget for a center, experience suggests that the annual budgets should increase during the first three years as the center's activities increase.)

In addition, the ATE program anticipates making up to 10 new *planning grants* to fund the development of well-formulated plans for future national or regional centers. Planning grants are made for up to $70,000 and have a duration of one to two years. A proposal for a planning grant should clearly describe the activities that will take place during the grant period. It should also provide details about the workforce demands that the prospective center will address, the organizations that will be (or will likely be) partners in the center, the core faculty members or administrators who will manage the center, and the criteria that will be used to judge the proposer's readiness to form an ATE center at the end of the planning period. The proposal should also outline plans for identifying and enlisting faculty and representatives from business or industry to provide intellectual leadership for the center's various activities. Planning-grant proposals need not present elaborate plans for evaluation and dissemination.

a. National Centers of Excellence

National Centers of Excellence may vary in size and disciplinary coverage but must have a national impact. In particular, a National Center should bring together a broad array of institutions that offer programs in the area of technology on which the center focuses. National Centers typically engage in the full range of activities associated with ATE Projects (see Section A.1 above). They are expected to develop high-quality educational materials, courses, and curricula; to provide professional development for educators to support the utilization of these resources; and to disseminate their products through commercial publishers, journals, conferences, workshops, electronic networks, and other means. Centers must also have well-developed strategies for recruiting, retaining, and placing students preparing to be science and engineering technicians.

Proposals should present a detailed plan for advancing the ATE program's mission and emphases. In particular, the proposals should lay out significant plans for:

- broad outreach to institutions offering programs in the area of technology on which the center will focus;

- curriculum development (including the improvement of core STEM courses, as well as specialized courses in various technologies);
- evaluation of products and student learning;
- dissemination of educational materials and practices;
- utilization, creation, or enhancement of skill standards;
- strong collaboration of educational institutions with business, industry, and government (especially with regard to identifying needed technical skills, planning curricula, and establishing internships for students and faculty);
- articulation of courses and programs between secondary schools, two-year colleges, and four-year colleges and universities;
- professional development of secondary school teachers and college faculty (especially two-year college faculty); and
- recruitment, retention, and placement of students, especially students from groups underrepresented in STEM fields.

b. Regional Centers for Manufacturing or Information Technology Education

Manufacturing and information technology (IT) are central to maintaining the economic competitiveness of the United States in the 21st century. ATE Regional Centers for manufacturing or IT education are designed to impact the nation's economy and workplace through the comprehensive reform of technician education in these critical areas.

These centers are expected to focus mainly on reforming academic programs, departments, and systems to produce highly qualified workers who meet industry's needs within a particular geographic region and who also meet national industry and academic skill standards appropriate for the region's employers.

A Regional Center must involve at least two academic institutions, and in most situations will involve more than two. Each center should lead systemic reform in the manufacturing or IT programs at all or most of the academic institutions in a region, engaging a majority of the region's college faculty and secondary school teachers in the relevant discipline(s). Each center's activities must be designed to have a clear, measurable impact on the region's workforce needs in manufacturing or IT; and the center must have mechanisms for measuring the number and quality of students who are recruited, achieve competencies in relevant areas, receive industry certifications (when relevant), participate in internships, graduate, and find appropriate employment. Center leaders should also be prepared to contribute to longitudinal studies that examine students' performance in the workplace and measure employers' satisfaction with graduates.

In conjunction with industry partners, each center should undertake activities that address:

- *academic program reform*, such as using industry and skill standards and other input from industry in program development, adapting and implementing exemplary educational materials and practices developed elsewhere, improving laboratories or equipment, and using distance-learning technologies to connect workplaces and two-year colleges;

- *professional development for college faculty (including adjunct faculty) and secondary school teachers*, such as cooperative activities between faculty and teachers in technology departments and those in mathematics and science departments, exchanges of faculty and teachers among educational institutions, internships in industry, and opportunities to obtain certifications in emerging technologies; and

- *capacity building (recruitment, retention, and placement of students)*, such as mentoring and tutoring prospective and current students, collaborating with secondary schools to ensure that students are prepared for technical programs, ensuring articulation between two-year technology programs and four-year programs, providing internships for students in industry or national laboratories, and utilizing parents, teachers, counselors, and industry representatives to recruit students into careers in manufacturing and IT.

c. Resource Centers

A Resource Center should constitute a highly visible source of materials, ideas, contacts, and mentoring in a particular field of technological education, and the proposers should have already made substantial, high-quality contributions in an area of technological education. These centers (1) serve as clearinghouses for, and broadly distribute, the exemplary educational materials, curricula, and pedagogical practices designed by previously funded ATE centers and projects and (2) provide support and mentoring for institutions that wish to start or improve educational programs in a particular field of technology. Generally, only ATE national or regional centers and exemplary ATE projects that have already completed their original grants are well-positioned to become Resource Centers.

3. Articulation Partnerships

This track promotes initiatives at two-year colleges, in partnership with four-year colleges and universities, to expand two important educational pathways. One type of articulation partnership aims to impact two-year college programs for prospective K-12 teachers (with a focus on activities and disciplines that have a strong technological foundation), and the other type of partnership targets two-year college programs for students who continue their education in four-year STEM degree programs, especially programs that have a strong technological basis.

With leadership based at two-year colleges, these articulation partnerships should enhance the ability of two-year college students to transfer to four-year programs and should improve the quality of these students' preparation in STEM.

Grants for Articulation Partnerships range from $50,000 to $100,000 per year and have a duration of three years.

a. Teacher Preparation

Because many of the nation's teachers begin their professional education and complete a significant portion of their required science and mathematics course work in two-year colleges, the resources of these institutions must be utilized fully if the national need for a teaching force well-prepared in science, mathematics, and technology is to be met. (See the report *Investing in Tomorrow's Teachers: The Integral Role of Two-Year Colleges in the Science and Mathematics Preparation of Prospective Teachers* [NSF 99-49].) Moreover, the nation's technological future depends not only on highly qualified technicians, engineers, and scientists, but also on K-12 teachers who are technologically literate and have been exposed to the advanced technologies used in the modern workplace.

Projects must involve both two-year and four-year institutions and should aim to increase the number, quality, and diversity of prospective K-12 science, mathematics, or technology teachers in preprofessional programs at two-year colleges; improve the prospective teachers' technological literacy; improve their understanding of advanced technologies used in the modern workplace; and strengthen their preparation in science and mathematics (since science and mathematics provide critical underpinnings for advanced technological education). The ATE program particularly encourages efforts that target prospective middle school and high school technology teachers. The program also encourages projects involving opportunities for in-service teachers to become certified in mathematics, science, or technology education.

Projects should focus on activities such as recruiting students, improving systems for advising and mentoring, developing high-quality STEM educational materials, engaging pre-service and in-service teachers in joint activities, and connecting two-year college programs for prospective teachers with other organizations (such as businesses, laboratories, professional societies, and museums) that have a stake in STEM education.

Each project's evaluation plan must include metrics for the recruitment of prospective K-12 teachers, the transfer of those students into four-year teacher preparation programs, and the improvement in those students' preparation in science, mathematics, and technology. Project leaders should also be prepared to contribute to longitudinal studies that track students beyond the grant period, in order to measure the number who graduate with teaching credentials, find positions in K-12 schools, and demonstrate successful performance in the classroom.

b. Articulation Between Associate's Degree and Bachelor's Degree Programs

The ATE program supports partnerships in which two-year colleges work with four-year colleges or universities to develop, implement, and evaluate model programs that enable students to make a successful transition from a STEM associate's degree program to a related bachelor's degree program. Like other ATE projects, these partnerships should also involve industry. The partnerships should aim to produce highly skilled technicians with bachelor's degrees and/or highly qualified bachelor's degree graduates in science, mathematics, or engineering who are well-prepared for employment in the technical workplace.

Projects that involve curricula central to technician education are strongly encouraged. Such projects might involve, for example, joint activities between students in programs with different educational requirements (e.g., engineering and engineering technology); "reverse transfer" arrangements in which students in a four-year degree program take technical courses in a two-year college; or students' transition from a two-year degree program to a four-year program from which graduates enter the workforce as technicians or technologists.

Project activities must constitute an innovative approach to articulation that can be disseminated and implemented broadly. For example, activities might focus on designing and implementing "bridge" programs, creating or reengineering curricula to respond to emerging workforce needs, attracting students into programs, or bringing together two-year and four-year college faculty in the design and implementation of new courses and programs.

Proposals should explain the rationale for the particular partnership that is proposed, describe existing barriers to effective articulation, detail a plan for overcoming those barriers, demonstrate strong institutional commitments to the new curricular arrangements that would come out of the project, estimate the project's impact on the number of students (or workers) going on to complete STEM bachelor's degrees, and describe the metrics that will be used to evaluate the project's impact on student transfers, degree production, workforce enrichment, and student learning.

B. INFORMATION ABOUT PREVIOUS AWARDS

The March 1999 issue of the newsletter *Synergy* (NSF 99-71) profiles the ATE program and a number of funded projects. DUE's Web site provides an online guide to abstracts for and other information about previous ATE awards (http://www.ehr.nsf.gov/ehr/due/programs/ate/). NSF's Web site provides an Awards Search feature (http://www.fastlane.nsf.gov/a6/A6Start.htm) that allows customized searches of NSF's award database. DUE's Web-based Project Information Resource System (http://www.ehr.nsf.gov/pirs_prs_web/search/) contains award abstracts and a variety of additional information provided directly by Principal Investigators.

Information about ATE awards was also published annually in booklet form through FY1999. The following editions of this booklet are available electronically via NSF's Online Document System (http://www.nsf.gov/cgi-bin/pubsys/browser/odbrowse.pl):

- *Advanced Technological Education: 1999 Awards and Activities* (NSF 00-112)
- *Advanced Technological Education: 1998 Awards and Activities* (NSF 99-113)
- *Advanced Technological Education: 1997 Awards and Activities* (NSF 98-110)
- *Advanced Technological Education: 1996 Awards and Activities* (NSF 97-50)

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the *Grant Proposal Guide* (Chapter 1, Section C) are eligible to submit proposals under this program solicitation. Two-year colleges and other associate degree-granting institutions are especially encouraged to submit proposals, and all proposals are expected to include one or more two-year colleges in a leadership role. A proposal from an informal consortium of institutions should be submitted by one member of the consortium; a proposal from a formal consortium--such as a community college system or school district--should be submitted by the consortium.

An individual may serve as the Principal Investigator (PI) on no more than one proposal submitted for each deadline date, but may serve as a co-PI on multiple proposals.

In accordance with NSF's cost-sharing policy (see NSF Important Notice No. 124, "Implementation of the New NSF Cost Sharing Policy"), proposers are reminded that NSF-required cost-sharing is considered an eligibility rather than a review criterion. Proposals that do not show the required cost-sharing are ineligible for consideration and may be returned without review. Specific cost-sharing requirements for proposals submitted in response to this solicitation are identified in Section V.B ("Budgetary Information") below. The proposed cost-sharing must be shown on Line M of the proposal budget.

IV. AWARD INFORMATION

NSF anticipates that approximately $39 million will be available for this program in FY2003. The program expects to make approximately 70 awards, depending on the quality of proposals received. Grants may be awarded in a wide variety of sizes and durations, as specified in Section II ("Program Description") above. The estimated program budget, number of awards, and average award size and duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals: The submission of a preliminary proposal is strongly encouraged but not required. Preliminary proposals are read by experienced reviewers and NSF staff. On the basis of these readers' judgment of the likelihood that a full proposal based on the preliminary proposal could be successful in the formal peer review process, NSF will either "encourage" or "discourage" the submission of a formal proposal. This is an advisory opinion only; a proposer may submit a formal proposal even if NSF recommends against it after review of the preliminary proposal. The ATE program anticipates being able to return reviews of preliminary proposals approximately ten weeks after the deadline date. These reviews will provide comments to help proposers strengthen their ideas and project plans before submitting a formal proposal.

Instructions for preparing preliminary proposals are included below along with the instructions for preparing a "Full Proposal." As indicated below (under "Full Proposal"), a *preliminary* proposal should contain the following sections/forms:

- Information About Principal Investigators and Co-Principal Investigators
- Cover Sheet
- Project Data Form
- Project Summary (no longer than 500 words)
- Table of Contents (automatically generated by FastLane)
- Project Description (no longer than 12 pages, double-spaced)
- Biographical Sketches
- Budget (including Budget Justification)

A preliminary proposal should *not* include the following sections/forms:

- Current and Pending Support
- Facilities, Equipment, and Other Resources
- Special Information and Supplementary Documentation
- Appendices

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: http://www.nsf.gov/cgi-bin/getpub?gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

FastLane (http://www.fastlane.nsf.gov), NSF's system for conducting business over the Internet, must be used to prepare and submit both preliminary and formal proposals. Paper proposals will not be accepted. Proposers should carefully follow the detailed instructions (http://www.fastlane.nsf.gov/a1/newstan.htm) on the FastLane Web site. PIs who have not used FastLane before are reminded to make sure that their institution is a registered FastLane institution (see http://www.fastlane.nsf.gov/a0/about/registration.htm) and to contact the institution's Sponsored Research Office (which might also be known as the Office of Grants Administration, Office of Sponsored Projects, Office of Research, etc.) to be added to the NSF PI database. (All co-PIs listed in the proposal must also be in the NSF PI database.) PIs who intend to use subawards in their proposal (see GPG, Chapter II, Section C.6.f.(v)) are reminded that the subawardee organization(s) must also have an NSF Institution ID Number (or be a registered FastLane institution) before FastLane can be used to prepare the subaward budget(s).

New FastLane users should acquaint themselves with the system as early as possible--well before the proposal deadline.

Helpful advice about the content of effective educational proposals can be found in *A Guide for Proposal Writing* (NSF 98-91), which was prepared by staff in the Division of Undergraduate Education to assist proposers to the division's programs. (Paper copies of the publication are no longer available.)

Proposals should contain the following sections/forms:

- ***Information About Principal Investigators and Co-Principal Investigators*** (see GPG, Chapter II, Section C)
- ***Cover Sheet*** (see GPG, Chapter II, Section C): In FastLane, select the correct "Program Announcement/Solicitation No."; this number can be found at the beginning of this document. If the proposal is for a **planning grant** for an ATE center, begin the project title with the words "Planning Grant for...."
- ***Project Data Form***: The information on this form is used to direct the proposal to appropriate reviewers and to determine the characteristics of NSF-supported projects. Take special care to identify the proper track for your proposal in Item 1 on the form. For any audience code(s) marked in Item F (e.g., women, minorities, persons with disabilities), include in the Project Description a substantive discussion of the strategies that the project will employ to affect the audience(s). Note: In FastLane, the Project Data Form will show up in the list of forms for your proposal only after you have (1) selected the correct Program Announcement/Solicitation No. on the Cover Sheet and (2) saved the Cover Sheet.
- ***Project Summary*** (see GPG, Chapter II, Section C.1): This summary should be no longer than 500 words. It should be single-spaced, in a standard font with a size no smaller than 12 points. It should clearly indicate, in the first few sentences, the disciplinary focus (or foci) of the proposed project, the kinds of activities to be undertaken (e.g., educational materials development, adaptation and implementation, professional development for educators), and the primary audience to be affected by those activities (e.g., two-year college students, high school students, two-year college faculty members). This information is used to assign the proposal to a panel for review. If the proposal is funded, NSF staff will edit the Project Summary, and it will be published along with abstracts of other awards.
- ***Table of Contents*** (see GPG, Chapter II, Section C.2): This page will be automatically generated by FastLane.
- ***Project Description (including Results from Prior NSF Support)*** (see GPG, Chapter II, Section C.3): Pages in this section must have margins no less than 2.5 cm at the top, bottom, and on each side. Every page must be numbered in the bottom center. The section must be double-spaced (i.e., no more than 3 lines of text per 2.5 cm of vertical space), in a standard font (Times New Roman, Times, Arial, or Helvetica are recommended) with a size no smaller than 12 points. Page limits are as follows:

- For **preliminary proposals**, the Project Description must not exceed **12 pages** (double-spaced).

- For **formal proposals for *planning grants* for ATE centers**, the Project Description must not exceed **15 pages** (double-spaced).

- For **all other formal proposals**, the Project Description must not exceed **30 pages** (double-spaced).

Tables, graphs, illustrations, etc., are included in these page limits. The Project Description should explain the project's motivating rationale, goals, objectives, deliverables, and activities; the timetable; the management plan; the roles and responsibilities of the PI, co-PI(s), and other senior personnel; the prospects for sustainability after the period of NSF funding; the evaluation plan; the dissemination plan; and results from prior NSF support. The subsection on *Results from Prior NSF Support* should only cover awards pertaining to education; describe research awards only if they have a direct bearing on the new proposal. If the proposed project is an extension of previously funded work, the proposal must thoroughly describe the results of the prior project, demonstrate that the project achieved its objectives, and provide evidence of the quality and effectiveness of the project's deliverables. (Appendices may also be used, subject to the constraints indicated below, to illustrate prior work.) For information about effective approaches to evaluation, see the *User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering, and Technology Education* (NSF 93-152); the *User-Friendly Handbook for Mixed Method Evaluations* (NSF 97-153); and the Online Evaluation Resource Library (http://oerl.sri.com/) of NSF's Directorate for Education and Human Resources.

- ***References Cited*** (see GPG, Chapter II, Section C.4): Any literature cited should be specifically related to the proposed project, and the Project Description should make clear how each reference has played a role in the motivation for or design of the project. Any relevant literature on research in teaching and learning should be cited.

- ***Biographical Sketches*** (see GPG, Chapter II, Section C.5)

- ***Budget*** (see GPG, Chapter II, Section C.6): A Budget Justification of up to three pages *must* accompany the budget forms and provide details about budget line items. Proposals that involve subawards should include a Budget Justification of up to three pages for each subawardee organization. However, in **preliminary proposals**, budget forms for subawards are not required.

- ***Current and Pending Support*** (see GPG, Chapter II, Section C.7): In **preliminary proposals**, this section should be omitted.

- ***Facilities, Equipment, and Other Resources*** (see GPG, Chapter II, Section C.8): In **preliminary proposals**, this section should be omitted.

- ***Special Information and Supplementary Documentation*** (see GPG, Chapter II, Section C.9) and ***Appendices***: In **preliminary proposals**, these sections should *not* be included. In **formal proposals**, these sections are optional. Their *combined* length must not exceed 30 pages. They might include, for example, letters of commitment, a sample of previously developed (relevant) educational materials, a published review of such materials, or a draft of a proposed unit or module. *Letters of commitment should document collaborative arrangements or pledge resources of significance to the proposal. Do not include letters which merely endorse the proposal or which offer nonspecific support for project activities.* FastLane's Supplementary Documents function should be used to submit these sections as one or more PDF files. Note that any letters must be obtained in or converted to electronic format; if necessary, electronically scan paper documents and convert them to PDF. (Proposers should not send videotapes, computer diskettes, CD-ROMs, slides, books, etc., as appendices or supplements to a proposal.)

Because most proposals submitted in response to this solicitation will be reviewed by panel review instead of mail review, there is no need for proposers to submit a list of suggested reviewers unless an NSF program officer specifically requests it.

Certain special types of proposals described in the GPG--i.e., Small Grants for Exploratory Research (SGER) proposals (see GPG, Chapter II, Section C.11.a), Equipment Proposals (see GPG, Chapter II, Section C.11.c), and Accomplishment-Based Renewal (ABR) proposals (see GPG, Chapter V, Section B.2)--are not appropriate for the ATE program.

Collaborative Proposals (see GPG, Chapter II, Section C.11.b) should in most cases be submitted as a single proposal. Under unusual circumstances, Collaborative Proposals involving the simultaneous submission of proposals from different organizations will be accepted in the formal proposal cycle. The lead proposer must obtain advance written approval from an ATE program officer to submit such a proposal, and the collaborating organizations must exactly follow the instructions for electronic submission specified in GPG, Chapter II, Section C.11.b.(ii). The project titles of the related proposals must be identical and must begin with the words "Collaborative Project," and the *combined* budgets of the related proposals should conform to the typical award sizes specified in this solicitation. These simultaneous Collaborative Proposals will be treated as a single proposal (with a single Project Summary, Project Description, and References Cited) during the review process.

Proposers are reminded to identify the program solicitation number (NSF-02-035) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Funds requested for equipment or instrumentation (as defined below) must be matched by non-Federal funds, equipment, or instrumentation with a value equal to the funds requested from NSF. For the match on equipment and instrumentation, an institution may obligate its matching funds or receive gifts of equipment or instrumentation to be counted toward matching at any time following the program deadline date for which the awarded proposal was submitted, but before the grant expiration date specified in the official award letter. This normally provides a lengthy period during which the institution must fulfill the requirement to match NSF equipment/instrumentation funds. For all other categories of cost-sharing (e.g., personnel time), an institution may obligate its matching funds at any time following the award effective date but before the grant expiration date specified in the official award letter.

Consistent with Executive Orders 12876, 12900, and 13021, cost-sharing/matching requirements will be waived for any institution that meets *both* of the following criteria: (1) the institution is a Historically Black College or University (HBCU), a Hispanic Serving Institution (HSI), or a Tribal College or University (TCU); and (2) the institution does not offer STEM degrees beyond the master's level. Institutions eligible for this exemption from cost-sharing requirements must describe their eligibility in the Budget Justification section of the proposal. The Web page at http://www.ehr.nsf.gov/ehr/due/programs/general/msi.asp provides further information about the exemption.

The proposed cost sharing must be shown on Line M on the proposal budget. Documentation of the availability of cost sharing must be included in the proposal. Only items which would be allowable under the applicable cost principles, if charged to the project, may be included as the awardee's contribution to cost sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in-kind (see OMB Circular A-110, Section 23). It should be noted that contributions counted as cost-sharing toward projects of another Federal agency may not be counted towards meeting the specific cost-sharing requirements of the NSF award. All cost-sharing amounts are subject to audit. Failure to provide the level of cost-sharing reflected in the approved award budget may result in termination of the NSF award, disallowance of award costs and/or refund of award funds to NSF.

Indirect Cost (F&A) Limitations: In *planning grants* for ATE centers, indirect costs may not exceed 10 percent of modified total direct costs.

Other Budgetary Limitations: Funds requested for equipment or instrumentation (as defined below) must not exceed $100,000 or 10 percent of the total NSF funding request, whichever is larger.

NSF funds may not be used to support expenditures that would normally be made in the absence of an award, such as costs for routine teaching activities (including curriculum development) and laboratory upgrades.

Instrumentation: In the ATE program, items such as computers, computer-related hardware, software, laboratory or field instrumentation, and scientific or industrial machinery, with an acquisition cost between $500 and $5,000 and an expected service life of more than one year, are defined as "instrumentation." Such items may be requested for use in projects, as may "equipment," which is defined as property that has an acquisition cost of $5,000 or more and an expected service life of more than one year (see GPG, Chapter II, Section C.6.c).

Any equipment or instrumentation requested must be necessary and appropriate for achieving the project's objectives, and the Project Description must justify this need and appropriateness. Charges (including material and labor costs) for the construction of equipment or instrumentation that would have advantages (for the project) over commercially available items are allowed. In the Budget Justification, any equipment or instrumentation requested must be listed by name and probable brand, model (or version), and price (which should reflect educational discounts when available); such selections may be changed after an award if more appropriate models have become available. Neither NSF project funds nor institutional matching funds may be used for:

- equipment or instrumentation that is not mainly for use in the project;
- replacement equipment or instrumentation that does not significantly improve instructional capability;
- teaching aids (e.g., films, slides, projectors, "drill and practice" software);
- vehicles, laboratory furnishings, or general utility items such as office equipment (including word-processing equipment), benches, tables, desks, chairs, storage cases, and routine supplies;
- maintenance equipment and maintenance or service contracts;
- the modification or construction of laboratories or other buildings;
- the installation of equipment or instrumentation (as distinct from the on-site assembly of multicomponent instruments--which is an allowable charge); or
- a flat percentage inflation allowance.

Any equipment or instrumentation requested as part of a proposal should be included in Line D ("Equipment") of the proposal budget.

Workshops: In proposals that involve professional development workshops, it is generally expected that the home institutions of the participants will bear the cost of travel to and from the workshop. However, some travel costs may be included in project budgets. Costs for subsistence (lodging and meals) during the workshop may be included. In addition, funds may be requested for a stipend of up to $100 per workshop day for participants; requests for such stipends must be specific to the target audience and must be fully justified--for example, to assure participation by faculty with few professional development opportunities or from resource-poor institutions. No tuition or other fees may be charged to the participants. The host institution is expected to cover the expenses incurred by its own faculty participants. Note that indirect costs may not be charged on participant support costs.

National Visiting Committee: For very large projects (generally those requesting a total of $750,000 or more), the budget should include provisions for a National Visiting Committee (NVC) to visit the project on an annual basis. An NVC is a group of experts who provide advice to the project staff, assess the plans and progress of the project (and make reports both to the project leadership and to NSF), and enhance the dissemination of the project's products. Typically, ATE Projects enlist four to six members for an NVC, and ATE Centers enlist eight to ten. After an award is made, an NSF program officer will work with the grantee to finalize NVC membership. But the proposal should address how the NVC will be used in the project. (Additional information describing the role of NVCs can be found in the brochure "National Visiting Committees," which was prepared by the Montana Systemic Teacher Excellence Preparation Project and is available on the Web at http://ecept.net/article.pl?sid=01/03/08/2318240.)

C. Deadline/Target Dates

Proposals must be submitted by the following date(s):

Preliminary Proposals (*optional*): April 24, 2002
Full Proposals *by 5:00 PM local time*: October 16, 2002

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: http://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: http://www.fastlane.nsf.gov.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Proposers are reminded that both the intellectual merit and the broader impacts of the work to be accomplished should be addressed. While reviewers are expected to address both merit review criteria, each reviewer will be asked to address only considerations that are relevant to the proposal and for which he/she is qualified to make judgements.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education
One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities
Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria
For the ATE program, questions such as the following are often relevant to evaluating proposals in terms of NSF's merit review criteria:

Intellectual Merit

- Does the proposed project address a major challenge facing technician education?
- Does the project have potential for improving student learning of important science, technology, engineering, or mathematics (STEM) principles?
- Are the goals and objectives, and the plans and procedures for achieving them, worthwhile, well-developed, and realistic?
- Is the rationale for selecting particular activities or components for development or adaptation clearly articulated?
- Does the project design consider the background, preparation, and experience of the target audience?
- Is the project informed by research in teaching and learning, current pedagogical issues, the efforts of others (particularly other NSF-funded projects), and relevant literature?
- Does the project provide for effective assessment of student learning, which reflects the proposed educational objectives and practices?
- Are plans for evaluation of the project appropriate and adequate for the project's size and scope, and will the evaluation appropriately inform project development?
- Does the project have the potential to provide fundamental improvements in teaching and learning through effective uses of technology?
- Is the project led by, and supported by the involvement of, capable faculty (and where appropriate, practicing scientists, mathematicians, engineers, and technicians), who have recent and relevant experience in education, in research, or in the workplace?
- Is the project supported by adequate facilities, resources, and departmental commitment?
- Is the evidence of institutional support clear and compelling?

Broader Impacts

- Does the project address the current and future needs of industry for technicians?
- Does the project enhance the status of technician education?
- Are the proposed activities integrated into the academic program(s) of the participating institution(s)?
- To what extent will the results of the project contribute to the knowledge base of activities that enhance student learning?
- Will the project evaluation inform others through the communication of results?
- Are the results of the project likely to be useful at other institutions?
- What is the potential for the project to produce widely used products that can be disseminated through commercial or other channels? Are plans for producing, marketing, and distributing these products appropriate and adequate?
- Will the project result in significantly improved content and pedagogical preparation of STEM faculty and teachers?
- Does the project effectively address one or more of the following objectives: ensuring the highest quality education for those students planning to pursue STEM careers; increasing the participation of women, underrepresented minorities, and persons with disabilities; providing a foundation for scientific, technological, and workplace literacy; developing multi- and interdisciplinary courses and curricula; developing courses and curricula that are aligned with national standards, as appropriate?

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions;* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at http://www.nsf.gov/cgi-bin/getpub?gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at http://www.gpo.gov.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

To assist NSF in evaluating the ATE program and meeting the reporting requirements of the Government Performance and Results Act of 1993, the PI must also respond annually to a survey that requests information about the number and characteristics of students and educators that have been affected by the project; the retention, graduation, and placement rates for students; the project's impact on workforce needs; awards and other measures of the quality of the project's products and activities; and other indicators of the project's effect on the quality and quantity of technicians being educated for the high-tech workplace. NSF will provide guidelines for the collection and reporting of data. (NSF may use an external evaluator to gather and analyze the data.)

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Advanced Technological Education should be made to:

- Dr. Elizabeth J. Teles, Division of Undergraduate Education, telephone: 703-292-4643, e-mail: ejteles@nsf.gov.

- Dr. Gerhard L. Salinger, Division of Elementary, Secondary, and Informal Education, telephone: 703-292-5116, e-mail: gsalinge@nsf.gov.

For questions related to the use of FastLane, contact:

- Ms. Antoinette Allen, Division of Undergraduate Education, telephone: 703-292-4646, e-mail: duefl@nsf.gov.
- FastLane Help Desk, telephone: 1-800-673-6188, e-mail: fastlane@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF web site at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (http://www.nsf.gov/home/cns/start.htm) to be notified of new funding opportunities that become available.

The Division of Undergraduate Education has compiled a short list of other funding opportunities for undergraduate STEM education, which can be found on the Web at http://www.ehr.nsf.gov/ehr/due/links/other_programs.asp.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees 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/solicitation for further information.

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 about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

OMB control number: 3145-0058.