

## Teacher Professional Continuum (TPC)

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### Program Solicitation

NSF 05-580

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### National Science Foundation

Directorate for Education and Human Resources

Division of Elementary, Secondary and Informal Education

Division of Undergraduate Education

### Preliminary Proposal Due Date(s) (required):

May 31, 2005

Required for categories (A) Research Studies and (B) Professional Resources; not required for category (C) Conferences and Symposia.

### Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

September 16, 2005

Deadline applies to categories A and B. Proposals for category C may be submitted at any time, but are expected to be submitted at least one year in advance of the planned event.

### REVISIONS AND UPDATES

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1. The Research Studies category now includes three levels of projects: Exploratory Research Projects that are limited in scope, Full Scale Research Projects that are larger studies, and Research on Models for Professional Learning that study professional development models.

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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#### Program Title:

Teacher Professional Continuum (TPC)

#### Synopsis of Program:

The Teacher Professional Continuum (TPC) program addresses critical issues and infrastructure needs regarding the recruitment, preparation, induction, retention, and life-long development of K-12 science, technology, engineering, and mathematics (STEM) teachers. Its goals are to improve the quality and coherence of teacher learning experiences across the continuum through research that informs teaching practice and the development of innovative resources for the professional development of K-12 STEM teachers. The program supports Research Studies, Resources for Professional Development, and Conferences and Symposia.

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

- 47.076 --- Education and Human Resources

### Eligibility Information

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- **Organization Limit:** Proposals may be submitted by institutions and organizations including universities, two- and four-year colleges, state and local agencies, school districts, professional societies, research laboratories, informal science education centers, private foundations, or other public and private organizations whether for-profit or not-for-profit.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

### Award Information

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- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 25 to 30
- **Anticipated Funding Amount:** \$15,000,000 FY 2006 pending availability of funds

### Proposal Preparation and Submission Instructions

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#### A. Proposal Preparation Instructions

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

**B. Budgetary Information**

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **Indirect Cost (F&A) Limitations:**

Indirect costs are not allowed on participant support costs.

- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

**C. Due Dates**

- **Preliminary Proposals (required) :**  
May 31, 2005  
Required for categories (A) Research Studies and (B) Professional Resources; not required for category (C) Conferences and Symposia.
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):  
September 16, 2005  
Deadline applies to categories A and B. Proposals for category C may be submitted at any time, but are expected to be submitted at least one year in advance of the planned event.

**Proposal Review Information**

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

**Award Administration Information**

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

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I. INTRODUCTION

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The Teacher Professional Continuum (TPC) program was created for the study and improvement of the infrastructure for K-12 science, technology, engineering, and mathematics (STEM) teaching and learning. This program encourages projects that address critical issues and needs related to the recruitment, preparation, induction, professional development and retention of K-12 STEM teachers. TPC projects should contribute to (1) the advancement and synthesis of a compelling body of research that will both inform and strengthen K-12 STEM teacher effectiveness and classroom instruction; (2) the development of resources for K-12 STEM teachers' professional learning; and (3) the dissemination of knowledge about STEM teaching and learning to all stakeholders.

Over the long-term, TPC expects that improving the infrastructure for K-12 STEM instruction will advance K-12 students' understanding of STEM concepts and processes and increase the number of students pursuing advanced study and entering STEM careers.

**MISSION**

The mission of the TPC program is to improve the infrastructure for K-12 STEM teaching and learning and student performance by:

- promoting research on effective STEM teaching and teacher learning; and
- developing and evaluating professional resources for STEM teachers and those who educate them.

**GOALS**

In support of its mission, the TPC program will pursue a research, development, and implementation agenda that informs STEM teaching practice and contributes to improved learning for all students through the following goals:

- **advancing the knowledge base** on the preparation, induction, enhancement, and retention of STEM teachers, and on the strategies that strengthen and diversify the STEM teaching workforce;
- **promoting scientifically based research** that examines teacher learning of STEM content and pedagogy, and assesses the subsequent impact of this learning on practice;
- **encouraging research on effective professional development** models and experiences that enhance STEM teachers' pedagogical content knowledge and its alignment with classroom practice;
- **understanding, through research, those instructional practices** that enhance student learning in STEM disciplines;
- **developing innovative resources**, materials, tools, and ideas, for preparing and supporting STEM teachers and those who educate them;
- **fostering effective collaborations** between the communities of STEM K-12 teachers, STEM researchers, practitioners, and others contributing to STEM education; and
- **disseminating research findings**, effective models, and field-tested resources to national audiences of practitioners, administrators, researchers, policy makers, education faculty, and/or STEM disciplinary faculty.

II. PROGRAM DESCRIPTION

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**CONTEXT**

The foundation of the TPC program rests on documented national needs and recommendations from recognized experts in STEM education, education research, and disciplinary research. Learning to teach may be regarded as a continuum of professional experiences (Bransford, Brown, & Cocking, 1999; National Research Council, 2000; Wilson, Floden, & Ferrini-Mundy, 2001). This continuum begins with a teacher's own K-12 educational experiences and progresses through teacher preparation programs, induction, professional development, and other life and professional activities. These experiences constitute a complex, life-long learning process but often lack coherence, continuity and a focus on many of the important elements teachers need.

The STEM instructional workforce is rapidly changing due to teacher shortages, attrition (teachers leaving the field for other careers), migration (teachers moving to different schools) and retirement. Ingersoll (2001) refers to this constant change as a

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"revolving door." It impacts all of our nation's school districts and has an especially dramatic effect on communities serving low-income children (Darling-Hammond, 2000). An inadequately prepared STEM instructional workforce presents a major challenge to any effort that seeks to ensure accountability. For states and districts to be accountable for increasing the expectations on teacher quality and student learning, strong candidates must be attracted to, and prepared for, the STEM teaching profession.

Simply increasing the number of teachers entering the field will not – in and of itself – suffice in meeting requirements for qualified teachers (Darling-Hammond, 2000; Ingersoll, 2001; National Commission on Teaching and America's Future, 2002). It is essential (1) to address organizational sources of low teacher retention (Ingersoll, 2001) by building systems and developing resources that support teachers' efforts in promoting STEM learning for all students, and (2) to strengthen the STEM teaching profession (Hinds, 2002) by providing professional development that improves teaching practice in large numbers of classrooms (Elmore, 1997). To accomplish these changes, scientifically based research is necessary, particularly on models of STEM teacher professional learning.

While such models of STEM teacher professional learning have been described (Borko, 2004; Wilson, et al., 2001; Putnam & Borko, 2000), little empirical research exists on their implementation and impact on teacher learning, classroom practice, and student outcomes (Borko, 2004; Wilson & Berne, 1999; Wilson, et al, 2001).

Specifically, a model describes the "key elements that make up any [pre-service or in-service] professional development system...the professional development program; the [pre-service or in-service] teachers, who are the learners in the system; the facilitator, who guides teachers as they construct new knowledge and practices; and the context in which the professional development occurs" (Borko, 2004, p. 4). In particular, research is needed that studies the ways promising models of teacher education are enacted in different settings by multiple people involved in teacher education and professional development, and "the effects and resource requirements of well-defined professional development programs" (Borko, 2004, p.11).

Teacher preparation programs and professional development experiences, particularly those experiences focused on expanding teachers' content knowledge, are often disjointed and disconnected from classroom practice (Garet, Porter, DeSimone, Birman, & Yoon, 2001; Goodlad, 1990;). Shulman (1986) noted that in addition to general content knowledge, teachers should know about the intersection of content knowledge and pedagogical knowledge that he referred to as pedagogical content knowledge. Over time, (Ball and Bass, 2001) and colleagues introduced the concept of *content knowledge for teaching* to focus attention on the specific content that teachers need to know as distinct from that needed by others who work in the discipline. The TPC program envisions the process of teacher learning as a coherent series of related events, bringing together as appropriate general content knowledge, content knowledge for teaching, pedagogical content knowledge, and general pedagogical knowledge (Shulman, 2000). It is with this vision of a comprehensive, coherent, and integrated sequence of teacher life-long learning that the TPC program has been conceptualized as a professional continuum.

However, efforts to directly impact large numbers of teachers and classrooms are beyond the scope of the TPC program. Instead, the program is aimed at improvement of the infrastructure for K-12 STEM teaching and learning. This will be accomplished through the development of research-based knowledge and resources and their broad dissemination, particularly to those charged with impacting policy and practice. TPC projects will provide the foundation for making evidence-based decisions and the professional resources for implementing improvement efforts.

### **GENERAL PROGRAM INFORMATION**

The TPC program welcomes proposals from first-time applicants and institutions that have not received prior funding. For guidance on proposal preparation and submission, applicants should consult the following sources: Grant Proposal Guide (<http://www.nsf.gov/pubsys/ods/getpub.cfm?nsf0423>), the Division of Grant and Agreements' Frequently Asked Questions on Proposal and Award Administration ([http://www.nsf.gov/pubs/2004/nsf042/faqs04\\_2.pdf](http://www.nsf.gov/pubs/2004/nsf042/faqs04_2.pdf)). TPC applicants are also invited to consult directly with cognizant TPC program officers.

All projects will be expected to participate in an NSF-initiated third-party evaluation, which will require submission of requested data to NSF program evaluators. NSF will separately fund this third-party evaluation. The PI should designate a staff member to be responsible for providing data for the third party evaluation. This will require a time commitment of at least one week, each year of the grant. PIs are also expected to provide copies of published research, as well as resources and instrumentation developed from the project to the third party evaluator.

In addition, all PIs are expected to participate in an annual TPC PI meeting to be held in the Washington, DC area. The purpose of this meeting is to share and discuss strategies for the dissemination of program models, research findings, professional development materials and best practices. All projects must include travel expenses in their respective budgets for the PI to attend the conference. Full Scale Research Projects, Research on Models and Full Development Resource projects should also budget for the participation an additional project team member. Specific information about the conferences will be provided to the current PIs each year the TPC program staff. Projects wishing to bring additional team members must contact the cognizant program officer.

### **CATEGORIES OF PROJECTS**

The vision of a continuum of learning experiences that develop teachers' knowledge, improve their practice, and strengthen their profession is at the core of the TPC program. Investigators are expected to identify the stage(s) of this continuum addressed by their project and to indicate connections (s) with to prior and later stages. Each project must focus on science, technology, engineering and/or mathematics education and identify specific issues and target audiences. The ability of the TPC program to impact the infrastructure for K-12 STEM teacher education requires meaningful and appropriate collaborations among practitioners, STEM and education faculty, education researchers, assessment and evaluation experts, and others who influence policy at the local, state, and national levels. Evidence of these collaborations is expected in all proposals. It is also expected that STEM practitioners will be actively engaged in and make significant contributions to all TPC projects.

The TPC program supports (a) research studies on the recruitment, preparation, induction, professional development, and retention of K-12 STEM teachers; (b) the development of research-based professional resources for STEM teachers; and (c) conferences and symposia that foster sharing knowledge and promoting collaborations across the STEM education community.

### **Category A. Research Studies**

TPC supports research on K-12 STEM teaching and teacher learning at all stages within the professional continuum. Research studies should contribute to the knowledge base for the recruitment, preparation, development, support and retention of K-12 STEM teachers. Funded projects are expected to employ accepted research methods (Richardson, 2001; Shavelson & Towne, 2002; Johnson & Onwuegbuzie, 2004). Research designs may employ qualitative or quantitative methodologies or a multiple methods approach (Raudenbush, 2004).

The TPC program encourages research on critical issues and needs regarding the recruitment, preparation, support, induction, and retention of K-12 STEM teachers and on models for professional learning at all stages along the professional continuum. Innovative research questions that are centered in, and informed by, practice are encouraged.

Research studies on models for STEM teacher professional learning may examine existing models or develop and test new ones. In studies of a new or modified model, proposals may request funding for a pilot-scale implementation. In such projects, adequate time must be available to implement the pilot and complete the research on it.

The translation and implementation of research findings for practice is of paramount interest to NSF. All projects are expected to inform STEM education audiences, including K-12 practitioners, of research methods and findings through publication in peer-reviewed journals, presentations at scholarly conferences and practitioner meetings, submissions to digital libraries with appropriate links to websites, and networking with other STEM educators. Additional dissemination processes are also encouraged.

TPC supports three subcategories of research projects: **Exploratory Research Projects** that are limited in scope, **Full Scale Research Projects** that are larger studies, and **Research on Models for Professional Learning** that study professional development models that serve STEM teachers at one or more points along their learning continuum. All subcategories of research projects are expected to further the knowledge base about the recruitment and preparation of undergraduates, as well as those entering teaching as a second career (through alternative certification), and the induction, professional development, and/or retention of K-12 STEM teachers. Innovative and high-risk projects with the potential for high gains are encouraged.

**Subcategory 1. Exploratory Research Projects** should address research questions that can be studied within a limited time and on a modest budget. These projects might (1) examine novel research protocols; (2) develop, adapt, and test research instruments that may ultimately be broadly applicable in research and evaluation; (3) synthesize and disseminate existing research; or (4) conduct secondary data analyses or qualitative studies to research the effectiveness of recognized best practices. Collaborations between K-12 practitioners and researchers are encouraged, as is research that is closely aligned with practice. Exploratory projects can request up to \$100,000 per year, with maximum project duration of three years. The amount of the request should be commensurate with the scope and complexity of the proposed effort.

**Subcategory 2. Full Scale Research Projects** are expected to be larger in scale, longer in duration and address issues of national concern. These projects may not exceed \$500,000 per year, with maximum project duration of five years.

**Subcategory 3. Research on Models for Professional Learning** must go beyond the evaluation of a particular implementation of a professional learning intervention and contribute generalizable knowledge about STEM teachers' professional learning. Proposals are expected to describe the model (a multi-year strategy for effective teacher professional development) including essential components and their interactions, and its efficacy for the professional learning of current and future STEM teachers. Projects in

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this category may study (1) an existing model, (2) a model that has been modified for the purpose of the research study, or (3) a new model. These projects may not exceed \$500,000 per year, with maximum project duration of five years. Where an implementation component is involved, the scale and cost of the implementation must be justified by the research design.

Competitive proposals for all three subcategories of research studies must address all of the elements below in the Project Description (See Section V), but they need not be in the order listed or explicitly titled. Although **Exploratory Research Projects** and **Research on Models** must also address these elements, some modifications in these expectations are noted below.

**1. Goals.** State the goals of the proposed research and their alignment with TPC program goals. The proposal should identify the national need being addressed and project focus (e.g., discipline, grade band, position(s) on the professional learning continuum).

*Exploratory Projects* may have a local focus but should describe its relevance to issues of national import.

**2. Rationale and Related Literature.** Reference should be made to relevant theoretical and empirical research supporting the rationale for selecting the proposed area of study. The theoretical framework and grounding research for the proposed project must be described. The proposed study should build upon and relate to previous and on-going developments in educational theory and practice. The rationale for the project should describe its innovative aspects and the potential value of the findings to the knowledge base informing the STEM education community, as well as the anticipated impact for K-12 STEM classrooms.

For *Research on Models*, the rationale for the project should defend the choice of the particular model for the research study and the model's relevance to the needs of the target population. The rationale should explain the model's potential value to a broad K-12 STEM teacher population. The proposal should indicate how the research might inform future larger scale national studies. These proposals must include a description of the model, its components and their interactions, and indicate the process by which the fidelity of implementation will be assured.

**3. Research Questions and/or Hypotheses.** Describe the research questions or hypotheses that will drive the inquiry of the proposed work and their relationship to national needs in STEM education. Proposals should also explicitly describe the relevance of research findings to K-12 STEM education, particularly the relevance of the results to practice.

**4. Research Design.** Describe all activities necessary to implement the research design. This section should include (1) plans for data collection, analysis, and interpretation; (2) methods for measuring the effects of the intervention (3) sample design and relevant control methods when appropriate; (4) instruments and their validity and reliability; (5) data analysis and hypothesis testing; and (6) criteria by which success of the work will be measured. Proposals should identify the methods by which the researcher(s) will create a coherent chain of reasoning from formulation of the question or hypothesis, through data collection, analysis, and interpretation to conclusions.

For *Research on Models*, proposals must describe how data collection and analysis will allow the researchers to establish that the phenomenon under study is a faithful implementation of the model.

**5. Work Plan.** Present a detailed timeline indicating when instruments will be developed (if appropriate), as well as when data will be collected and analyzed. The plan should also note important milestones that will inform progress being made, including dissemination of findings to the public. Assignment of responsibility for each phase of the work is required.

For *Research on Models* present a detailed timeline indicating how and when the model will be implemented. Include a timeline for how the research work plan will be integrated with the implementation. Projects researching a new model should also provide details in the work plan and timeline for the development of the implementation, including who is responsible for what and when, and the connection between these activities and the data collection and analysis.

**6. Dissemination.** Provide details of a comprehensive and robust dissemination plan for the research findings, and instrumentation that will strengthen educational research and evaluation. Innovative strategies should focus on major stakeholder groups (practitioners, policy makers, administrators, professionals in

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STEM and education disciplines, and members of the education research community). Particular attention should be placed on efforts that accelerate the translation of research to practice. All projects are expected to publish research findings in peer-reviewed journals. In addition, dissemination of the research findings via presentations at scholarly and practitioner meetings, submissions to the National Science Digital Library (NSDL <http://www.nsd.org>) and networking with others involved in STEM education and research are expected.

For **Exploratory Research** projects, the dissemination plan should indicate what conferences and/or peer-reviewed journals are the expected outlets for the project work. Additionally, the authors should indicate how the proposed project fits into their research agenda.

**7. Personnel.** Describe the expertise represented by the project team, depicting the strength and balance of collaborations among STEM research and education faculty, education researchers, classroom teachers, administrators, and assessment and evaluation experts. Special attention will be given to projects that show evidence of strong collaborations with K-12 STEM practitioners. The expertise, role, and commitment of the key project personnel must be described. Project leadership must include personnel who can provide a range of expertise to ensure multiple perspectives within the research project. Projects involving higher education institutions in delivery of STEM content or pedagogy must include STEM disciplinary faculty and education faculty on the leadership team. Large projects should include external expertise, such as an advisory panel, to assist in guiding the program and its outcomes.

For **Exploratory Research** projects, the research team may be significantly smaller although collaborative efforts as noted above are encouraged.

For **Research on Models**, it is expected that the Researcher will be an objective participant, external to the implementation of the model. While the research team may collaborate on the implementation design, the proposal should provide evidence of the independence of the researcher and research component from the implementation activities.

### Category B. Professional Resources

**Professional Resources** projects contribute to preparing, supporting, enhancing, and sustaining K-12 STEM teachers, leaders, teacher educators, and administrators. Professional Resources must be grounded in research on teaching and learning, address a recognized national need, and advance the knowledge base on STEM teaching and/or the STEM teaching profession. Professional Resources may include, but are not limited to, professional development materials focused on STEM content and pedagogy; tools (e.g., delivery systems, knowledge assessment instruments, applications of learning technologies); and teacher education curricula and information resources.

To strengthen the nation's capacity to provide high-quality STEM education, NSF invests significantly in the development of innovative, standards-based instructional materials and student assessments that are designed to create classroom environments enabling all students to achieve their full potential. Recognizing that implementation of these student materials requires significant teacher professional development, the TPC program encourages development of closely aligned professional resources focused on increasing teachers' content knowledge and instructional skills.

**NOTE: Potential PIs should be aware that TPC supports professional resources for K-12 STEM teachers, but not students. Investigators wishing to submit proposals for the development of instructional materials for K-12 students should refer to the Instructional Materials Development (IMD) solicitation located at <http://www.nsf.gov/div/index.jsp?div=ESIE>**

The TPC program supports two subcategories of projects, **Proof-of-Concept Projects** and **Full Development Projects**.

**Subcategory 1. Proof-of-Concept Projects** are intended to develop and test prototype materials or tools. These projects should be focused on pilot-scale efforts and are intended to encourage and foster innovation. Projects developing effective **Proof-of-Concept** resources should consider submission of a proposal for full-scale development, field-testing, and dissemination to a subsequent TPC competition. **Proof-of-Concept** projects can request a maximum of \$300,000 total for duration not to exceed three years.

**Subcategory 2. Full Development Projects** are expected to create new resources, to demonstrate their effectiveness, and to promote the dissemination of tested and effective materials at a national level. The work should include a realistic determination of the investment (time and money) needed for implementation. **Full Development Projects** can request a maximum of \$300,000 per year with maximum project duration of five years.



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Potential PIs are expected to review existing materials related to the professional development of STEM teachers by consulting appropriate sources, such as the Teacher Education Materials (TE-MAT) database (<http://www.te-mat.org>) and the National Science Digital Library (NSDL) (<http://www.nsdli.org>). Proposals may develop new materials and/or make revisions that significantly improve the quality of existing materials but should not duplicate materials that have already been developed.

**Professional Resources** proposals must address all of the elements below, but they need not be in the order listed or explicitly titled. Although **Proof-of-Concept** projects must also address these elements, some modifications in these expectations are noted below.

**1. Goals and Outcomes.** Describe, in detail, the goals and the anticipated products of the project. Projects must identify learning goals for the targeted audience and what will constitute evidence that these goals have been met. The alignment of the proposed resources with research on teaching and learning and with standards-based content, instructional strategies, and assessment must also be presented.

**2. Rationale.** Present the rationale and supporting research for the intended resource. Proposed resources should (1) address a national need in the STEM teaching field; (2) be developed from a research base that grounds the work; (3) build upon and relate to previous and on-going developments in educational theory and practice; (4) support learning experiences and/or enhance the STEM teaching profession; and (5) promote improved teaching and learning in STEM classrooms. The proposal should clearly articulate the innovative aspects of the resources and the contribution that would be made to STEM education reform.

**3. Anticipated Products.** Describe in detail the intended audience, content, and format of the proposed resources (e.g., curricula, software, online courses, videos, CD-ROMs, tools, ideas, information resources).

*For Proof-of-Concept projects, also describe how the prototype would be adapted for full implementation.*

**4. Design and Work Plan.** Describe how project goals will be achieved, what evidence will be collected, and what criteria will be used to evaluate the evidence. The proposal should explain the process for development of the resources and how they will be reviewed, pilot- and field-tested, and revised. Describe the size and characteristics of pilot- and field-test populations. STEM educators must be included in the development, review, and field-testing stages. Field test populations should reflect the diversity of the intended audience.

Proposals should address how resources could be adapted to serve audiences of varied needs and skill levels. A detailed work plan indicating who is responsible for each facet of the work and a timeline showing when each stage will be accomplished must be included.

*For Proof-of-Concept projects, the size and characteristics of the pilot and field test populations should be described and justified in terms of the scope of the project.*

**5. Project Evaluation.** Describe how the evaluation plan addresses the process of developing the resources and assessing their effectiveness. The evaluation must examine (1) the quality of the resources' content and pedagogy; (2) the impact of the resources on the intended audiences for the intended purposes; (3) the integrity of the development process; (4) the integrity of the implementation process; and (5) the cost effectiveness of developing and implementing the resources. The data collection instruments and the procedures for data collection, analysis and reporting, and all pilot- or field-testing must be described. The evaluation must document how findings from the formative evaluation, pilot- and field-tests will inform the development/revision process.

In addition, the evaluation plan must include an external review of materials by a content expert to ensure accuracy of the content. Although formative evaluation may be conducted by members of the development team, external evaluators who are not themselves involved in the development process must conduct the summative evaluation. Results of the summative evaluation and the external content review of the resources must be reported directly to the National Science Foundation.

*For Proof-of-Concept projects, the evaluation plan must be appropriate in scope to the scale of the project. This plan must include an external review of the resource to ensure accuracy of content and appropriateness of pedagogy. This review must be part of any subsequent proposal seeking further support.*

**6. Dissemination.** Provide a comprehensive and robust plan for disseminating (1) the resources, (2) information about their impact, and (3) and guidelines for educating appropriate audiences on their effective use. Proposals should address how the resources will be made available to relevant audiences including

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state/district/local administrators, practitioners, professional developers, higher education faculty in STEM and education disciplines, and experts in evaluation and assessment. It is expected that materials will be submitted to the National Science Digital Library (NSDL; <http://www.nsdli.org>) and the Teacher Education Materials database (TE-MAT; <http://www.te-mat.org>). A timeline for securing a publisher (if appropriate) and/or identifying other dissemination outlets is expected. Projects are also expected to document and disseminate information about the resource development, field-testing, and revision processes.

*For **Proof-of-Concept** projects, it is not expected that products would be ready for full dissemination. Nevertheless, it is reasonable to disseminate findings from the grant effort. The proposal should identify the appropriate audiences and describe the dissemination plan.*

**7. Personnel.** Describe the strengths and balance of appropriate collaborations among STEM disciplinary and education faculty, classroom teachers, school/district/state administrators, educational researchers, curriculum developers, as well as assessment and evaluation experts within the project team. The expertise, role, and commitment level of the key personnel should be described. Project leadership should include personnel who can provide a range of expertise, offer multiple perspectives, and assure diversity within the research project.

### Category C. Conferences and Symposia

Conferences and symposia are intended to assemble experts (1) to introduce, discuss, and/or synthesize research related to the recruitment, preparation, development or retention of K-12 STEM teachers; (2) to present and discuss professional resources for K-12 STEM teachers; or (3) to review and develop action plans for future research and resource development projects. Conference proposals can request up to \$200,000 with maximum project duration of two years.

Competitive proposals for conferences and symposia must contain the following elements in their project descriptions:

**1. Goals and Outcomes.** Describe the major goals and anticipated outcomes of the conference or symposium. Tangible deliverables (if any) must be described.

**2. Description of Event.** Describe the content, format, purpose, presenters, method of announcement or invitation, location, and dates for the proposed activity. Proposals should explain how diverse groups, particularly those traditionally underrepresented in STEM education, would be enlisted as presenters and participants.

**3. Rationale.** Provide references to the literature or other evidence in support of the rationale for the proposed event. The proposal must explain how the event (1) addresses a national need, problem or issue; (2) builds on and relates to previous and on-going efforts in the field; (3) selects and/or recruits participants; and (4) advances knowledge among practitioners and others in the STEM content and education communities.

**4. Audience.** Describe the intended audience for the event. Competitive proposals should indicate the extent to which practitioners will be included in the proceedings and how they would be recruited. Whenever possible, practitioners should be involved in conference planning.

**5. Work Plan.** Provide a detailed work plan (including timeline of critical milestones) that identifies specific steps in planning and presenting the event, indicating who is responsible for each step.

**6. Evaluation.** Describe plans for the evaluation of the conference/symposium. Evaluation results must be reported to NSF.

**7. Dissemination.** Describe the plan for preparing and disseminating the proceedings. Dissemination audiences should include STEM teachers, administrators, researchers, and others in the STEM research and education communities.

**8. Personnel.** Describe the planning team. This team should include strong and well-balanced collaborations among STEM research and education faculty, classroom teachers, school administrators, educational researchers, curriculum developers, and assessment and evaluation experts. The expertise, role, and commitment level of key personnel should be described. Teams are expected to include personnel who can provide a range of expertise, offer multiple perspectives, and assure diversity within the effort.

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### III. ELIGIBILITY INFORMATION

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Proposals may be submitted by institutions and organizations including universities, two- and four-year colleges, state and local education agencies, school districts, professional societies, research laboratories, informal science education centers, private foundations, or other public and private organizations whether for-profit or not-for-profit.

### IV. AWARD INFORMATION

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The program anticipates funding 25-30 awards in FY 2006.

Projects involving *Research Studies* (Category A) may not exceed \$100,000 per year for a duration of up to 3 years for Exploratory Projects. Research Projects and Research on Models for Professional Learning may not exceed \$500,000 per year for a duration of up to 5 years.

Proof-of-Concept projects in *Professional Resources* (Category B) may not exceed a total budget of \$300,000 for a maximum duration of three years. Full Development projects may not exceed \$300,000 per year for a duration of up to 5 years.

*Conferences and Symposia* (Category C) may not exceed a total budget of \$200,000 for a duration of up to 2 years.

### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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#### A. Proposal Preparation Instructions

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##### **Preliminary Proposals (required):**

##### **Description:**

Projects falling within Categories A or B require a preliminary proposal as a prerequisite for the full proposal submission. Preliminary proposals must be submitted via FastLane no later than 5:00 p.m., local time, on the specified deadline. Preliminary proposals are not required for Category C.

Submission of preliminary proposals via FastLane requires completion of the following FastLane forms:

**Cover Sheet.** Complete this form with the appropriate information and make sure to check the preliminary proposal box.

##### **Project Summary.**

Describe the following elements: (1) **the project category and sub-category**, (2) the **Intellectual Merit** of the proposed work and (3) the project's **Broader Impacts**. The latter two are fully described in Section VI of this solicitation and in the **Grant Proposal Guide**. As indicated in the **Grant Proposal Guide**, the project summary may not be more than one page in length and "should not be an abstract of the proposal but rather a self-contained description of the activity that would result if the proposal were funded. The summary should be written in the third person and include a statement of objectives and methods to be employed."

##### **Project Description**

Describe the following project elements: (1) rationale and related research, (2) goals and projected outcomes, (3) work plan for accomplishing the goals, (4) personnel, (5) essential features and characteristics, (6) evaluation plans (if applicable), and (7) dissemination plans. Limited to six pages with 2.5-cm margins on all sides, the project description should be single-spaced and use a legible, 12-point font.

**Budgets.** Provide an estimated budget for the total amount of money requested from NSF, with information on salaries and

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other expenses, including but not limited to, equipment (where allowable), participants, consultants, travel, subawards, and indirect costs. Include a budget narrative that describes and justifies each of the expenses.

Preliminary proposals require cumulative budgets only. Given FastLane's present constraints, the only option available is to enter the project's cumulative budget as the Year 1 budget. FastLane automatically creates the cumulative budget, which, in the case of preliminary proposals, is identical to the Year 1 budget. Enter a one-page budget-explanation narrative in the Budget Justification section.

**Biographical Sketches.** Provide a brief narrative describing the key personnel expertise, relevant to the proposed work. Biographical sketches should be sufficiently detailed to show that the necessary expertise is available to conduct the project.

**Supplementary Documents.** Appendices and letters of support are NOT permitted for preliminary proposals.

### **Review of Preliminary Proposals**

Carefully selected reviewers from the field and members of the NSF staff will review preliminary proposals. Ultimate submission of a formal proposal is either encouraged or discouraged based on the reviewers' perceptions of the likelihood that a proposal, as written, will be successful in the formal merit-review process. ***This recommendation is strictly an advisory opinion; formal proposals may be submitted regardless of the recommendation.*** Written reviews are intended to provide constructive feedback and suggestions that will help strengthen the final proposal. Reviews are returned as expeditiously as possible, but no later than one month prior to the full-proposal submission date.

### **Full Proposal Instructions:**

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 Website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

**The following instructions deviate from the GPG guidelines:**

#### **Description:**

Proposals for projects falling within Categories A or B must be submitted via FastLane no later than 5:00 p.m., local time, on the specified deadline. Proposals for Category C are accepted at any time, but are expected to be submitted at least one year prior to the date of the planned event. Submission of full proposals via FastLane requires completion of the following FastLane forms:

**Project Summary.** Each TPC proposal must have a **Project Summary** that includes (1) **the project category and sub-category**, (2) the **Intellectual Merit** of the proposed work and (3) the project's **Broader Impacts**. The latter two are fully described in Section VI of this solicitation and in the Grant Proposal Guide. As indicated in the **Grant Proposal Guide**, the project summary may not be more than one page in length and "should not be an abstract of the proposal but rather a self-contained description of the activity that would result if the proposal were funded. The summary should be written in the third person and include a statement of objectives and methods to be employed."

**Project Description.** Refer to the *Program Description* section of this solicitation, which clearly outlines the requirements for the project description section (of the proposal) for each specific TPC category. Limited to 15 pages with 2.5-cm margins on all sides, the project description narrative should be single-spaced and use a legible, 12-point font. **The project description should include discussion of previous NSF support relevant to the proposed work by any key personnel that received funding in the last five years (see Grant Proposal Guide).** Evidence and results from prior support, including a discussion of lessons learned from both successes and failures must be provided. The proposal should describe how the proposed work differs from, and where appropriate build upon prior efforts.

**Budget.** Provide a budget request for each year of the project. If applicable, also include a complete budget for each year of individual subawards. FastLane automatically creates the cumulative project budget. Limited to three pages, the accompanying budget justification should clearly explain how each line-item was determined.

**Special Information/Supplementary Documentation.** If applicable, provide additional documents such as letters indicating support for the proposed project. Please note that reviewers are not required to read the supporting documents. Therefore, make certain that the project description provides sufficient information about the project that will enable reviewers to make informed judgements.

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Proposers are reminded to identify the program announcement/solicitation number (05-580) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

### **B. Budgetary Information**

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#### **Cost Sharing:**

Cost sharing is not required by NSF in proposals submitted under this Program Solicitation.

#### **Indirect Cost (F&A) Limitations:**

Indirect costs are not allowed on participant support costs.

#### **Other Budgetary Limitations:**

**Funding Levels** -- Budgets should reflect the scope and impact of the proposed work. The level of funding is determined by the size and nature of the activity. All projects must be cost-effective and budgets must adequately justify requested funds.

Projects involving *Research Studies* (Category A) may not exceed \$100,000 per year for a duration of up to 3 years for Exploratory Projects. Research Projects and Research on Models for Professional Learning may not exceed \$500,000 per year for a duration of up to 5 years.

Proof-of-Concept projects in *Professional Resources* (Category B) may not exceed a total budget of \$300,000 for a maximum duration of three years. Full Development projects may not exceed \$300,000 per year for a duration of up to 5 years.

*Conferences and Symposia* (Category C) may not exceed a total budget of \$200,000 for a duration of up to 2 years.

#### **Budget Preparation Instructions:**

Equipment purchases that support the efforts of the research and development process or the development of professional resources are allowed, but must be justified in the *Project Description* and *Budget Justification* of the full proposal.

The budget narrative should reflect the work plan and justify any request for tuition. If there is a budget request for instructional salary support and indirect costs are claimed, tuition costs are not allowed.

A direct stipend of up to \$100 per day (prorated for partial days) for participation in project activities occurring outside of paid school time is allowed. The total stipend may exceed that amount if it is supplemented from other sources. Stipends/honoraria for conference or symposia attendance are not allowed. Teachers or other practitioners who are assuming responsible roles within the project should be paid at an appropriate higher level. In this situation practitioners should appear in the Personnel and Consultant Services lines of the budget and budget justification.

The use of NSF funds to hire substitute teachers is allowed under the following conditions: (1) it is necessary to meet the goals and objectives of the project, and (2) it can be documented that the substitute teachers are directly replacing teachers participating in the NSF-funded project. Substitute teachers should be paid in accordance with established school-district policies, and in lieu of paying the teachers participating in the project. Records must be maintained on the hiring and use of substitutes.

### **C. Due Dates**

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

#### **Preliminary Proposals (required):**

May 31, 2005

Required for categories (A) Research Studies and (B) Professional Resources; not required for category (C) Conferences and Symposia.

**Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

September 16, 2005

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Deadline applies to categories A and B. Proposals for category C may be submitted at any time, but are expected to be submitted at least one year in advance of the planned event.

### D. FastLane Requirements

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Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

*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 electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

## VI. PROPOSAL REVIEW INFORMATION

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### A. NSF Proposal Review Process

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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.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

#### **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?

NSF staff will give careful consideration to the following 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:**

In addition to the Foundation-wide criteria described above, special criteria to be used in evaluating Research Studies, Resources for Professional Development, and Conference and Symposia proposals are described under the Project Description (Section II of this solicitation) for each category.

Additional review criteria for Research Studies include the goals of the proposed research and their alignment with the TPC program goals; the rationale and related literature relevant to the proposed project; the research questions associated with the proposed work; the research design; the work plan; dissemination plans; project personnel; and results of prior NSF support.

Additional review criteria for Resources for Professional Development include goals and outcomes of the project; rationale for the proposed resources; anticipated products; design and work plan; project evaluation; dissemination; personnel; and results of prior NSF support.

Additional review criteria for Conferences and Symposia include goals and outcomes; description of the event; rationale; work plan; evaluation; dissemination; and personnel.

**B. Review Protocol and Associated Customer Service Standard**

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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.

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.

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 proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. 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



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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 their own risk.

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### **VII. AWARD ADMINISTRATION INFORMATION**

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#### **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.)

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#### **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 Website at <http://www.nsf.gov/awards/managing/>. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto: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 Website at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpm](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=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 Website at <http://www.gpo.gov>.

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#### **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.

Additional reporting requirements apply, as described in Section II of this solicitation. Specifically, all projects will be expected to participate in an NSF-initiated third-party evaluation, which will require the submission of requested data to NSF program evaluators. This third party evaluation will be separately funded by NSF.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. 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.

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### **VIII. CONTACTS FOR ADDITIONAL INFORMATION**

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General inquiries regarding this program should be made to:

- Emmett L. Wright, Section Head, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5088, fax: (703) 292-9044, email: [elwright@nsf.gov](mailto:elwright@nsf.gov)
- Julia V. Clark, Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5119, fax: (703) 292-9044, email: [jclark@nsf.gov](mailto:jclark@nsf.gov)
- John R. Haddock, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-8670, email: [jhaddock@nsf.gov](mailto:jhaddock@nsf.gov)
- Michael R. Haney, Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5102, fax: (703) 292-9044, email: [mhaney@nsf.gov](mailto:mhaney@nsf.gov)
- David Hanych, Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-8614, fax: (703) 292-9044, email: [dhanych@nsf.gov](mailto:dhanych@nsf.gov)
- Daniel L. Householder, Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5112, fax: (703) 292-9044, email: [dhouseho@nsf.gov](mailto:dhouseho@nsf.gov)
- Karen King, Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5105, fax: (703) 292-9044, email: [kking@nsf.gov](mailto:kking@nsf.gov)
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- General TPC Information, telephone: (703) 292- 8613, email: [ehr-esie-info@nsf.gov](mailto:ehr-esie-info@nsf.gov)

For questions related to the use of FastLane, contact:

- NSF Fast Lane Contact, telephone: (800) 673-6188,

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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 Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [MyNSF News Service](#) (<http://www.nsf.gov/mynsf/>) to be notified of new funding opportunities that become available.

### Related Programs:

- Advanced Technological Education ([NSF 05-530](#))

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- Centers For Learning and Teaching ([NSF 04-501](#))
- Course, Curriculum, and Laboratory Improvement (CCLI) ([NSF 05-559](#))
- Informal Science Education ([NSF 05-544](#))
- National Science, Technology, Engineering, and Mathematics Education Digital Library ([NSF 05-545](#))
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