Math and Science Partnership (MSP)

Program Solicitation
NSF 08-525

Replaces Document(s):
NSF 06-539

National Science Foundation

Directorate for Education & Human Resources
Division of Undergraduate Education

Letter of Intent Due Date(s) ***(optional)*** (due by 5 p.m. proposer's local time)***:***

February 18, 2008

Optional, but strongly encouraged - Targeted Partnerships, Institute Partnerships, MSP-Start Partnerships, Phase II Partnerships, and RETA Projects

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

March 25, 2008

Targeted Partnerships, Institute Partnerships, MSP-Start Partnerships, Phase II Partnerships, RETA Projects

April 10, 2008

Innovation through Institutional Integration

REVISION NOTES

In furtherance of the President's Management Agenda, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system.

The solicitation continues two major Partnership components of the MSP program - the *Targeted Partnerships* and the *Institute Partnerships – Teacher Institutes for the 21st Century*. Targeted Partnerships seek to improve student achievement in a specific grade range and/or with a specific disciplinary focus in mathematics or the sciences while Institute Partnerships are designed especially to meet national needs for teachers who have deep knowledge of disciplinary content and are school-based intellectual leaders in mathematics and science.

1. The solicitation includes an opportunity for *MSP-Start Partnerships* for awardees new to the MSP program. MSP-Start Partnerships will conduct the necessary data analysis, project design, evaluation and team building activities needed to develop a full MSP Targeted or Institute Partnership. Proposals are especially encouraged from minority-serving institutions (e.g., Tribal Colleges, Historically Black Colleges and Universities, Hispanic Serving Institutions), community colleges and primarily undergraduate institutions.

2. The solicitation includes an opportunity for *Phase II Partnerships* for prior MSP Partnership awardees to focus on specific innovative areas of their work where evidence of significant positive impact is clearly documented and where an investment of additional resources and time would produce more robust findings and results.
3. The solicitation also invites *Research, Evaluation and Technical Assistance* (RETA) proposals that directly support the work of the Partnerships and that design and develop methods and tools to measure the impact of interventions in mathematics and science education. Especially encouraged are proposals to develop tools that assess teachers' growth in the knowledge of mathematics or the sciences needed for teaching, to conduct longitudinal studies of teachers and their students who participate in the MSP projects, or that engage the national disciplinary and professional societies in MSP work.
4. LEAD partner eligibility for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II - is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations). Such an organization or consortia may be the LEAD partner in only one proposal. Eligibility for RETA is open to all categories of proposers identified in the NSF Grant Proposal Guide; these organizations may submit one or more RETA proposals.
5. A new track for *Innovation through Institutional Integration* (I^3) has been added. I^3 challenges institutions to think strategically about the creative integration of NSF-funded awards and is itself an integrative, cross-cutting effort within the Directorate for Education and Human Resources (EHR). For Fiscal Year 2008, proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP. All proposals submitted to I^3 through these programs have a common due date and will be reviewed in competition with one another. Awards will be made to institutions of higher education (including two- and four-year colleges). Given the focus on institutional integration, an institution may submit only one proposal to the I^3 competition in only one program.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Math and Science Partnership (MSP)

Synopsis of Program:

The Math and Science Partnership (MSP) program is a major research and development effort that supports innovative partnerships to improve K-12 student achievement in mathematics and science. MSP projects are expected to raise the achievement levels of all students and significantly reduce achievement gaps in the mathematics and science performance of diverse student populations. In order to improve the mathematics and science achievement of the Nation's students, MSP projects contribute to the knowledge base for mathematics and science education and serve as models that have a sufficiently strong evidence base to be replicated in educational practice.

In this solicitation, NSF seeks to support six types of awards:

1. ***Targeted Partnerships*** focus on studying and addressing issues within a specific grade range or at a critical juncture in education, and/or within a specific disciplinary focus in mathematics or the sciences;

2. ***Institute Partnerships – Teacher Institutes for the 21st Century*** are designed to meet national needs for teacher leaders/master teachers who have deep knowledge of disciplinary content and are school- or district-based intellectual leaders in mathematics and science;

3. ***MSP-Start Partnerships*** are for awardees new to the MSP program, especially from minority-serving institutions, community colleges and primarily undergraduate institutions, to support the necessary data analysis, project design, evaluation and team building activities needed to develop a full MSP Targeted or Institute Partnership;

4. ***Phase II Partnerships*** for prior MSP Partnership awardees focus on specific innovative areas of their work where evidence of significant positive impact is clearly documented and where an investment of additional resources and time would produce more robust findings and results;

5. ***Research, Evaluation and Technical Assistance*** (RETA) projects directly support the work of the Partnerships, especially by developing tools to assess teachers' growth in the knowledge of

mathematics or the sciences needed for teaching, conducting longitudinal studies of teachers and their students who participate in the MSP projects, or engaging the national disciplinary and professional societies in MSP work; and

6. ***Innovation through Institutional Integration (I^3)*** projects enable institutions to think and act strategically about the creative integration of NSF-funded awards, with particular emphasis on awards managed through programs in the Directorate for Education and Human Resources (EHR), but not limited to those awards. For Fiscal Year 2008, proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP.

Cognizant Program Officer(s):

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

- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant or Cooperative Agreement

Estimated Number of Awards: 25 to 36 total for MSP projects, including 6-8 Targeted Partnerships, 8-10 Institute Partnerships, 5-8 MSP-Start Partnerships, 3-5 Phase II Partnerships and 3-5 RETA awards, pending availability of funds. For the Innovation through Institutional Integration competition, up to 10 continuing awards in this cross-divisional effort will be made, pending availability of funds.

Anticipated Funding Amount: $40,000,000 for MSP projects in FY 2008 pending availability of funds. $10,000,000 over 5 years for Innovation through Institutional Integration projects which are being requested across multiple EHR programs, pending availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- For all Targeted, Institute, MSP-Start and Phase II Partnerships, one of the core partner organizations serves as the LEAD partner and submits the MSP proposal on behalf of the Partnership. The lead partner accepts management and fiduciary responsibility for the project. Lead partner eligibility for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II - is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations).

Eligibility for Phase II Partnerships is limited to institutions of higher education that were partners in previously funded Comprehensive or Targeted Partnerships whose work began in 2002 or 2003.

Eligibility for Research, Evaluation and Technical Assistance (RETA) projects is open to all categories of proposers identified in the NSF *Grant Proposal Guide*.

Any proposal to the MSP Program should be a single submission that includes support for all partners that are requesting funding from NSF.

Eligibility for Innovation through Institutional Integration (I^3) is limited to institutions of higher education (including two- and four-year colleges) located and accredited in the US, acting on behalf of their faculty members.

PI Limit:

The PI of a proposal for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II – must be a faculty member in a mathematics, science or engineering department in a higher education core partner. One or more co-Principal Investigators must be representative(s) from the K-12 core partner organization(s).

The PI for an Innovation through Institutional Integration (I^3) proposal must be the university provost or equivalent, unless the proposal is exclusively for I^3 STEM educational or related research.

Limit on Number of Proposals per Organization:

An institution of higher education, non-profit organization or consortia of such institutions or organizations may be the Lead partner in only one proposal among any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II.

Organizations may be a non-Lead partner on more than one proposal.

For this competition, an institution of higher education and its institutionally affiliated foundation or research foundation are considered to be the same organization.

A central organization that acts as fiscal agent for multiple institutions in a university system is not considered to be the same as the individual colleges and universities that are part of the system, and may act as fiscal agent for one or more proposals submitted in response to this solicitation.

There are no limits on the number of RETA proposals submitted by an organization.

For Fiscal Year 2008, proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to the I^3 competition in only one program.

Limit on Number of Proposals per PI:

A PI may submit only one proposal within any of the Partnership categories - Targeted, Institute, MSP-Start or Phase II.

RETA proposers may submit one or more RETA proposals. RETA proposers may also submit one proposal within any of the Partnership categories - Targeted, Institute, MSP-Start or Phase II.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable

- **Full Proposals:**

  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. 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.

  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf)

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.

- **Indirect Cost (F&A) Limitations:** Not Applicable

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

C. Due Dates

- **Letter of Intent Due Date(s) *(optional)*** (due by 5 p.m. proposer's local time)***:***

  February 18, 2008

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  April 10, 2008

  Innovation through Institutional Integration

Proposal Review Information Criteria

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

Award Conditions: Standard NSF award conditions apply

Reporting Requirements: Standard NSF reporting requirements apply

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I. INTRODUCTION

The Math and Science Partnership (MSP) program at the National Science Foundation is a major research and development effort designed to improve K-12 student achievement in mathematics and science. NSF's MSP program coordinates its effort with the Mathematics and Science Partnerships program of the U.S. Department of Education in the expectation that effective innovations in mathematics and science education will be disseminated into wider practice. The two programs are significant components of the America COMPETES Act of 2007 (Public Law 110-69).

Since NSF's MSP program was initiated in FY 2002, awards have been made for (a) Comprehensive Partnerships, (b) Targeted Partnerships, (c) Institute Partnerships – Teacher Institutes for the 21st Century, and (d) Research, Evaluation and Technical Assistance (RETA) projects. In this solicitation, NSF seeks to support six types of awards:

1. ***Targeted Partnerships*** focus on studying and addressing issues within a specific grade range or at a critical juncture in education, and/or within a specific disciplinary focus in mathematics or the sciences;

2. ***Institute Partnerships – Teacher Institutes for the 21st Century*** are designed to meet national needs for teacher leaders/master teachers who have deep knowledge of disciplinary content and are school- or district-based intellectual leaders in mathematics and science;

3. ***MSP-Start Partnerships*** are for awardees new to the MSP program, especially from minority-serving institutions, community colleges and primarily undergraduate institutions, to support the necessary data analysis, project design, evaluation and team building activities needed to develop a full MSP Targeted or Institute Partnership;

4. ***Phase II Partnerships*** for prior MSP Partnership awardees focus on specific innovative areas of their work where evidence of significant positive impact is clearly documented and where an investment of additional resources and time would produce more robust findings and results;

5. ***Research, Evaluation and Technical Assistance*** (RETA) projects directly support the work of the Partnerships, especially by developing tools to assess teachers' growth in the knowledge of mathematics or the sciences needed for teaching, conducting longitudinal studies of teachers and their students who participate in the MSP projects, or engaging the national disciplinary and professional societies in MSP work; and

6. ***Innovation through Institutional Integration*** (I^3) projects enable institutions to think and act strategically about the creative integration of NSF-funded awards, with particular emphasis on awards managed through programs in the Directorate for Education and Human Resources (EHR), but not limited to those awards. For Fiscal Year 2008,

proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP.

II. PROGRAM DESCRIPTION

The MSP program seeks to improve K-12 student achievement through a sharp focus on three inter-related issues:

- Ensuring that all students have access to, are prepared for and are encouraged to participate and succeed in challenging and advanced mathematics and science courses;
- Enhancing the quality, quantity and diversity of the K-12 mathematics and science teacher workforce; and
- Developing evidence-based outcomes that contribute to our understanding of how students effectively learn mathematics and science.

K-20 education institutions (that is, colleges and universities offering graduate and/or undergraduate programs, and K-12 schools and school districts) are critical partners in the MSP program. Specifically, disciplinary faculty and their departments of mathematics, the sciences and/or engineering, as well as education faculty and administrators in higher education partner organizations, join with administrators, teachers of mathematics and the sciences and guidance counselors in K-12 partner organizations in efforts to effect deep, lasting improvement in K-12 mathematics and science education. All core partner organizations commit to implementing the K-20 institutional changes necessary to sustain Partnerships' successes in the long-term, including the continued participation of mathematics, science and engineering faculty in work that clearly results in improved K-12 student and teacher learning. The substantial intellectual engagement of the disciplinary faculty in these projects is one of the attributes that distinguishes the MSP program from other programs seeking to improve K-12 student outcomes in mathematics and science.

Other partners and partner organizations may also be involved in Partnership projects. These additional partners may include business and industry, state education agencies, district-level educational support centers, parents and families, science centers and museums, disciplinary and professional societies, research laboratories, private foundations and other public and private organizations with interests in K-12 mathematics and science education. The participation of mathematicians, scientists and/or engineers from such organizations is encouraged.

All MSP projects incorporate a depth and quality of creative, strategic actions that ***extend beyond commonplace approaches***. Additionally, MSP-funded projects contribute to the MSP Learning Network, a network of researchers and practitioners studying, documenting and evaluating promising strategies to improve K-12 student achievement in mathematics and science. The work of the MSP Learning Network fosters greater national collaboration and informs the Nation's understanding of how students effectively learn mathematics and science such that successful approaches can be broadly disseminated and emulated in educational practice.

KEY FEATURES

Each MSP Targeted, Institute and Phase II Partnership must incorporate ALL of the five following Key Features, although the extent to which Key Features are addressed may differ among individual Partnerships. The work of MSP-Start Partnerships must lead to a plan to address the Key Features in a proposed project. Each MSP-RETA proposal must identify the Key Features to be addressed and describe how its work contributes to the underlying knowledge base for those features.

Partnership-Driven - Projects partner disciplinary faculty in mathematics, the sciences and/or engineering, as well as education faculty and administrators in higher education, with key administrators, teachers and guidance counselors in participating K-12 core partner organizations. Partnerships draw upon the disciplinary expertise of faculty in mathematics, the sciences and/or engineering in the higher education core partner organizations, and link these individuals with in-service teachers, administrators and guidance counselors in K-12 core partner organizations. Scientists, mathematicians, engineers and individuals from other core and supporting partner organizations may also play significant roles in project activities. Core partners are deeply engaged in the effort at both the institutional and individual levels, and share goals, responsibilities and accountability for the project.

Teacher Quality, Quantity and Diversity - Partnerships enhance and sustain the quality, quantity and diversity of K-12 teachers of mathematics and/or the sciences. Drawing upon the expertise of scientists, mathematicians, and/or engineers in partner organizations, pre-service students and in-service K-12 teachers deepen their mathematics or science content knowledge for teaching and enlarge their repertoire of pedagogical methods and skills, including the effective use of technology in the teaching of mathematics and/or the sciences. These activities support the challenging courses and curricula implemented in K-12 core partner organizations. Projects ensure that K-20 educators develop the knowledge and skills necessary to effectively match local and state standards with challenging courses and curricula, instructional strategies, learning technologies and assessments. Partnerships develop and apply innovative strategies that include: increasing the diversity of the K-12 teacher workforce; recruiting well-qualified individuals to the teaching profession; developing and implementing high quality teacher preparation programs; influencing the teacher certification process; providing for the

effective induction of new teachers; establishing policies and procedures that appropriately impact teacher qualification requirements and placement; and/or increasing teacher retention rates.

Challenging Courses and Curricula - Partnerships ensure that both K-12 students and teachers are prepared for, have access to and are encouraged to participate and succeed in challenging courses and curricula that enable them to develop a deeper understanding of mathematics and/or the sciences. Innovative approaches integrate a mastery of fundamentals with the more sophisticated conceptual understandings essential to improve student achievement in mathematics and the sciences, drawing upon technology and contemporary research on the science of learning to enhance student access and performance. Where appropriate, projects incorporate advances in the cyberinfrastructure to create powerful learning experience. Projects ensure that K-12 students and teachers develop sufficient depth and breadth of content knowledge, skills and ways of thinking to allow them to apply the acquired mathematics and/or science knowledge and skills. Challenging courses and curricula are aligned with State mathematics and science academic achievement standards.

Evidence-Based Design and Outcomes - Project design must be informed by current research and studies on teaching and learning. Project outcomes are evidence-based contributions to the teaching and learning knowledge base so that research findings and successful evidence-based strategies may be disseminated. Projects report on both student and teacher indicators in mathematics and/or the sciences, and, unless precluded by local or state law, disaggregate data by race, ethnicity, socio-economic status, gender and disability. Partnerships develop, collect and analyze data on the effectiveness of the Partnership; the impact of the contributions made by faculty in the sciences, mathematics and/or engineering; the effects of new institutional policies and practices; and other important factors. The accumulated data inform the continuous refinement of the project.

Institutional Change and Sustainability- To ensure the sustainability of project work, K-20 core partner organizations redirect resources, and design and implement new policies and procedures to result in well-documented, comprehensive and coordinated institutional change at both the college/university and the local school district levels. Higher education core partners reward participating faculty for strengthening their own teaching practices and for their work - particularly their scholarly work - in K-20 mathematics and science education, including K-12 teacher preparation and professional development. K-12 core partner organizations create and sustain an environment that values an evidence-based approach, and that recognizes and rewards significant contributions to improved mathematics and science teaching and learning.

TARGETED PARTNERSHIPS

Proposals for Targeted Partnerships emphasize improving student achievement (a) within a specific disciplinary focus in mathematics and/or the sciences, and/or (b) within a specific grade range (e.g., elementary, middle or high school) or at a critical juncture in the educational continuum (e.g., elementary to middle school, middle to high school, high school to college). Targeted Partnership efforts should focus on specific elements/issues in K-12 mathematics or science teaching and learning, where analysis of the data indicates that a concentrated effort would result in the greatest improvement. Proposals that develop and study approaches which foster inventiveness and innovation among K-12 students, clearly articulating what they will know and be able to do, are highly encouraged.

Targeted Partnerships unite the efforts of local school districts with institutions of higher education to support K-12 students and teachers, implementing innovative approaches that effectively engage the higher education community with the K-12 school district(s) in addressing critical issues in K-12 mathematics and science education. As appropriate and while fulfilling the needs of the local situation, partnerships must include mathematics, science, and/or engineering faculty, and should link to the efforts of education faculty and students intending to become teachers. The MSP program expects that partnering institutions of higher education will positively address policies and practices that impact the professional status of faculty members involved in K-12 activities. Targeted Partnerships led by and/or involving community colleges and/or minority-serving institutions are highly encouraged to broaden the spectrum of institutions involved in the national MSP effort.

A proposal for a Targeted Partnership will define goals and benchmarks and describe a project design with attention to MSP Key Features, as well as articulating clear research questions. Targeted Partnership proposals will include plans that take into account the broader context of other mathematics and/or science efforts of the partners. For example, if a proposed Partnership project seeks to improve student achievement in mathematics in grades 6-8, the proposal must articulate how the project is part of a comprehensive plan that addresses the overall improvement of K-12 mathematics education, detailing student achievement in mathematics in grades K-5 and student participation rates in advanced mathematics courses in grades 9-12 in core partner schools/districts. Baseline student data relevant to student performance in mathematics in grades 6-8 place the proposed work in its appropriate context. The proposal narrative also describes other relevant efforts such as mathematics teacher preparation and professional development for mathematics teachers, as well as other contributions intended to improve K-16 student outcomes in mathematics.

Targeted Partnerships are expected to engage present teachers and/or students studying to become teachers in a stimulating multi-year program that provides in-depth study within mathematics and/or science disciplines. Additionally, the program of teacher professional development and teacher preparation activities should be based on contemporary research findings on effective classroom practice and the science of learning. Therefore, Targeted Partnership proposals should offer a synthesis of the research literature that will inform the proposed work as well as clear descriptions of the activities (e.g., workshops, institutes, courses) that will constitute the structure of the proposed teacher professional development and teacher preparation program.

While prior MSP awards have begun to add to a literature supporting the general MSP model involving partnerships and engaging disciplinary faculty to provide current and future teachers with the knowledge and skills they need, much more needs to be learned about how to best design these experiences to lead to enhanced teacher and subsequent student learning. All Targeted Partnerships are expected to be designed in such a way that they will contribute evidenced-based findings that contribute to the knowledge base about teacher and student learning. Funding requests must correlate directly with the scale and complexity of the proposed project, including the numbers of pre-service students and in-service teachers that would be directly engaged in the proposed work and the numbers of K-12 students thus impacted.

INSTITUTE PARTNERSHIPS: TEACHER INSTITUTES FOR THE 21st CENTURY

Approximately fifty years ago, the National Science Foundation created its Institute Program, stressing subject-matter competence for science and mathematics teachers. The original NSF Institutes are widely acknowledged as having been integral to the development of much of the Nation's human infrastructure and leadership capacity in K-12 mathematics and science education in recent decades.

A successful proposal for a Teacher Institutes for the 21st Century Partnership will exhibit the enthusiasm and disciplinary spirit of the past NSF Institutes while recognizing and responding to the contemporary challenges of preparing teachers to be master teachers in K-12 mathematics and science. A proposal must describe the process for recruitment and selection of Institute participants and articulate a vision of the attributes to be developed in those who are selected together with a clear plan for achieving the goals. Institute participants will be experienced classroom teachers who are eager to renew their interest in and enthusiasm for their discipline, extend and deepen their knowledge of the subject they teach, and build leadership skills. They will be the mathematics and science specialists in elementary grades and the curricular leaders of mathematics and the sciences in the secondary grades. Graduates of the Institutes will be school- and district-based intellectual leaders and accomplished practitioners in their disciplines who return to their classrooms and schools with an expanded disciplinary, pedagogical and leadership repertoire, able to analyze and continually refine their practice of teaching. As instructional leaders, master teachers and mentors, they will become resources for their peers and their profession. Through their involvement in policy and decision making they will work with their peers and key administrators on behalf of improved mathematics and science education in their schools and districts.

An Institute Partnership is expected to immerse teachers in a stimulating multi-year program of coherent and rigorous courses that provides in-depth study within a particular discipline. The proposal, therefore, should include a clear description of course offerings that will form the structure of the proposed work. Although proposals will describe varying models of Institute Partnerships, each Institute is expected to have its own compelling sense of identity and purpose, offering innovative strategies while being informed by research on how to develop in teachers a deep understanding of mathematics and/or the sciences that allows them to grow individually as intellectual leaders and become masters in their profession. Each Institute curriculum is to include leadership development in recognition of the fact that, to develop as intellectual leaders, teachers need multiple, coordinated experiences of sufficient depth and duration to help them build the critical capital needed. The entire program must be coherent, multi-year and of sufficient depth and duration to allow teachers to acquire a formal credential upon completion (e.g. a new certification or a master's degree). Within this requirement, Institute Partnerships may differ in their intensity (e.g., numbers of weeks) and venues (e.g., residential, commuter, distance-learning or blends thereof; national or regional/local geographic reach). All Institute Partnerships are expected to be designed in such a way that they will contribute evidenced-based findings that contribute to the knowledge base about teacher leadership and its impact on student learning.

A proposal for an Institute Partnership will define goals and benchmarks for preparing the school- and district-based intellectual leaders and accomplished practitioners envisioned, and will describe a project design with attention to MSP Key Features, as well as articulating clear research questions. The proposal will describe a Partnership led by an institution of higher education that includes (a) a department(s) in mathematics, the sciences or engineering, in collaboration with other university/college departments (e.g., education faculty), administrative units or other institutions that contribute needed expertise; (b) K-12 districts or schools; and (c) other stakeholders, as enumerated in the section on Eligibility Information. Instructors in the Institutes will include college/university faculty members drawn from mathematics, the sciences, engineering and education who model effective pedagogy. Institute Partnerships led by and/or involving community colleges and/or minority-serving institutions are highly encouraged to broaden the spectrum of institutions involved in the national MSP effort.

An Institute Partnership's core K-12 partners are the districts from which teacher participants are selected. These school districts will be expected to show evidence of their Partnership through ongoing commitments and agreements that define (a) an alignment of the teacher leadership effort within a strategic plan for continuing educational improvements and reform in mathematics or science, (b) increased responsibilities for the emerging teacher leaders in their schools or districts, as a result of successful completion of the Institute, and (c) administrative support, time, resources and recognition or rewards commensurate with this increased responsibility. K-12 core partners are required to grant sufficient non-classroom time to Institute participants to carry out their responsibilities as master teachers and intellectual leaders, and to provide assurance of this commitment. To enhance the supportive culture in schools/districts, provide greater opportunity for enduring professional communities, and contribute to institutional change and sustainability, schools and districts are encouraged to support small teams of Institute participants. K-12 partner organizations are encouraged to acknowledge that the presence and full utilization of teacher leaders will require adjustments, and, therefore, agree to implement the restructuring, reorganization or

other innovations needed to fully incorporate and support teacher leadership beyond the period of NSF funding.

MSP-START PARTNERSHIPS

NSF wishes to further diversify the types of institutions of higher education engaged in the national MSP effort. The new MSP-Start Partnership component intentionally seeks to expand the work of the MSP program to include institutions of higher education of varying scope, size, experience and perspectives emphasizing minority-serving institutions (e.g., Tribal Colleges, Historically Black Colleges and Universities, Hispanic Serving Institutions), community colleges and primarily undergraduate institutions.

In an MSP-Start Partnership award, a lead organization identifies the appropriate K-12, higher education and other institutions that are anticipated to come together to form a partnership and engages a broad team of personnel in these organizations – educators at both the K-12 and higher education level, administrators, other stakeholders – in one to two years of partnership activities that are a necessary prerequisite to a strong project design. MSP-Start Partnerships must develop a plan to address the Key Features in a proposed project. MSP-Start awardees will conduct the data collection, analysis, team building and evaluation necessary for developing a proposal for a full MSP Targeted or Institute Partnership, but an MSP-Start Partnership award is not a prerequisite for submission of these proposals. NSF anticipates that a fully successful MSP-Start Partnership award will lead to strong partnerships among the participating institutions of higher education and school districts prepared to engage in MSP-type work with or without future funding from NSF. An MSP-Start Partnership award will also produce knowledge about factors that contribute to the successful development of partnerships between higher education and K-12 schools.

MSP PHASE II PARTNERSHIPS

Phase II Partnerships proposals are invited from any institution of higher education partner in a previously funded Comprehensive or Targeted Partnership whose work began in 2002 or 2003.

Phase II Partnerships will concentrate on analysis, adaptation, dissemination and use of existing innovative practices developed through prior MSP support. A Phase II Partnership proposal will describe in detail why the investment of additional resources and time will result in significant progress towards long lasting improvement in K-12 mathematics and/or science education. Proposals will provide documented evidence-based outcomes demonstrating the successes and results produced through prior MSP support. In the proposal for Phase II support, an existing Partnership must describe how it will both deepen and/or extend project impact by focusing its efforts in one or a limited number of areas of emphasis carried out during the original award. Of particular interest are focused efforts that take successful innovative approaches and bring them to scale while maintaining quality and impact. The intent is that focused efforts carry out the necessary research and evaluation to advance our knowledge and understanding of both the factors that contribute to success and the context in which the particular strategy is successful. A viable plan to disseminate evidence-based findings must be incorporated.

All proposals for Phase II Partnerships must present one or more research questions, in conjunction with appropriate research methodologies, to be carried out in the course of the new award. In addition, all Phase II proposals must include a detailed Evaluation Plan with benchmarks and measures that will demonstrate results of the various components of the project. These proposals must include plans to continue longitudinal analyses on aspects of the prior work and must continue to contribute data to the MSP Management Information System. As Phase II Partnership projects are, by definition, designed to narrow and intensify the focus of the original work, the members that comprise the ongoing Partnership may change. However, the partners in Phase II must include some, but not necessarily all, of the original partners and the rationale for the new Partnership should be articulated. In addition, as a means of dissemination and broadening participation, Phase II Partnerships are encouraged to include community colleges and/or minority-serving institutions as new higher education partners.

RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE (RETA) PROJECTS

This solicitation calls for proposals that directly support or inform the work of the Partnerships in the MSP program through:

- research on the characteristics that define teacher intellectual leadership in K-12 mathematics and the sciences, and the factors that contribute to its development;
- the development of tools that assess teachers' growth in the knowledge of mathematics or the sciences needed for teaching, especially for grades 9-12;
- longitudinal studies of teachers and their students who participate in the MSP projects; or
- work of the national disciplinary or professional societies.

A research or tool development proposal should address the current state of knowledge relevant to the proposed work, including a review of relevant literature, and indicate the gap(s) in the current base of knowledge or practice to be addressed by the proposed work. The quality of research and scholarship expected in all MSP-funded RETA projects should be commensurate with results that are potentially publishable in appropriate and respected peer-reviewed journals. For these proposals, methodologies must be well defined, rigorous and appropriate and should result in valid, reliable findings with the

potential to inform MSP work. The logic among research question, method, evidence, analysis and inference should be well articulated. The development of any tools is to be accompanied by sufficient piloting, revision and field-testing – with appropriate methodologies – to ensure confidence in subsequent use by the Partnerships and others.

This solicitation also calls for RETA proposals that build and sustain the capacity of the nation's STEM disciplinary faculty for educational work by engaging the national disciplinary or professional societies to (a) assist STEM faculty and university administrators in preparing to work effectively in K-12 mathematics/science education; and/or (b) leverage the considerable influence of the societies in identifying and promoting the institutional changes in higher education that are critical for sustaining faculty engagement in K-12 STEM education. In this way, the RETA work of the societies studies and enhances the MSP expectation for the substantial engagement of STEM disciplinary faculty in the work of K-12 mathematics and science education, one of the attributes that distinguishes the MSP program from other programs seeking to improve K-12 student outcomes in mathematics and science.

A proposal from a national disciplinary or professional society should address the current state of knowledge relevant to the proposed work, including a brief review of relevant literature, and indicate the gap(s) in the current base of knowledge or practice to be addressed by the proposed work. The logic and connections between any proposed faculty development and the work to be done in K-12 should be well articulated. Faculty/administrator enhancement plans and anticipated outcomes should be given in detail. Proposals from the societies must address how the proposed work would lead to increased disciplinary faculty engagement in K-12 work as well as examining and influencing the institutional and professional barriers to supporting such work.

MSP LEARNING NETWORK

All MSP-funded projects participate in the MSP Learning Network through which they are linked with other researchers and practitioners in the study and evaluation of educational innovations designed to improve student achievement in mathematics and science. The MSP Learning Network fosters greater national collaboration and contributes to the Nation's capacity to engage in and understand large-scale education innovation.

MSP DATA COLLECTION, PROGRAM EVALUATION, KNOWLEDGE MANAGEMENT AND DISSEMINATION

The MSP program has funded the development of online data collection modules in an MSP Management Information System (MSP-MIS) to collect common data from funded projects. The program has also awarded an external contract for overall program evaluation (MSP-PE) that addresses evaluation questions consonant with the role of the MSP program as part of a research and development venture in K-12 mathematics and science education. Thus, the MSP-PE will address evaluation questions not only about the impacts MSP projects might have produced but also about their contribution to advancing knowledge in mathematics and science education.

MSP-funded knowledge management projects synthesize findings across MSP work and integrate them into the larger knowledge base for educational reform, thus strengthening the potential bonds between educational research and practice and contributing to the nation's capacity to understand and engage in large-scale education innovation.

MSP awardees are required to provide the common data required by the MSP-MIS and to cooperate with the MSP-PE. As the MSP-PE is a program-level evaluation, individual Partnership projects must have a strong, independent and objective external evaluation that should be well-described in the proposal.

MSP awardees are also expected to contribute to MSP knowledge management at the program level and, at the project level, to disseminate key findings and promising policies and practices derived from MSP project work and evaluation.

MSP awardees participate in the MSP Learning Community through conferences and the online MSPnet **(www.mspnet.org).** New proposers are encouraged to visit MSPnet, which offers insights into many facets of the MSP program.

INNOVATION THROUGH INSTITUTIONAL INTEGRATION (I^3)

Creativity, connectivity, integration, and synergy are keys to innovation and to developing human and institutional capacity to full potential. In both research and education, it is the forging of new links between ideas or methodologies that were previously disparate that frequently paves the way for innovation. When institutions optimize the benefits to be derived from the creative integration of intellectual perspectives or related domains of work, they create important opportunities for making progress on some of the most important scientific, technological, and educational challenges of our time. On individual campuses across the nation, for example, significant synergistic potential can be ignited when scholars and educators in related disciplines to work together. Similarly, NSF awardees can harness new synergies by working together with other NSF-funded projects on their own campus or in close geographic proximity.

Innovation through Institutional Integration challenges institutions to think strategically about the creative integration of NSF-funded awards towards a whole that exceeds the sum of its parts. Although there is particular emphasis in I^3 on awards

managed by programs in the Directorate for Education and Human Resources (EHR), institutional integration is not limited only to EHR awards but can include other NSF awards with a STEM educational focus. Two or more institutions in geographic proximity might, for example, partner to bridge existing NSF-funded awards on their campuses (e.g., IGERT, LSAMP, RDE, ATE, CREST, REU) to broaden participation in STEM fields and enhance undergraduate research opportunities. Additional connections might be made internationally with faculty or students outside the United States who would add their considerable intellectual and cultural perspectives. As another example, an institution might implement new policies, procedures, or mechanisms that encourage and value synergistic efforts among existing NSF-funded awards (e.g., GK-12, MSP, Noyce, REESE, DRK-12) and with other institutional units to better understand and enhance seamlessness across critical educational junctures, perhaps infusing innovative approaches to cyber-learning.

This effort has the following interrelated goals:

- Increase synergy and collaboration across NSF-funded projects and within/between institutions, towards an educational environment where artificial boundaries are significantly reduced and the student experience is more fully integrated;
- Expand and deepen the footprints of NSF-funded projects and enhance their sustainability;
- Promote innovative programming, policies, and practices to encourage the integration of STEM research and education;
- Provide additional avenues to broaden participation by those underserved in STEM research and education, especially underrepresented minorities, women, and people with disabilities; attend to seamless transitions across critical educational junctures; and/or provide more effectively for a globally engaged workforce; and
- Encourage STEM educational or related research in domains that hold promise for promoting intra- or inter-institutional integration and broader impacts.

Excellence or its potential exists everywhere, throughout the nation and in all types and sizes of institutions of higher education. Proposals that facilitate either (a) inter-institutional or (b) intra-institutional efforts are encouraged. Proposals may be submitted by (a) a single institution to address intra-institutional goals only or (b) an institution acting on behalf of an institutional partnership to address inter-institutional goals.

Proposals are expected to incorporate a depth and quality of creative, coherent, and strategic actions that extend beyond commonplace approaches to normal institutional operations. Proposals may also be submitted for research on institutional integration, commensurate with the goals above.

Innovation through Institutional Integration (I^3) is a cross-divisional effort in the Directorate for Education and Human Resources (EHR). For Fiscal Year 2008, proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP. All proposals submitted to I^3 through these programs have a common due date and will be reviewed in competition with one another.

III. AWARD INFORMATION

NSF expects to make an estimated 25-36 total MSP awards (Standard or Continuing Grant or Cooperative Agreement), including 6-8 Targeted Partnerships, 8-10 Institute Partnerships, 5-8 MSP-Start Partnerships, 3-5 Phase II Partnerships and 3-5 RETA awards, pending availability of funds. For the Innovation through Institutional Integration competition, up to 10 awards in this cross-divisional effort will be made. The anticipated funding amount is approximately $40M for MSP projects in FY 2008 and $10M over 5 years for Innovation through Institutional Integration projects (across multiple EHR programs), pending availability of funds.

TARGETED PARTNERSHIPS: Awards for Targeted Partnerships will be made for a duration of up to 5 years and for average annual budgets of up to $2.5M. Targeted Partnerships awards will be made as cooperative agreements or continuing grants, and will be subject to annual review and special conditions. Funds requested must directly correlate with the scope and complexity of the budget as well as with the numbers of teachers and/or students engaged in or impacted by the project.

INSTITUTE PARTNERSHIPS: Awards for Institute Partnerships will be made for a duration of up to 5 years and for average annual budgets of up to $1M, commensurate with the geographic reach of the Institute (i.e., national or regional/local) and expected numbers of participants. This award amount is to include participant support and other subsistence. Teacher stipends of at least $1000 per week for structured, summertime Institute participation are to be included, where a week is defined as five days (totaling 30 or more hours) and where local district policies are not in conflict with such stipends.

Stipends for structured academic-year participation are pro-rated, as appropriate or needed, and a supporting rationale is to be included. Appropriate participant support for subsistence (e.g., travel, lodging, supplies) is also to be included, together with a supporting rationale. Funding for non-classroom time for an Institute participant to carry out his/her responsibilities as an intellectual leader and master teacher in the school may be requested for up to one year, if needed. In such cases, a supporting rationale and a plan by which the district will continue support for such non-classroom time after one year must be provided. Since NSF funds may be requested to support project administration, instruction and indirect costs, NSF monies may not be requested for tuition. It is, however, expected that institutions will award teachers appropriate credits for completion of Institute curricula and experiences, consistent with institutional policy and with a reward system for teachers that enhances their professional standing in their schools and districts. Funds requested must directly correlate with the scope and complexity of the project as well as with the numbers of K-12 teachers and/or students engaged in or impacted by the project.

Institute Partnerships awards will be made as standard or continuing grants.

MSP-START PARTNERSHIPS: Awards for MSP-Start Partnerships will be made for a duration of up to 2 years and for average annual budgets of up to $150,000. The request for funding should be consistent with the scope and complexity of the proposed MSP-Start work. MSP-Start awards will be made as standard or continuing grants.

PHASE II PARTNERSHIPS: Awards for Phase II projects will be made for a duration of up to 3 years and for average annual budgets of up to $700,000. The request for funding should be consistent with the scope and complexity of the proposed Phase II work. Phase II awards will be made as standard or continuing grants.

RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE PROJECTS: Awards for RETA projects will be made for a duration of up to 3 years and for average annual budgets of up to $500,000. The request for funding should be consistent with the scope and complexity of the proposed work. RETA awards will be made as standard or continuing grants.

INNOVATION THROUGH INSTITUTIONAL INTEGRATION PROJECTS: Awards for Innovation through Institutional Integration projects will be made for durations of up to five years, with years four and five dependent on performance, in amounts of up to $200,000 per year, for a total of up to $ 1 million over 5 years. Innovation through Institutional Integration awards will be made as continuing grants.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- For all Targeted, Institute, MSP-Start and Phase II Partnerships, one of the core partner organizations serves as the LEAD partner and submits the MSP proposal on behalf of the Partnership. The lead partner accepts management and fiduciary responsibility for the project. Lead partner eligibility for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II - is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations).

  Eligibility for Phase II Partnerships is limited to institutions of higher education that were partners in previously funded Comprehensive or Targeted Partnerships whose work began in 2002 or 2003.

  Eligibility for Research, Evaluation and Technical Assistance (RETA) projects is open to all categories of proposers identified in the NSF *Grant Proposal Guide*.

  Any proposal to the MSP Program should be a single submission that includes support for all partners that are requesting funding from NSF.

  Eligibility for Innovation through Institutional Integration (I^3) is limited to institutions of higher education (including two- and four-year colleges) located and accredited in the US, acting on behalf of their faculty members.

PI Limit:

The PI of a proposal for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II – must be a faculty member in a mathematics, science or engineering department in a higher education core

partner. One or more co-Principal Investigators must be representative(s) from the K-12 core partner organization(s).

The PI for an Innovation through Institutional Integration (I^3) proposal must be the university provost or equivalent, unless the proposal is exclusively for I^3 STEM educational or related research.

Limit on Number of Proposals per Organization:

An institution of higher education, non-profit organization or consortia of such institutions or organizations may be the Lead partner in only one proposal among any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II.

Organizations may be a non-Lead partner on more than one proposal.

For this competition, an institution of higher education and its institutionally affiliated foundation or research foundation are considered to be the same organization.

A central organization that acts as fiscal agent for multiple institutions in a university system is not considered to be the same as the individual colleges and universities that are part of the system, and may act as fiscal agent for one or more proposals submitted in response to this solicitation.

There are no limits on the number of RETA proposals submitted by an organization.

For Fiscal Year 2008, proposals are being solicited in six EHR programs that advance I^3 goals: CREST, ITEST, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to the I^3 competition in only one program.

Limit on Number of Proposals per PI:

A PI may submit only one proposal within any of the Partnership categories - Targeted, Institute, MSP-Start or Phase II.

RETA proposers may submit one or more RETA proposals. RETA proposers may also submit one proposal within any of the Partnership categories - Targeted, Institute, MSP-Start or Phase II.

Additional Eligibility Info:

PARTNERS DEFINITION AND ELIGIBILITY FOR PARTNERSHIPS

Targeted, Institute, MSP-Start and Phase II Partnership proposals are developed by Partnerships that must include CORE Partners and may also include SUPPORTING Partners.

Each proposal to the MSP Program for a Targeted, Institute, MSP-Start or Phase II Partnership should be a single submission that includes support for all partners that are requesting funding from NSF. Collaborative proposals, as defined in the NSF *Grant Proposal Guide* (Chapter II, Section D.3. Collaborative Proposals), are not appropriate and will be returned without review.

CORE PARTNERS

Core partner organizations share responsibility and accountability for the MSP project. Core partner organizations ARE REQUIRED to provide evidence of their commitment to undergo the institutional change necessary to sustain the partnership effort beyond the funding period. This is what distinguishes core partner organizations from other supporting partner organizations.

Core partner organizations in each Partnership MUST include:

- At least one institution of higher education (including 2-year and 4-year colleges and universities) AND
- At least one K-12 local school district.

Within core partnering institution(s) of higher education, the Partnership must include science, mathematics

and/or engineering departments. Community colleges and minority-serving institutions are encouraged to participate as core partner organizations in MSP projects.

Core partner organizations may also include other stakeholder organizations in K-12 mathematics and science education, such as state education agencies, business and industry, science centers and museums, disciplinary and professional societies, research laboratories, district-level educational support centers, private foundations and other public and private organizations with interests in K-12 mathematics and science education. The participation of scientists, mathematicians and/or engineers from these core partner organizations is encouraged.

SUPPORTING PARTNERS

Supporting partners include important stakeholders and stakeholder organizations in K-12 mathematics and science education, including parents and families and the types of partner organizations described above. The main distinction between core and supporting partners is that while supporting partners clearly add value to the proposed project, they are not required to commit to the institutional change necessary to sustain project activities beyond the funding period.

PARTNERSHIP LEADERSHIP TEAM DEFINITION

The Partnership Leadership Team MUST include those individuals identified in the proposal as Principal Investigator and co-Principal Investigators.

The Partnership Leadership Team for all Partnerships should also include a Project Director who is responsible for day-to-day management of the project; the Project Director need not be identified as a Principal Investigator or co-Principal Investigator.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(optional):*

Lead partners, working on behalf of Partnerships or RETA teams intending to submit proposals to this competition, ARE STRONGLY ENCOURAGED to submit a Letter of Intent by February 18, 2008, indicating: proposal designation according to *Targeted*, *Institute, MSP-Start, Phase II* or *RETA*; PI and co-PI names; lead organization; and, for Targeted, Institute and Phase II Partnerships, (a) the names of core and supporting partners, (b) disciplinary focus of the Institute and (c) grade range focus. **Letters of Intent must be submitted via FastLane.** A detailed synopsis is not required in the Letter of Intent.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is not required when submitting Letters of Intent
- Core and Supporting Partners is required when submitting Letters of Intent
- Disciplinary Focus is required when submitting Letters of Intent
- Grade Range Focus is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program 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. 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. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing

guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

The following instructions supplement the GPG and NSF Grants.gov Application Guide guidelines.

After selecting the MSP program solicitation number on the Cover Sheet, the "NSF Unit Consideration" must be specified - select either Targeted, Institute, MSP-Start, Phase II, RETA **or** I^3. For Grants.gov users, the program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page.

Each proposal to the MSP Program for a Targeted, Institute, MSP-Start or Phase II Partnership should be a single submission that includes support for all partners that are requesting funding from NSF. Collaborative proposals, as defined in the NSF *Grant Proposal Guide* (Chapter II, Section D.3. Collaborative Proposals), are not appropriate and will be returned without review.

ALL PROPOSALS MUST CONTAIN THE FOLLOWING SECTIONS:

PROJECT SUMMARY

Provide a one-page summary that briefly describes the project vision, goals and work to be undertaken. For Targeted, Institute or Phase II Partnerships, the Project Summary should begin by listing the following: the title of the proposed project, the name of the lead partner, the name(s) of the additional core and supporting partners. The text of the Summary should include, where applicable, the numbers of teachers to be directly engaged in the project, the number of new teachers that will be prepared, and the number of students (including grade ranges) who will benefit from the proposed work. For MSP-Start and RETA projects, the Project Summary should begin by stating the title of the proposed project, the lead institution and names of other partners to be involved in the proposed work. **Note that for all proposals the Project Summary MUST address both NSB-approved merit review criteria in separate statements. NSF will return without review proposals that do not address both merit review criteria in separate statements.**

PROJECT DESCRIPTION

Provide a Project Description that DOES NOT EXCEED 15 SINGLE-SPACED PAGES. The text, including font type and size, **MUST** conform to the guidance noted in NSF's Grant Proposal Guide (see GPG, Chapter II, Section B, Format of the Proposal). Proposals that do not comply with these formatting requirements may not be reviewed or considered for funding. *SUPPLEMENTARY DOCUMENTATION* (up to an additional 20 pages; see below) COMPLEMENTS THE PROJECT DESCRIPTION - THEREFORE, PROJECT DESCRIPTIONS SHOULD MAKE SPECIFIC REFERENCES TO ELEMENTS OF THE *SUPPLEMENTARY DOCUMENTATION*, WHERE APPROPRIATE. THIS IS ESPECIALLY TRUE FOR TARGETED, INSTITUTE AND PHASE II PARTNERSHIP PROPOSALS WHICH ARE REQUIRED TO INCLUDE SOME KEY INFORMATION IN THE *SUPPLEMENTARY DOCUMENTATION*. In preparing proposals, Principal Investigators are encouraged to consult Section VI of this solicitation, which includes additional review criteria specific to this solicitation.

FOR TARGETED AND INSTITUTE PARTNERSHIPS

The Project Description should address ALL of the MSP Key Features described in Section II of this solicitation, within the following elements. It is up to proposers to determine how many pages are devoted to each element.

Vision, Goals and Outcomes

A proposal must clearly describe the Partnership's vision, goals and anticipated outcomes with respect to all of the MSP Key Features. This part of the proposal should also present one or more research questions that will be pursued in the course of the Partnership activities.

The Partnership's vision and goals for the project are informed by relevant baseline K-12 student and teacher data, and are consistent with relevant State mathematics or science student academic achievement standards. (Baseline data and quantitative outcome goals and annual benchmarks are to be provided in the *SUPPLEMENTARY DOCUMENTATION*

section of the proposal. Except where precluded by local or state law, supporting teacher data and supporting student data should be disaggregated by race, gender, socio-economic factors and disability.)

For the higher education partner(s), describe the institutional context for this project and the anticipated work in K-12 science and mathematics education; the degree and kinds of prior involvements/experiences with K-12 education or disciplinary faculty in the sciences, mathematics and engineering; and a description of relevant institutional policies/practices that reward such faculty involvement.

The proposal should provide evidence of (a) an effective partnership among core and supporting organizations that will work together to realize the project's vision and goals, (b) the participation of all key stakeholders (including teachers, faculty and administrators) in project planning and design and (c) sufficient capacity in and preparation of the higher education partners to support the scale and scope of the project, especially the number of teacher participants.

Lessons learned from previous and current support, including a discussion of successes and of failures, should be included. ***The proposal should also clearly indicate how the intended work differs from, builds on or is otherwise informed by prior efforts, especially those supported by NSF***.

For Targeted Partnerships, (a) provide data on the numbers of in-service teachers who will participate and the expected numbers of hours of structured professional development for a typical participant over the life of the project and (b) provide data on the numbers and diversity of teachers who will be reached through strategies intended to increase teacher quantity and quality – proposed strategies may target teacher preparation activities and/or those activities that impact the induction period for new teachers as a means of improving retention in the teacher workforce.

For Institute Partnerships, provide data on the numbers of in-service teachers who will participate and the expected numbers of hours of structured professional development for a typical participant over the life of the project.

Research and Implementation Framework

Describe in detail the plan by which the Partnership will achieve the project vision, goals and anticipated quantitative outcomes by means of a coherent research and implementation plan. This description should include the research or evidence base that constitutes the foundation on which the proposed work rests. The proposal should offer a clear rationale for the strategies being proposed, including theoretical foundations that are tied to the appropriate research and literature in mathematics and science education. Consistent with the MSP Key Feature on Evidence-Based Design and Outcomes, the proposal should identify the research questions to be studied and show how the design of the project will allow warranted claims that the activities conducted by the Partnership contributed to the measured outcomes.

Describe the creative, strategic actions **that extend beyond commonplace approaches** and that promise significant improvements in student and teacher workforce outcomes accruing from the work of the Partnership. All project work directed towards improvement of the teacher workforce should support the implementation of challenging courses and curricula to result in improved K-12 student learning and achievement in mathematics and/or the sciences. Proposals for projects that will focus on a *critical juncture* in education should articulate strategies that portend to increase student success in mathematics or science in the transition from (a) elementary to middle school, (b) middle school to college, OR (c) high school to college.

All proposals must include a robust research design that discusses the theoretical or research base for the proposed activities, a clear description of these activities, the proposed assessment instruments that would be used to measure outcomes, and the logic of how reasonable, warranted conclusions will link the activities to the outcomes. While expecting partnership work to include a rigorous research component, the MSP program does not specify methodology which should be determined by the research questions. The individual(s) who will conduct the research should be identified in the proposal. The research component of the proposed work is in addition to the Evaluation Plan (described below) that will demonstrate impact of the project, and goes beyond documentation of implementation to the further generation of evidence.

Consistent with the Partnership-Driven Key Feature, describe how each partner will contribute to the proposed work, with particular emphasis on the contributions scientists, mathematicians and/or engineers will make. If applicable, describe how the Partnership collaborates with or complements other K-12 educational initiatives supported by NSF and/or other private or public funds.

Each Institute curriculum is also expected to include leadership development and the preparation necessary to work with adult learners, as well as a component that assists participants in working in the implementation of contemporary research findings on effective classroom practice and the science of learning. Therefore, Institute Partnership proposals should offer clear descriptions of the course offerings and academic year follow-up activities that constitute the structure of the proposed Institute. Similar detail should be described for the professional development and pre-service instruction to be offered in a Targeted Partnership.

Provide a project timeline that correlates with the proposed action plan and the quantitative outcome goals and annual benchmarks described in the *SUPPLEMENTARY DOCUMENTATION* section of the proposal.

Evaluation Plan

Describe the Evaluation Plan that will guide project progress annually and will measure the impact of the work described in the action plan, including a description of the instruments/metrics by which partners will document, measure and report on the project's progress toward realizing improved student and teacher outcomes. The Evaluation Plan should directly relate to the annual benchmarks and outcome goals in the *SUPPLEMENTARY DOCUMENTATION* section of the proposal. Formative evaluation should provide evidence of the strengths and weaknesses of the project, informing the Partnership's understanding of what works and what does not in order to inform project progress and success. Summative evaluation should give an objective analysis of qualitative and quantitative data, thus demonstrating the effectiveness of the project on student and teacher outcomes and K-20 institutional change. Although the Evaluation Plan will be developed with input from the Partnership, objective analyses and findings require either an external evaluator or an objective evaluator within a partner institution who is clearly separate and distinct from the partnership participants and their departments/units (e.g., in a department/unit within a university that is not part of the Partnership itself). The qualifications of the evaluator(s) must be provided in the proposal.

Partnership Management/Governance Plan

Describe the management plan, demonstrating that all partners are fully engaged to realize the partnership's vision, goals and outcomes.

Describe in detail the specific roles, responsibilities and time commitments of the members of the Partnership Leadership Team. Also provide the number of scientists, mathematicians and/or engineers who will be engaged in the work of the project and provide information on their intellectual contributions/roles and responsibilities, referring to individuals listed in a Disciplinary Partner table located in the *SUPPLEMENTARY DOCUMENTATION*.

Institutional Change and Sustainability

Describe how the proposed action plan will result in institutional change within all core partner organizations to ensure sustainability of project ideas, practices and work. Include plans to redirect resources and develop/revise and implement policies and practices critical for the work of the Partnership and necessary for project sustainability.

FOR MSP-START PARTNERSHIPS

The project description should contain the following elements. It is up to proposers to determine how many pages are devoted to each element.

Developing the Partnership

Identify the initial institutions and organizations – and their personnel – likely to be engaged in the MSP-Start Partnership, although additional institutions and organizations may be added as appropriate during the award period. Describe why these organizations are coming together at this time and the process by which they will advance and strengthen the Partnership. Identify the disciplinary faculty to be involved, their titles and departments, and the roles they will take within the Partnership; other faculty to be involved may also be listed.

Address the process by which the MSP-Start Partnership will conduct a needs analysis that will provide a framework for future work, engage STEM faculty in the work, and address the five MSP Key Features.

Demonstrate how the work will build on the literature about STEM teaching and learning as well as funding from other NSF and related projects.

Evaluation and Management

Include plans for formative and summative evaluation of the MSP-Start award. Additionally, outline the process for developing a comprehensive evaluation of the impact of a potential full MSP Targeted or Institute Partnership. Although the Evaluation Plan will be developed with input from the Partnership, objective analyses and findings require either an external evaluator or an objective evaluator within a partner institution who is clearly separate and distinct from the partnership participants and their departments/units (e.g., in a department/unit within a university that is not part of the Partnership itself). The qualifications of the evaluator(s) must be provided in the proposal.

A management plan and timeline for activities should be included in the proposal. Describe the management and administrative structure, including identification of the members of a Partnership Leadership Team, demonstrating the capability for conducting the proposed work.

FOR PHASE II MSP PROJECTS

The project description should contain the following elements. It is up to proposers to determine how many pages are devoted to each element.

Results from Prior NSF Support

A critical aspect of a Phase II proposal will be the detailed linkage to prior support through the MSP program. Describe the evidence-based outcomes of prior MSP support to include improvement in student achievement, increased enrollment and success in higher level mathematics and science coursework, implementation of rigorous challenging courses and curricula, increased depth of disciplinary content knowledge by teachers, impact on STEM disciplinary faculty, policy changes at the K-12 and IHE levels, programmatic changes at the IHE level, and other unique project specific outcomes. Articles published in peer-reviewed journals should also be listed. The proposal must explain in detail how the results of the prior support and evaluation findings inform the proposed Phase II work.

Research and Implementation Framework

A Phase II project should be framed around specific research questions, and the proposal must delineate the research questions to be pursued, the research methodologies to be employed, and the names of the researcher(s). Refer to the list of quantitative benchmarks (in the *SUPPLEMENTARY DOCUMENTATION)* to be obtained relative to student outcomes, teacher enhancement, and curriculum, and a description of qualitative programmatic and policy changes to be attained within the Core IHE and K-12 Partners.

Describe the strategies previously implemented in the MSP that will be extended to increase efficiency of implementation related to bringing them to scale while maintaining quality and impact. Describe how the Partnership will conduct focused studies that extend one or a limited number of strategies previously implemented by the MSP and document the aspects of bringing successful strategies to scale. In addition, the plan should be explicit in describing a proactive dissemination plan that will support others in benefiting from and implementing findings emanating from this work.

Evaluation

All Phase II proposals must include a detailed Evaluation Plan, including tools and methodologies to be used for the evaluation, which will demonstrate impact of the project and go beyond documentation of implementation to the generation of evidence. Describe how the current Phase II proposal contributes to longitudinal study of aspects of the prior MSP work, and how ongoing submission of data to the MSP-MIS contributes to the study. Although the Evaluation Plan will be developed with input from the Partnership, objective analyses and findings require either an external evaluator or an objective evaluator within a partner institution who is clearly separate and distinct from the partnership participants and their departments/units (e. g., in a department/unit within a university that is not part of the Partnership itself). The qualifications of the evaluator(s) must be provided in the proposal.

Partnership Management/Governance Plan

The proposal must list the partners which will comprise the Phase II Partnership, including the designation of those that are considered Core Partners, meaning they commit to explicit institutional change, and those that are considered Supporting Partners. A Disciplinary Partners table in the *SUPPLEMENTARY DOCUMENTATION* section of the proposal must include a list of the disciplinary faculty to be involved, their titles and departments, whether they have been involved previously with the Partnership or are new to the work, and the roles they will take within the Partnership; other faculty to be involved may also be listed.

Describe the management and administrative structure, including identification of the members of a Partnership Leadership Team, demonstrating the capability for conducting the proposed work. There should be clear evidence of a full partnership among the Core Partners in terms of roles, responsibilities, accountability and decision making. The proposal should explicitly commit to continue submission of data to the MIS.

Institutional Change and Sustainability

Provide plans to sustain activities and impact of the project beyond Phase II support, and for advancing the work beyond the Partnership.

FOR RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE (RETA) PROJECTS

The project description should contain the following elements. It is up to proposers to determine how many pages are devoted to each element.

Clear Description of Proposed Work

Describe in detail the research/work being proposed, with clear connections to one or more of the MSP Key Features.

Research Base

Discuss the current state of knowledge relevant to the proposed work, including a brief review of the relevant literature, and the gap(s) in the base of current knowledge or practice to be addressed by the proposed work. If the proposal builds on prior work, indicate what was learned from this work and how any lessons learned are incorporated in the proposed project.

Methodologies and Plan of Work

Provide a clear plan for carrying out the proposed work. The logic among research question, method, evidence, analysis and inference should be well articulated. Methodologies must be well defined, rigorous and appropriate and should result in valid, reliable findings with the potential to inform MSP work. The development of any tools is to be accompanied by sufficient piloting, revision and field-testing – with appropriate methodologies – to ensure confidence in subsequent use by Partnerships and others. Faculty/administrator enhancement plans and anticipated outcomes should be given in detail. The logic and connections between any proposed faculty development and the work to be done in K-12 should be well articulated.

For research projects and those that propose the development of tools, include a plan for working with a small group of existing or new Partnerships. The project description should discuss how the project expects to interact with the Partnerships, including an estimate of the number of Partnerships to be involved and the time and effort to be required of them. The proposal should clearly indicate the benefits to the Partnerships by virtue of their participation. NSF will work with the awardees under this solicitation and with the Partnerships to ensure appropriate interactions among all projects.

Evaluation, Data Sharing and Dissemination

The quality of research and scholarship expected in all MSP-funded RETA projects should be commensurate with results that are potentially publishable in appropriate and respected peer-reviewed journals. The development of any tools is to be accompanied by sufficient piloting, revision and field-testing. Methodologies must be proposed that will ensure the validity and reliability of any instruments developed by the project. Projects should ensure that mathematicians or scientists are involved in determining validity of the instruments. Describe plans for sharing findings and for dissemination of products.

For projects that engage the national disciplinary or professional societies in MSP work, describe the Evaluation Plan that will guide project progress annually and will measure the impact of the work. Evaluation must include data documenting the numbers of faculty/administrator participants and, for these participants, (a) the types of K-12 STEM activity in which they are currently engaged and the degree of intensity of their engagement, (b) the types of K-12 STEM activity in which they are subsequently engaged after completion of the enhancement activities and the degree of intensity of their engagement, (c) impacts of K-12 engagement on their own instructional practice in higher education and (d) impacts of K-12 engagement on their own careers in higher education. Formative evaluation should provide evidence of the strengths and weaknesses of the project, informing the project's leadership of what is working and what is not in order to inform project progress and success. Summative evaluation should give an objective analysis of qualitative and quantitative data, thus demonstrating the effectiveness of the project in building the capacity of STEM faculty to engage in K-12 education and in promoting the institutional changes in higher education needed to sustain their engagement. Although the evaluation plan will be developed with input from project leadership, objective analyses and findings require an external evaluation.

Expertise

Demonstrate that project personnel have the expertise and capability to carry out the proposed work.

Management Capability

Demonstrate that the submitting team has the capability to manage the project, organize the work and meet deadlines.

FOR INNOVATION THROUGH INSTITUTIONAL INTEGRATION (I^3) PROJECTS

The proposal should articulate the project's vision, goals, and anticipated outcomes and describe how the project will achieve them. It is expected that the plan of work will impact participating NSF awards, as well as other relevant parts of the institution (s). The proposal should include a management/governance plan that describes who is responsible for what, a timeline, and an evaluation plan. All proposals must clearly demonstrate that the submitting team has the capability to manage the project, organize the work, and meet deadlines. The proposed evaluation plan should address the effectiveness of the strategies employed for institutional integration, including any institutional policies, practices, or mechanisms developed and

implemented under this effort; and, as appropriate, provide for the evaluation of any products produced under this effort, as well as for the collection and analyses of data that track increases in STEM student recruitment and retention (against baseline data) and other measures of student progress (against comparable baseline data). In addition to project-level evaluation, awardees will be required to participate in an NSF data collection system (to be developed) that will track outcomes and impacts over time, as well as in an independent, multi-method program-level evaluation to assess the effectiveness of the I^3 investment.

Proposals for I^3 research should discuss the current state of knowledge relevant to the project. This brief literature review should clearly inform the proposed research. The project description should identify the methods the project will use and explain why those methods are appropriate to the questions that the proposal addresses. Methodologies must be matched with strategic research questions, and the logic among research question, method, analysis, inference, and evidence should be well articulated.

RESULTS FROM PRIOR NSF-SUPPORT

If any Principal or co-Principal Investigator has received funding from NSF in the last five years, information on the prior award is required IF RELEVANT TO THE PROPOSED SCOPE OF WORK. The results of any prior NSF investment(s) should be clearly demonstrated and supported by data. A discussion of both successes and lessons learned from previous support MUST be included. The proposal should also clearly indicate how the intended work differs from, builds on or is otherwise informed by prior efforts.

While all proposals must address prior NSF-support, results of prior support from the MSP program must be a major component of a Phase II proposal. Please review this section in the description for Phase II MSP Projects.

BIOGRAPHICAL SKETCH

Provide a Biographical Sketch for the Principal Investigator, co-Principal Investigators and Project Evaluator. Individual biographical sketches must not exceed two pages and may include a list of up to five publications most closely related to the proposed endeavor.

CURRENT AND PENDING SUPPORT

Provide a Statement of Current and Pending Support for the Principal Investigator and all co-Principal Investigators.

SPECIAL INFORMATION AND SUPPLEMENTARY DOCUMENTATION

For ***MSP-Start*** **Partnerships and** ***RETA projects***, no Appendices are permitted; however, letters of commitment/ collaboration may be submitted in the Supplementary Documentation section of the proposal but MAY NOT EXCEED 12 PAGES.

For ***Targeted, Institute and Phase II Partnerships***, Supplementary Documentation should be uploaded as a separate PDF file NOT TO EXCEED 20 PAGES. Include in this documentation:

1. Baseline Data. TEACHERS: For Targeted and Phase II Partnership proposals, provide data describing the numbers of teachers of mathematics and/or the sciences in the core partner school district(s). The data should relate to quantity, diversity and quality (e.g., baccalaureate/masters degrees, teaching out of the certification field, retention, and professional development hours) of teachers in the system(s). Also provide teacher preparation and/or professional development data that describe the current capacity of the core partner institution(s) of higher education to serve the teacher professional continuum needs of the school district core partner(s). Data should describe the numbers of mathematics and/or science teachers produced annually (through traditional pre-service and/or alternative routes), placement and support of new teachers in their initial teaching appointments, numbers of teachers impacted by professional development activities provided by the core partner institution(s) of higher education, etc. For Institute Partnership proposals, provide a plan by which baseline data will be collected after teacher participants have been selected. Baseline teacher data are to document teacher qualifications and enable an assessment of teachers' growth as intellectual leaders and accomplished practitioners and of their effects on their school environment. Include a description of any instruments/metrics to be used. STUDENTS: For Targeted, Institute and Phase II Partnership proposals, provide baseline student data that will enable the Partnership to demonstrate the effects of participation by its teachers on the achievement of their students or on other student outcomes (e.g., tracking student academic performance or choice of post-secondary studies in mathematics, the sciences, engineering or technology). Student achievement data are to be the most recent in comparison to state and/or national averages and, unless precluded by local or state law, disaggregation by race-ethnicity, socio-economic status, gender and disability is expected. The data should identify the test and indicate the grade levels in which system-wide science and/or mathematics assessments were administered. They should include achievement scores, the percentage of students tested against grade-level enrollment and the appropriate categories for reporting test results (quartiles, mean percentiles, proficiency levels, or above or below cut scores). Data must also include

course enrollment and completion rates and, where appropriate, college matriculation rates.

2. Annual Benchmarks and Outcome Goals. Provide a summary of quantitative benchmarks that are linked to strategies/activities and summative goals of the project. While some benchmarks and goals may be qualitative in nature, most indicators of student achievement, of the teacher workforce and of higher education involvement should be quantitative and should describe expected project progress relative to baseline data provided elsewhere in the Project Description and Supplementary Documentation. The project's proposed Evaluation Plan should directly relate to the benchmarks and goals. Institute Partnerships should, in addition, include a plan by which the project will document the career paths of Institute graduates.

3. Partnership Leadership Team. In a table, identify members of the Partnership Leadership Team. For each, briefly describe their specific roles and responsibilities and indicate the time committed.

4. Disciplinary Partners. In a table, identify the scientists, mathematicians and/or engineers engaged in the work of the project. For each, briefly describe their specific roles and responsibilities and indicate the time committed.

5. Commitment to Institutional Change. Provide evidence of commitment to institutional change in the form of one or more letters signed by senior administrator(s) (equivalent to a Dean or higher) in the higher education core partner (s). In addition, provide at least one letter signed by senior administrator(s) in a school district(s) core partner.

   For Institute Partnerships, letters from K-12 core partners will be expected to show commitment to (a) an alignment of the teacher leadership effort with ongoing educational improvements and reform in mathematics and science, (b) increased responsibilities for the emerging teacher leaders in their home organizations, as a result of successful completion of the Institute, and (c) administrative support, time, resources and recognition/rewards commensurate with this increased responsibility. K-12 core partners are required to grant sufficient nonclassroom time to Institute participants to carry out their responsibilities as master teachers and intellectual leaders, and to provide assurance of this commitment. If – in addition to core partners in higher education and K-12 – there are other core partners, provide letters signed by senior officials that describe plans to redirect resources and to develop/revise policies and practices critical to the work of the Partnership and necessary to ensure the sustainability of project work.

6. Other Letters of Substantive Commitment. As space will allow, provide letters of substantive commitment from other project partners.

B. Budgetary Information

Cost Sharing: Cost sharing is not required under this solicitation.

Other Budgetary Limitations:

Teacher stipends of at least $1000 per week for structured Institute participation are to be included, where local district policies are not in conflict with such stipends. See Section III. AWARD INFORMATION for additional details.

C. Due Dates

- **Letter of Intent Due Date(s)** ***(optional)*** (due by 5 p.m. proposer's local time)***:***

  February 18, 2008

  Optional, but strongly encouraged - Targeted Partnerships, Institute Partnerships, MSP-Start Partnerships, Phase II Partnerships, and RETA Projects

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

  March 25, 2008

  Targeted Partnerships, Institute Partnerships, MSP-Start Partnerships, Phase II Partnerships, RETA Projects

  April 10, 2008

D. FastLane / Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of 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. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

  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. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

  Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: http://www.grants.gov/CustomerSupport. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

  Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program and, if they meet NSF proposal preparation requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts with the proposer.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. 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 the reviewer 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, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

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 general NSF review criteria, reviewers will also be asked to review MSP Partnership proposals (i.e., for Targeted, Institute, MSP-Start or Phase II projects) by considering the following questions.

- How well does the proposal address the MSP Key Features?
- Is the proposed work strategic and innovative, and informed by the current research literature on teaching and learning?
- Is the evaluation plan comprehensive in nature, including both formative and summative components, and to be conducted by objective expert parties external to the project?

For proposals for Targeted, Institute or Phase II projects, reviewers will also be asked to consider if the proposal presents the research questions to be studied and shows how the design of the project will allow warranted claims that the activities conducted by the Partnership contribute to the measured outcomes.

In addition to the two NSF criteria for Intellectual Merit and Broader Impacts, special review criteria for I^3 are:

- The extent to which the proposed project addresses the interrelated goals for institutional integration.
- The degree of innovation in the proposed project as evidenced by a depth and quality of creative, coherent, and strategic actions that extend beyond commonplace approaches to normal institutional integration.
- The extent to which the proposed project addresses programming, policies, and practices commensurate with the substantial institutional change needed to seed and nurture appropriate, synergistic relationships among discrete NSF awards.

B. Review and Selection Process

Proposals submitted in response to this program 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.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's 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 Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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 their 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 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.B. 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 (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 agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/general_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a

final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. 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. Such reports provide information on activities and findings, project participants (individual and organizational) 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. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Kathleen B. Bergin, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-5171, email: kbergin@nsf.gov
- Joyce B. Evans, Senior Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-5098, email: jevans@nsf.gov
- James E. Hamos, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-4687, email: jhamos@nsf.gov
- Daniel P. Maki, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-4620, email: dmaki@nsf.gov
- Joan T. Prival, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-4635, email: jprival@nsf.gov
- Elizabeth VanderPutten, Program Director, Directorate for Education & Human Resources, Division of Undergraduate Education, telephone: (703) 292-5147, email: evanderp@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at http://www.nsf.gov/mynsf/.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF

funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

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

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

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

  or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

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; and 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 proposer 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 or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; 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," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records, " 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (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 the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230