Math and Science Partnership   (MSP)

PROGRAM SOLICITATION
09-507

REPLACES DOCUMENT(S):
NSF 08-525

National Science Foundation

Directorate for Education & Human Resources
    Division of Undergraduate Education

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

February 17, 2009

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

February 24, 2009

> Innovation through Institutional Integration

August 20, 2009

> Targeted Partnerships

August 25, 2009

> Innovation through Institutional Integration

April 07, 2010

> Innovation through Institutional Integration

REVISION NOTES

1. The solicitation continues three Partnership components of the MSP program – the *Targeted Partnerships,* the *Institute Partnerships – Teacher Institutes for the 21st Century and MSP-Start Partnerships,* but the proposals are due on different deadline dates. 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. MSP-Start Partnerships conduct the necessary data analysis, project design, evaluation and team building activities needed to develop a full MSP Targeted or Institute Partnership.

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 the potential for significant positive impact is clearly documented. The intent is that focused efforts carry out the necessary research to advance knowledge and understanding in the specific area(s).

3. For this solicitation, MSP *Research, Evaluation and Technical Assistance* (RETA) is limited to research studies that examine the impacts of MSP activities on student and teacher learning.

4. Limits on the number of proposals that may be submitted by a PI, found in prior solicitations, have been eliminated in the current solicitation.

5. Optional Letters of Intent, which were encouraged in prior solicitations, are not requested in the current solicitation.

6. **Innovation Through Institutional Integration (I[3])**

   A track for *Innovation through Institutional Integration (I[3])* is included. I[3] challenges faculty, administrators, and others in 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 2010, proposals are being solicited in nine EHR programs that advance I[3] goals:

   - Centers of Research Excellence in Science and Technology (CREST)
   - Research on Gender in Science and Engineering (GSE)
   - Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)
   - Innovative Technology Experiences for Students and Teachers (ITEST)
   - Alliances for Broadening Participation in STEM: Louis Stokes Alliances for Minority Participation (LSAMP)
   - Math and Science Partnership (MSP)
   - Robert Noyce Teacher Scholarship Program
   - Research in Disabilities Education (RDE)
   - Tribal Colleges and Universities Program (TCUP)

All proposals submitted to I^3 through these programs have a common due date and will be reviewed in competition with one another. Eligibility is limited to institutions of higher education (including two- and four-year colleges). If the proposal is exclusively for I^3 STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit. Given the focus on institutional integration, an institution may submit only one proposal to this I^3 competition.

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

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 what is known in mathematics and science education and serve as models that have a sufficiently strong evidence/research base to improve the mathematics and science education outcomes for all students. 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).

Through this solicitation, NSF seeks to support five types of MSP awards plus EHR-wide projects:

1. *Targeted Partnerships* focus on studying and solving teaching and learning 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* focus on meeting national needs for teacher leaders/master teachers who have deep knowledge of disciplinary content for teaching and are fully prepared to be school- or district-based intellectual leaders in mathematics or the sciences;

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 the potential for significant positive impact is clearly documented. The intent is that focused efforts carry out the necessary research to advance knowledge and understanding in the specific area(s).

5. *Research, Evaluation and Technical Assistance (RETA)* projects directly support the work of the Partnerships by conducting methodologically rigorous studies of the impacts of MSP activities on student or teacher learning. Longitudinal and cross-site studies are particularly encouraged as are those that test innovative methodologies; and

6. *Innovation through Institutional Integration (I^3)* projects enable faculty, administrators, and others in 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 2010, proposals are being solicited in nine EHR programs that advance I^3 goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, 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

Estimated Number of Awards: 15 to 24 MSP projects total, including 4-6 Institute Partnerships, 2-4 MSP-Start Partnerships, 4-6 Phase II Partnerships and 2-3 RETA awards for the February 17, 2009, competition, pending availability of funds. 3-5 Targeted Partnerships will be made in the Fiscal Year 2010 for the August 20, 2009, competition, pending availability of funds. Up to 10 continuing awards will be made in this Innovation through Institutional Integration (I^3) competition, pending availability of funds.

Anticipated Funding Amount: $35,000,000 for the MSP Program: Up to $35,000,000 in FY 2009 and up to $35,000,000 in FY 2010, pending availability of funds. $5,500,000 for Innovation through Institutional Integration (I^3) projects across multiple EHR programs pending the availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

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

    Eligibility for Innovation through Institutional Integration (I^3) is limited to institutions of higher education (including two- and four-year colleges) accredited in, and having a campus located in the US. If the proposal is exclusively for I^3 STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit.

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

PI Limit:

The Principal Investigator of a proposal for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II – must be a mathematician, scientist or engineer and a regular 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 Principal Investigator for an Innovation through Institutional Integration (I^3) proposal must be the university provost or equivalent chief academic officer, 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 per Partnership category – Targeted, Institute, MSP-Start and 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.

RETA proposers may submit one or more RETA proposals.

For Fiscal Year 2010, proposals are being solicited in nine EHR programs that advance the goals of Innovation through Institutional Integration (I^3): CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to this I^3 competition.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

Letters of Intent: Not Applicable

- **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/publications/pub_summ.jsp?ods_key=grantsgovguide)

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

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

    February 17, 2009

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

    February 24, 2009

    > Innovation through Institutional Integration

    August 20, 2009

    > Targeted Partnerships

    August 25, 2009

    > Innovation through Institutional Integration

    April 07, 2010

    > 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 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).

Through this solicitation, NSF seeks to support five types of MSP projects plus EHR-wide projects:

1. ***Targeted Partnerships*** focus on studying and solving teaching and learning 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;

1. ***Institute Partnerships – Teacher Institutes for the 21st Century*** focus on meeting national needs for teacher leaders/master teachers who have deep knowledge of disciplinary content for teaching and are fully prepared to be school- or district-based intellectual leaders in mathematics or the sciences;

2. ***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;

3. ***Phase II Partnerships*** for prior MSP Partnership awardees focus on specific innovative areas of their work where evidence of the potential for significant positive impact is clearly documented. The intent is that focused efforts carry out the necessary research to advance knowledge and understanding in the specific area(s).

4. ***Research, Evaluation and Technical Assistance (RETA)*** projects directly support the work of the Partnerships by conducting methodologically rigorous studies of the impacts of MSP activities on student or teacher learning. Longitudinal and cross-site studies are particularly encouraged as are those that test innovative methodologies; and

5. Proposals submitted to the ***Innovation through Institutional Integration (I^3)*** track would request support for projects that enable faculty, administrators, and others in 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 2010, proposals are being solicited in nine EHR programs that advance I^3 goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, 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 Targeted, Institute and Phase II MSP projects. Specifically, disciplinary faculty and their departments of mathematics, the sciences and/or engineering, as well as education faculty in a department, college, or program of education at an institution of higher education 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.

Mathematicians, scientists and engineers, particularly those who are faculty in higher education partner organizations, have considerable roles in Partnership projects. Their substantive intellectual engagement 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 and local 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 common 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.

MSP projects led by and/or involving community colleges and/or minority-serving institutions are highly encouraged in order to broaden the spectrum of institutions involved in the national MSP effort.

KEY FEATURES

Each MSP Targeted and Institute 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 Phase II Partnership and MSP-RETA proposal must describe how its work contributes to what is known about the Key Features to be addressed.

Partnership-Driven - Core partners are deeply engaged in the effort at both the institutional and individual levels, and share goals, responsibilities and accountability for the project. 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. Scientists, mathematicians, engineers and individuals from other core and supporting partner organizations are encouraged to play significant roles in project activities

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 that are content-based and grounded in current research, 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; developing induction programs, for teachers in their first two years of teaching; 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 K-12 students 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 are content-based and integrate a mastery of fundamentals with the more sophisticated conceptual understandings essential to improve student achievement in mathematics and the sciences, drawing upon technology, laboratory experiences, the development and dissemination of curriculum tools that will help foster inventiveness and innovation, and contemporary research on the science of learning to enhance student access to and performance in challenging STEM courses. Where appropriate, projects incorporate advances in the cyber infrastructure to create powerful learning experiences. Projects ensure that K-12 teachers and students develop sufficient depth and breadth of content knowledge, skills and ways of thinking that 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 what is known about teaching and learning. 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 initiate policies that recognize and reward 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 foster inventiveness and innovation among K-12 students 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. Partnerships must include mathematics, science, and/or engineering faculty, and should, as appropriate and while fulfilling the needs of the local situation, 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 are expected to engage current teachers and/or students studying to become teachers in a stimulating multi-year program designed to strengthen the capabilities of mathematics and science teachers, or activities to prepare teachers to teach challenging mathematics, science and technology college-preparatory courses. 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.

Targeted Partnerships develop goals and benchmarks incorporating the MSP Key Features and enact plans that take into account the broader context of other mathematics and/or science efforts of the partners. For example, if a project seeks to improve student achievement in mathematics in grades 6-8, the Partnership must consider how the project is part of a comprehensive plan that

addresses the overall improvement of K-12 mathematics education. The Partnership also takes into account 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.

Research and evaluation are major components of a Targeted Partnership with all projects designed in such a way that they will contribute evidenced-based findings that add to what is known about how partnerships and engaged disciplinary faculty can provide current and future teachers with the knowledge and skills they need to enhance student learning. Research questions and an associated research design should be explicit and linked specifically to the proposed work.

INSTITUTE PARTNERSHIPS: TEACHER INSTITUTES FOR THE 21st CENTURY

Teacher Institutes for the 21st Century Partnership emphasize a coherent, multi-year program in science, technology, engineering, or mathematics of sufficient depth and duration to prepare highly qualified, experienced teachers to become exceptional teacher leaders. Each Institute has its own compelling sense of identity and purpose, offering innovative strategies while being informed by current research on how to develop in teachers a deep understanding of science and mathematics, expertise in teaching, and the knowledge and skills necessary to become intellectual leaders in their schools and districts. The participants shall be eager to renew their interest in and enthusiasm for their discipline as well as extend and deepen their subject area knowledge and the special knowledge needed for teaching.

Institute curriculum will focus on content, pedagogy and leadership. The content of an Institute emphasizes depth in a field of mathematics, one of the sciences or an engineering discipline. Instructors in the Institutes will include college/university faculty members drawn from mathematics, the sciences, and engineering, as well as education, who model effective pedagogy to ensure that the pedagogy component is designed around specific strategies that are relevant to teaching the subject. They will excite the intellectual curiosity of the participants and assist them in the implementation of contemporary research findings on effective classroom practice and the science of learning, and help provide a "way of knowing." The leadership development components of the Institutes must address the need that as intellectual leaders teachers require multiple coordinated experiences of sufficient depth and duration to help them build critical intellectual capital. Teachers will be transformed through the quality, rigor, and depth of the courses that build their confidence, and strengthen their intellectual flexibility, together with their ability to use the language of mathematics and science in clear and focused communication, both verbal and written, with other teachers and students. These programs also provide a mechanism for teachers to acquire a formal credential upon completion (e.g., a new certification or a master's degree).

After finishing the Institute program, teachers return to their schools and districts 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 be resources for their peers and their profession. Through their knowledge of district needs and the school-year curriculum as well as their involvement in policy and decision making, they work with their peers and key administrators on behalf of improved mathematics and science education in their schools and districts. They are likely to serve as the mathematics and science specialists in elementary grades or the curricular leaders of mathematics and the sciences in the secondary grades.

Research and evaluation are major components of an Institute. Institutes assess teachers' growth in content knowledge, as intellectual leaders and as accomplished classroom practitioners; teachers' effects on the school environment; the teacher leaders' impacts on the academic achievement of their students; and the Institute instructional leader's impacts on higher education instructional practices. Furthermore, all Institute Partnerships are expected to provide explicit research questions and associated design in order to contribute to what is known about teacher leadership and student learning.

An Institute Partnership's core K-12 partners, the districts from which teacher participants are selected, are required to have an ongoing commitment and agreement to align the teacher leadership effort with the school and district strategic plans for reform in mathematics or science. 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. These core K-12 partners are also required to have clearly defined roles for the teacher leaders as they successfully complete the Institute, and provide appropriate administrative support, time, resources, and compensation with these new roles. Moreover, the core K-12 partners 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 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, Targeted or Institute Partnership whose work began in 2002, 2003 or 2004.

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 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 objective 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. **As with all MSP Partnerships, STEM disciplinary faculty must be substantively involved in Phase II work in mathematics and/or science.** 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 longitudinal and cross-site studies of the impact of MSP activities on teacher or student learning

The quality of research and scholarship expected in all MSP-funded RETA projects should be commensurate with results that are publishable in 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. Proposals that have the potential to contribute to methodological advances in the analysis of the effects of large scale projects such as MSP are particularly encouraged. Proposals are encouraged from researchers not directly associated with current MSP partnerships. In those cases, the proposal should indicate commitment from the MSP partnerships to participate and provide necessary data and access.

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 external evaluation that is based on objective measures and is 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 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. When the results of these synergies are both compatible with and beneficial for the institution(s) involved, successful innovation can be created[i]. Past efforts at integration have shown that opportunities for synergy can be created most successfully when collaborative projects include:

- Clear support from senior administrators;

- A cogent plan of action that includes expectations and staff development;

- Open cross-institutional dialogue that is supported and encouraged;

- A common campus-wide vision and value system that stresses the importance of synergistic efforts;

- The formation of a campus network with a set of individuals who take ownership and provide leadership for the initiative[ii].

The campus network is an important aspect of successful collaboration at every stage of development and is critical to the sustainability and enhancement of created partnerships as well as the institutionalization of new innovations. This network can (a) foster communication across the campus to encourage the formation and dissemination of new ideas, values, and learning; (b) serve as a source of leadership to promote and carry out integrative activities; and (c) develop and sustain existing connections while continually expanding collaborative efforts[iii].

Innovation through Institutional Integration (I^3) challenges faculty, administrators, and others in 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., RDE, IGERT, LSAMP, 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 impact of NSF-funded projects and enhance their sustainability;

- Provide additional avenues to broaden participation through workforce development, especially for those underrepresented in STEM research and education; attend to seamless transitions across critical educational junctures; and/or provide more effectively for a globally engaged workforce;

- Promote innovative programming, policies, and practices to encourage the integration of STEM research and education; and

- Encourage STEM educational or related research in domains that hold promise for promoting intra- or inter-institutional integration and broader impacts.

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 or other closely related themes articulated in the goals above.

I^3 is a cross-divisional effort in the Directorate for Education and Human Resources (EHR). For Fiscal Year 2010, proposals are being solicited in nine EHR programs that advance I^3 goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, 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.

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[i] Levine, A. (1980). Why Innovation Fails. New York: State University of New York Press. Pg. 160.

[ii] Kezar, A. (2003). Enhancing Innovative Partnerships: Creating a Change Model for Academic and Student Affairs Collaboration. *Innovative Higher Education* 28(2): 137-156.

[iii] Kezar, A. (2005). Redesigning for Collaboration within Higher Education Institutions: An Exploration into the Developmental Process. *Research in Higher Education* 46(7): 831-860.

III. AWARD INFORMATION

NSF expects to make an estimated 15-24 total MSP awards, including 3-5 Targeted Partnerships, 4-6 Institute Partnerships, 2-4 MSP-Start Partnerships, 4-6 Phase II Partnerships and 2-3 RETA awards, pending availability of funds. The anticipated funding amount, through this Solicitation, is up to $35M in FY 2009 and up to $35M in FY2010, pending availability of funds for the MSP program.

For the Innovation through Institutional Integration competition, up to 12 awards in this cross-divisional effort will be made as continuing grants by the Directorate for Education and Human Resources (EHR); $10,000,000 for Innovation through Institutional Integration projects across multiple EHR programs, pending the 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 standard or continuing grants. 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 nonclassroom 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 nonclassroom 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 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 duration of up to 3 years and for average annual budgets of up to $650,000. 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 (I^3): Awards for Innovation through Institutional Integration (I^3) projects will be made for durations of up to five years, with years four and five dependent on performance, in amounts of up to $250,000 per year, for a total of up to $1.25 million over 5 years. I^3 awards will be made as continuing grants.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

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

    Eligibility for Innovation through Institutional Integration (I^3) is limited to institutions of higher education (including two- and four-year colleges) accredited in, and having a campus located in the US. If the proposal is exclusively for I^3 STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit.

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

PI Limit:

The Principal Investigator of a proposal for any of the Partnership categories – Targeted, Institute, MSP-Start or Phase II – must be a mathematician, scientist or engineer and a regular 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 Principal Investigator for an Innovation through Institutional Integration (I^3) proposal must be the university provost or equivalent chief academic officer, 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 per Partnership category – Targeted, Institute, MSP-Start and 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.

RETA proposers may submit one or more RETA proposals.

For Fiscal Year 2010, proposals are being solicited in nine EHR programs that advance the goals of Innovation through Institutional Integration (I^3): CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to this I^3 competition.

Limit on Number of Proposals per PI:

None Specified

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.

LEAD PARTNER DEFINITION AND ELIGIBILITY

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).

PARTNERSHIP LEADERSHIP TEAM DEFINITION AND ELIGIBILITY INFORMATION

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

The Principal Investigator of each Targeted, Institute, MSP-Start or Phase II Partnership MUST be a mathematician, scientist or engineer and a regular faculty member in a mathematics, science or engineering department in a higher education core partner. In addition, one or more co-Principal Investigators MUST be a representative(s) from the K-12 core partner organization(s).

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.

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, unless the proposal is exclusively for I^3 STEM educational or related research. An institution may not receive more than one I^3 award.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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 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** Innovation Through Institutional Integration (I^3).

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

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.

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 DOCUMENTS section of the proposal.

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.

For the K-12 partner(s), describe the context within which the proposed work will occur, including curricular, instructional, and technological initiatives within which this STEM effort would sit. Also include any policy endeavors that would be supportive of this proposed effort.

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 common approaches** and offer innovative pre-service and in-service programs that promise significant improvements in student and teacher workforce outcomes, as a result of 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 DOCUMENTS 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 DOCUMENTS 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 DOCUMENTS .

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.

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.

Results from Prior NSF Support

A critical aspect of a Phase II proposal will be the 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 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. The proposal must state the research questions, describe

the research methodologies to be employed to answer the questions, and name the researcher(s) who will conduct the work. Include a list of quantitative benchmarks to be achieved for 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 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. Indicate the role of STEM disciplinary faculty in the Phase II work and how the Phase II work will advance the teaching and learning of science and/or mathematics. In addition, the plan should be explicit in describing a proactive dissemination plan that will be made widely available to others, who can benefit from and/or implement the results emerging 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. For the analyses and findings to be seen as objective, it is a requirement to have 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 new institutional change, and those that are considered Supporting Partners. A Disciplinary Partners table in the SUPPLEMENTARY DOCUMENTS 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, indicate new institutional change expected to emanate from Phase II, and for advancing the work beyond the Partnership.

FOR RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE (RETA) PROJECTS

The Project Description should contain the following elements.

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

Methodologies must be well defined, rigorous and appropriate and should result in valid, reliable findings. The logic among research question, method, evidence, analysis and inference should be well articulated. Discuss how the sample of teachers and/or students will be chosen and that the sample will be sufficient for the proposed analysis. If a new analytic method is proposed, discuss the potential benefits and issues with the method.

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

Projects should have an external advisory board to serve as a peer review mechanism. Members should be chosen to provide the appropriate statistical and STEM expertise needed by the project.

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. The proposal should draw on the existing, relevant base of literature and articulate how the plan of work is so informed. It is expected that implementation of the plan of work will impact participating NSF awards, as well as other relevant parts of the institution(s). The proposal should, therefore, address how the goals of the overall project are compatible with the goals of the individual integrated components, as well as how the project is both compatible with and beneficial for the host 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.

Each proposed implementation project in Innovation through Institutional Integration (I^3) should have an evaluation plan to assess progress and success in meeting project goals and objectives. An independent, external project-level evaluation is to be conducted to inform the institution and others of the progress and findings of the grant activities, especially those that address the project's synergistic activity (i.e., the value added by I^3). I^3 projects are expected to have baseline data, establish measurable targets, and collect evidence to determine annual progress and long-term outcomes. If applicable, it is highly desirable to establish a systematic plan to track student participants beyond their involvement in the project. Project-level evaluation should be designed to offer feedback for strengthening implementation over the course of the project, provide credible evidence to justify continued investment in the project, and report results (and describe models/paradigms) of institutional and/or disciplinary changes associated with the investment strategy.

Each I^3 project, as part of a national effort, is expected to cooperate in the monitoring and independent portfolio evaluation efforts conducted by NSF's contracted evaluators. While each project will propose its own types of specific qualitative and quantitative measures, some later standardization of performance monitoring is anticipated so that NSF can conduct a summative/impact evaluation. The I^3 portfolio (summative/impact) evaluation will be designed to determine how effectively I^3 is contributing to the knowledge base, building a community of innovators, strengthening/advancing the higher education STEM infrastructure, and promoting collaborations that advance the goals of I^3.

Proposals for research must address one or more I^3 goals and 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.

The results of prior, relevant NSF investment(s), *especially projects on which the proposed institutional integration is based*, are to be described and supported by data,along with a discussion of both successes and failures. The proposal should also clearly indicate how the intended work differs from, builds on, or is otherwise informed by prior efforts.

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 (see Grant Proposal Guide NSF 07-140, June 2007). 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 projects, RETA projects and Innovation through Institutional Integration (I^3)*, no Appendices are permitted; however, letters of commitment/collaboration may be submitted in FastLane's Supplementary Documents Section.

For *Targeted, Institute and Phase II Partnerships*, Supplementary Documents should be uploaded in FastLane 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 Appendices. 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 the 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:

Awards for Institute Partnerships will be made for durations of up to five years and for average annual budgets of up to $1M. 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.

C. Due Dates

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

    February 17, 2009

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

    February 24, 2009

    > Innovation through Institutional Integration

    August 20, 2009

    > Targeted Partnerships

    August 25, 2009

    > Innovation through Institutional Integration

    April 07, 2010

    > Innovation through Institutional Integration

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 where they will be reviewed if they meet NSF proposal preparation requirements. 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 of interest with the proposal.

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.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

NSF staff also 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 elaboration of the general NSF review criteria, reviewers will also be asked to review MSP proposals by considering the following questions.

- How well does the proposal address 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, conducted by independent, objective, experts external to the project?

- Does the proposal present the research questions to be studied and show how the design of the project will allow 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 Innovation through Institutional Integration (I^3) implementation projects are:

- The extent to which the proposed project addresses the interrelated goals for institutional integration and adds value to existing NSF awards.

- The extent to which there is a demonstrated track record of success for the existing NSF awards on which the proposed institutional integration is based.

- 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 operations.

- The extent to which the proposed project addresses programming, policies, and practices commensurate with the sustained 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 deadline or target date, or receipt date, whichever is later. 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 Research 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/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@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

- 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, National Science Foundation Update is a free e-mail subscription service 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 when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the NSF web site.

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**   (703) 292-5111

(NSF Information Center):

- **TDD (for the hearing-impaired):**   (703) 292-5090

- **To Order Publications or Forms:**

     Send an e-mail to: nsfpubs@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

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