Math and Science Partnership (MSP)

PROGRAM SOLICITATION
NSF 12-518

REPLACES DOCUMENT(S):
NSF 10-556

National Science Foundation

Directorate for Education & Human Resources
Research on Learning in Formal and Informal Settings

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

March 05, 2012

Targeted Partnerships

March 05, 2012

Research, Evaluation and Technical Assistance (RETA), including STEM Education Resource Collaboratory

December 18, 2012

Targeted Partnerships

December 18, 2012

Research, Evaluation and Technical Assistance (RETA)

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the ***NSF Proposal & Award Policies & Procedures Guide*** (PAPPG), NSF 13-1, was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in NSF 13-1 apply to proposals submitted in response to this funding opportunity.

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, National Science Foundation's Merit Review Criteria: Review and Revisions. While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the *Grant Proposal Guide* and the *Award & Administration Guide*.

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the Grant Proposal Guide.

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 11-1, was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in NSF 11-1 apply to proposals submitted in response to this funding opportunity.

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG)* Chapter II.C.2.g(xi) for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: http://www.nsf.gov/bfa/dias/policy/dmp.jsp. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement. Guidelines for data management in EHR projects can be found at: http://www.nsf.gov/bfa/dias/policy/dmpdocs/ehr.pdf.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Revisions to this Solicitation from earlier ones of the Math and Science Partnership Program

1. This solicitation continues only one Partnership component of the MSP program, *Targeted Partnerships*, and these must address a new innovation in one of four focal areas identified in the Introduction which follows.
2. The maximum amount for a Targeted Partnership award has been reduced and there are two levels for Targeted Partnership proposals. The maximum amount for a full Implementation project is $8 million for a project duration of up to 5 years. The maximum amount for a Prototype project is $1.5 million for a project duration of up to 3 years.
3. For this solicitation, MSP *Research, Evaluation and Technical Assistance* (RETA) has been focused with proposals accepted only in a few topical areas.
4. This solicitation includes a call, through MSP RETA, for proposals for a single STEM Education Resource Collaboratory that would be a national resource for gathering, synthesizing and disseminating knowledge from STEM educational research.

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 STEM performance of diverse student populations. MSP projects contribute to what is known in K-12 STEM education. All STEM (Science, Technology, Engineering and Mathematics) fields supported by NSF may be involved in this work, with special encouragement to areas that are gaining increased traction at the K-12 level, such as computer science and engineering, in addition to mathematics and science. MSP projects also serve as models that have a sufficiently strong evidence/research base to improve STEM education outcomes for all students.

Through this solicitation, NSF seeks to support two levels of Targeted Partnership awards, Implementation and Prototype. Implementation awards are intended to develop and put into practice innovative approaches and strategies in education. Prototype awards explore potentially innovative approaches and strategies in education. Both types of Partnerships incorporate significant new innovations to STEM education, linked to a strong educational research agenda, in one of four focal areas: Community Enterprise for STEM Learning; Current Issues Related to STEM Content; Identifying and Cultivating Exceptional Talent; and K-12 STEM Teacher Preparation. In addition, there are three types of Research, Evaluation and Technical Assistance (RETA) project opportunities in this solicitation: research related to sustainability, or policies, or state plans for STEM education; technical assistance for evaluators of MSP projects; and the STEM Education Resource Collaboratory.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Kathleen B. Bergin, telephone: (703) 292-5171, email: kbergin@nsf.gov
- Maura Borrego, telephone: (703) 292-7855, email: mborrego@nsf.gov
- Ron Buckmire, telephone: (703) 292-5323, email: rbuckmir@nsf.gov
- Louis J. Everett, telephone: (703) 292-4645, email: leverett@nsf.gov
- James E. Hamos, telephone: (703) 292-4687, email: jhamos@nsf.gov
- Michael Jacobson, telephone: (703) 292-4641, email: mjacobso@nsf.gov
- Don L. Millard, telephone: (703) 292-4620, email: dmillard@nsf.gov
- Joan T. Prival, telephone: (703) 292-4635, email: jprival@nsf.gov
- Elizabeth VanderPutten, telephone: (703) 292-5147, email: evanderp@nsf.gov

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 22

For FY2012, NSF expects to make an estimated 10-15 total Targeted Partnership awards, including 5-7 Implementation awards and 5-8 Prototype awards. An additional 5-7 RETA awards, including 1 STEM Education Resource Collaboratory award, are anticipated in FY2012. For Targeted Partnerships projects in FY2013, NSF expects to make 10-15 total awards, including 5-7 Implementation awards and 5-8 Prototype awards. An additional 4-6 RETA awards are anticipated in FY2013. Both FY2012 and FY2013 intents are pending availability of funds.

Anticipated Funding Amount: $55,000,000

Approximately $55 million for new awards and continuing awards in FY2012 and in FY2013; pending the availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Lead institution eligibility for a Targeted Partnership is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations). A non-profit organization eligible to serve as a lead institution for a Partnership project is defined as a nonprofit research institute, or a nonprofit professional association, with demonstrated experience and effectiveness in mathematics or science education (National Science Foundation Act of 2002, Public Law 107-368).

  Eligibility for Research, Evaluation and Technical Assistance (RETA) projects, including the STEM Education Resource Collaboratory, is open to all categories of proposers identified in the NSF *Grant Proposal Guide*. Proposals for research on state plans for STEM education in the RETA research component must include a state or consortium of states.

  With the exception of a RETA proposal for the STEM Education Resource Collaboratory, any proposal to the MSP Program should be a single submission that includes support for all partners that are requesting funding from NSF. Separately submitted collaborative proposals, as defined in the NSF *Grant Proposal Guide* (Chapter II, Section D.4 Collaborative Proposals), are not appropriate and will be returned without review.

  A RETA proposal for the STEM Education Resource Collaboratory may be submitted as a single proposal or as simultaneous submissions of proposals from different organizations.

PI Limit:

There is no eligibility requirement for the Principal Investigator of a Targeted Partnership proposal. Among the team of the Principal Investigator and co-Principal Investigators for such a Partnership, there must be:

- at least one mathematician, engineer, or scientist who is a college/university faculty member with a regular appointment in a disciplinary unit of a Core Partner institution of higher education and with a history of publishing in the discipline (not only education of the discipline), and
- at least one person who is a representative from a Core Partner K-12 organization.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

An individual may serve as Principal Investigator or co-Principal Investigator on only one proposal (Prototype or Implementation) per focal area.

RETA proposers may submit one or more RETA proposals, but they may submit only one proposal (Prototype or Implementation) per focal area.

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: Inclusion of voluntary committed cost sharing is prohibited.
- 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):

  March 05, 2012

  Targeted Partnerships

  March 05, 2012

  Research, Evaluation and Technical Assistance (RETA), including STEM Education Resource Collaboratory

December 18, 2012

Targeted Partnerships

December 18, 2012

Research, Evaluation and Technical Assistance (RETA)

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: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

Summary of Program Requirements

I. Introduction

II. Program Description

III. Award Information

IV. Eligibility Information

V. Proposal Preparation and Submission Instructions
- A. Proposal Preparation Instructions
- B. Budgetary Information
- C. Due Dates
- D. FastLane/Grants.gov Requirements

VI. NSF Proposal Processing and Review Procedures
- A. Merit Review Principles and Criteria
- B. Review and Selection Process

VII. Award Administration Information
- A. Notification of the Award
- B. Award Conditions
- C. Reporting Requirements

VIII. Agency Contacts

IX. Other Information

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. Through this solicitation, NSF seeks to support Targeted Partnerships that focus on new innovations in K-12 mathematics, computer science, engineering, or science education, linked to a strong educational research agenda, in one of four focal areas. Targeted Partnerships study and solve issues of importance to STEM education related to teaching and learning within a specific grade range or at a critical juncture in education, and/or within a specific disciplinary focus in mathematics, computer science, engineering, or the natural sciences. While focusing on one of the following areas, proposals may include strategies that incorporate aspects of other focal areas as necessary to support the goals of the proposed project.

- ***Community Enterprise for STEM Learning*** - The focus is to expand the composition of partnerships beyond school districts and higher education in order to provide and integrate necessary supports for students so they can learn challenging mathematics, science, engineering, and/or computer science. This involves attentiveness to aspects of their lives that reach beyond the school setting. These projects involve K-12 school districts and institutions of higher education with other partners to provide multifaceted resources that (a) broaden teaching and learning by incorporating additional STEM assets of the community, such as museums/zoos/parks/ aquariums, business & industry, or national/state-funded science/engineering/technology laboratories and centers, and/or (b) address the social situations of students by engaging necessary and important community entities, such as social services, family/parent organizations, before/after school providers, or civic organizations. Documenting learning across formal and informal educational settings is encouraged. (NRC, 2005, 2007, 2009; PCAST, 2010)
- ***Current Issues Related to STEM Content*** - The focus is on innovative solutions related to current key issues in STEM education, such as, but not limited to, Common Core State Standards in Mathematics, Next Generation Science Standards, engineering/computer science in the K-12 curriculum, or as indentified in a recent National Research Council report on

successful K-12 STEM education. As rich conceptual understanding is central to all such issues, these projects should be narrowly focused on one or a few related foundational concepts of the STEM disciplines and advance the capacity of the STEM education system to provide students with deep knowledge and facility related to these concepts. (ACM, 2010; CCSSI, 2010; NRC, 2011a, 2011b; PCAST, 2010)

- ***Identifying and Cultivating Exceptional Talent*** - The focus is on innovative mechanisms for identifying "*all* types of talents and to nurture potential in *all* demographics of students" with creative ways of thinking and applying conceptual understandings in the STEM disciplines. These projects should provide students with "coordinated, proactive, sustained formal and informal interventions to develop their abilities...at a pace, depth, and breadth commensurate with their talents and interests and in a fashion that elicits engagement, intellectual curiosity, and creative problem solving" and address the implementation of policies that foster a culture that "nurtures...innovative thinking." (NSB, 2010)
- ***K-12 STEM Teacher Preparation*** - The focus is on innovations in the preparation of K-12 teachers of science, mathematics, engineering, and/or computer science at the pre-service level and support of new teachers during their early years in the profession. Designing and studying the effectiveness of new teachers in terms of impact on learners is encouraged as is attention to the needs of next generation teachers to meet the demands of diverse learners. Supporting STEM teachers as professionals in practicing the art of teaching is implicit in these projects. The MSP program is particularly interested in innovations in the STEM preparation of elementary teachers. (NRC, 2010; PCAST, 2010)

Where appropriate, Partnerships are encouraged to consider incorporation of learning technologies, as well as the study of their impact on the ways students approach learning and problem-solving, in support of proposed project goals. (NSF Task Force on Cyberlearning, 2008).

In addition, NSF seeks proposals for several different varieties of RETA projects. Some projects will conduct research on (a) sustainability of partnerships from the past and current NSF MSP portfolio, of ideas emanating from these partnerships, or of institutional changes that have persisted from these partnerships, or (b) local, state and/or national policies that have resulted from and/or impact NSF MSP projects. Other RETA projects will conduct research in the context of states conducting needs assessments, identifying and coordinating their STEM assets, and creating all-encompassing plans for K-12 STEM education. NSF also seeks proposals for a RETA project that will offer technical assistance to evaluators of MSP projects.

The MSP program also seeks to fund one RETA project for a STEM Education Resource Collaboratory that will focus on: (a) gathering and synthesizing knowledge from STEM educational research that can be meaningful for K-12 practitioners, drawing upon varied sources of research, including that which has been supported by NSF's Directorate for Education and Human Resources, particularly the past and current MSP portfolio; (b) designing innovative mechanisms of actively disseminating research-based findings to STEM educational practitioners and researchers; (c) providing approaches for practitioners and researchers to consider translational research in order to implement the ever-evolving research on effective K-12 STEM educational projects, programs, and practices; and (d) engaging educational practitioners and STEM education researchers and social/behavioral/economic sciences researchers in identifying areas of mutual interest for further educational research.

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 STEM courses;
- Enhancing the quality, quantity and diversity of the K-12 STEM teacher workforce; and
- Developing evidence-based outcomes that contribute to our understanding of how students effectively learn the knowledge, skills and ways of thinking inherent in mathematics, computer science, engineering, and/or the natural sciences.

TARGETED PARTNERSHIPS

Targeted Partnerships study and solve issues of importance to STEM education related to teaching and learning within a specific grade range or at a critical juncture in education, and/or within a specific disciplinary focus in mathematics, computer science, engineering, or the natural sciences. Each Targeted Partnership must focus its efforts on one of the focal areas in K-12 STEM teaching and learning identified in this solicitation's Introduction - Community Enterprise for STEM Learning, Current Issues Related to STEM Content, Identifying and Cultivating Exceptional Talent, or K-12 STEM Teacher Preparation. While the proposal is expected to focus primarily on one of the focal areas, it is recognized that aspects from other focal areas may be included as necessary to support the goals of the proposed project. This solicitation seeks to support two types of Targeted Partnership awards, Implementation or Prototype, which are described below.

IMPORTANT PROJECT COMPONENTS of ALL PARTNERSHIPS

Partnership projects may vary considerably in the approaches they take, the number of school districts and institutions of higher education involved, the number and types of other Partner entities engaged, the number of STEM disciplinary faculty members and STEM education faculty members that participate, the number of teachers and building/district administrators contributing, the number of educational and/or social/behavioral/economic sciences researchers assisting, and the focus area of the project. However, all promising projects share certain traits. Overarching defining characteristics are: (a) it is necessary for a Partnership to be mutually beneficial in order for the proposed work and outcomes to be accomplished, i.e., the proposed work is such that without the Partnership it could not be accomplished, and (b) the ideas promoted and attendant research design are of considerable national import to the STEM educational field, i. e., while the Partnership focuses on identified local need, the issue(s) addressed is/are of national importance in STEM education.

Central tenets of the MSP program are that all Partnerships:

- are centered on improvement in STEM learning by K-12 students;
- contribute to the literature on STEM teaching and learning, and thus must have a focal area (or areas) of research embedded within implementation strategies;
- must involve at least one institution of higher education and at least one school district; and
- utilize expertise of STEM disciplinary faculty, educational researchers, and K-12 teachers and administrators, with individuals from the learning sciences also encouraged to participate.

Requirements of ALL Partnership Proposals: All proposals MUST present an implementation framework that employs innovative strategies (***beyond the commonplace***); this framework should incorporate all of the following:

Partnership Driven

- At least one institution of higher education as a Core Partner (defined in Eligibility Information)
- At least one school district as a Core Partner
- At least one PI/Co-PI from a K-12 Core Partner organization
- At least one PI/Co-PI who is a mathematician, engineer, or scientist from a higher education Core Partner; while STEM education faculty members do not meet this requirement, their involvement is encouraged and they may participate as a PI/Co-PI on a project
- Substantive engagement of STEM disciplinary faculty members (i.e., mathematicians, engineers, or scientists) appropriate to the intents of the project and with clearly defined roles

Teacher Quality, Quantity and Diversity

- Strategies and activities that are designed to increase the capacity of teachers to enhance student learning in STEM, while being attentive to the diversity of the teacher workforce

Challenging Courses and Curriculum

- A description of what the K-12 students, within a grade range subset, will be learning through this project that is sufficiently challenging and rigorous to bring about enhanced student mastery of fundamentals, sophisticated conceptual understandings, and ways of thinking essential to allow students to demonstrate success in the STEM discipline(s) that is/are the target of the project; proposals focusing on K-12 STEM Teacher Preparation should describe the content and skills the pre-service teachers will learn in support of engaging their future K-12 students in challenging STEM courses and curriculum

Evidence-based Design and Outcomes

- Linkages of current research and studies, including theoretical foundations, used to inform the project design
- One or more educational research questions, of considerable import to the STEM education community, and associated research design
- Student and teacher data that provide the baseline for the specific improvements targeted by the project; these data serve to define the need to be addressed by the project; data should be disaggregated by race, ethnicity, socio-economic status, gender and disability, unless precluded by local or state law
- An external evaluator, evaluation questions, and evaluation design linked to the goals and outcomes of the project; the analysis of data informs the continuous refinement of the project
- Credible measures documenting impact, inclusive of quantitative and qualitative benchmarks of progress and outcomes associated with student learning and teacher quality, as well as related to the measurement of other goals delineated in the project
- Reliable procedures for analyzing data on the effectiveness of the Partnership and the impact of the contributions made by faculty members in the STEM disciplines

Institutional Change and Sustainability

- Identifiable institutional change that will result from the work for each Core Partner (university/college and school district(s)), which will contribute to sustainability of project goals; it is likely that changes in policy, practices, and programs will vary for different Core Partners

Through this solicitation, NSF seeks to support two types of Targeted Partnership awards, Implementation or Prototype. Proposals must identify whether the submission is for an Implementation award or for a Prototype award.

Targeted Partnership proposals for Implementation awards are intended to develop and put into practice innovative education approaches/strategies (e.g., instructional approaches, curricula, professional development, technology, school-wide programs) based on educational research. Depending on the complexity and scope of the strategies, the design and development of a project may encompass more than one research study. There should be a compelling rationale that (a) specifies the practical problem that the project is intended to address, (b) justifies the importance of this problem, (c) describes how the proposed approach is different from existing practices, and (d) explains why the proposed approach/strategies have the potential to improve education outcomes or gain efficiencies for education systems beyond what current practices achieve. The proposal should include a description of the approach/strategies that will be implemented and its theory of action, identifying key components of the approach/strategies (i.e., the active ingredients that are hypothesized to be critical to achieving the intended results) and how they relate to each other operationally and theoretically. There should be a strong theoretical and empirical rationale for the project grounded in the STEM education literature.

Targeted Partnership proposals for Prototype awards explore potentially innovative educational approaches/strategies that challenge conventional thinking while building upon existing fundamental educational research. Such projects examine associations between malleable factors (i.e., factors that can be changed, such as but not limited to students' behaviors, teachers' practices, school programs, education policies) and education outcomes. Prototype proposals should present a well-explicated theory of action for the proposed education intervention which the project will try out. The project design framework should be such that the findings are suitable for future broader implementation. The proposal should include a compelling rationale that (a) specifies the practical problem that the project is intended to address, (b) justifies the importance of this problem, and (c) shows how the proposed research will inform the development of the proposed approach/strategies and its potential for wider adoption. There should be a strong theoretical and empirical rationale for the project grounded in the STEM education literature.

RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE (RETA) PROJECTS

MSP RETA projects are intended to enhance the capacity of the Partnership projects to achieve their goals and to contribute to the development and dissemination of the knowledge base necessary to achieve sustained educational reform. There are three RETA opportunities in this solicitation: research; technical assistance for evaluators of MSP projects; and the STEM Education Resource Collaboratory.

Research on sustainability and impact of policies: One element of the research component of MSP RETA accomplishes its purpose through research on: (a) sustainability of partnerships from the past and current NSF MSP portfolio, ideas emanating from these partnerships, or institutional changes that have persisted; or (b) local, state and/or national policies that have resulted from and/or impact NSF MSP projects.

The quality of research and scholarship expected in these MSP RETA projects should lead to articles in peer-reviewed journals. Methodologies must be well-defined, rigorous and appropriate and should result in valid, reliable data/findings with the potential to inform MSP work. The logic among research question, method, evidence, analysis and inference(s) to be derived 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.

Research on state plans for STEM education: Another element of the research component of MSP RETA will support one or more projects that enable states to identify and coordinate the infrastructure/resources, both organizations and people, that can be mobilized within a state, multiple states or a region and the use of extant data to support the identification of specific and targeted needs to advance K-12 STEM education. Such proposals will demonstrate an understanding of public policy issues impacting STEM education, conduct a self-study leading to the generation of a state plan for advancing STEM education, and conduct research on the development of the plan so that others may learn from the process. Proposals for these projects should focus on: (1) the identification of the resources (e.g., school districts, institutions of higher education, federal/state-funded MSP projects, museums/zoos/parks/aquariums, business & industry, federal/state-funded science laboratories and centers) that a state or region can coordinate to develop a specific plan for advancing K-12 STEM education; (2) the use of existing data at the district, state or regional level that can identify the specific needs that should be addressed by this coordinated effort and/or the identification and development of data elements that must be improved in data systems to provide more information to identify specific needs; and (3) the characterization of the facilitating conditions and barriers to the development and implementation of a coordinated plan that addresses targeted and specific K-12 STEM education needs.

The quality of research expected in these MSP RETA projects should lead to the diffusion of ideas, including the processes/mechanisms by which the work was accomplished, that can inform other state-level efforts in resolving intractable issues in K-12 STEM education. Methodologies must be well-defined, rigorous and appropriate and should result in valid, reliable findings with the potential to inform the work of other states. The logic among the project intents, methods, evidence, analyses and inferences to be derived should be well-articulated.

Technical assistance for evaluators: MSP RETA also includes technical assistance to MSP projects in order to enhance their effectiveness and opportunities for success. In this solicitation, the evaluation and technical assistance components of MSP RETA will support one project that offers technical assistance to evaluators of MSP Partnerships, and may involve support to evaluators of MSPs funded through U.S. Department of Education funds to states, in addition to NSF-funded Partnerships. This project will discern significant issues that hinder the work of evaluators of Partnership projects, offer technical assistance to help resolve these issues, and provide venues for MSP evaluators and project personnel to share strategies and findings from the evaluation work inherent in MSP Partnerships.

STEM Education Resource Collaboratory: Through the MSP RETA, NSF will fund one STEM Education Resource Collaboratory that will focus on: (a) gathering and synthesizing knowledge from STEM educational research that can be meaningful for K-12 practitioners, drawing upon varied sources of research, including that supported by NSF's Directorate for Education and Human Resources, particularly the past and current MSP portfolio; (b) designing innovative mechanisms of actively disseminating research-based findings to STEM educational practitioners and researchers; (c) providing approaches for practitioners and researchers to consider translational research in order to implement the ever-evolving research on effective K-12 STEM educational projects, programs, and practices; and (d) engaging educational practitioners and STEM education researchers and social/behavioral/economic sciences researchers in identifying areas of mutual interest for further educational research. The Collaboratory will pay particular attention to dissemination and translation of educational research among practitioners involved in STEM education programs of the U.S. Department of Education and in support of STEM education efforts within states and/or across local communities.

RESPONSIBILITIES OF MSP PROJECTS

All MSP projects participate in the following MSP program-wide initiatives. As such, proposals should include planning for this work in management structures and in budgets.

MSP Learning Network

All MSP-funded projects participate in NSF's 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 outcomes in STEM disciplines. The MSP Learning Network fosters greater national collaboration and contributes to the Nation's capacity to engage in and understand large-scale education innovation. A component of the MSP Learning Network is MSPnet.org. It is the facilitated electronic network serving the MSP community in order to build capacity and enrich the knowledge base of the MSP Learning Community of which they are an integral part. In addition, the MSP community comes together annually in an MSP Learning Network Conference. Each Partnership typically sends 4-5 individuals to this Conference annually.

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

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-level 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 STEM 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 STEM education.

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

MSP-funded projects are expected to participate in MSP-funded knowledge management and dissemination endeavors to include the STEM Education Resource Collaboratory, 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 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.

REFERENCES

Association for Computing Machinery (ACM, 2010) Running on Empty. New York, NY.http://www.acm.org/runningonempty

Common Core State Standards Initiative (CCSSI, 2010) Common Core State Standards for Mathematics Initiative. http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

National Research Council (NRC, 2005) *How Students Learn: History, Science, and Mathematics in the Classroom*. Washington, DC: National Academy Press. http://www.nap.edu/openbook.php?isbn=0309074339

National Research Council (NRC, 2007) *Taking Science to School: Learning and Teaching Science in Grades K-8*. Washington, DC:

National Academy Press. http://www.nap.edu/catalog.php?record_id=11625

National Research Council (NRC, 2009) *Engineering in K-12 Education: Understanding the Status and Improving the Prospects*. Washington, DC: National Academy Press. http://www.nap.edu/catalog.php?record_id=12635

National Research Council (NRC, 2010) *Preparing Teachers: Building Evidence for Sound Policy*. Washington, DC: National Academy Press. http://www.nap.edu/catalog.php?record_id=12882

National Research Council (NRC, 2011a) *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: National Academy Press. http://www.nap.edu/catalog.php?record_id=13165

National Research Council (NRC, 2011b) *Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics*. Washington, DC: National Academy Press. http://www.nap.edu/catalog.php?record_id=13158

National Science Board (NSB, 2010) *Preparing the Next Generation of STEM Innovators: Identifying and Developing our Nation's Human Capital*. Arlington, VA. http://www.nsf.gov/news/news_summ.jsp?cntn_id=117713

National Science Foundation Task Force on Cyberlearning (NSF, 2008) *Fostering Learning in the Networked World: The Cyberlearning Opportunity and Challenge*. National Science Foundation, Arlington, VA. http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08204

President's Council of Advisors on Science and Technology (PCASE, 2010) *Prepare and Inspire: K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future*. White House Office of Science and Technology Policy (OSTP), Washington, DC. http://www.whitehouse.gov/administration/eop/ostp/pcast/docsreports

Westat (2010) *The 2010 User-Friendly Handbook for Project Evaluation,* Frechtling, J., Mark, M., Rog, D., Thomas, T., Frierson, H., Hood, S., and Hughes, G. Rockville, MD. http://www.westat.com/Westat/pdf/news/UFHB.pdf

III. AWARD INFORMATION

For FY2012, NSF expects to make an estimated 10-15 total Targeted Partnership awards, including 5-7 Implementation awards and 5-8 Prototype awards. An additional 5-7 RETA awards, including 1 STEM Education Resource Collaboratory award, are anticipated in FY2012. For Targeted Partnerships projects in FY2013, NSF expects to make 10-15 total awards, including 5-7 Implementation awards and 5-8 Prototype awards. An additional 4-6 RETA awards are anticipated in FY2013. Both FY2012 and FY2013 intents are pending availability of funds.

Anticipated Funding Amount: Approximately $55 million for new awards and continuing awards in FY2012 and in FY2013; pending the availability of funds.

TARGETED PARTNERSHIPS: The maximum total budget for a Targeted Partnership that is an Implementation project is $8,000,000 (average annual budgets of $1,600,000) with a duration of up to 5 years. The maximum total budget for a Targeted Partnership that is a Prototype project is $1,500,000 (average annual budgets of $500,000) with a duration of up to 3 years. 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. As NSF is interested in models of varying scales and scope, but still with national significance, requests for funding of lesser amounts are encouraged. The budget should be commensurate with the scale and scope of the proposed work.

RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE PROJECTS: The maximum total budget for RETA research and evaluation technical assistance projects is $1,200,000 (average annual budgets of $400,000) with a duration of up to 3 years. 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. The maximum total budget for the STEM Education Resource Collaboratory is $8,000,000 (average annual budgets of $1,600,000) with a duration of up to 5 years. The request for funding should be consistent with the scope and complexity of the proposed work. The Resource Collaboratory award will be made as a continuing grant.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Lead institution eligibility for a Targeted Partnership is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations). A non-profit organization eligible to serve as a lead institution for a Partnership project is defined as a nonprofit research institute, or a nonprofit professional association, with demonstrated experience and effectiveness in mathematics or science education (National Science Foundation Act of 2002, Public Law 107-368).

  Eligibility for Research, Evaluation and Technical Assistance (RETA) projects, including the STEM Education Resource Collaboratory, is open to all categories of proposers identified in the NSF *Grant Proposal Guide*. Proposals for research on state plans for STEM education in the RETA research component must include a state or consortium of states.

  With the exception of a RETA proposal for the STEM Education Resource Collaboratory, any proposal to the MSP Program should be a single submission that includes support for all partners that are requesting funding from NSF. Separately submitted collaborative proposals, as defined in the NSF *Grant Proposal Guide* (Chapter II, Section D.4 Collaborative Proposals), are not appropriate and will be returned without review.

  A RETA proposal for the STEM Education Resource Collaboratory may be submitted as a single proposal or as simultaneous submissions of proposals from different organizations.

PI Limit:

There is no eligibility requirement for the Principal Investigator of a Targeted Partnership proposal. Among the team of the Principal Investigator and co-Principal Investigators for such a Partnership, there must be:

- at least one mathematician, engineer, or scientist who is a college/university faculty member with a regular appointment in a disciplinary unit of a Core Partner institution of higher education and with a history of publishing in the discipline (not only education of the discipline), and
- at least one person who is a representative from a Core Partner K-12 organization.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

An individual may serve as Principal Investigator or co-Principal Investigator on only one proposal (Prototype or Implementation) per focal area.

RETA proposers may submit one or more RETA proposals, but they may submit only one proposal (Prototype or Implementation) per focal area.

Additional Eligibility Info:

PARTNERS DEFINITION AND ELIGIBILITY FOR PARTNERSHIPS

Targeted 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 Partnership should be a single submission that includes support for all partners that are requesting funding from NSF. Separately submitted collaborative proposals, as defined in the NSF *Grant Proposal Guide* (Chapter II, Section D.4 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 identify the institutional change(s) that will occur and provide evidence of their commitment to undergo the institutional change necessary to sustain the work of the partnership beyond the funding period. This is what distinguishes Core Partner organizations from 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, computer science, 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 STEM 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 STEM education. The participation of mathematicians, engineers, and/or scientists from these Core Partner organizations is encouraged.

SUPPORTING PARTNERS

Supporting partners include important stakeholders and stakeholder organizations in K-12 STEM education, including parents and families and the types of partner organizations described above. 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 INSTITUTION DEFINITION AND ELIGIBILITY

For all Targeted Partnerships, one of the Core Partner organizations serves as the lead institution and submits the MSP proposal on behalf of the Partnership. The lead partner accepts management and fiduciary responsibility for the project.

Lead institution eligibility for Targeted Partnerships is limited to an institution of higher education or an eligible non-profit organization (or consortia of such institutions or organizations). A non-profit organization eligible to serve as a lead institution for a Partnership project is defined as a nonprofit research institute, or a nonprofit professional association, with demonstrated experience and effectiveness in mathematics and/or science education.

PARTNERSHIP LEADERSHIP TEAM DEFINITION AND ELIGIBILITY INFORMATION

The Partnership Leadership Team for a Targeted Partnership must include those individuals identified in the proposal as Principal Investigator and co-Principal Investigators.

There is no eligibility requirement for the Principal Investigator of a proposal for a Targeted Partnership proposal. However, the Principal Investigator of each Targeted Partnership must be an individual who can represent the Lead Core institution.

Among the team of the Principal Investigator and co-Principal Investigators, there must be:

- at least one mathematician, engineer, or scientist who is a college/university faculty member with a regular appointment in a disciplinary unit of a Core Partner institution of higher education and with a history of publishing in the discipline (not only education of the discipline), and
- at least one who is a representative from a Core Partner K-12 organization.

It is also encouraged that the Partnership Leadership Team for all Targeted Partnerships and/or the project's Research Team include educational researchers and researchers from the social/behavioral/economic sciences. Proposals may also indentify a Project Director who is responsible for day-to-day management of the project. These individuals may be, but are not required to be, identified as a Principal Investigator or co-Principal Investigator.

ELIGIBILITY FOR RETA PROPOSALS

The categories of proposers identified in the NSF *Grant Proposal Guide* are eligible to submit Research, Evaluation and Technical Assistance proposals under this program solicitation. Proposals for research on state plans for STEM education in the RETA research component must include a state or consortium of states.

PARTNER ORGANIZATION PROPOSAL LIMIT

There are no limits on the number of Partnership or RETA proposals submitted by an Institution.

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 nsfpubs@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 nsfpubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

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

After selecting the MSP program solicitation number on the Cover Sheet, the "NSF Unit Consideration" must be specified - select either Targeted or RETA. Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. Grants.gov users should refer to Section VI.1.2. of the NSF Grants.gov Application Guide for specific instructions on how to designate the NSF Unit of Consideration.

HUMAN SUBJECTS

- On the Cover Sheet, mark the Human Subjects box as pending, approved, or exempted (with exemption subsection indicated). This box should not be left blank.
- Human Subjects box should be marked as pending if an IRB is either (1) reviewing the project plan and has not yet determined a ruling of "approved" or "exempt", or (2) the project plan has not yet been submitted to an IRB for review.

Projects involving research with human subjects, or the reporting of information gathered from human subjects, must ensure that subjects are protected in conformance with the relevant federal policy known as the Common Rule (*Federal Policy for the Protection of Human Subjects*, 45 CFR 690). All projects involving human subjects must either (1) have approval from the organization's Institutional Review Board (IRB) before issuance of an NSF award or, (2) must affirm that the IRB or an appropriate knowledgeable authority previously designated by the organization (not the Principal Investigator) has declared the research exempt from IRB review, in accordance with the applicable subsection, as established in section 101(b) of the Common Rule. If the box for "Human Subjects" is checked on the Cover Sheet along with either (1) the IRB approval date, or (2) the exemption subsection from the Common Rule identified, then no additional certification is required. In the event the proposal is recommended for funding and IRB review is pending, certification of IRB approval or exemption should be submitted to NSF in electronic form as soon as it is available. Delays in obtaining IRB certification may result in NSF being unable to make an award. For more information regarding the protection of human subjects, consult: http://www.nsf.gov/bfa/dias/policy/human.jsp

PROJECT SUMMARY

Provide a one-page summary that briefly describes the project vision, goals and work to be undertaken. For Targeted 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 additional Core Partners,
- the name(s) of any supporting partners,

- designation as an Implementation or Prototype project, and
- the project's one targeted focal area - Community Enterprise for STEM Learning, Current Issues Related to STEM Content, Identifying and Cultivating Exceptional Talent, or K-12 STEM Teacher Preparation.

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 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 NSF merit review criteria - Intellectual Merit and Broader Impacts - in separate statements (see Section VI below).

PROJECT DESCRIPTION (including Results from Prior NSF Support)

FOR TARGETED PARTNERSHIPS

The Project Description should include the following elements: Vision, Goals and Outcomes; Research and Implementation Framework; Evaluation Plan; Partnership Management/Governance Plan; Institutional Change and Sustainability; and Results from Prior NSF Support.

Vision, Goals and Outcomes

A proposal must clearly describe the project's vision, goals and anticipated outcomes linked to the project's stated theory of action and with respect to all required components of a Partnership. 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 relative to student and teacher outcomes are to be provided in the Special Information and Supplementary Documentation section of the proposal.

For the higher education partner(s), describe the institutional context for this project and the anticipated work in K-12 STEM education; the degree and kinds of prior involvements/experiences with K-12 education of disciplinary faculty in the sciences, mathematics, and engineering; and a description of relevant institutional policies/practices that reward such faculty involvement. In what way(s) the institution of higher education partner(s) will benefit/learn from partnering with the K-12 partner(s), as well as the contributions the institution of higher education partner(s) will make to the K-12 partner(s) should be explicit.

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 effort would sit. Also include any policy endeavors that would be supportive of this proposed effort. In what way(s) the K-12 partner(s) will benefit/learn from partnering with the institution of higher education partner(s), as well as the contributions the K-12 partner(s) will make to the institution of higher education partner(s) should be explicit.

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 members and administrators) in project planning, design and management/decision-making, and (c) sufficient capacity in and preparation of the higher education and K-12 partners to support the scale and scope 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 strategic actions, which extend beyond common approaches, being proposed, including theoretical foundations that are tied to the appropriate research and literature in STEM education. Consistent with expectations for 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.

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 being partnership-driven, describe how each partner will contribute to the proposed work, with particular emphasis on the depth and breadth of contributions mathematicians, engineers, and/or scientists 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.

Provide a project timeline that correlates with the proposed action plan and the quantitative outcome goals and annual benchmarks described in the Special Information and Supplementary Documentation section of the proposal.

For an Implementation project, there should be a compelling rationale that (a) specifies the practical problem that the project is intended to address, (b) justifies the importance of this problem, (c) describes how the proposed approach is different from existing practices, and (d) explains why the proposed approach/strategies have the potential to improve education outcomes or gain efficiencies for education systems beyond what current practices achieve. The proposal should include a description of the approach/strategies that will be implemented and its theory of action, identifying key components of the approach/strategies (i.e., the active ingredients that are hypothesized to be critical to achieving the intended results) and how they relate to each other operationally and theoretically. There should be a strong theoretical and empirical rationale for the project grounded in the STEM education literature.

For a Prototype project, there should be a compelling rationale that (a) specifies the practical problem that the project is intended to address, (b) justifies the importance of this problem, and (c) shows how the proposed research will inform the development of the proposed approach/strategies and its potential for wider adoption. The theory of action should be explicitly stated, supported by a strong theoretical and empirical rationale for the project grounded in the STEM education literature.

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 the questions the evaluation plan will address. It should include 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 Special Information and Supplementary Documentation section of the proposal. Formative evaluation should provide evidence of the strengths and weaknesses of the project, informing the Partnership's understanding of what works and what does not in order to inform project progress and success. Summative evaluation should give an objective analysis of qualitative and quantitative data, thus demonstrating the effectiveness of the project on student and teacher outcomes and institutional change among all Core Partners. 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. (Westat, 2010)

Partnership Management/Governance Plan

Describe the management plan, demonstrating that all partners are fully engaged as mutual partners 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 mathematicians, engineers and/or scientists who will be engaged in the work of the project and their intellectual contributions/roles and responsibilities, referring to individuals listed in a Disciplinary Partner table located in the Special Information and Supplementary Documentation.

Institutional Change and Sustainability

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

Results from Prior NSF Support

If any PI or co-PI identified on the project has received NSF funding in the past five years, information on the award(s) is/are required. Each PI and co-PI who has received *more than one award* (excluding amendments) must report on the award most closely related to the proposal. The Grant Proposal Guide provides guidance on six aspects of prior support that are required to be reported (GPG NSF 11-1). Lessons learned from previous and current support, including a discussion of successes and 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 RESEARCH, EVALUATION AND TECHNICAL ASSISTANCE (RETA) PROJECTS

The project description should contain the following elements: Research and Methodology; Evaluation/External Feedback; Management Capability; and Results from Prior NSF Support.

Research and Methodology

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. The project description should indicate a clear understanding of the goals of the MSP program and illustrate how the RETA project contributes to these goals.

Methodologies must be well-defined, rigorous and appropriate and should result in valid, reliable data/findings. The logic for the proposed work should be explicit. The methodologies to be used should be fully presented and referenced, and must be representative of cutting-edge educational and/or social science approaches. All RETA projects are expected to produce scholarly publications.

Plan for Working with the NSF-MSP Partnership Projects related to Partnership Sustainability or Local, State, and/or National Policies Impact

The project description should discuss how the project expects to interact with the Partnership projects. This section should include an estimate of the number, type, duration, and intensity of interactions with the Partnership projects. The proposal should clearly indicate the benefits to Partnership projects by virtue of their participation. NSF does not want current Partnership projects to be burdened with numerous requests for support or collaboration. Therefore, a proposal should not include letters of commitment or other indications of support from these projects. For information about the Partnership projects, see MSPnet at: http://www.mspnet.org/.

NSF will work with the RETA awardees under this solicitation and with the current and future Partnership projects to ensure appropriate interactions among all projects.

Plan for Working with States or Consortium of States or Regions related to State Plans for STEM Education

The project description should discuss the processes/mechanisms for accomplishing the work, inclusive of the research base that informs the approach. If more than one state is involved or parts of states comprising a region are indicated, the rationale for this composition should be well-presented. Letters of commitment should be included in the Special Information and Supplementary Documentation section.

Plan for Working with MSP Project Evaluators

The project description should discuss the technical assistance the RETA intends to provide for evaluators, how the interaction will occur, and an estimate of the number, type, duration, and intensity of the interactions with the MSP project evaluators. The anticipated number of evaluators to be supported should be indicated.

NSF does not want current Partnership projects to be burdened with numerous requests for support or collaboration. Therefore, a proposal should not include letters of commitment or other indications of support from these projects. For information about the Partnership projects, see MSPnet at: http://www.mspnet.org/. and ED State MSP Links at: https://msp.ed-msp.net/msp23d3AOW/searchStateCoordinator.jsp

NSF will work with the RETA awardees under this solicitation and with the current and future Partnership projects to ensure appropriate interactions among all projects.

Plan for Working with Individuals and Entities related to the Design and Implementation of the STEM Education Resource Collaboratory

The project description should discuss the processes/mechanisms for accomplishing the work, who will be engaged in conducting the work, as well as who the intended beneficiaries of the work will be, and the products and outcomes that are expected to result from the project. Letters of commitment from those conducting the work should be included in the Special Information and Supplementary Documentation section.

Evaluation/External Feedback

Describe the means by which the RETA project will receive significant external feedback on processes and impact of the proposed work. The source of feedback (e.g., external evaluator, Advisory Board) will vary depending on the variety of RETA proposed, but the rationale and mechanisms must be fully explained, with commensurate support for individuals in the budget. A proposal for the STEM Education Resource Collaboratory must include plans for 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 Collaboratory itself).

The external feedback for any RETA project should guide project progress annually and will measure the impact of the work proposed elsewhere in the Project Description. The plan for feedback should include a description of the methods/instruments/metrics by which the RETA project will document, measure and report on the project's progress toward its goals. Formative feedback should provide evidence of the strengths and weaknesses of the project, informing the RETA team'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. The qualifications of evaluators or members of an Advisory Board must be provided in the proposal. If an evaluator is used, there should be a biographical sketch included among the other documents included in the Biographical Sketch section and a letter of commitment in the Supplementary Documentation section. If an Advisory Board is used, letters of commitment by each member of the proposed Board should be included in the Supplementary Documentation. (Westat, 2010)

Management Capability

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

Results from Prior NSF Support

If any PI or co-PI identified on the project has received NSF funding in the past five years, information on the award(s) is required. Each PI and co-PI who has received *more than one award* (excluding amendments) must report on the award most closely related to the proposal. The Grant Proposal Guide provides guidance on six aspects of prior support that are required to be reported (GPG NSF 11-1). Lessons learned from previous and current support, including a discussion of successes and 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.*

BIOGRAPHICAL SKETCH

For Partnership and RETA proposals, provide a Biographical Sketch for the Principal Investigator, co-Principal Investigators and External 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

Both Partnership and RETA proposals must include Current and Pending Support information for the Principal Investigator and all co-Principal Investigators.

SPECIAL INFORMATION AND SUPPLEMENTARY DOCUMENTATION

The Data Management Plan and Postdoctoral Researcher Mentoring Plan (if applicable) are submitted in the Special Information and Supplementary Documentation section in Fastlane or Grants.gov. In addition, Appendices and letters of support may be submitted consistent with the information below.

For ***RETA*** *projects*, no Appendices are permitted; however, letters of commitment/collaboration may be submitted in the Special Information and Supplementary Documentation section.

For ***Targeted Partnerships***, Appendices are permitted and should be uploaded in Fastlane or Grants.gov as a separate PDF file not to exceed 25 pages. Include in this documentation:

1. Baseline Data. Students: For the Core Partners, provide baseline student data that will enable the Partnership to demonstrate the effects of the project on the achievement of students and on other student outcomes. Student data should be disaggregated by race-ethnicity, socio-economic status, gender and disability, unless precluded by local or state law. Achievement test data should be the most recent in comparison to state and/or national averages and should identify the test and grade levels in which system-wide assessments of STEM disciplines were administered. (Baseline data on K-12 students are not necessary for the K-12 STEM Teacher Preparation focal area.) Teachers: For the Core Partners, provide data to describe the current teacher capacity in the STEM discipline(s) with which the proposal is involved. This should include: the number of teachers in the discipline and grade range; demographics of teachers (gender, ethnicity/race, number of years of teaching, baccalaureate/masters degrees, teaching out of the certification field, retention, and professional development hours within the discipline in the last three years). Also provide teacher preparation and/or professional development data that describe the current capacity of the Core Partner institution(s) of higher education relative to the teacher professional continuum needs of the school district Core Partner(s). Other data: Data that assist in describing the need that will be addressed through the proposed project may also be included and are not limited to student and teacher data.
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, many indicators of outcomes related to students, teachers, administrators, classrooms, schools, higher education faculty, and the institutions and entities involved should be quantitative. These benchmarks and outcomes goals 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.
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 mathematicians, engineers and/or scientists 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.
6. Other Letters of Substantive Commitment. As space will allow, provide letters of substantive commitment from other project partners.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

Budget Preparation Instructions:

A careful and realistic budget in accordance with the general guidelines contained in the NSF Grant Proposal Guide and consistent with the scope and complexity of the proposed activities of the project should be included.

Please note that as a general policy, NSF limits salary compensation for senior project personnel to no more than two months of their regular salary in any one year. This limit includes salary compensation received from all NSF-funded grants. If the current and pending support documents for a proposal show individual senior personnel with more than 2 months of annual compensation expected, an explanation must be provided in the budget justification.

C. Due Dates

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

  March 05, 2012

  Targeted Partnerships

  March 05, 2012

  Research, Evaluation and Technical Assistance (RETA), including STEM Education Resource Collaboratory

  December 18, 2012

  Targeted Partnerships

  December 18, 2012

  Research, Evaluation and Technical Assistance (RETA)

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. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. 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 for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with 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. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years (FY) 2011-2016*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission 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 variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which 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.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (GPG Chapter II.C.2.d.i. contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including GPG Chapter II.C.2.d.i., prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- Intellectual Merit: The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- Broader Impacts: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
    a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
    b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

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

- Are mathematics, engineering, and/or science faculty members from Core higher education partners deeply and broadly involved in the proposed work?
- Does the proposal clearly identify one of the four focal areas and provide an implementation plan explicitly linked to the project's stated theory of action?
- Is the proposed work strategic and innovative, and informed by the current research literature on teaching and learning?
- Is the evaluation plan comprehensive in nature, including both formative and summative components, and to be conducted by objective expert parties external to the project?
- Does the proposal present the research question(s) to be studied and show how the design of the project will allow warranted claims that the activities conducted by the Partnership contribute to the measured outcomes?
- Is the potential for positive impact on teaching and learning and the importance of the research to STEM education high?

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or 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.

Special Award Conditions:

Additional award conditions apply. Please see "Responsibilities of MSP Projects" in "Section II. Program Description."

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 prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. 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 Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements 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.

Additional award conditions apply. Please see "Responsibilities of MSP Projects" in "Section II. Program Description."

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Kathleen B. Bergin, telephone: (703) 292-5171, email: kbergin@nsf.gov
- Maura Borrego, telephone: (703) 292-7855, email: mborrego@nsf.gov
- Ron Buckmire, telephone: (703) 292-5323, email: rbuckmir@nsf.gov
- Louis J. Everett, telephone: (703) 292-4645, email: leverett@nsf.gov
- James E. Hamos, telephone: (703) 292-4687, email: jhamos@nsf.gov
- Michael Jacobson, telephone: (703) 292-4641, email: mjacobso@nsf.gov
- Don L. Millard, telephone: (703) 292-4620, email: dmillard@nsf.gov
- Joan T. Prival, telephone: (703) 292-4635, email: jprival@nsf.gov
- Elizabeth VanderPutten, 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, "My NSF" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "My NSF" also is available on NSF's website at http://www.nsf.gov/mynsf/.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 55,000 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 Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

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

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

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

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

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

- Location: 4201 Wilson Blvd. Arlington, VA 22230
- For General Information (NSF Information Center): (703) 292-5111
- TDD (for the hearing-impaired): (703) 292-5090
- To Order Publications or Forms:
  - Send an e-mail to: 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
Office of the General Counsel
National Science Foundation
Arlington, VA 22230