Interagency Education Research Initiative (IERI)

Program Solicitation
NSF 04-553

National Science Foundation
Directorate for Education and Human Resources
Division of Research, Evaluation and Communication

Letter of Intent Due Date(s) *(required):*

April 01, 2004

March 01, 2005

March 01, 2006

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

May 10, 2004

April 06, 2005

April 07, 2006

General Information

Program Title:

Interagency Education Research Initiative (IERI)

Synopsis of Program:

The Interagency Education Research Initiative (IERI) is a collaborative effort jointly sponsored by the National Science Foundation, the Institute of Education Sciences in the U.S. Department of Education (see http://www.ed.gov/programs/edresearch/applicant.html), and the National Institute of Child Health and Human Development in the National Institutes of Health (see http://www.nichd.nih.gov/funding/funding-opps. htm). In FY 2004 the IERI grant competition will be managed separately by each agency. The National Science Foundation invites proposals for research projects that will investigate the effectiveness of interventions designed to improve student learning and achievement in preK-12 science and/or preK-12

mathematics with an emphasis on middle and high school. Technology should be a part of the intervention or used in an essential manner in the analysis of the intervention.

The goal of the Interagency Education Research Initiative for NSF is to support scientific research that investigates the effectiveness of educational interventions (defined as educational practices, strategies, curricula, or programs) in preK-12 science and/or mathematics as they are implemented in varied school and home settings with diverse student populations. From an empirical perspective, the aim of IERI is to identify the conditions under which effective, evidence-based interventions to improve preK-12 student learning and achievement succeed when applied on a large scale. This necessarily requires a multidisciplinary approach; the participation of a variety of experts including science, mathematics, and engineering faculty along with education researchers is encouraged. In addition, successful projects will include a variety of partners such as states, universities, schools, teachers, and parents and will also require the use of technology for the scaling or the study of the intervention. NSF especially encourages proposals focusing on middle and high school mathematics and/or science.

IERI will fund two types of projects -- contextual projects and scaling projects.

- **Contextual projects** are smaller projects that aim to develop components of a potential scaling project. Examples include feasibility studies, instrument development, and replication studies. Contextual projects can be funded for up to 5 years for up to a total of $2,000,000.
- **Scaling projects** are larger projects that aim to demonstrate that an intervention can scale in either size of affected population or in the variety of contexts in which the intervention is successful. Scaling projects can be funded for up to 5 years for up to a total of $6,000,000. Scaling projects must have a strong evidentiary base and demonstrate, through rigorous, well-controlled, large-scale empirical studies, which proposed education approaches are in fact most effective in practice. The interventions may be school-based or based outside of school and should use technology either in the intervention or in its analysis.

Agency Representative

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

- 47.074 --- Biological Sciences
- 47.070 --- Computer and Information Science and Engineering
- 47.076 --- Education and Human Resources
- 47.041 --- Engineering
- 47.050 --- Geosciences
- 47.049 --- Mathematical and Physical Sciences
- 47.078 --- Office of Polar Programs
- 47.075 --- Social, Behavioral and Economic Sciences

Eligibility Information

- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 11 to 13 - 1 scaling award at up to a total of $6 million for 5 years, and 10 to 12 Contextual Awards for up to a total of $2 million up to 5 years.
- **Anticipated Funding Amount:** $22,000,000 Approximately for FY 2004, pending availability of funds

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

This document has been archived.

C. Due Dates

- **Letters of Intent** *(required)***:**
  - April 01, 2004
  - March 01, 2005
  - March 01, 2006
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
  - May 10, 2004
  - April 06, 2005
  - April 07, 2006

Proposal Review Information

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

Award Administration Information

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

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I. INTRODUCTION

Improving education is a mission that must be supported by rigorous and sustained research and development. State and local policy makers, as well as school-level administrators and university faculty and administrators, need information on efforts at improvement that have led to increased and sustained student learning. In support of this mission, the Interagency Education Research Initiative (IERI) is designed to help educators integrate the insights of scientific research on educational improvement into the realities of varied educational contexts to produce sustainable improvements in learning for diverse student populations. NSF focuses its contribution to the interagency program on preK-12 mathematics and science education, with an emphasis on the middle and secondary school years.

IERI received its initial impetus from a 1997 report of the President's Committee of Advisors on Science and Technology (PCAST). The report emphasized the need for a strong research base for educational improvement and highlighted the potential importance of taking advantage of the benefits of technological change in designing solutions to educational problems. Building on the PCAST recommendations, NSF, the Department of Education's Institute for Education Sciences, and the National Institute of Child Health and Human Development (NICHD) developed IERI as a joint activity of the three agencies. The focus of IERI has been on improving reading, mathematics and science education through scaling up of proven approaches with an emphasis on using technology.

After 5 years of a joint solicitation, the agencies have determined they can best meet the objectives of the interagency program through individual solicitations that focus attention in their particular areas of expertise and build capacity in those areas. A joint solicitation will be revisited in two years. In the early years of the program, participation from the science and mathematics communities and the related educational communities has been less intense than originally anticipated. This NSF IERI solicitation is aimed at enhancing participation of these communities in developing a strong base of information regarding approaches to improving mathematics and science education that will influence current and future efforts to move to larger scale.

IERI aims to build to the next generation of educational research that is attentive to the context in which educators do their work, pushing past controlled laboratory studies to ensure adaptability to classroom settings. Exploration of technology in improving student learning is important because of its potential to change radically the approaches we take to education. IERI looks beyond an individual course or pedagogical approach to improved student learning that is sustained and capable of supporting advanced study in science and mathematics.

II. PROGRAM DESCRIPTION

NSF has organized its approach to educational improvement in science, mathematics, and technology into a cycle of discovery, innovation and application that includes:

- Developing and testing theory and knowledge about teaching and learning;
- Designing and developing tools, materials and methods;
- Designing, implementing, and documenting interventions;
- Synthesizing and interpreting results and identifying new insights and questions; and
- Conducting research on problems of learning, teaching, implementation, and policy.

(The cycle of discovery is adapted from *Rand Mathematics Study Panel, 2002*)

IERI focuses its attention on the last three elements of this cycle. Scaling up requires attention to synthesis and interpretation of results; identification of the evidence base for effectiveness of interventions; articulating questions that arise from exploring this information base; and designing, implementing and documenting new interventions at larger scale. Conducting the research that enables these processes is what IERI is all about.

Over the past two decades, there have been many different types of projects that aim at educational improvement in science and mathematics. Some projects have undergone evaluation processes that provide evidence of effectiveness; others have not. Very few have had participation from individuals with the full range of expertise needed to explore the issues central to scaling up. Likewise, very few have brought to bear the full range of ideas and tools needed to explore scaling to new contexts or larger venues.

This IERI solicitation is designed to improve the capability of the science, mathematics, and education communities to address the substantive issues of scaling up that are critical to attaining the IERI objectives. While IERI will accept proposals for scaling up, the focus for FY 2004 is on establishing the scientific ground from which scaling up might occur. Participation of the mathematics and science communities is particularly important in identifying those activities that have a long term, sustainable impact on improving learning that paves the way for advanced study. This will complement the participation of those with expertise in the tools and methods of research into educational improvement, as well as those with experience in implementing improvement strategies and those on the front lines in our schools and classrooms.

Background:

Many studies show that US students struggle to achieve in mathematics. The Third International Mathematics and Science Study (TIMSS), and the TIMSS-Repeat Study (http://nces.ed.gov/timss/) reveal that students in the United States master fundamental skills and knowledge of mathematics and science during their elementary school years at the same rate as their international peers on average. These studies, however, indicate that U.S. students are less likely to master and/or be taught more complex and conceptually difficult material during their middle and high school years, resulting in lower achievement, relative to students from other countries. The Third International Mathematics and Science Study - Benchmark Study - indicates that there are great inequities in science achievement across the country. The results demonstrate that students in some schools perform among the best in the world, while students in other schools do poorly (Martin et al., 2001; National Center for Educational Statistics, 1999).

The National Academy of Sciences (NAS) recently published *Adding it Up: Helping Children Learn Mathematics* (2001). The NAS report argues for a comprehensive view of mathematics learning that the committee refers to as "mathematical proficiency." A report recently issued by the RAND Corporation (*Rand Mathematics Study Panel*) highlighted three areas of research: 1) Developing teachers' mathematical knowledge for teaching, 2) teaching and learning mathematical practices, and 3) teaching and learning algebra (see http://www.rand.org/multi/achievementforall/math/ for the full text of the report).

The most recent results from the National Assessment of Educational Progress (NAEP) (National Center for Education Statistics, 2002) show that, overall, student achievement is not improving in the sciences. At the 12th grade level, student achievement has actually declined when compared with students' scores five years ago (National Center for Educational Statistics, 2000).

IERI projects can help address these serious concerns by scaling up the most powerful and promising approaches to mathematics and science education—approaches for which effectiveness has been demonstrated by the accumulated evidence from research.

Projects eligible for IERI support could arise from existing projects supported within the EHR Directorate, from education projects within other NSF Directorates, or from projects not supported by NSF. Projects that address math and science content at the middle and high school levels are especially encouraged.

Mechanisms of Support

Contextual Projects : Contextual Project proposals may not exceed an overall budget of $2,000,000 for up to five years.

Examples of contextual projects include:

Feasibility Studies - Support for pilot studies of scale-up that are designed to study critical implementation factors and/or to refine methodological features for scale up. Such studies might include synthesis from existing research and applications of the synthesized results in developing the design for intervention and research in the next cycle of innovation.

Replication Studies - IERI will support the replication of previous studies in new contexts.

Measurement Studies **–** Studies to develop and document the psychometric properties of test items that are designed to measure learning critical to scaling up research are eligible as contextual projects. Investigators may, for example, propose to develop measures that assess the fidelity of implementations, student knowledge, teacher knowledge, or other important predictor or outcome variables related to scale-up. The study of measures that use technology as an essential component is especially encouraged. For example, a variety of concept inventories are currently available in several science disciplines; studies of their reliability and validity are important before they can be used widely for scaling up research.

Technology Projects

IERI will support pilot technology projects with student learning as an outcome and will support the use of technology in the development of ways of assessing student progress.

All contextual projects should promise a synthesis and interpretation of their results that, in combination with results of other projects, can lead to a scaling project.

Scaling Projects : Scaling Project proposals may not exceed an overall budget of $6,000,000 for up to five years.

Examples of Scaling Projects include:

Curriculum Studies - Studies of complete mathematics or science curricula, which were shown to be successful in limited settings, applied across a wider spectrum of schools and settings, especially when tied to student learning and the preparation for university science and mathematics study.

Teacher Enhancement - Studies involving teacher enhancement programs that deal with activities likely to be encountered in typical schools. These studies should include measures of teacher knowledge regarding mathematics and/or science content, pedagogy, and effective use of assessment strategies. These studies should have student learning as a primary measure to determine the effectiveness of the teacher intervention and should include partnerships with university science and mathematics departments.

Technology Deployment - Studies of deployment of technology to a much larger scale (state-wide, nation-wide). Examples of such deployment include the essential use of the world wide web, the use of automated tutors in schools, and the use of virtual learning environments in science and mathematics. The initial deployment must have shown substantial student achievement gains in order to be eligible for a scaling award.

Additional Considerations

Sources for IERI Projects Projects eligible for IERI suppport can arise from many sources, including NSF-supported projects at any educational level. For example, projects in undergraduate education with an evidentiary base for effectiveness might be adapted to the secondary school environment. This might include technology-based pedagogical innovations such as virtual laboratories, mentoring mechanisms, use of digital libraries, or curricular innovations. In-service teacher enhancement activities might be adapted to pre-service teacher education programs or vice-versa. Advances in science and

mathematics may provide new ways for students to learn what it is to do science, rather than simply learning about science.

Technology

Projects that advance the state of new technology uses in the context of mathematics or science learning are especially welcome. These include the use of digital libraries in science and mathematics curricula, experimental mathematics and science using computational tools, the use of collaboration technologies to support student/faculty interactions, the use of visualization to support mathematics and science learning, and the use of Grid-like technologies for virtual classrooms. Additionally, projects that use innovative technology in the analysis of interventions, such as data mining and statistical learning, are welcome.

Human Capital

An important component of IERI projects is attention to the development of people who will be able to participate in future contextual or scaling projects. In particular, the involvement of scientists and engineers in science education projects and mathematicians in mathematics education projects is highly recommended. Scientists, engineers, and mathematicians could be involved in projects as   PI's, co-PI's, post-doctoral investigators or graduate and undergraduate students.   Additionally, the training of the next generation of education researchers with the requisite methodological skills to develop scaling projects is important. Both graduate and postdoctoral support can be used for such training activities.

Accumulation of Knowledge

All IERI projects are expected to accumulate and communicate knowledge to the relevant research communities. Successful IERI projects must demonstrate that they are building upon knowledge from previous research and that they can successfully contribute to that knowledge base. Simply publishing papers or building a web site does not constitute evidence of knowledge accumulation. Active engagement with the research community at large and active contributions to data repositories, active tool sharing, active instrument sharing, and strong outreach are characteristics of knowledge building for successful projects. IERI supports a Data Coordination Center at the National Opinion Research Center (NORC) and funded scaling projects are expected to share data with NORC and provide access to findings. NORC also provides technical assistance for scaling projects.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the Grant Proposal Guide are eligible to submit proposals under this program solicitation.

IV. AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant.
- **Estimated Number of Awards:** 11 to 13 - 1 scaling award at up to a total of $6 million for 5 years, and 10 to 12 Contextual Awards for up to a total of $2 million up to 5 years.
- **Anticipated Funding Amount:** $22,000,000 Approximately for FY 2004, pending availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required):*

Prospective proposers must submit a Letter of Intent (LOI). The LOI should be submitted by e-mail by **April 1, 2004** to ieri@nsf.gov. The letter must not exceed a single page and must provide 1) Project title, 2) Names and institutional affilations of the Principal Investigator and Co-Principal Investigator(s), 3) Whether the project is a scaling or a contextual project, 4) Level(s) and field(s) of mathematics or science the project will address.

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: http://www.nsf.gov/cgi-bin/getpub?gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

Full proposals are expected to address the objectives of the IERI activity as articulated in the description of the IERI program. In particular, IERI proposals must address the following:

Essential use of Technology: The proposal should describe how the project will make use of technology, either in the implementation of scaling up or in the research and analysis central to the activity. Technology may serve as a tool, device, or environment for implementing and/or evaluating specific learning or instructional approaches and strategies. The proposal must link the technology to its appropriateness in addressing the educational issues under investigation.

Evidentiary Base:The proposed innovation must be based on solid research. This means that either there must be a set of plausible studies showing that the innovation works; there is a scientifically based theory (cognitive, developmental, or other learning science based theory) that strongly suggests that the proposed innovation will be successful; or that the study will establish its design for intervention and research based on synthesis of results of past interventions.

Interdisciplinary approach: Proposals in mathematics and science learning are expected to address learning issues in the context of the content domain of the learning. Successful proposals to IERI will incorporate researchers from the learning science community and from the science and/or mathematics content areas that the learning addresses, along with any other disciplinary areas that are necessary to address the research questions under investigation.

Scaling proposals must pay particular attention to:

Empirical Evidence for Scaling up: An intervention identified for scaling up should have an associated foundation of empirical evidence upon which plausible cause and effect assertions (between interventions and student learning and achievement) may be based. Proposers may provide an argument that such a foundation exists by: 1) presenting results from randomized studies - experimental or quasi-experimental, 2) demonstrating evidence of convergent research findings gathered from a methodologically rigorous, substantively coherent body of research directly related to the types of questions cited in the proposed study, 3) describing results from meta-analytic studies in which the impact of an educational innovation has been measured by effect size.

Research Methodology: IERI proposals must study student learning and achievement and scaling up by employing research and measurement designs that are demonstrably valid and reliable. Experimental studies, with random assignment, and quasi-experimental designs are encouraged when appropriate. Randomized experiments or well-controlled quasi-experiments combined as appropriate with detailed observational, micro-genetic, survey and qualitative methodologies are encouraged. A report recently issued by the National Academy of Sciences, titled "Scientific Inquiry in Education," provides general guidance about the nature of methodologically rigorous research (see http://www.nap.edu/catalog/10236.html).

Proposers are reminded to identify the program announcement/solicitation number (04-553) in the program announcement/

solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

Budget Preparation Instructions:

PIs will be expected to attend yearly PI meetings and scaling projects will be required to participate in a single reverse site visit in Arlington, VA. The budget should reflect costs associated with these trips.

C. Due Dates

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

Letters of Intent *(required):*

April 01, 2004

March 01, 2005

March 01, 2006

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

May 10, 2004

April 06, 2005

April 07, 2006

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: http://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 announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: http://

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

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

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

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

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

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

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

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

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

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

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

Integrating Diversity into NSF Programs, Projects, and Activities

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

Additional Review Criteria:

IERI SPECIFIC REVIEW CRITERIA

In addition to the NSF-wide criteria described above, reviewers will be asked to evaluate proposals within the context of the specific IERI objectives and pay particular attention to:

- The essential use of technology and its appropriateness to the project;
- The development and/or use of a solid base of evidence for effectiveness of educational improvement strategies;
- The breadth of expertise appropriate to an interdisciplinary approach;
- The develoment of human capital for educational improvement in science and mathematics; and
- The strength of the research methodology on which the project is based.

B. Review Protocol and Associated Customer Service Standard

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

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

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

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 Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

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

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

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

C. Reporting Requirements

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

Grantees will be required to participate in annual PI meetings. Additionally, all IERI scaling projects will be reviewed on a reverse site visit in the second year of the award.

D. Other Requirements

Because IERI is a long-term initiative oriented toward specific educational issues, the coordination of research projects is particularly important. Principal Investigators will be required to meet at least once each year with agency staff and consultants to review results within their areas, discuss methodologies, and identify promising avenues for future research efforts. These meetings will be part of the annual PIs meeting.

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

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

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Finbarr C. Sloane, Program Director, Directorate for Education & Human Resources, Division of Research, Evaluation & Communication, 855 S, telephone: (703) 292-5146, fax: (703) 292-9046, email: fsloane@nsf.gov

- Janice M. Earle, Senior Program Director, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5097, fax: (703) 292-9044, email: jearle@nsf.gov

- John C. Cherniavsky, Senior EHR Advisor for Research, Directorate for Education & Human Resources, Division of Research, Evaluation & Communication, 855 S, telephone: (703) 292-5136, fax: (703) 292-9046, email: jchernia@nsf.gov

- Ione de Bornemiss Hunt von Herbing, Program Director, Directorate for Biological Sciences, Division of Integrative Biology & Neuroscience, 685 S, telephone: (703) 292-8284, fax: (703) 292-9153, email: ihuntvon@nsf.gov

- Kenneth Whang, Program Director, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 255 S, telephone: (703) 292-8936, fax: (703) 292-9381, email: kwhang@nsf.gov

- Marguerite (Peg) Barratt, Program Director, Directorate for Social, Behavioral & Economic Sciences, Division of Behavioral and Cognitive Sciences, 995 N, telephone: (703) 292-7305, fax: (703) 292-9068, email: mbarratt@nsf.gov

- Michael A. Mayhew, Program Director, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8557, fax: (703) 292-9025, email: mmayhew@nsf.gov

- Henry N. Blount, III, Head Office of Multidisciplinary Activities, Directorate for Mathematical & Physical Sciences, 1005 N, telephone: (703) 292-8803, fax: (703) 292-9151, email: hblount@nsf.gov

- Paul J. Werbos, Program Director, Directorate for Engineering, Division of Electrical & Communications Systems, 675 S, telephone: (703) 292-8339, fax: (703) 292-9147, email: pwerbos@nsf.gov

For questions related to the use of FastLane, contact:

- DeMonica L. Parks, Directorate for Education & Human Resources, Division of Research, Evaluation &

Communication, 855 S, telephone: (703) 292-5167, fax: (703) 292-9046, email: dparks@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

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

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

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

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The following programs may be of interest to potential IERI proposers. Information on NSF guidelines can be obtained from http://www.nsf.gov.

- Centers for Learning and Teaching (CLT), NSF 04-501.

- Development and Learning Science Program (DLS), NSF 02-008.

- Evaluation Research and Evaluation Capacity Building (EREC) and Research on Learning and Education (ROLE), NSF 03-542.

- Information Technology Research for National Priorities, NSF 04-012.

- Instructional Materials Development (IMD), NSF 03-524.

- National Science, Technology, Engineering, and Mathematics Education Digital Library Program (NSDL), NSF 03-530.

- Research on Learning and Education (ROLE), NSF 02-023.

- Science of Learning Centers (SLC), NSF 03-573.

- Teacher Professional Continuum (TPC), NSF 03-534.

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Rand Mathematics Study Panel (2002). Mathematical Proficiency for all Students: Towards a Strategic Development Program in Mathematics Education, Rand Corporation MR-1643.0-OERI

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Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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