CreativeIT

Program Solicitation
NSF 08-572

Replaces Document(s):
NSF 07-562

National Science Foundation

Directorate for Computer & Information Science & Engineering
    Division of Information & Intelligent Systems
    Division of Computing and Communication Foundations
    Division of Computer and Network Systems

Directorate for Social, Behavioral & Economic Sciences
    Division of Behavioral and Cognitive Sciences

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

    September 26, 2008

REVISION NOTES

Categories of Proposals: This year the categories of proposals are delimited in terms of effort rather than maximum budget. A Pilot project is typically defined as a single PI and single undergraduate or graduate student. A Major project is one or more PIs and multiple undergraduate and graduate students.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

    CreativeIT

Synopsis of Program:

    The CreativeIT Program solicits proposals for projects that explore synergistic cross disciplinary research in creativity and computer science and information technology. Information technology is playing an increasing role in extending the capability of human creative thinking and problem solving. The study of creativity and computing as a way to advance computer science and information technology, cognitive science, engineering, education, or science can lead to new models of creative computational processes, innovative approaches to education that encourage creativity, innovative modes of research that include creative professionals, and new technology to support human creativity.

Cognizant Program Officer(s):

- Mary Lou Maher, Lead Program Director for CreativeIT, telephone: (703) 292-7242, email: mmaher@nsf.gov

- Anita La Salle, Program Director, Education and Workforce in Computing, telephone: (703) 292-5006, email: alasalle@nsf.gov

- Alan Hevner, Program Director, Rethinking Software, telephone: (703) 292-8649, email: ahevner@nsf.gov

- Richard Beigel, Program Director, Theoretical Foundations of Computer Science, telephone: (703) 292-8910, email: rbeigel@nsf.gov

- Diana Rhoten, Program Director, Office of Cyberinfrastructure, telephone: (703) 292-8970, email: drhoten@nsf.gov

- Judy Vance, Program Director, Engineering Design, telephone: (703) 292-7060, email: jmvance@nsf.gov

- Errol Arkilic, Program Director, Small Business Innovation Research and Technology Transfer, telephone: (703) 292-8095, email: earkilic@nsf.gov

- Betty K. Tuller, Program Director, Perception, Action & Cognition, telephone: (703) 292-7238, email: btuller@nsf.gov

- Julia I. Lane, Program Director, Science of Science and Innovation Policy, telephone: (703) 292-5145, email: jlane@nsf.gov

- Arlene M. de Strulle, Program Director, Learning in Formal and Informal Settings, telephone: (703) 292-5117, email: adestrul@nsf.gov

- Alphonse T. Desena, Program Director, Learning in Formal and Informal Settings, telephone: (703) 292-5106, email: adesena@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering
- 47.075 --- Social Behavioral and Economic Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 20

Anticipated Funding Amount: $6,500,000 pending availability of funds.

Eligibility Information

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

- **Preliminary Proposal Submission:** Not Applicable

- **Full Proposals:**

    - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.

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

B. Budgetary Information

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

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

- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

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

    September 26, 2008

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

Creativity, design, and research all contribute new knowledge and artifacts. The CreativeIT program focuses on the commonality of these three processes and solicits proposals that bring creative practice and creativity research to play a role in transformative research in specific contexts of computer science, cognitive science, information technology, education, engineering design and science. The program considers design as a type of research in which the definition of the problem may change in response to the exploration and development of alternative solutions, leading to creative solutions and innovation. The program's objective is to bring together different disciplines associated with creative and scientific advances in a way that is mutually beneficial. This program encourages new ways of thinking about one discipline in terms of another, so that the interdisciplinary nature of the project is a means to an end rather than an end in itself.

II. PROGRAM DESCRIPTION

Information technology is playing an increasing role in extending the capability of human creative thinking and problem solving, and conversely, creative uses of information technology are leading to new areas of research and innovation. Creativity is often the result of a design process in which the exploration of possible designs changes our perspective on what the design can or should achieve. A designer develops new artifacts in the context of a perceived need or problem specification. In creative design, the reflection on problem finding becomes as important as problem solving. The combination of creativity and design thinking in information technology, science, and engineering has the potential to define new areas and lead to increased successful innovation.

Advances: CreativeIT seeks proposals for projects whose objectives are new models of creativity, new models for research and education, or creativity enhancing tools developed in the context of a specific discipline. A project may respond to one or more of the following types of advances.

- *New theoretical models*: The synergy of research in creativity and computing can lead to new computational and/or cognitive models of creativity as ways of searching for problems and solutions. The formal models developed in this kind of project can be the basis for new computing devices and environments, new approaches to education, and new ways of doing research.
- *New modes of research*: A focus on understanding the role of creative processes or creative professionals in research in computer science and information systems can lead to new modes of research. This understanding can be developed empirically through doing, observing, and studying innovative modes of research.
- *Innovative educational approaches*: Creativity can be a focus for learning environments, such as studio learning, problem-based learning, and informal learning environments, that reward creative thinking. The development and evaluation of learning that uses innovative computational environments to encourage creativity can lead to new ways of teaching knowledge and skills-based subjects.
- *Creativity enhancing tools*: Innovation in information technology tools and infrastructure can support and enhance creativity in problem finding as well as problem solving. The design and evaluation of creativity enhancing tools can lead to improved methods for understanding the current and potential role of IT in the creative process.

Research Areas: The following research areas elaborate on these potential types of advances as guidelines for describing how the objectives of the project contribute to CreativeIT.

1. *Understanding Creative Cognition and Computation.* Research in this area develops or applies cognitive models that serve as inspiration for computational models of creativity, support for human creativity, or approaches for educating people to be more creative. This research is typically done by adopting or adapting a model of cognition and evaluating its creative performance in different contexts, or developing a new model of creativity based on empirical or ethnographic studies. The emphasis in this area is the development of new models of cognition and computation that explain or simulate creativity and how these models open up new research areas in computing.
2. *Creativity to Stimulate Breakthroughs in Science and Engineering.* This area considers the role and performance of creative professionals in developing new technologies, discovering new patterns in information, and in finding new ways of seeing, knowing, and doing computing, science and engineering. This area seeks to foster research that is conducted with groups of people from different backgrounds in which the creative synergy is focused on a specific context, problem, or perceived need. The result of this research is a new product, new model, or new area of research. The evaluation of the results of this kind of research does not follow directly from existing metrics or performance criteria and therefore may need to redefine relevant performance criteria.
3. *Educational Approaches that Encourage Creativity.* This area considers a broad range of approaches to learning that encourages creativity: multi-disciplinary teaching and learning, design studio environments, skills development through making and doing, serious games, and open-ended problem-based learning. This area includes the development and evaluation of innovative computational environments for learning that reward creativity leading to transformative changes in curriculum objectives and structure.
4. *Supporting Creativity with Information Technology.* This area develops new software and interaction design to support people in being more creative and evaluates their performance through user studies either in controlled environments with empirical studies or in the context of a complex problem or situation with ethnographic studies. The emphasis in this area is the development of new computing environments where the environment itself may be a creative product, and the environment is intended to support people in their creative activities.

Categories of Proposals: There are two types of projects: Pilot and Major. To indicate the type of proposal, include "Pilot:" or "Major:" as the first word in the title of the proposal.

1. *Pilot Projects* typically have a single PI and a single undergraduate or graduate student for a duration of one to three years. A pilot project identifies a synergy from understanding creativity in a specific context in which a computing environment has the potential to lead to innovative and creative advances in one or more disciplines. These projects will start with a set of objectives that are consistent with the CreativeIT program and will pursue a methodology, including a plan for evaluation, that is consistent with the claims or objectives in the proposal. The outcomes of a Pilot Project may be an innovative solution, model, or area of research that will benefit from further development.
2. *Major Projects* have one or more PIs and multiple undergraduate and graduate students for a duration of three years with a maximum budget of $800,000. A Major project brings together a group of people to develop a synergistic effect that can transform our understanding of models, computing environments or education relevant to CreativeIT. While the research may use a design approach in which the specifics of the problem and solution may change during the life of the project, the overall objectives and methods are well defined. This type of project is well founded on previous research in the individual or combined disciplines involved in the project.

Opportunities for Synergies with other NSF Programs. Synergies with other programs at NSF are encouraged and provide opportunities for additional funding or co-review.

Theoretical Foundations of Computer Science: The CreativeIT program encourages PIs to consider how theorists and artists can inspire each other; how our understanding of creativity can advance sub-fields of theoretical computer science; creative approaches to teaching theoretical foundations of computer science; and how formal models and methods can be applied to the study of creativity. The cognizant program manager in Theoretical Foundations of Computer Science is Richard Beigel: rbeigel@nsf.gov.

Rethinking Software: The CreativeIT program encourages PIs to consider the synergies between creativity and rethinking the design of software intensive systems. Design is a topic of great interest in many fields; and a synergy with CreativeIT to meet the critical software design challenges of the 21st century is encouraged. Combining creativity and software design can bring new paradigms, concepts, approaches, models, and theories into the development of a strong intellectual foundation for software design, which will ultimately improve the processes of constructing, evaluating, and modifying software-intensive systems. The cognizant program manager is Alan Hevner: ahevner@nsf.gov.

Education and Workforce in Computing: The CreativeIT program encourages PIs to consider new approaches that encourage creativity in learning computing subjects at all levels: K-12, undergraduate, graduate and workforce development. Research related to creative learning environments that increase the diversity of the workforce and broaden participation in all levels of computing education are encouraged. The cognizant program manager in Education and Workforce in Computing is Anita La Salle: alasalle@nsf.gov.

Cyberinfrastructure: The CreativeIT program encourages PIs to include a cyberinfrastructure component in their proposals (see Cyberinfrastructure Vision for 21st Century Discovery, http://www.nsf.gov/pubs/2007/nsf0728/index.jsp). For example, PIs may incorporate their cyberinfrastructure research activities and tools, such as those involving high performance computing, digital data collection and observation tools, advanced visualization technologies, and virtual interaction and

collaboration, to support and enhance CreativeIT projects. The cognizant program manager in OCI is Diana Rhoten: drhoten@nsf.gov.

Small Business Innovation Research: The CreativeIT program encourages PIs to consider the potential commercial applications of projects early in the project lifecycle and include participation of the small business community when appropriate. Through the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) programs, NSF can provide support for transition to industry of knowledge developed in the CreativeIT program. A small business applying knowledge gained through basic research to market-driven needs increases the probability that the research will lead to significant commercially-viable innovations. For more information see: http://www.nsf.gov/eng/iip/sbir/. The cognizant program manager in SBIR is Errol Arkilic: earkilic@nsf.gov.

Engineering Design: The Creative IT program encourages PIs to consider synergies with research focused on advancing understanding of the engineering design process. Research in information technology, visualization, human-computer-interaction and learning technologies as related to the engineering design process positively impacts our ability to perform effective engineering design. Looking beyond the traditional engineering design boundaries holds promise for breakthrough solutions to solve the most pressing engineering challenges of the 21st century. The cognizant program manager in Engineering Design is Judy Vance: jmvance@nsf.gov.

Behavioral and Cognitive Sciences: The Creative IT program encourages PIs to consider synergies with research focused on advancing neural, developmental, cognitive, and social theories of human creativity, particularly with respect to how scientists and engineers produce new discoveries and innovations. Creativity is a primary driver of progress and transformation in our nation's science and engineering disciplines. Thus a better understanding of human creativity, using both empirical and computational research methods, promises to inform tool development as well as policy development aimed at supporting transformative progress in science and engineering. The cognizant program manager in Behavioral and Cognitive Sciences is Betty Tuller, btuller@nsf.gov.

Science of Science and Innovation Policy: The Creative IT program encourages PIs to consider synergies with research focused on developing usable knowledge and theories of creative processes and their transformation into social and economic outcomes. Characterizing the dynamics of discovery and innovation is important for developing valid metrics, for predicting future returns on investments, for constructing fruitful policies, and for developing new forms of workforce education and training. The cognizant program manager in the Science of Science and Innovation Policy program is Julia Lane, jlane@nsf.gov.

Design of Informal STEM Education Tools and Methods: The Creative IT program encourages PIs to consider interdisciplinary R&D focused on the design and evaluation of new tools and methods that enhance the creativity of design professionals in the informal STEM education field, such as exhibit designers. The objective is to produce design tools and methods whose application can potentially improve the impact on the public's engagement with and understanding of STEM. The cognizant program managers are Arlene de Strulle (adestrul@nsf.gov) and Al DeSena (adesena@nsf.gov).

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 20

Anticipated Funding Amount: $6,500,000

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Organization Limit:

None Specified

PI Limit:

>   None Specified

Limit on Number of Proposals per Organization:

>   None Specified

Limit on Number of Proposals per PI:

>   None Specified

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

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

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.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

The project will be assessed on whether it responds to one or more of the following questions. Please indicate in the Project Summary which question(s) the research addresses, or the proposal may be returned without review.

1. Will this research improve our understanding of creative processes in the context of a specific problem in computer science, information technology, science or engineering?

2. Will the research lead to the development of new technologies to support human creativity?

3. Will the research lead to transformational research in computer science, information technology, science or engineering through the use of creative practitioners?

4. Will the research lead to innovative educational approaches in computer science, science, or engineering that reward creativity?

B. Budgetary Information

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

Budget Preparation Instructions: The budget should include funds to travel to an annual CreativeIT Principal Investigator's meeting.

C. Due Dates

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

     September 26, 2008

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

  Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

A. NSF Merit Review Criteria

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

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

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

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

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

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

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

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

Additional Review Criteria:

As indicated in Section V, the project will be assessed on whether it responds to one or more of the following questions.

1. Will this research improve our understanding of creative processes in the context of a specific problem in computer science, information technology, science or engineering?

2. Will the research lead to the development of new technologies to support human creativity?

3. Will the research lead to transformational research in computer science, information technology, science or engineering through the use of creative practitioners?

4. Will the research lead to innovative educational approaches in computer science, science, or engineering that reward creativity?

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 pubs@nsf.gov.

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

C. Reporting Requirements

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

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Mary Lou Maher, Lead Program Director for CreativeIT, telephone: (703) 292-7242, email: mmaher@nsf.gov

- Anita La Salle, Program Director, Education and Workforce in Computing, telephone: (703) 292-5006, email: alasalle@nsf.gov

- Alan Hevner, Program Director, Rethinking Software, telephone: (703) 292-8649, email: ahevner@nsf.gov

- Richard Beigel, Program Director, Theoretical Foundations of Computer Science, telephone: (703) 292-8910, email: rbeigel@nsf.gov

- Diana Rhoten, Program Director, Office of Cyberinfrastructure, telephone: (703) 292-8970, email: drhoten@nsf.gov

- Judy Vance, Program Director, Engineering Design, telephone: (703) 292-7060, email: jmvance@nsf.gov

- Errol Arkilic, Program Director, Small Business Innovation Research and Technology Transfer, telephone: (703) 292-8095, email: earkilic@nsf.gov

- Betty K. Tuller, Program Director, Perception, Action & Cognition, telephone: (703) 292-7238, email: btuller@nsf.gov

- Julia I. Lane, Program Director, Science of Science and Innovation Policy, telephone: (703) 292-5145, email: jlane@nsf.gov

- Arlene M. de Strulle, Program Director, Learning in Formal and Informal Settings, telephone: (703) 292-5117, email: adestrul@nsf.gov

- Alphonse T. Desena, Program Director, Learning in Formal and Informal Settings, telephone: (703) 292-5106, email: adesena@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In

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

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

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