

# Interface between Computer Science and Economics & Social Sciences (ICES)

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## PROGRAM SOLICITATION

NSF 11-584

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## REPLACES DOCUMENT(S): NSF 10-583

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National Science Foundation

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

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

Submission Window Date(s) (due by 5 p.m. proposer's local time):

November 21, 2011 - December 06, 2011

## IMPORTANT INFORMATION AND REVISION NOTES

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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.

**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.

### Revision Summary

The list of Cognizant Program Officers has been revised.

The synopsis, introduction, and program description have been revised.

The total amount of funds available for awards and expected number of awards are different from the previous year.

The proposal window dates are different from the previous year.

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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Program Title:

Interface between Computer Science and Economics & Social Sciences (ICES)

Synopsis of Program:

The three divisions of CISE and the SES division of SBE seek interdisciplinary research and education projects that develop new knowledge at the Interface between Computer Science and Economics & Social Sciences. Projects should advance knowledge on both sides of the interface. Projects that use known techniques and results from Computer Science or Economics & Social Sciences to advance only one field (either CS or Econ/SS) are not of interest to the program.

Proposers are invited to submit proposals in two project classes, which are defined as follows:

- Small Projects - up to \$400,000 total budget with durations up to three years; and
- Large Projects - \$400,001 to \$1,000,000 total budget with durations up to four years.

A more complete description of the two project classes can be found in section II. *Program Description* of this solicitation.

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.*

- Bala Kalyanasundaram, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: [bkalyana@nsf.gov](mailto:bkalyana@nsf.gov)
- Nancy A. Lutz, Program Director, SBE/SES, 995, telephone: (703) 292-7280, email: [nlutz@nsf.gov](mailto:nlutz@nsf.gov)
- Sven Koenig, Program Director, CISE/IIS, 1125, telephone: (703) 292-7242, email: [skoenig@nsf.gov](mailto:skoenig@nsf.gov)
- J. Bryan Lyles, Program Director, CISE/CNS, 1175, telephone: (703) 292-8950, email: [jlyles@nsf.gov](mailto:jlyles@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

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Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 10 to 20 pending the availability of funds

Anticipated Funding Amount: \$6,500,000

## Eligibility Information

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Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

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

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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](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](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: Not Applicable

## C. Due Dates

- Submission Window Date(s) (due by 5 p.m. proposer's local time):  
November 21, 2011 - December 06, 2011

## Proposal Review Information Criteria

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Merit Review Criteria: National Science Board approved criteria apply.

## Award Administration Information

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Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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## I. INTRODUCTION

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An important research interaction has emerged at the interface of computing and economics and social sciences. The synergy between these fields creates a rich opportunity for studying questions that involve interconnected systems with economic and social aspects. This research interaction has already led to the identification of a number of underlying principles and research themes. These include network structures in economic interaction, theories of learning in the context of such networks, welfare properties of equilibria, the design of mechanisms with constraints, the complexity of computing equilibria, the robustness of equilibria, and the roles of information, reputation, and trust in economic and social interactions. These principles provide lines of attack on a set of important applications. These include the emergence of new kinds of on-line markets, the roles of economic issues in the architecture of the Internet, the design and analysis of markets in the developing world, and the roles of social and economic networks in innovation and knowledge creation.

## II. PROGRAM DESCRIPTION

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The ubiquity of socio-technical networks has led to new, more intimate ties between fields of computing and economics and social sciences. New kinds of interactions and transactions have been and will continue to be enabled by such networks. Key features of these new transactions include:

- parties who may not know or trust each other
- parties who may be represented by computational agents
- real-time adaptation and decision making by agents, possibly leading to chain reactions.

Designing decision mechanisms that can govern these increasingly important types of transactions in ways that meet criteria such as fairness, revenue maximization, and efficient resource use is a challenge that requires the expertise of both social and economic scientists and computer scientists.

Traditional concerns of computer scientists such as internet traffic, email, the allocation of computing resources to competing processes, and many more may be managed using economic and social choice mechanisms to achieve better utilization and reduction of the nuisance and harm caused by such adversaries as intruders and spammers. Good incentive mechanisms are also needed to mediate the interactions among infrastructure providers, service providers, and clients for computing and communication infrastructure and services. Mechanisms are also important in driving multi-agent software systems towards socially desirable goals. These questions may require a new understanding of simultaneous collaboration and competition among self-interested agents.

Conversely, an algorithmic/computational perspective has the potential to change the types of questions considered by social and economic scientists. For example, Nash and other equilibria lie at the hearts of theories about the behavior of economic agents. Computational concepts can help characterize the range and robustness of possible equilibria and markets for which the computation of equilibria is intractable. Theories of strategic learning by selfish agents, studied both in economics and computer science, can shed light on the dynamics of how agents arrive at equilibria. Theories of the spread of information or gossip in networks can help explain and contain (or propel) the chain reactions that can arise.

Social/behavioral/economic scientists and computer scientists can jointly study the dynamic functioning and evolution of social and economic networks with mutual benefit to both fields of study. The Interface between Computer Science and Economics & Social Sciences (ICES) program seeks innovative research at this interdisciplinary boundary, including both projects that develop or extend algorithmic/computational concepts for economic and social decision problems, and those that develop or extend concepts in economics and other social sciences for improvements in computing and communication systems.

Mathematical rigor will often accompany such research, although well-designed empirical studies and heuristics are also of interest. Understanding the basic principles of evolving socio-economic network models, designing mechanisms for traditional and new markets on such networks, understanding game-theoretic equilibria from a computational point of view, using economic principles to guide the behavior of large computing and communication systems, and understanding the learning and adaptive behavior of human and software agents as well as the dynamics of contagion and similar network processes are some of the main goals of this program. Projects should advance knowledge on both sides of the Interface between Computer Science and Economics & Social Sciences. Projects that use known techniques and results from Computer Science or Economics & Social Sciences to advance only one field (either CS or Econ/SS) are not of interest to the program. Research in Socially Intelligent Computing as defined by the [Social-Computational Systems \(SoCS\) program](#) should be submitted to SoCS; refer to the SoCS program materials for definitions. Illustrative examples of the kinds of research ICES seeks to support can be found at: [http://www.nsf.gov/cise/ccf/ices\\_pgm.jsp](http://www.nsf.gov/cise/ccf/ices_pgm.jsp)

The program hopes to attract proposals from faculty at a broad range of academic institutions, including faculty at minority-serving and predominantly undergraduate institutions. The submission of far-reaching, creative research and education projects is encouraged. Funds will be used to support potentially transformative research with high-impact potential.

### III. AWARD INFORMATION

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Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. The program is supported by the 3 Divisions in CISE – CCF, CNS, and IIS – and by SBE. We anticipate a program budget of \$6.5M. We expect to support approximately 2 Large 4-year awards of up to \$1 Million each. We also expect to support approximately 10 Small 3-year awards of up to \$400,000 each. We may consider EAGER proposals after consultation with a Program Director as specified in the GPG. Projects should be at the interface of computer science and economics & social sciences and should advance knowledge on both sides of the interface.

### IV. ELIGIBILITY INFORMATION

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Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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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](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](mailto: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/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)). 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](mailto: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.

Proposal Titles: For management purposes, all proposal titles should begin with the ICES acronym followed by a colon, then the project class followed by a colon, then the title of your project. For example, if you are submitting a small proposal, then your title would be ICES:Small:Title. If you submit a proposal as part of a set of collaborative proposals, the title of the proposal should begin with ICES followed by a colon, then the project class followed by a colon, then "Collaborative Research" followed by a colon, and the title. For example, if you are submitting a collaborative set of proposals for a Large project, the title of each would be ICES:Large:Collaborative Research: Title.

### B. Budgetary Information

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Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

### C. Due Dates

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- Submission Window Date(s) (due by 5 p.m. proposer's local time):  
November 21, 2011 - December 06, 2011

### D. FastLane/Grants.gov Requirements

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- 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](mailto: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](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](mailto: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

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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

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

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

What is the intellectual merit of the proposed activity?

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

What are the broader impacts of the proposed activity?

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

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

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

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

#### **Integration of Research and Education**

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

#### **Integrating Diversity into NSF Programs, Projects, and Activities**

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

### B. Review and Selection Process

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

Most proposals will be reviewed by panel review. Ad hoc review may be used for a small number of proposals that do not fit into panels. Internal review may be used for EAGER proposals. SES programs may be asked to co-review some proposals and ICES may accept co-review requests from SBE programs. CISE programs may be asked to co-review some proposals and ICES may accept co-review requests from CISE programs.

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.

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## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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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

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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](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](mailto: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](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

### C. Reporting Requirements

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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, 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 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. The project outcomes report 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.

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## VIII. AGENCY CONTACTS

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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:

- Bala Kalyanasundaram, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: [bkalyana@nsf.gov](mailto:bkalyana@nsf.gov)
- Nancy A. Lutz, Program Director, SBE/SES, 995, telephone: (703) 292-7280, email: [nlutz@nsf.gov](mailto:nlutz@nsf.gov)
- Sven Koenig, Program Director, CISE/IIS, 1125, telephone: (703) 292-7242, email: [skoenig@nsf.gov](mailto:skoenig@nsf.gov)
- J. Bryan Lyles, Program Director, CISE/CNS, 1175, telephone: (703) 292-8950, email: [jlyles@nsf.gov](mailto:jlyles@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto: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](mailto:support@grants.gov).

## IX. OTHER INFORMATION

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The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and 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.

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