

## Program Solicitation

NSF 10-571

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### Replaces Document(s):

NSF 09-557

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#### National Science Foundation

Directorate for Computer & Information Science & Engineering  
Division of Information & Intelligent Systems

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

September 01, 2010 - September 15, 2010

September 1 - September 15, Annually Thereafter

MEDIUM Projects

November 01, 2010 - November 28, 2010

November 1 - November 28, Annually Thereafter

LARGE Projects

December 01, 2010 - December 17, 2010

December 1 - December 17, Annually Thereafter

SMALL Projects

## IMPORTANT INFORMATION AND REVISION NOTES

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Several changes have been made to the IIS Core Programs solicitation:

- The program descriptions of the Human-Centered Computing, Information Integration and Informatics Robust Intelligence have been updated to fully reflect their scientific scope, and to indicate the Division's continuing interest in funding research supported by the former CreativeIT (<http://nsf.gov/pubs/2009/nsf09572/nsf09572.htm>) and Data-intensive Computing ([http://nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503324&org=IIS&from=home](http://nsf.gov/funding/pgm_summ.jsp?pims_id=503324&org=IIS&from=home)) programs.
- The submission window for all Medium proposals will now be September 1-15 annually.

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

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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#### Program Title:

Information and Intelligent Systems (IIS): Core Programs

#### Synopsis of Program:

CISE's Division of Information and Intelligent Systems (IIS) supports research and education projects that develop new knowledge in three **core programs**:

- The Human-Centered Computing program;
- The Information Integration and Informatics program; and
- The Robust Intelligence program.

IIS is also responsible for managing the review process for proposals in Computer Graphics and Visualization; these proposals may be submitted to any of the three core programs described above.

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

- Small Projects - up to \$500,000 total budget with durations up to three years;
- Medium Projects - \$500,001 to \$1,200,000 total budget with durations up to four years; and
- Large Projects - \$1,200,001 to \$3,000,000 total budget with durations up to five years.

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

CISE investments in Small, Medium and Large projects complement the directorate's investments in the Expeditions in Computing program, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503169&org=CISE](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503169&org=CISE), where projects are funded at levels of up to \$10,000,000 total for durations up to 5 years.

#### **Cognizant Program Officer(s):**

- William S. Bainbridge, Point of Contact, Human-Centered Computing (HCC), 1125, telephone: (703) 292-8930, email: [wbainbri@nsf.gov](mailto:wbainbri@nsf.gov)
- Ephraim P. Glinert, Point of Contact, Human-Centered Computing (HCC), 1125, telephone: (703) 292-8930, email: [eglinert@nsf.gov](mailto:eglinert@nsf.gov)
- Gia-Loi Le Gruenwald, Point of Contact, Information Integration and Informatics (III), 1122, telephone: (703) 292-8930, email: [lgruenwa@nsf.gov](mailto:lgruenwa@nsf.gov)
- Maria Zemankova, Point of Contact, Information Integration and Informatics (III), 1125, telephone: (703) 292-8930, email: [mzemanko@nsf.gov](mailto:mzemanko@nsf.gov)
- Jie Yang, Point of Contact, Robust Intelligence (RI), 1125, telephone: (703) 292-4768, email: [jyang@nsf.gov](mailto:jyang@nsf.gov)
- Kenneth Whang, Point of Contact, Robust Intelligence (RI), 1125, telephone: (703) 292-8930, email: [kwhang@nsf.gov](mailto:kwhang@nsf.gov)
- Lawrence Rosenblum, Point of Contact, Computer Graphics and Visualization (CGV), 1125, telephone: (703) 292-8910, email: [lrosenbl@nsf.gov](mailto:lrosenbl@nsf.gov)

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

- 47.070 --- Computer and Information Science and Engineering

#### **Award Information**

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**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 170 to 200 awards will be made each year.

**Anticipated Funding Amount:** \$100,000,000 per year, dependent upon the availability of funds.

#### **Eligibility Information**

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##### **Organization Limit:**

None Specified

##### **PI Limit:**

None Specified

## Limit on Number of Proposals per Organization:

None Specified

## Limit on Number of Proposals per PI: 2

In any contiguous September through December period, an individual may participate as PI, Co-PI or Senior Personnel in **no more than two** proposals submitted in response to the *coordinated solicitation* (where *coordinated solicitation* is defined to include the *Information and Intelligent Systems (IIS): Core Programs*, the *Computer and Network Systems (CNS): Core Programs* and the *Computing and Communication Foundations (CCF): Core Programs* solicitations). For example, between September 2010 and December 2010, an individual may participate as PI, co-PI or Senior Personnel in one proposal submitted to a core program in CCF and in a second proposal submitted to a core program in CNS, or an individual may participate as PI, co-PI or Senior Personnel in two proposals submitted to an IIS core program, etc.

**These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently.** In the event that an individual exceeds this limit, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e. the first two proposals received will be accepted and the remainder will be returned without review). **No exceptions will be made.**

The limit on the number of proposals per PI, co-PI or Senior Personnel applies only to the *coordinated solicitation*.

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

September 01, 2010 - September 15, 2010

September 1 - September 15, Annually Thereafter

MEDIUM Projects

November 01, 2010 - November 28, 2010

November 1 - November 28, Annually Thereafter

LARGE Projects

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## Proposal Review Information Criteria

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**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

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**Award Conditions:** Standard NSF award conditions apply.

**Reporting Requirements:** Standard NSF reporting requirements apply.

## TABLE OF CONTENTS

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### Summary of Program Requirements

- I. **Introduction**
- II. **Program Description**
- III. **Award Information**
- IV. **Eligibility Information**
- V. **Proposal Preparation and Submission Instructions**
  - A. Proposal Preparation Instructions
  - B. Budgetary Information
  - C. Due Dates
  - D. FastLane/Grants.gov Requirements
- VI. **NSF Proposal Processing and Review Procedures**
  - A. NSF Merit Review Criteria
  - B. Review and Selection Process
- VII. **Award Administration Information**
  - A. Notification of the Award
  - B. Award Conditions
  - C. Reporting Requirements
- VIII. **Agency Contacts**
- IX. **Other Information**

## I. INTRODUCTION

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The Division of Information and Intelligent Systems (IIS) studies the inter-related roles of people, computers, and information. IIS supports research and education activities that 1) develop new knowledge about the role of people in the design and use of information technology; 2) increase our capability to create, manage, and understand data and information in circumstances ranging from personal computers to globally-distributed systems; and 3) advance our understanding of how computational systems can exhibit the hallmarks of intelligence.

## II. PROGRAM DESCRIPTION

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IIS supports three core programs as described below

- **Human Centered Computing (HCC)**

Human beings, whether as individuals, teams, organizations, or societies, play an integral role in all stages of the creation and use of computational systems. Moreover, computing technologies and human societies co-evolve, transforming each other in the process. Human Centered Computing (HCC) research explores creative ideas, novel theories, and innovative technologies that advance our understanding of the complex and increasingly coupled relationships between people and computing.

HCC research targets diverse computing platforms such as traditional computers, handheld and mobile devices, robots, and wearable computers, at scales ranging from an individual device with a single user to large, evolving, heterogeneous socio-technical systems that are emerging from the increasingly pervasive availability of networking technologies. Environments of interest range from physical interaction with a single device to systems in which places and people, both physical and virtual, merge. As all electronic communications media become digital and interconnected, computing is also playing a central role in how humans communicate, work, learn, and play, dramatically transcending traditional geographical and cultural boundaries. HCC research explores and improves our understanding of new human-computer and human-human interactions, collaboration, and competition, developing systems that are aware of their social surroundings and of the conceptualizations, values, preferences, abilities, special needs, and diverse ranges of capability of the people that use them. HCC researchers and educators explore systems that interact with people using various and possibly multiple modalities such as innovative computer graphics, and haptic, audio, and brain-machine interfaces. Through partnerships and engagements with disciplines in the digital humanities and design HCC research increases our understanding and support of creativity and innovation as it pertains to computing; brings new perspectives and new models of inquiry, practice, and scholarship to computing research and education; and extends the reach of computing to new communities. HCC research outcomes are expected to transform the human-computer interaction experience, so that the computer is no longer a distraction or worse yet an obstacle, but rather a device or environment that empowers the user at work, in school, at home and at play, and that facilitates natural and productive human-computing integration.

The HCC program encourages research on how humans, in various roles and domains, perceive computing artifacts as they design and use them, and on the wider social implications of those artifacts. HCC supports scholars in a highly diverse range of disciplines including the behavioral, computer, design, digital humanities, information, and social sciences.

More information on topics of interest to the HCC program is available at:  
[http://www.nsf.gov/cise/iis/hcc\\_pgm.jsp](http://www.nsf.gov/cise/iis/hcc_pgm.jsp)

#### • **Information Integration and Informatics (III)**

Data continue a massive expansion in scale, diversity, and complexity. Data underpin activities in all sectors of society. Achieving the full transformative potential from the use of data in this increasingly digital world requires addressing open and new questions. The Information Integration and Informatics (III) program focuses on principled approaches to the science and technology challenges to realize the potential of data.

III seeks projects that are responsive to a range of technical challenges. Projects could address data of unprecedented scale, complexity, and rate of acquisition, as well as issues of heterogeneous and complex data types and representations. Projects may support the diverse functionalities and processing needs for data from disparate and uncoordinated sources, or address the implications of the changing landscape of computing platforms, at scales ranging from small mobile devices to potentially planetary-scale cloud and networked computing resources. Successful proposals should demonstrate effectiveness in dimensions such as quality, scalability, accountability, interactivity, social responsibility, or resiliency to incomplete, uncertain, inconsistent, contaminated, or manipulated data.

III-funded projects should advance contemporary applications of societal importance. They may address facets of the full knowledge lifecycle from creation, acquisition and extraction, storage, curation and management, dissemination and protection, visualization and understanding, to prediction and action. III-funded research aims at making computer and information science and engineering advances that could have wide applicability. Ultimately, the deep insights and the advanced technologies resulting from this research will transform the function and uses of data, information, and knowledge in society.

Example topics of interest to the III program are available at:

[http://www.nsf.gov/cise/iis/iii\\_pgm.jsp](http://www.nsf.gov/cise/iis/iii_pgm.jsp)

#### • **Robust Intelligence (RI)**

The Robust Intelligence (RI) program encompasses all aspects of the computational understanding and modeling of intelligence in complex, realistic contexts. In contrast to systems that use limited reasoning strategies or address problems in narrow contexts, robust intelligence may be characterized by a system's flexibility, resourcefulness, creativity, real-time responsiveness and long-term reflection, and awareness of and competence in larger natural, built, and social contexts. The RI program advances and integrates the research traditions of artificial intelligence, computer vision, human language research, robotics, machine learning, computational neuroscience, cognitive science, and related areas.

Researchers across all areas of RI are addressing progressively richer environments, larger-scale data and more diverse computing platforms, and more sophisticated computational and statistical approaches, looking to nature in many cases to model cognitive and computational processes. Interactions across traditional disciplines are also of increasing importance. For example, speech and dialogue research seeks to understand the cognitive psychological underpinnings of conversation that contribute to the robustness of human speech perception and intention understanding. Computer vision is exploring approaches developed in language processing to represent the semantic information in images and video in ways useful for mining, navigation, and robotic interaction, and working with ideas developed in computer graphics and physics-

based modeling to understand and depict collections of images. A cognitive architecture may bridge sophisticated planning and problem solving modules with perception and action modules, perhaps accounting for certain human or animal behaviors. Robotic systems need to understand and interact with humans in unfamiliar and unstructured environments. Computational understanding of neurons, networks, and the brain increasingly draws on computer vision, robotics, and machine learning, and provides insights into the coding, representations, and learning underlying intelligent behavior in nature.

These examples are meant to convey the general goals of RI, not to limit its scope. The program supports projects that will advance the frontiers of all RI research areas, as well as those that integrate different aspects of these fields.

More information on topics of interest to the RI program is available at:  
[http://www.nsf.gov/cise/iis/ri\\_pgm.jsp](http://www.nsf.gov/cise/iis/ri_pgm.jsp)

The IIS core programs support research in computer graphics and visualization, covering such topics as the modeling, rendering, and display pipeline for computer graphics, as well as the use of computer graphics and closely related themes to facilitate the understanding of wide-ranging types of information. Proposals addressing research challenges and opportunities in computer graphics and visualization will be reviewed together.

In light of the importance of information privacy and security in our increasingly digital world, as well as the importance of ensuring the usability of innovations in trustworthy computing systems, research in these areas are now key components in CISE's Trustworthy Computing (TC) program. Projects whose primary focus is on these topics should be submitted to the TC program.

## PROJECT CLASSES

Proposals submitted to this solicitation must be consistent with one of three project classes defined below. Proposals will be considered for funding within their project classes.

- **Small Projects, with total budgets up to \$500,000 for durations of up to three years**, are well suited to one or two investigators (PI and one co-PI or other Senior Personnel) and at least one student and/or postdoc.
- **Medium Projects, with total budgets ranging from \$500,001 to \$1,200,000 for durations up to four years**, are well-suited to one or more investigators (PI, co-PI and/or other Senior Personnel) and several students and/or postdocs. Medium project descriptions must be comprehensive and well-integrated, and should make a convincing case that the collaborative contributions of the project team will be greater than the sum of each of their individual contributions. Rationale must be provided to explain why a budget of this size is required to carry out the proposed work. Since the success of collaborative research efforts are known to depend on thoughtful coordination mechanisms that regularly bring together the various participants of the project, a Collaboration Plan is **required** for all Medium proposals with more than one investigator. The length of and level of detail provided in the Collaboration Plan should be commensurate with the complexity of the proposed project. Please see *Proposal Preparation Instructions* Section V.A for additional submission guidelines.
- **Large Projects, with total budgets ranging from \$1,200,001 to \$3,000,000 for durations of up to five years**, are well-suited to two or more investigators (PI, co-PI(s), or other Senior Personnel), and a team of students and/or postdocs. Large project descriptions must be comprehensive and well-integrated, and should make a convincing case that the collaborative contributions of the project team will be greater than the sum of each of their individual contributions. Rationale must be provided to explain why a budget of this size is required to carry out the proposed work. Since the success of collaborative research efforts are known to depend on thoughtful coordination mechanisms that regularly bring together the various participants of the project, a Collaboration Plan is **required** for all Large proposals. The length of and degree of detail provided in the Collaboration Plan should be commensurate with the complexity of the proposed project. Please see *Proposal Preparation Instructions* Section V.A for additional submission guidelines.

CISE investments in Small, Medium and Large projects complement the directorate's investments in the Expeditions in Computing program, where projects are funded at levels of up to \$10,000,000 total for durations of up to 5 years. The Expeditions solicitation can be accessed at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf08568&org=NSF](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08568&org=NSF).

## IMPORTANT PROJECT CHARACTERISTICS

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. In this way, CISE will catalyze exciting new research activities with the potential to make significant advances in the state-of-the-art.

Interdisciplinary, international and/or academic-industry collaborations that promise to result in major science or engineering advances are welcome. The directorate hopes to attract proposals from faculty at a broad range of academic institutions, including faculty at minority-serving and predominantly undergraduate institutions.

Proposals submitted should demonstrate that rich learning experiences will be provided for a diverse population of students, and may propose the development of innovative curricula or educational materials that advance literacy about and expertise in areas supported by CISE.

Proposals that extend beyond the scope of one CISE core program are welcome. In such cases, PIs should identify the most relevant program(s) in the proposal submission process (see *Proposal Preparation Instructions* later in this document). CISE Program Officers will work with their NSF colleagues to ensure that these proposals are appropriately co-reviewed and considered for funding.

### III. AWARD INFORMATION

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Approximately \$100 million each year, dependent upon the availability of funds, for up to 200 awards. Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

### IV. ELIGIBILITY INFORMATION

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#### Organization Limit:

None Specified

#### PI Limit:

None Specified

#### Limit on Number of Proposals per Organization:

None Specified

#### Limit on Number of Proposals per PI: 2

In any contiguous September through December period, an individual may participate as PI, Co-PI or Senior Personnel in **no more than two** proposals submitted in response to the *coordinated solicitation* (where *coordinated solicitation* is defined to include the *Information and Intelligent Systems (IIS): Core Programs*, the *Computer and Network Systems (CNS): Core Programs* and the *Computing and Communication Foundations (CCF): Core Programs* solicitations). For example, between September 2010 and December 2010, an individual may participate as PI, co-PI or Senior Personnel in one proposal submitted to a core program in CCF and in a second proposal submitted to a core program in CNS, or an individual may participate as PI, co-PI or Senior Personnel in two proposals submitted to an IIS core program, etc.

**These eligibility constraints will be strictly enforced in order to treat everyone fairly and consistently.** In the event that an individual exceeds this limit, proposals received within the limit will be accepted based on earliest date and time of proposal submission (i.e. the first two proposals received will be accepted and the remainder will be returned without review). **No exceptions will be made.**

The limit on the number of proposals per PI, co-PI or Senior Personnel applies only to the *coordinated solicitation*.

#### Additional Eligibility Info:

### 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.

The following information SUPPLEMENTS (not replaces) the guidelines provided in the NSF Grant Proposal Guide (GPG).

**Proposal Titles:** Proposal titles must begin with one of four acronyms that will help IIS staff manage the merit review process. Select an acronym from the following list:

- Human-Centered Computing: HCC
- Information Integration and Informatics: III
- Robust Intelligence: RI
- Computer Graphics and Visualization: CGV

The acronym should be followed with a colon, then the project class followed by a colon and the title of your project. For example, if you are submitting a Small proposal to the Human-Centered Computing core program, then your title would be **HCC: Small:Title**. If you submit a proposal as part of a set of collaborative proposals, the title of the proposal should begin with the relevant acronym, 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 to the Robust Intelligence core program, the title of each would be **RI: Large:Collaborative Research: Title**.

Proposals from PIs in institutions that have RUI (Research in Undergraduate Institutions) eligibility should have a proposal title that begins with the relevant acronym, followed by a colon then the project class, followed by a colon then "RUI", followed by a colon and then the title, for example, **CGV:Medium:RUI:Title**.

PIs submitting Grant Opportunities for Academic Liaison with Industry (GOALI) proposals should have a proposal title that begins with the relevant acronym, followed by a colon then the project class, followed by a colon then "GOALI", followed by a colon and then the title, for example, **III:Small:GOALI:Title**.

Proposals that extend beyond the scope of one CISE core program or area (in the case of CGV) are welcome. In such cases, PIs should identify the acronym for the **most relevant** core program or area, followed by any other relevant program acronym (s) separated by colons, for example, **III:CGV:Small:Title**. CISE Program Officers will work with their NSF colleagues to ensure that these proposals are appropriately co-reviewed and considered for funding.

**Project Summary:** The Project Summary must include an explicit description of both the Intellectual Merit and Broader Impacts of the activities proposed, preferably in separate paragraphs titled "Intellectual Merit" and "Broader Impacts".

Please provide between 2 and 6 sets of key words at the end of the Project Summary. CISE personnel will use this information in the merit review process. The key words should describe the main scientific/engineering areas explored in the proposal. Key words should be prefaced with "Key Words"; followed by a colon and each key word set should be separated by semi-colons. Key words should be of the type used to describe research in a journal submission. They should be included at the end of the project summary and might appear, for example, as **Key Words: energy-aware computing; formal logic; computer graphics; sensor networks; information visualization; privacy**.

#### **Project Description:**

*All Proposals* - Describe the research and education activities to be undertaken in 15 pages or less. Describe curriculum development activities in a separate section titled "Curriculum Development Activities".

*Medium and Large Proposals* - Since the success of collaborative research efforts are known to depend on thoughtful coordination mechanisms that regularly bring together the various participants of the project, all Medium proposals that include more than one investigator and all Large proposals must include a Collaboration Plan. While the length of the Project Description for Small proposals is limited to 15 pages, for Medium and Large proposals up to 3 additional pages are allowed for Collaboration Plans. Collaboration Plans should be included at the end of the Project Description in a section entitled "Collaboration Plan". The length of and degree of detail provided in the Collaboration Plan should be commensurate with the complexity of the proposed project. Where appropriate, the Collaboration Plan might include: 1) the specific roles of the project participants in all organizations involved; 2) information on how the project will be managed across all the investigators, institutions, and/or disciplines; 3) identification of the specific coordination mechanisms that will enable cross-investigator, cross-institution, and/or cross-discipline scientific integration (e.g., yearly workshops, graduate student exchange, project meetings at conferences, use of the grid for videoconferences, software repositories, etc.), and 4) specific references to the budget line items that support collaboration and coordination mechanisms. ***If a Large proposal, or a Medium proposal with more than one investigator, does not include a Collaboration Plan, that proposal will not be merit reviewed until the proposing organization submits such a Plan to NSF. Failure to respond within 10 business days to NSF's request for a missing Collaboration Plan may result in the proposal being returned without review.***

## Supplementary Documents:

In the Supplementary Documents Section, upload the following information where relevant:

(1) *List of Project Personnel and Partner Institutions (Note - In collaborative proposals, only the lead institution should provide this information),*

Provide current, accurate information for all personnel and institutions involved in the project. NSF staff will use this information in the merit review process to manage conflicts of interest. The list should include all PIs, Co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdocs, and project-level advisory committee members. This list should be numbered and include (in this order) Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line. For example:

1. Mary Smith; XYZ University; PI
2. John Jones; University of PQR; Senior Personnel
3. Jane Brown; XYZ University; Postdoc
4. Bob Adams; ABC Inc.; Paid Consultant
5. Mary White; Welldone Institution; Unpaid Collaborator
6. Tim Green; ZZZ University; Subawardee

(2) *Post Doctoral Mentoring Plan (if applicable)*

Proposals that include funding to support postdoctoral researchers in any way must include a Post Doctoral Mentoring Plan. Proposals that request funding to support post docs and that do not include Post Doctoral Mentoring Plans will be returned without review.

(3) *Other Specialized Information*

RUI Proposals: PIs from predominantly undergraduate institutions should include a Research in Undergraduate Institutions (RUI) Impact Statement and Certification of RUI Eligibility in this Section.

GOALI proposals: PIs submitting GOALI proposals should include industry-university agreement letters on intellectual property in this section.

## B. Budgetary Information

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

## C. Due Dates

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

September 01, 2010 - September 15, 2010

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MEDIUM Projects

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SMALL Projects

## 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. 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](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.

#### **Additional Review Criteria:**

For Large and relevant Medium proposals, reviewers will be asked to:

- Comment on the extent to which the project scope justifies the level of investment requested, and the degree to which the Collaboration Plan (if required) adequately demonstrates that the participating investigators will work synergistically to accomplish the project objectives.

## **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.

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**

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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.

### VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- William S. Bainbridge, Point of Contact, Human-Centered Computing (HCC), 1125, telephone: (703) 292-8930, email: [wbainbri@nsf.gov](mailto:wbainbri@nsf.gov)
- Ephraim P. Glinert, Point of Contact, Human-Centered Computing (HCC), 1125, telephone: (703) 292-8930, email: [eglinert@nsf.gov](mailto:eglinert@nsf.gov)
- Gia-Loi Le Gruenwald, Point of Contact, Information Integration and Informatics (III), 1122, telephone: (703) 292-8930, email: [lgruenwa@nsf.gov](mailto:lgruenwa@nsf.gov)
- Maria Zemankova, Point of Contact, Information Integration and Informatics (III), 1125, telephone: (703) 292-8930, email: [mzemanko@nsf.gov](mailto:mzemanko@nsf.gov)
- Jie Yang, Point of Contact, Robust Intelligence (RI), 1125, telephone: (703) 292-4768, email: [jyang@nsf.gov](mailto:jyang@nsf.gov)
- Kenneth Whang, Point of Contact, Robust Intelligence (RI), 1125, telephone: (703) 292-8930, email: [kwhang@nsf.gov](mailto:kwhang@nsf.gov)
- Lawrence Rosenblum, Point of Contact, Computer Graphics and Visualization (CGV), 1125, telephone: (703) 292-8910, email: [lrosenbl@nsf.gov](mailto:lrosenbl@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).

In addition to the Program Officers identified as program points of contact above, the following IIS Program Officers also support IIS core programs as indicated below:

#### Human-Centered Computing (HCC)

- Pamela Jennings, Room 1122, (703) 292-8491, [pajennin@nsf.gov](mailto:pajennin@nsf.gov)

#### Information Integration & Informatics (III)

- Sylvia Spengler, Room 1122, (703) 292-8930, [sspengle@nsf.gov](mailto:sspengle@nsf.gov)
- Vasant Honavar, Room 1125, (703) 292-7129, [vhonavar@nsf.gov](mailto:vhonavar@nsf.gov)
- Petros Drineas, Room 1125, (703) 292-7338, [pdrineas@nsf.gov](mailto:pdrineas@nsf.gov)
- Xiaoyang (Sean) Wang, Room 1125, (703) 292-8930, [xwang@nsf.gov](mailto:xwang@nsf.gov)

#### Robust Intelligence (RI)

- Tom Henderson, Room 1122, (703) 292-7838, [thenders@nsf.gov](mailto:thenders@nsf.gov)
- Tatiana (Tanya) Korelsky, Room 1125, (703) 292-8930, [tkorelsk@nsf.gov](mailto:tkorelsk@nsf.gov)
- Jie Yang, Room 1125, (703) 292-4768, [jyang@nsf.gov](mailto:jyang@nsf.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>.

In addition to the *coordinated solicitation* discussed in this document, NSF provides funding opportunities for the computing community via the following programs and their solicitations:

#### Discovery Research Programs

CAREER: Faculty Early Career Development, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5262](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5262)

CISE Cross-cutting Programs: FY 2010, <http://www.nsf.gov/funding>

In addition to the *coordinated solicitation* discussed in this document, NSF provides funding opportunities for the computing community via the following programs and their solicitations:

#### Discovery Research Programs

CAREER: Faculty Early Career Development, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5262](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5262)

CISE Cross-cutting Programs: FY 2010, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13451](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13451)

Collaborative Research in Computational Neuroscience (CRCNS), [http://nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5147](http://nsf.gov/funding/pgm_summ.jsp?pims_id=5147)

Community-Based Data Interoperability Networks (Interop), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=502112&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=502112&org=CISE&sel_org=CISE&from=fund)

Cyber-enabled Discovery and Innovation (CDI), <http://www.nsf.gov/crssprgm/cdi/>

Cyber-Physical Systems (CPS), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503286&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503286&org=NSF&sel_org=NSF&from=fund)

Engineering Research Centers (ERCs), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5502&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5502&org=NSF&sel_org=NSF&from=fund)

Expeditions in Computing, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503169&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503169&org=NSF&sel_org=NSF&from=fund)

Foundations of Data and Visual Analytics (FoDaVA), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=501081&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501081&org=NSF&sel_org=NSF&from=fund)

Grant Opportunities for Academic Liaison with Industry (GOALI), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13706&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13706&org=CISE&sel_org=CISE&from=fund)

High-End Computing University Research Activity (HECURA), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13645&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13645&org=NSF&sel_org=NSF&from=fund)

Industry/University Cooperative Research Centers Program (IUCRC), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5501&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5501&org=CISE&sel_org=CISE&from=fund)

Partnerships for International Research and Education (PIRE), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12819&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12819&org=CISE&sel_org=CISE&from=fund)

Research in Undergraduate Institutions (RUI), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5518&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5518&org=CISE&sel_org=CISE&from=fund)

Science of Learning Centers (SLCs), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5567&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5567&org=CISE&sel_org=CISE&from=fund)

Science and Technology Centers (STCs), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5541&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5541&org=CISE&sel_org=CISE&from=fund)

Sustainable Digital Data Preservation and Access Network Partners (DataNet), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503141&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503141&org=CISE&sel_org=CISE&from=fund)

### **Education and Workforce Development Programs**

ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5383&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383&from=fund)

Advanced Technological Education (ATE), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5464](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5464)

Broadening Participation in Computing (BPC), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13510&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13510&org=NSF&sel_org=NSF&from=fund)

Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13655&org=EHR&sel\\_org=EHR&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13655&org=EHR&sel_org=EHR&from=fund)

Developing Global Scientists and Engineers [International Research Experiences for Students (IRES) and Doctoral Dissertation Enhancement Projects (DDEP)], [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12831&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12831&org=CISE&sel_org=CISE&from=fund)

Discovery Research K-12 (DR-K12), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=500047&org=EHR&sel\\_org=EHR&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047&org=EHR&sel_org=EHR&from=fund)

Federal Cyber Service: Scholarship for Service (SFS), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5228](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5228)

Graduate Research Fellowships (GRF), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=6201&org=DGE&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201&org=DGE&from=home)

Integrative Graduate Education and Research Training (IGERT), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12759](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12759)

International Research Fellowship Program (IRFP), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5179&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5179&org=CISE&sel_org=CISE&from=fund)

Information Technology Experiences for Students and Teachers (ITEST), [http://www.nsf.gov/funding/pgm\\_summ.jsp](http://www.nsf.gov/funding/pgm_summ.jsp)

NSF Graduate Teaching Fellows in K-12 Education (GK-12), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5472&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5472&from=fund)

NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5257&org=EHR&sel\\_org=EHR&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5257&org=EHR&sel_org=EHR&from=fund)

Research Experiences for Undergraduates (REU) Sites and Supplements, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5517&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund)

Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5488&org=EHR&sel\\_org=EHR&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5488&org=EHR&sel_org=EHR&from=fund)

Transforming Undergraduate Education in Science (TUES), <http://www.nsf.gov/pubs/2010/nsf10544/nsf10544.htm>

### **Research Infrastructure Programs**

Computing Research Infrastructure (CRI), [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=12810&org=NSF&sel\\_org=NSF&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12810&org=NSF&sel_org=NSF&from=fund)

EPSCoR Research Infrastructure Improvement Grant Program, [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5672&org=CISE&sel\\_org=CISE&from=fund](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5672&org=CISE&sel_org=CISE&from=fund)

Major Research Infrastructure (MRI), <http://www.nsf.gov/od/oia/programs/mri/>

For more information on these programs, please consult the NSF web site.

## **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 Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

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

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

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

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

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

- . **Location:** 4201 Wilson Blvd. Arlington, VA 22230
  
- . **For General Information** (NSF Information Center): (703) 292-5111
  
- . **TDD (for the hearing-impaired):** (703) 292-5090
  
- . **To Order Publications or Forms:**
  - Send an e-mail to: [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov)
  - or telephone: (703) 292-7827
  
- . **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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