This solicitation has been archived and replaced by NSF 17-519.

Integrative Strategies for Understanding Neural and Cognitive Systems (NSF-NCS)

INTEGRATIVE FOUNDATIONS and CORE+ SUPPLEMENTS

PROGRAM SOLICITATION
NSF 16-508

REPLACES DOCUMENT(S):
NSF 14-611

National Science Foundation

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Social, Behavioral & Economic Sciences

Letter of Intent Due Date(s) ***(required)*** (due by 5 p.m. proposer's local time)***:***

December 10, 2015

INTEGRATIVE FOUNDATIONS

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

January 26, 2016

INTEGRATIVE FOUNDATIONS

IMPORTANT INFORMATION AND REVISION NOTES

This is the second phase of the NSF-NCS program, which reflects the following changes:

- Two additional integrative research themes are introduced: ***Cognitive and Neural Processes in Realistic, Complex Environments;*** and ***Data-Intensive Neuroscience and Cognitive Science.***
- Program expectations have been clarified with respect to risk, reward, and risk management; and strategy for maximizing a project's integrative impact.
- INTEGRATIVE FOUNDATIONS proposals must include the following or they will be returned without review: The project summary must contain a separate statement labeled "**Integrative Value and Transformative Potential**," and the project description must contain, as separate sections within the narrative, sections labeled "**Integrative Strategy**" and "**Risk, Reward, and Risk Management**," as described in the solicitation.
- An INTEGRATIVE FOUNDATIONS project may explicitly build on another associated project or projects (e.g., a proposed or funded NSF-NCS project, or a research or infrastructure project from another program), to synergistically advance the project goals.
- CORE+ SUPPLEMENTS, formerly CORE+ EXTENSIONS, may provide additional support to new or existing projects. The process for new and existing projects is described in Section V of this solicitation.
- Directorate participation in the proposal classes is as follows:
  INTEGRATIVE FOUNDATIONS: CISE, EHR, ENG, SBE;
  CORE+ SUPPLEMENTS: CISE, EHR, ENG.

IMPORTANT INFORMATION

Letters of Intent submitted in response to this solicitation should be submitted in accordance with the current NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 15-1).

Full Proposals submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 16-1) which is effective for proposals submitted, or due, on or after January 25, 2016.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Integrative Strategies for Understanding Neural and Cognitive Systems (NSF-NCS)

Synopsis of Program:

The complexities of brain and behavior pose fundamental questions in many areas of science and engineering, drawing intense interest across a broad spectrum of disciplinary perspectives while eluding explanation by any one of them. Rapid advances within and across disciplines are leading to an increasingly interconnected fabric of theories, models, empirical methods and findings, and educational approaches, opening new opportunities to understand complex aspects of neural and cognitive systems through integrative multidisciplinary approaches.

This program calls for innovative, integrative, boundary-crossing proposals that can best capture those opportunities. NSF seeks proposals that are bold, risky, and transcend the perspectives and approaches typical of single-discipline research efforts. This cross-directorate program is one element of NSF's broader effort directed at Understanding the Brain, a multi-year activity that includes NSF's participation in the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative (http://www.nsf.gov/brain/). NSF envisions a connected portfolio of transformative, integrative projects that create synergistic links across investigators and communities, yielding novel ways of tackling the challenges of understanding the brain in action and in context.

In this second phase of the program, Integrative Strategies for Understanding Neural and Cognitive Systems is open to proposals to advance the foundations of one or more of the integrative research themes described below. Two of the themes are continued from FY15: ***Neuroengineering and Brain-Inspired Concepts and Designs,*** and ***Individuality and Variation***. Two additional themes for FY16 are ***Cognitive and Neural Processes in Realistic, Complex Environments***; and ***Data-Intensive Neuroscience and Cognitive Science***. Within each theme, advances in theory and methods, technological innovations, educational approaches, research infrastructure, and workforce development are all of significant interest. Proposals must be consistent with the missions of the participating directorates. High-risk, high-payoff approaches are expected. Proposals must directly address risks and how they will be managed, potentially transformative payoffs, and the relationship between the risks and rewards at stake.

The program will consider two classes of proposals. **INTEGRATIVE FOUNDATIONS** awards (CISE, EHR, ENG, SBE) will support projects that develop foundational advances that are deeply connected to a broad scope of important research questions in neural and cognitive systems, and have significant potential for transformative advances in one or more of the integrative thematic areas. **CORE+ SUPPLEMENTS** (CISE, EHR, ENG) will provide additional support to new or existing projects in the participating directorates, to enable additional activities that will connect those projects to significant new integrative opportunities in neural and cognitive systems.

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.

- Catherine Arrington,Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7276, email: carringt@nsf.gov
- Mitra Basu,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8910, email: mbasu@nsf.gov
- Alumit Ishai,Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-5145, email: aishai@nsf.gov
- Admela Jukan,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8950, email: ajukan@nsf.gov
- Todd Leen,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8930, email: tleen@nsf.gov
- Alexander Leonessa,Directorate for Engineering, telephone: (703) 292-2678, email: aleoness@nsf.gov
- Héctor Muñoz-Avila,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-7129, email: hmunoz@nsf.gov
- Laura Namy,Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7305, email: lnamy@nsf.gov
- Aude Oliva,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8114, email: auoliva@nsf.gov
- Gregg Solomon,Directorate for Education and Human Resources, telephone: (703) 292-8333, email: gesolomo@nsf.gov
- Betty K. Tuller,Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7238, email: btuller@nsf.gov
- Amy Walton,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-4538, email: awalton@nsf.gov
- Kenneth Whang,Directorate for Computer and Information Science and Engineering, telephone: (703) 292-5149, email: kwhang@nsf.gov
- Mona Zaghloul,Directorate for Engineering, telephone: (703) 292-8339, email: mzaghlou@nsf.gov

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

- 47.041 --- Engineering
- 47.070 --- Computer and Information Science and Engineering
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 30

A range of award sizes is anticipated in each of the above proposal classes, depending on the specific collaborative arrangement and

research approach of each project. **Proposers are strongly discouraged from requesting larger budgets than are necessary for the activities being proposed.**

Anticipated Funding Amount: $12,500,000 to $16,500,000

Approximately $12.5 to $16.5 million will be made available in FY 2016 to support an estimated 15 to 30 awards. Estimated program budget, number of awards, and average award size and duration are subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

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

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 1

An individual may participate as PI, Co-PI, or Senior Personnel on **only one** proposal in response to this solicitation. This eligibility constraint will be strictly enforced in order to treat everyone fairly and consistently. In the event that an individual exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission (i.e., the first proposal received will be accepted and the remainder will be returned without review). No exceptions will be made.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Letter of Intent Due Date(s) *(required)*** (due by 5 p.m. proposer's local time)***:***

  December 10, 2015

  INTEGRATIVE FOUNDATIONS

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

  January 26, 2016

  INTEGRATIVE FOUNDATIONS

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

TABLE OF CONTENTS

I. INTRODUCTION

The complexities of brain and behavior pose fundamental questions in many areas of science and engineering, drawing intense interest across a broad spectrum of disciplinary perspectives while eluding explanation by any one of them. Rapid advances within and across disciplines are leading to an increasingly interconnected fabric of theories, models, empirical methods and findings, and educational approaches, opening new opportunities to understand complex aspects of neural and cognitive systems through integrative multidisciplinary approaches.

This program calls for innovative, integrative, boundary-crossing proposals that can best capture those opportunities. NSF seeks proposals that are bold, risky, and transcend the perspectives and approaches typical of single-discipline research efforts. Projects supported by this program will bridge temporal and spatial scales, levels of abstraction, levels of analysis, and disciplinary, methodological, and technological approaches. The aim is to engage a broad community of researchers in creative, interdisciplinary efforts that yield innovations and advances in and across cognitive science, neuroscience, neuroengineering, and education research. The proposed research and related efforts should build on leading-edge developments across multiple scholarly traditions, experimental methods, and/or modeling and theoretical approaches.

This cross-directorate program is one element of NSF's broader effort directed at Understanding the Brain, a multi-year activity that includes NSF's participation in the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative (http://www.nsf.gov/brain/). NSF envisions a connected portfolio of transformative, integrative projects that create synergistic links across investigators and communities, yielding novel ways of tackling the challenges of understanding the brain in action and in context.

The Foundation's goal is to leverage its existing investments in cognitive science, neuroscience, neuroengineering, and STEM education research, and to tackle previously intractable challenges regarding the brain, cognition, and brain-based technologies through groundbreaking interdisciplinary research collaboration. This program is expected to provide new empirical insights, expand theoretical understanding, facilitate development of computational and bioengineered systems, promote new educational approaches, and generate new hypotheses that connect physical, biological, and cognitive mechanisms. These activities will contribute to development of an interdisciplinary cognitive science, neuroscience, neuroengineering, and education workforce, and to new collaborations, including international collaborations where appropriate.

II. PROGRAM DESCRIPTION

This program will support innovative, potentially transformative science and engineering that will accelerate understanding of neural and cognitive systems. Projects responsive to this solicitation will integrate across existing disciplines or approaches, spatial or temporal scales, and/or levels of abstraction or analysis and, where appropriate, challenge prevailing paradigms and practices.

In this second phase of the program, Integrative Strategies for Understanding Neural and Cognitive Systems is open to proposals to advance the foundations of one or more of the integrative research themes described below. Two of the themes are continued from FY15: ***Neuroengineering and Brain-Inspired Concepts and Designs,*** and ***Individuality and Variation***. Two additional themes for FY16 are ***Cognitive and Neural Processes in Realistic, Complex Environments;*** and ***Data-Intensive Neuroscience and Cognitive Science***. Proposals must specify how they will make integrative advances and bridge critical gaps in understanding within one or more of these integrative themes.

Proposals must develop integrative strategies that transcend the perspectives and approaches typical of individual NSF core programs,

building productively on leading-edge research across multiple disciplines. Integrative strategies are expected to advance scientific frontiers; generate new classes of research questions; develop new research capacities through interdisciplinary training and outreach; and develop broadly accessible, high-quality resources such as data, code, models, and stimuli that will be useful to the research and education community at large. In the global context, proposals that call for linking U.S. teams with international counterparts should identify opportunities to leverage resources through cooperation that enable advances that would not otherwise readily occur.

All proposals must clearly address how the proposed activity will extend the boundaries of what is currently possible; advance existing literature, knowledge, and technologies; challenge current scientific paradigms, as appropriate; and bridge temporal or spatial scales, levels of abstraction, levels of analysis, or disciplinary or methodological approaches.

High-risk, high-payoff approaches are expected. Proposals must directly address risks and how they will be managed, potentially transformative payoffs, and the relationship between the risks and rewards at stake, so that the investigators' framing of feasibility, contingencies, and potentially transformative impacts can be evaluated.

Proposals must be consistent with the missions of the participating directorates listed on the cover page or they will not be considered responsive to the solicitation. Questions about appropriateness may be addressed to the directorate representatives listed in Section VIII of the solicitation.

Integrative Themes

The integrative research themes around which this competition is organized each represent an emerging focus of multidisciplinary interests where novel integrative strategies are expected to have significant impact. Within each theme, advances in theory and methods, technological innovations, educational approaches, research infrastructure, and workforce development are all of significant interest. Scientifically, a proposal may relate to more than one theme, but for administrative purposes only, each proposal must be associated with a single primary theme. **Each proposal must clearly articulate how it will advance the foundations of one or more of the following:**

1. ***Neuroengineering and Brain-Inspired Concepts and Designs:*** Merging insights gained from neuroscience and cognitive science with those from rapidly changing technologies will lead to significant innovations that are inspired by or directed toward the brain. These may include technologies for imaging, sensing, recording, or affecting real-time brain activity and behavior; brain-inspired computing paradigms; brain-computer interfaces; augmented and adaptive systems (e.g., for communication, prosthetics, learning, education, or performance); functional neurotechnologies; and other computational and bioengineered systems.
2. ***Individuality and Variation:*** Neural and cognitive processes at all levels, from synapses to societies, display functionally important variability across time, context, individual units of analysis (e.g., neurons, nodes, persons), and populations. Explaining this variation, including the role of noise, in biological and machine systems, signaling and communication at all levels, representations, learning and adaptation, development, resilience, ability, cultural and social processes, and group differences, will have far-reaching consequences in many scientific domains. Alongside these domain-specific issues are statistical and modeling challenges to explore, describe, and understand the role of naturally occurring variability.
3. ***Cognitive and Neural Processes in Realistic, Complex Environments:*** Understanding the brain in action and in context requires moving beyond static, artificial experimental settings that minimize naturally occurring complexity and interactions. This theme includes, but is not limited to: adaptive processes during complex physical, social, and educational interactions; flexibility and contextual aspects of cognitive, biological, and machine learning; experimental paradigms leveraging immersive environments (e.g., virtual reality) or other simulation or synthesis methods; mobile technologies for cognitive and neural processing and data gathering; and cyber-human interactions such as human-robot symbiosis.
4. ***Data-Intensive Neuroscience and Cognitive Science:*** New methods and technologies for gathering and analyzing vast amounts of data are rapidly changing how neural and cognitive processes can be explored, modeled, and understood. Neural and cognitive data pose specific challenges with respect to complexities of scale, heterogeneity, throughput requirements, experimental limitations, and behavioral, cognitive, and biological richness; and may involve acquisition by multiple instruments, investigators, or communities in a wide variety of contexts. Proposed research and innovation to enable large-scale analysis, modeling, aggregation, sharing, and open science must confront these complexities, while being driven by integrative neural and cognitive discovery goals that require data-intensive approaches to succeed.

Activities under these integrative research themes may dovetail with related infrastructure efforts, and are encouraged to leverage existing standards, frameworks, platforms, and resources, and to build on associated infrastructure projects as appropriate.

Proposal Classes

The program will consider two classes of proposals, for pursuit of integrative opportunities at two different levels of collaboration and coordination. The motivation and implementation of each proposal class are described here. Please refer to Section V of this solicitation for specific proposal instructions. Please note the participation of specific NSF directorates in each proposal class.

INTEGRATIVE FOUNDATIONS awards **(CISE, EHR, ENG, and SBE Directorates)** will support projects that develop foundational advances that are deeply connected to a broad scope of important research questions in neural and cognitive systems, and have significant potential for transformative advances in one or more of the integrative thematic areas. Teams of two or more investigators with distinct but complementary expertise are required. Proposals must demonstrate the transformative potential of the work to be funded, and situate it within a broader intellectual context of work to which it can connect and contribute. Projects are expected to be integrative both in the approaches that they build on, and in the catalytic effects that result. A proactive strategy for maximizing the project's integrative impact, and an analysis of risk, reward, and risk management, are required elements of the proposal. An INTEGRATIVE FOUNDATIONS project may, as appropriate, explicitly build on another associated project or projects (e.g., a proposed or funded NSF-NCS project, or another research or infrastructure project, as documented through letters of collaboration), to synergistically advance the project goals. Total budgets for INTEGRATIVE FOUNDATIONS awards are anticipated to range from a total of $500,000 to $1,000,000 (including direct and indirect costs), with durations of 2 to 4 years.

CORE+ SUPPLEMENTS (CISE, EHR, and ENG Directorates) will provide additional support to new or existing projects in the participating directorates, to enable additional activities that will connect those projects to significant new integrative opportunities in neural and cognitive systems. These supplements are intended to build on NSF-funded projects in other disciplines, to bring new approaches or capabilities emerging from other fields into cognitive science, neuroscience, and neuroengineering, or to enable other kinds of synergistic connections that will advance one or more of the integrative themes. A request for a CORE+ SUPPLEMENT may be submitted in either of two ways: (1) Proposers may include a CORE+ SUPPLEMENT activity as a component of a new (or renewal) proposal submitted to the CISE, EHR, or ENG directorate, requesting additional funds of up to $200,000; or (2) Investigators holding an existing award managed by CISE, EHR, or ENG may submit a post-award request for supplemental funding of up to 20% of the existing award, not to exceed $200,000. *Contact your cognizant program officer or directorate contact (listed in Section VIII of this solicitation) prior to submitting a CORE+ SUPPLEMENT request.*

Anticipated Future Activities

This solicitation continues a series of activities that are planned within a multi-year initiative, subject to availability of funds. Also

anticipated in future solicitations is a class of larger proposals, **INTEGRATIVE FRONTIERS**, intended to support ambitious, highly integrative, interdisciplinary projects requiring larger teams of investigators engaged in a sustained synergistic effort. These projects will advance and connect multiple integrative research threads to tackle challenges that, without a high level of collaboration and coordination, would remain intractable.

III. AWARD INFORMATION

A range of award sizes is anticipated in each of the above proposal classes, depending on the specific collaborative arrangement and research approach of each project. **Proposers are strongly discouraged from requesting larger budgets than are necessary for the activities being proposed.**

Approximately $12.5 to $16.5 million will be made available in FY 2016 to support an estimated 15 to 30 awards. Estimated program budget, number of awards, and average award size and duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

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

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

Limit on Number of Proposals per PI or Co-PI: 1

An individual may participate as PI, Co-PI, or Senior Personnel on **only one** proposal in response to this solicitation. This eligibility constraint will be strictly enforced in order to treat everyone fairly and consistently. In the event that an individual exceeds this limit, proposals will be accepted based on earliest date and time of proposal submission (i.e., the first proposal received will be accepted and the remainder will be returned without review). No exceptions will be made.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required):*

Letters of Intent are required for INTEGRATIVE FOUNDATIONS proposals. They are not to be submitted for CORE+ SUPPLEMENT requests.

INTEGRATIVE FOUNDATIONS Letters of Intent:

Potential proposers may not submit an INTEGRATIVE FOUNDATIONS proposal without first submitting a corresponding FastLane Letter of Intent (LOI), compliant with the instructions below, by the LOI deadline. Submitting a Letter of Intent does not oblige potential proposers to submit a full proposal. If a collaborative proposal is planned, a single LOI should be submitted by the lead institution only. LOIs are not subject to merit review but are used for internal planning purposes. Investigators should not expect to receive any feedback on their LOIs. Although there are no restrictions on the submission of multiple LOIs from the same institution, an individual may participate in **only one** LOI in response to this solicitation. It is the responsibility of the PI to ascertain that no member of the proposed team is listed as PI, co-PI, or Senior Personnel on any other LOI.

Each letter of intent must include the following information:

1. In the Project PI and Senior Project Personnel sections, list the full names and institutional affiliations for all PIs, Co-PIs, and senior personnel on the project, including all collaborative proposals and subawardees. The point of contact for NSF inquiries must be the same as the project PI, with the project PI's e-mail address.
2. In the Participating Organizations section, list all of the institutions involved in the project.
3. In the “Synopsis” data field, provide a synopsis that describes the work in sufficient detail to convey the innovative, integrative nature of the project and to permit an appropriate selection of potential reviewers. (limit: 2500 characters)
4. List the research theme(s) that the project addresses, then the participating directorate(s) to which the proposal is relevant, with the most relevant theme and directorate listed first. (limit: 255 characters; use directorate acronyms)
5. Describe why this project would not be suitable scientifically as a submission to an NSF core program. (limit: 255 characters)
6. What are the distinct areas of expertise, research approaches, or disciplines represented by the investigator team, and how is that evident (e.g., via training histories, departmental affiliations, publication or presentation venues)? (limit: 255 characters)

Upon successful submission of the Letter of Intent by the Sponsored Projects Office, please save a PDF copy of the submitted LOI, for use in the Full Proposal submission.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 1 and Maximum of 4 Other Senior Project Personnel are allowed
- A Minimum of 0 and Maximum of 10 Other Participating Organizations are allowed
- "Research theme(s) and Directorate(s)" is required when submitting Letters of Intent
- "Why is this project not suitable scientifically for an NSF core program?" is required when submitting Letters of Intent
- "What are the distinct areas of expertise, research approaches, or disciplines?" is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is allowed

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

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

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/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.

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

See Chapter II.C.2 of the GPG for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

INTEGRATIVE FOUNDATIONS Full Proposals:

Full Proposals for INTEGRATIVE FOUNDATIONS projects should be prepared according to the general guidelines contained in the GPG, as modified by the additional instructions specified below.

1. On the Cover Sheet, a **Unit of Consideration** must be selected according to the project's primary integrative research theme. **Note that this is for administrative purposes only; all themes are cross-directorate and the scientific review will be handled through a shared, cross-directorate process.**
    a. If the primary theme is ***Neuroengineering and Brain-Inspired Concepts and Designs***, select ECCS/Intg Strat Undst Neurl & Cogn Sys.
    b. If the primary theme is ***Individuality and Variation***, select BCS/Intg Strat Undst Neurl & Cogn Sys.
    c. If the primary theme is ***Cognitive and Neural Processes in Realistic, Complex Environments***, select DRL/Core R&D Programs.
    d. If the primary theme is ***Data-Intensive Neuroscience and Cognitive Science***, select IIS/Intg Strat Undst Neurl & Cogn Sys.

    If collaborative proposals are submitted, the same unit of consideration must be selected for all component proposals of a given project.
2. The **Title of Proposed Project** should begin with "NCS-FO:"
3. The **Project Summary** must include three sections: Overview, Statement of Intellectual Merit, and Statement of Broader Impacts. The Overview must include a separate statement labeled "**Integrative Value and Transformative Potential:**" that briefly describes the potential of the proposed activity to meet the solicitation-specific review criteria (Section VI.A). **Proposals that do not clearly address the solicitation-specific review criteria in the Project Summary will be returned without review.**
4. The **Project Description** must develop a fully articulated vision and research plan that describes the foundational advances being pursued, their deep connections to a broad scope of important research questions in neural and cognitive systems, and their potential for transformative advances in one or more of the integrative thematic areas. Proposals must demonstrate the transformative potential of the work to be funded, and situate it within a broader intellectual context of work to which it can connect and contribute. In addition to the required sections on "**Broader Impacts of the Proposed Work**" and, if applicable, "**Results from Prior NSF Support**," as described in the GPG, the project description must contain, as separate sections within the narrative:
    a. a section labeled "**Integrative Strategy**" summarizing the project's proactive strategy to maximize its integrative impact, including how it will maximally build on, connect to, and contribute to a broader intellectual context of work, and how it will maximize resulting catalytic effects; and
    b. a section labeled "**Risk, Reward, and Risk Management**" addressing the risks entailed by the project, how risks will be managed, and the relationship between risks and rewards at stake, including issues of feasibility, contingencies, and potentially transformative payoffs.

    Proposals that do not contain these required sections will be returned without review.
5. The Project Description must include a **Collaboration Plan. Up to two additional pages are permitted in the Project Description for this purpose only, allowing a maximum of 17 pages total.** The Collaboration Plan must include: 1) the specific roles of the collaborating PIs, Co-PIs, other Senior Personnel and paid consultants at all organizations involved and how their expertise is complementary; 2) how the project will be managed across institutions and disciplines; 3) identification of the specific coordination mechanisms that will enable cross-institution or cross-discipline scientific integration (e.g., workshops, graduate student exchange, project meetings at conferences, use of videoconferencing and other communication tools, software repositories, etc.), and 4) specific references to the budget line items that support these coordination mechanisms.
6. Letters of Collaboration **must follow the template in APPENDIX A below** and be submitted under Other Supplementary Documents. These are not to be letters of endorsement.

7. If collaboration with another **associated project** or projects is contemplated, letters of collaboration, representing each associated project, must be submitted **also following the template in APPENDIX A,** under Supplementary Documents. The substantive description of relationships and dependencies among associated projects must be contained within the Collaboration Plan or elsewhere within the Project Description.
8. The **Data Management Plan,** submitted under Supplementary Documents, is a critical part of the proposal, where data management consistent with the project's integrative strategy should be described. It should explicitly state how the data and results generated by the project will be managed and stored, and how broad accessibility and usability will be maximized, including efforts to ensure security. The Plan should also clearly define rights, obligations, roles and responsibilities of all parties, and as needed, address possible differences between U.S. and applicable non-U.S. data protection requirements.
9. The **Budget** should include travel funds for the PIs to attend an annual NSF-NCS Principal Investigators' meeting.
10. **Personnel Conflict of Interest document: Combined Conflict of Interest document.** The template found at http://www.nsf.gov/sbe/NCS/NCS_COI_2016_Template.xlsx, contains a total of five tabs. Please read the Instructions carefully and follow guidance. Using the template, compile an Excel Workbook that identifies conflicts of interest (COIs) for all PIs, Co-PIs, and Other Senior Personnel. Conflicts to be identified are (1) Ph.D. dissertation advisors and advisees; (2) collaborators or co-authors within the past 48 months, including postdoctoral researchers, and persons with whom collaboration is being actively planned, regardless of whether any publications have resulted; (3) co-editors within the past 24 months; (4) spouse or other relatives; and (5) any other individuals with whom, or institutions with which, the senior personnel (PI(s), Co-PI(s), and any named personnel) have financial ties, including advisory committees (specify type), boards of directors, or prospective employers or employees. **Following the Instructions provided in the template, the completed Excel Workbook should be emailed to** nsf-ncs-coi@nsf.gov **immediately following proposal submission, and no later than 24 hours after the proposal deadline.** Do not use the temporary FastLane ID or a Research.gov ID to fill out the COI template. Use only the 7-digit NSF Proposal Number assigned at the time of submission. (The 7-digit Proposal Number can be looked up in FastLane and will be included in the FastLane confirmation e-mail; it will start with the last two digits of the fiscal year, e.g., for FY16, all Proposal Numbers will start with "16.") Do not send in the COI template until the proposal has been submitted and assigned an NSF Proposal Number.
11. A PDF copy of the **corresponding letter of intent** must be included as a **single-copy document**.
12. **Proposals containing special information or supplementary documentation that has not been explicitly allowed in the GPG or this solicitation, such as article reprints or preprints, or appendices, will be returned without review.**

CORE+ SUPPLEMENT Requests (CISE, EHR, and ENG Directorates):

A request for a CORE+ SUPPLEMENT may be submitted in either of two ways: as a component of a new (or renewal) proposal, or as a post-award request for supplemental funding.

Regardless of which mechanism is used, the description of the CORE+ SUPPLEMENT should discuss specific additional activities that would connect the project to significant new integrative opportunities in neural and cognitive systems, bringing new approaches or capabilities emerging from other fields into cognitive science, neuroscience, and neuroengineering, or enabling other kinds of synergistic connections that will advance one or more of the integrative themes.

Contact your cognizant program officer or directorate contact (listed in Section VIII of this solicitation) prior to submitting a CORE+ SUPPLEMENT request.

A request for a CORE+ SUPPLEMENT as part of a new (or renewal) proposal should be embedded as a Supplementary Document, within a proposal submitted to another program in the CISE, EHR, or ENG directorate. The proposal must conform to all deadlines, requirements, and other considerations of the primary program to which it is submitted. *A CORE+ SUPPLEMENT cannot be funded unless the underlying proposal is funded by the primary program; conversely, the underlying proposal may be funded by the primary program independent of the CORE+SUPPLEMENT.* The additional document should be prepared according to the instructions below.

1. The **Title of the Supplementary Document,** centered at the top of the first page, should be exactly as follows:

   NSF-NCS CORE+ SUPPLEMENT REQUEST

2. The first sentence of the narrative should be exactly as follows: "This supplementary document is included according to the NSF-NCS solicitation, to request funding for additional activities that would connect a project to significant new integrative opportunities in neural and cognitive systems."
3. The remainder of the narrative, **not exceeding 2 pages**, should discuss specific additional activities proposed in response to the CORE+ SUPPLEMENT opportunity of this solicitation. The last paragraph of the narrative should summarize the costs to be covered and total additional funds requested.
4. Additional funds for a CORE+ SUPPLEMENT requested as a component of a new (or renewal) research proposal will not exceed $200,000. **These funds should not be included within the original proposal budget.** If funding for the additional activities is recommended, the additional funding will be negotiated as part of a revised budget. The revised budget should include travel funds for the PI(s) to attend an annual NSF-NCS Principal Investigators' meeting.
5. Please see further instructions below for submitting a **required e-mail notification** following successful submission of the proposal.

A request for a CORE+ SUPPLEMENT to an existing award managed by CISE, EHR, or ENG should be submitted as a Supplemental Funding Request in FastLane, prepared according to the instructions below.

1. In the form entitled **Summary of Proposed Work**, enter the following information:

   NSF-NCS CORE+ SUPPLEMENT REQUEST

   This supplement request has been prepared according to the NSF-NCS solicitation, to request funding for additional activities that would connect a project to significant new integrative opportunities in neural and cognitive systems.

2. In the form entitled **Justification for Supplement**, begin with the same title and first sentence as above. The remainder of the narrative, **not exceeding 2 pages**, should discuss specific additional activities proposed in response to the CORE+ SUPPLEMENT opportunity of this solicitation. The last paragraph of the narrative should summarize the costs to be covered and total additional funds requested.
3. The request for supplemental funds may total up to 20% of the original negotiated award, not to exceed $200,000. **The funding request should be specified in the budget pages** of the supplement request. The budget should include travel funds for the PI(s) to attend an annual NSF-NCS Principal Investigators' meeting.
4. Please see further instructions below for submitting a **required e-mail notification** following successful submission of the proposal.

Upon successful submission by the Sponsored Projects Office of a new (or renewal) proposal that includes a CORE+ SUPPLEMENT request, or a supplemental funding request for an existing award, the PI must send an e-mail to nsf-ncs-

coreplus@nsf.gov with the following information:

In the Subject line, write the NSF acronym of the division to which the proposal was submitted.

In the body of the e-mail, in a single line, include:

- The 7-digit NSF Proposal Number (The 7-digit Proposal Number can be looked up in FastLane and will be included in the FastLane confirmation e-mail; it will start with the last two digits of the fiscal year, e.g., for FY16, all Proposal Numbers will start with "16");
- The cognizant program officer to whom the proposal has been assigned; and
- The project title.

This e-mail is needed for internal tracking of CORE+ SUPPLEMENT requests.

APPENDIX A

Letters of Collaboration

Letters of collaboration must be limited to stating the intent to collaborate and may not contain endorsements or evaluation of the proposed project. Letters of collaboration must use the following format:

Template for a letter of collaboration:

To: Program Management - Integrative Strategies for Understanding Neural and Cognitive Systems

If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment or Other Resources section of the proposal.

My contribution to the project [choose one of the following as appropriate]

will be supported by [insert source(s) of support] is under consideration for support by [insert source(s) of potential support] does not depend on external support

[Signature, Organization, and Date]

This statement may be in the form of a signed statement or a statement sent by e-mail to the PI. Such a statement is not needed from individuals included as senior personnel on a project.

Lengthier letters describing collaborative activities or their merits may be included in the Project Description, but must be accommodated within the page limit of the Project Description.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

International activities: NSF funds are not intended to provide support for international partners, but may provide US team members' (including PIs, junior researchers, and students) international travel costs as necessary and within budgetary limits. International partners should obtain support independently from national or regional sources, via normal channels.

C. Due Dates

- **Letter of Intent Due Date(s)** ***(required)*** (due by 5 p.m. proposer's local time)***:***

  December 10, 2015

  INTEGRATIVE FOUNDATIONS

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

  January 26, 2016

  INTEGRATIVE FOUNDATIONS

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

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

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://www.grants.gov/web/grants/applicants.html. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers

general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

Proposers that submitted via FastLane are strongly encouraged to use FastLane to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

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

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

The following additional review criteria reflect this solicitation's central emphasis on transformative and integrative research that will accelerate understanding of neural and cognitive systems. Not all suggested considerations for evaluation will apply to every proposal. Their applicability and relative weighting will vary depending on the nature of the activities being proposed and the proposal class.

Integrative Value and Transformative Potential

- Is the proposed activity bold, potentially risky, and well beyond a typical disciplinary approach?
- Will it advance the foundations of one or more of the integrative research themes?
- Does it bring together deep, complementary, synergistic expertise, build productively on leading-edge research across multiple disciplines, and develop proactive plans to contribute to a broader intellectual context of work?
- Does it forge meaningful connections across distinctly different temporal or spatial scales, levels of abstraction, levels of analysis, or disciplinary, methodological, or technological approaches?
- To what extent will it lead to significant advances in theory, methods, or educational approaches, or significant technological innovations?
- Will it lead to the development of broadly accessible, high-quality resources that will be useful to the research and education community at large?
- How will it contribute to development of an interdisciplinary cognitive science, neuroscience, neuroengineering, and education research workforce?

B. Review and Selection Process

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

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will be completed and submitted by each reviewer. 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 strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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. After an administrative review has occurred, Grants and Agreements Officers perform 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.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, 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.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process).

B. Award Conditions

An NSF award consists of: (1) the award notice, 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 notice; (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 notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

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

C. Reporting Requirements

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

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

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

VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Catherine Arrington, Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7276, email: carringt@nsf.gov
- Mitra Basu, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8910, email: mbasu@nsf.gov
- Alumit Ishai, Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-5145, email: aishai@nsf.gov
- Admela Jukan, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8950, email: ajukan@nsf.gov
- Todd Leen, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8930, email:

tleen@nsf.gov

- Alexander Leonessa, Directorate for Engineering, telephone: (703) 292-2678, email: aleoness@nsf.gov
- Héctor Muñoz-Avila, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-7129, email: hmunoz@nsf.gov
- Laura Namy, Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7305, email: lnamy@nsf.gov
- Aude Oliva, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-8114, email: auoliva@nsf.gov
- Gregg Solomon, Directorate for Education and Human Resources, telephone: (703) 292-8333, email: gesolomo@nsf.gov
- Betty K. Tuller, Directorate for Social, Behavioral, and Economic Sciences, telephone: (703) 292-7238, email: btuller@nsf.gov
- Amy Walton, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-4538, email: awalton@nsf.gov
- Kenneth Whang, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-5149, email: kwhang@nsf.gov
- Mona Zaghloul, Directorate for Engineering, telephone: (703) 292-8339, email: mzaghlou@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

General inquiries regarding this program should be made to: NCS@nsf.gov.

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on NSF's website.

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

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

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

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

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

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

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
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