

Secure and Trustworthy Cyberspace (SaTC)

PROGRAM SOLICITATION NSF 12-596

REPLACES DOCUMENT(S): NSF 12-503



National Science Foundation

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

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

Directorate for Mathematical & Physical Sciences
Division of Mathematical Sciences

Office of Cyberinfrastructure

Directorate for Education & Human Resources
Division of Undergraduate Education

Directorate for Engineering
Division of Electrical, Communications and Cyber Systems

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

November 15, 2012 - November 30, 2012

MEDIUM Projects

December 01, 2012 - December 14, 2012

SMALL Projects

December 01, 2012 - December 14, 2012

CYBERSECURITY EDUCATION Projects

January 16, 2013 - January 30, 2013

FRONTIER Projects

September 15, 2013 - September 30, 2013

September 15 - September 30, Annually Thereafter

MEDIUM Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

SMALL Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

CYBERSECURITY EDUCATION Projects

November 01, 2014 - November 17, 2014

November 1 - November 15, Annually Thereafter

FRONTIER Projects

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the **NSF Proposal & Award Policies & Procedures Guide** (PAPPG), [NSF 13-1](#), was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in [NSF 13-1](#) apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 14, 2013, must also follow the guidelines

contained in [NSF 13-1](#).

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, [National Science Foundation's Merit Review Criteria: Review and Revisions](#). While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the [Grant Proposal Guide](#) and the [Award & Administration Guide](#).

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the [Grant Proposal Guide](#).

This program originated as Program Solicitation 12-503 and has been extended to include the Directorate for Education & Human Resources (EHR) and the Directorate for Engineering (ENG).

For Frontier proposals (only) the page limit on the Project Description has been increased to 20 pages.

A complete List of Project Personnel and Partner Institutions is required of all proposals.

For Education, Small, and Medium awards, attendance at the first PI meeting held after the beginning of the award is required. For Frontier awards, attendance at every PI meeting held throughout the duration of the grant is required.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Secure and Trustworthy Cyberspace (SaTC)

Synopsis of Program:

Cyberspace has transformed the daily lives of people for the better. The rush to adopt cyberspace, however, has exposed its fragility and vulnerabilities: corporations, agencies, national infrastructure and individuals have been victims of cyber-attacks. In December 2011, the National Science and Technology Council with the cooperation of NSF has advanced a broad, coordinated federal strategic plan for cybersecurity research and development to "change the game," check the misuses of cyber technology, bolster education and training in cybersecurity, establish a science of cybersecurity, and transition promising cybersecurity research into practice. This challenge requires a dedicated approach to research, development, and education that leverages the disciplines of mathematics and statistics, the social sciences, and engineering with the computational and information sciences.

This program welcomes proposals that address Cybersecurity from a Trustworthy Computing Systems perspective (TWC); a Social, Behavioral and Economic Sciences perspective (SBE); and a Transition to Practice perspective (TPP) (see below). In addition, we welcome proposals that integrate research addressing two or more of these perspectives as well as proposals focusing entirely on Cybersecurity Education (see below). Proposals may be submitted in one of the following three categories:

- Small projects: up to \$500,000 in total budget, with durations of up to three years
- Medium projects: \$500,001 to \$1,200,000 in total budget, with durations of up to four years
- Frontier projects: \$1,200,001 to \$10,000,000 in total budget, with durations of up to five years

Projects with Trustworthy Computing Systems and/or Social, Behavioral and Economic Sciences perspectives may include a *Transitions* option, described in a supplemental document of no more than five pages. This document should describe how successful research results are to be further developed, matured, and experimentally deployed in organizations or industries, including in networks and end systems used by members of the NSF science and engineering communities. Proposals with a Transitions option may exceed the above-stated maximums up to \$167,000 for small projects, \$400,000 for medium projects and \$750,000 for Frontier projects.

In addition, the SaTC program seeks proposals addressing Cybersecurity Education with total budgets limited to \$300,000 and durations of up to two years. Cybersecurity education projects may not include any of the three perspectives named above.

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.

- Jeremy Epstein, Program Director, CISE/CNS, 1175, telephone: (703) 292-8338, email: jepstein@nsf.gov
- Samuel Weber, Program Director, CISE/CNS, 1175, telephone: (703) 292-7096, email: sweber@nsf.gov
- Kevin Thompson, Program Director, OCI, 1145, telephone: (703) 292-4220, email: kthompso@nsf.gov
- Peter Muhlberger, Program Director, SBE/SES, 972, telephone: (703) 292-7848, email: pmuhlber@nsf.gov
- Andrew D. Pollington, Program Director, MPS/DMS, 1025, telephone: (703) 292-4878, email: adpollin@nsf.gov
- Nina Amla, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: namla@nsf.gov

- Sol Greenspan, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: sgreensp@nsf.gov
- Vijayalakshmi (Vijay) Atluri, Program Director, CISE/IIS, 1125, telephone: (703) 292-8930, email: vatluri@nsf.gov
- Victor P. Piotrowski, Program Director, EHR/DUE, 865, telephone: (703) 292-5141, email: vp Piotrow@nsf.gov
- Zhi (Gerry) Tian, Program Director, ENG/ECCS, 525, telephone: (703) 292-2210, email: ztian@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.070 --- Computer and Information Science and Engineering
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.080 --- Office of Cyberinfrastructure

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 70

NSF anticipates approximately 5 Education awards, 51 Small awards, 12 Medium awards and 2 Frontier awards in FY13.

Anticipated Funding Amount: \$74,500,000

Up to \$74,500,000 dependent upon the availability of funds in FY13.

Eligibility Information

Organization Limit:

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

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 3

An individual can participate as a PI, co-PI or Senior Personnel on no more than three proposals, of which no more than two can be for the TWC, SBE and/or TTP perspectives, and no more than one for the EDU perspective.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

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

November 15, 2012 - November 30, 2012

MEDIUM Projects

December 01, 2012 - December 14, 2012

SMALL Projects

December 01, 2012 - December 14, 2012

CYBERSECURITY EDUCATION Projects

January 16, 2013 - January 30, 2013

FRONTIER Projects

September 15, 2013 - September 30, 2013

September 15 - September 30, Annually Thereafter

MEDIUM Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

SMALL Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

CYBERSECURITY EDUCATION Projects

November 01, 2014 - November 17, 2014

November 1 - November 15, Annually Thereafter

FRONTIER Projects

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: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Standard NSF reporting requirements apply.

TABLE OF CONTENTS

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. Merit Review Principles and 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

Cyberspace - a global "virtual" village enabled by hyper-connected digital infrastructures - has transformed the daily lives of people for the better. Families and friends regardless of distance and location can see and talk with one another as if in the same room. Cyber economies create new opportunities. Every sector of the society, every discipline, has been transformed by cyberspace. Today it is no surprise that cyberspace is critical to our national priorities in commerce, education, energy, financial services, healthcare, manufacturing, and defense.

The rush to adopt cyberspace, however, has exposed its fragility. The risks of hyper-connectedness have become painfully obvious to all. The privacy of personally identifiable information is often violated on a massive scale by persons unknown. Our competitive advantage is eroded by the exfiltration of significant intellectual property. Law enforcement is hobbled by the difficulty of attribution, national boundaries, and uncertain legal and ethical frameworks. All these concerns now affect the public's trust of cyberspace and the ability of institutions to fulfill their mission.

The National Science and Technology Council with the cooperation of NSF has put forth a 2011 report, (NSTC) [Trustworthy Cyberspace: Strategic Plan for the Federal Cybersecurity Research and Development Program](#). The plan identifies a broad, coordinated research agenda to make cyberspace secure and trustworthy. Research in cybersecurity must "change the game," check the misuses of cyber technology, bolster education and training in cybersecurity, establish a science of cybersecurity, and transition promising cybersecurity research into practice. The goal is to make cyberspace worthy of the public's trust.

This solicitation is supportive of the NSTC strategic plan for a trustworthy cyberspace. It recognizes that cyberspace will continue to grow and evolve, and that advances in the sciences and technologies will create new "leap-ahead" opportunities expanding cyberspace. It recognizes that cybersecurity must also grow and co-evolve, and that a secure and trustworthy cyberspace will ensure continued economic growth and future technological innovation.

II. PROGRAM DESCRIPTION

Cybersecurity is arguably the most important challenge confronting society in the information age. No one - whether governments, businesses or individuals - is exempt from the ravages of malicious cyber acts upon imperfect technologies. Posing cyber conflict solely in terms of classic attackers and defenders shortchanges the diversity and subtlety of the motivations, incentives, ethics, asymmetries, and strategies of the constituent actors and players in cyberspace. The intelligent adversary, whether human or software, learns, evolves, and co-evolves to exploit, disrupt, and overpower with cyberspace. Addressing this challenge requires a coordinated multi-disciplinary approach, contributing to the body of knowledge on cybersecurity in the respective disciplines, and leading to practical usable deployable technologies.

This program welcomes proposals that address Cybersecurity from a Trustworthy Computing Systems perspective (TWC); a Social, Behavioral and Economic Sciences perspective (SBE); and a Transition to Practice perspective (TPP) (see below). In addition, we welcome proposals that integrate research addressing two or more of these perspectives as well as proposals focusing entirely on Cybersecurity Education (see below). Proposals may be submitted in one of the following three categories:

- Small projects: up to \$500,000 in total budget, with durations of up to three years
- Medium projects: \$500,001 to \$1,200,000 in total budget, with durations of up to four years
- Frontier projects: \$1,200,001 to \$10,000,000 in total budget, with durations of up to five years

Projects with Trustworthy Computing Systems and/or Social, Behavioral and Economic Sciences perspectives may include a *Transitions* option, described in a supplemental document of no more than five pages. This document should describe how successful research results are to be further developed, matured, and experimentally deployed in organizations or industries, including in networks and end systems used by members of the NSF science and engineering communities. Proposals with a *Transitions* option may exceed the above-stated maximums up to \$167,000 for Small projects, \$400,000 for Medium projects and \$750,000 for Frontier projects.

In addition, the SaTC program seeks proposals addressing Cybersecurity Education with total budgets limited to \$300,000 and durations of up to two years.

Perspectives

A proposal's "primary perspective" is the perspective whose acronym is listed first in its title, as described below. Which perspective is primary has implications for how the proposal will be reviewed. For instance, the proposal title: "TWC SBE TTP: Medium: Title" indicates that the medium proposal has TWC as its primary perspective but also involves SBE and TTP, though as non-primary perspectives.

Trustworthy Computing Systems Perspective

Proposals addressing Cybersecurity with a Trustworthy Computing Systems perspective aim to provide the basis for designing, building, and operating a cyberinfrastructure with improved resistance and improved resilience to attack that can be tailored to meet a wide range of technical and policy requirements, including both privacy and accountability. Within its scope, the program supports all research approaches from theoretical to experimental, including participation by human subjects. Theories, models, cryptography, algorithms, methods, architectures, languages, software, tools, systems and evaluation frameworks are all of interest.

Of particular interest is research addressing how better to design into components and systems desired security and privacy properties. Methods for raising attacker costs by incorporating diversity and change into systems, while preserving system manageability, are also relevant.

Research that studies the tradeoffs among trustworthy computing properties, e.g., security and usability, or accountability and privacy, as well as work that examines the tension between security and human values such as openness and transparency is also welcomed. Also, methods to assess, reason about, and predict system trustworthiness, including observable metrics, analytical methods, simulation, experimental deployment and, where possible, deployment on live testbeds for experimentation at scale are considered. Statistical, mathematical and computational methods in the area of cryptographic methods, new algorithms, risk assessments and statistical methods in cybersecurity are also welcome.

Social, Behavioral and Economic Sciences Perspective

Proposals addressing the Social, Behavioral and Economic Sciences (SBE) perspective of Cybersecurity may include research at the

individual, group, organizational, market, and societal levels, identifying cybersecurity risks and exploring the feasibility of potential solutions. All research approaches, including (but not limited to) theoretical, experimental, observational, statistical, survey, and simulation-based are of interest. A variety of methods can be used in research from the SBE perspective, including field data, laboratory experiments, observational studies, simulations, and theoretical development, among others.

Not all proposals that examine aspects involving people are from the SBE perspective. Proposals in which such aspects are not the primary focus of the proposal or that merely apply rather than make contributions to the SBE sciences might fit under "Trustworthy Computing Systems" as human factors research.

A proposal with SBE as its *primary* perspective must have SBE science as its main focus and must involve theoretical or methodological contributions to the SBE sciences. Contributions to the SBE sciences includes identifying generalizable theories and regularities and "pushing the boundaries" of our understanding of social, behavioral, or economic phenomena in cybersecurity and beyond. We seek research that is generalizable, identifies scope conditions, or provides an advance in SBE science methods. We seek research that holds the promise of constructing new SBE theories that would apply to a variety of domains, or new generalizations of existing theory which clarify the conditions under which such generalizations hold (scope conditions). More inductive or interpretative approaches may contribute to the SBE sciences as well, especially if they set the groundwork for generalizable research or reveal broad connections that forward SBE science understandings. SBE / SaTC proposals should clearly state and elaborate how the proposed research will contribute to SBE sciences. A proposal that involves SBE, *but not as its primary perspective*, must include at least an application of the SBE sciences, but need not involve a theoretical or methodological contribution.

All SBE primary or non-primary proposals must, like all SaTC proposals, also contribute toward the goal of creating a secure and trustworthy cyberspace. The SBE science contribution of any SBE / SaTC proposal must be related to bringing about that goal. It is not sufficient for a proposal submitted under SBE / SaTC to have an SBE science contribution alone or unrelated to bringing about a secure and trustworthy cyberspace. Such proposals are perhaps best submitted to a standing (core) SBE program.

Strong proposals will demonstrate the capabilities of the research team to bring to bear state-of-the-art research in the human sciences to the question. Strong proposals will seek to understand, predict and explain prevention, attack and/or defense behaviors and contribute to developing strategies for remediation. Proposals that contribute to the design of incentives, markets or institutions to reduce either the likelihood of cyber attack or the negative consequences of cyber attack are especially welcome, as are proposals that examine incentives and motivations of individuals.

Proposals submitted with a Social, Behavioral & Economic Sciences perspective will be evaluated with careful attention to the following:

- The mutual application of, and contribution to, basic Social, Behavioral and Economic science research.
- The generalizability of the research to multiple cyber security settings.
- The ultimate contribution to the construction of institutions that induce optimal behavior.
- The value of the research toward creating a secure and trustworthy cyberspace.

Given the nascent state of SBE science research in cybersecurity, we welcome proposals for workshops and other opportunities for intellectual engagements. Such proposals, however, should clarify how the efforts are likely to enable future SBE science contributions, preferably from a range of SBE sciences. Infrastructure-oriented proposals should include components that go beyond merely providing a resource for other researchers and should contribute directly to research.

Proposals with a SBE perspective may be submitted to all funding categories. However, Frontier proposals may not have SBE as their sole perspective, although multi-perspective Frontier proposals may include SBE as one of their perspectives.

Transition to Practice Perspective

Proposals from this perspective address the challenge of moving from research to capability. Proposals leverage successful results from previous and current basic research and focus on later stage activities in the research and development lifecycle - applied research, development, prototyping, testing, and experimental deployment. Strong preference will be given to projects whose outcomes result in fielded capabilities and innovations of direct benefit to networks, systems, and environments supporting NSF science and engineering research and education. Any software developed in this program area is required to be released under an open source license listed by the Open Source Initiative (<http://www.opensource.org/>). (This requirement is specific to the Transition to Practice Perspective and does not apply to other perspectives in the SaTC program.) Industry partnerships and collaborations are strongly encouraged.

Proposals submitted with a Transition to Practice perspective will be evaluated with careful attention to the following:

- The expected impact on the deployed environment described in the proposal.
- The extent to which the value of the proposed cybersecurity research and development is described in the context of a needed capability required by science and engineering, and potential impact across a broader segment of the NSF community.
- The feasibility, utility, and interoperability of the capability in its proposed operational role.
- A project plan that addresses in its goals and milestones the demonstration and evaluation of a working system in the target environment.
- Tangible metrics described to evaluate the success of the capabilities developed, and the steps necessary to take the system from prototype status to production use.

Transitions Option

Proposals for Small, Medium or Frontier projects that are submitted without a Transition to Practice perspective may include a Transitions option. Proposed activities under the Transitions option **MUST NOT** be described in the project description, and instead **MUST** be described in a supplemental document of no more than five pages. As opposed to the Transition to Practice Perspective, where proposed activities leverage pre-existing or current research results ready for hardening, experimentation and deployment, the Transitions option is meant to support the leveraging of proposed research activities and ideas whose outcomes at the end of the award are capable of being implemented, matured, applied, experimentally useable, or demonstrated as a useable capability. This option should describe how successful research results are to be further developed, matured and experimentally deployed in organizations or industries, including in networks and end systems. Proposals with a Transitions option may exceed the above-stated maximums of up to \$167,000 for Small projects, \$400,000 for Medium projects, and \$750,000 for Frontier projects.

Proposals submitted with a Transitions option will be evaluated with careful attention to the following:

- The expected impact on the deployed environment described in the supplemental document.
- The extent to which the value of the proposed cybersecurity research and development is described in the context of a needed capability and potential impact.

- The feasibility, utility, and interoperability of the capability in its proposed operational role.
- A plan that addresses in its goals and milestones the demonstration and evaluation of a working system in the target environment.
- Tangible metrics described to evaluate the success of the capabilities developed, and the steps necessary to take the system from prototype status to production use.
- The appropriateness of the budget for the option. The supplemental document should explain how the additional budget will be used to execute the option.

Questions on The Transition to Practice Perspective or the Transitions Option should be addressed directly to SaTC Program Officer Kevin Thompson in the Office of Cyberinfrastructure at ktompson@nsf.gov.

Cybersecurity Education Perspective

On occasion, the results of SaTC funded research lead to widespread changes in our understanding of the fundamentals of cybersecurity that can, in turn, lead to fundamentally new ways to motivate and educate students about cybersecurity. Proposals submitted to this perspective leverage successful results from previous and current basic research in cybersecurity and research on student learning, both in terms of intellectual merit and broader impact, to address the challenge of expanding existing educational opportunities and resources in cybersecurity. This might include but is not limited to the following efforts:

- Based on the results of previous and current basic research in cybersecurity, define a cybersecurity body of knowledge and establish curricular recommendations for new courses (both traditional and online), degree programs, and educational pathways leading to wide adoption nationally;
- Evaluate these effects of these curricula on student learning;
- Encourage the participation of a broad and diverse student population in Cybersecurity Education;
- Develop virtual laboratories to promote collaboration and resource sharing in Cybersecurity Education;
- Develop partnerships between centers of research in cybersecurity and institutions of higher education that lead to improved models for the integration of research experiences into cybersecurity degree programs;
- Develop and evaluate the effectiveness of cybersecurity competitions, games, and other outreach and retention activities.

Any software developed in this program area is required to be released under an open source license listed by the Open Source Initiative (<http://www.opensource.org>).

Cybersecurity Education proposal budgets are limited to \$300,000 and their durations are limited to two years.

Questions on Cybersecurity Education proposals should be addressed directly to SaTC Program Officer Victor Piotrowski in the Directorate for Education and Human Resources at vp Piotrowski@nsf.gov.

Frontier Projects, with total budgets ranging from \$1,200,001 to \$10,000,000 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. NSF seeks to fund approximately two Frontiers in Cybersecurity projects this year. They should be large, multi-institution projects that provide high-level visibility to grand challenge research areas in cybersecurity. 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 Frontier proposals. The length of and degree of detail provided in the Collaboration Plan should be commensurate with the complexity of the proposed project. Frontier projects may be submitted to the Trustworthy Computing Systems Perspective and/or the Transition to Practice Perspective. Frontier projects may also include the Social Behavioral, and Economic Sciences Perspective if it is integrated into one or both of the other perspectives.

A Frontiers proposal should have a long-term vision, with objectives that could not be attained simply by a collection of small or medium proposals provided similar resources. Such research could be multidisciplinary, but does not need to be: a successful Frontier project could be a deep, intensively focused effort on a single cybersecurity problem in a single discipline. We encourage both single perspective and multi-perspective Frontier proposals.

SaTC PI Meetings: The SaTC program aims to further and expand its research community. In this spirit, the program plans to host PI meetings every other year with participation from all funded projects and other representatives from the research community, government and industry. Principal investigators from all perspectives are expected to participate in these meetings.

For Small, Medium and Education awards, one or more project representatives (PI/co-PI/senior researcher, or NSF-approved replacement) must attend the first PI meeting held after the beginning of the award. For Frontier awards, one or more project representatives (PI/co-PI/senior researcher, or NSF-approved replacement) must attend EVERY PI meeting held throughout the duration of the grant.

III. AWARD INFORMATION

NSF anticipates approximately 5 Education awards, 51 Small awards, 12 Medium awards and 2 Frontier awards in FY13 and up to \$74,500,000 dependent upon the availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

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

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 3

An individual can participate as a PI, co-PI or Senior Personnel on no more than three proposals, of which no more than two can be for the TWC, SBE and/or TTP perspectives, and no more than one for the EDU perspective.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=jpg. 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.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

Additional Proposal Preparation and Submission Instructions

All proposals must be submitted to the CNS division, regardless of the proposal's perspective(s).

Proposal Titles: Proposal titles must begin with an acronym that indicates the most relevant perspective. Select an acronym from the following list:

- Trustworthy Computing Systems Perspective: TWC
- Social, Behavioral and Economic Science Perspective: SBE
- Transition to Practice Perspective: TTP
- Transitions Option: Option

More than one acronym can be used, separated by spaces. The first acronym should indicate the primary focus of the proposal. The acronym or acronyms should be followed with a colon, then the project class (Small, Medium or Frontier) followed by a colon, then the title of your project. For example, if you are submitting a Small proposal to the Trustworthy Computing Systems Perspective, then your title would be TWC: Small: Title.

If you are submitting to multiple perspectives, put the primary perspective first, followed by the second perspective, followed by a colon, then the project class, followed by a colon, then the title. For example, if you are submitting a Small proposal to the Trustworthy Computing Systems Perspective and the Social Behavioral and Economic Sciences Perspective, then your title would be TWC SBE: Small: Title.

If you submit a Transitions option, the title should begin with the acronym that indicates the relevant perspectives followed by a colon, then "Option" followed by a colon, then the project class followed by a colon, and then title. For example, If you are submitting a Medium Social, Behavioral and Economic Sciences Perspective with a Transitions Option, then the title would be: SBE: Option: Medium: Title.

If you submit a proposal as part of a set of collaborative proposals, the title of the proposal should begin with the acronym that indicates the relevant perspectives followed by a colon, then the project class followed by a colon, then "Collaborative" followed by a colon, and the title. For example, if you are submitting a collaborative set of proposals for a Medium project to the Transition to Practice Perspective, the title of each would be TTP: Medium: Collaborative: Title.

Finally, combinations of all the above are possible, with multiple perspectives, a Transitions option, and collaboration. An example title would be: TWC SBE: Option: Medium: Collaborative: Title.

Cybersecurity Education proposals' titles must contain a single acronym: EDU. They must not include a project class, a Transitions option, or any other perspective. Thus, the only valid SaTC specific title styles are EDU: Title or EDU: Collaborative: Title.

Project Description: The page limit for Frontiers proposals is increased to 20 pages, not including the

collaboration plan.

Supplementary Documents: In the Supplementary Documents Section, upload a list of Project Personnel and Partner Institutions (*Note - In collaborative proposals, only the lead institution should provide this information*) as follows:

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 must include all PIs, Co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdocs, and project-level advisory committee members. If the project includes a Transitions option, this list must include personnel and institutions involved in the option. 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

Proposals without a List of Project Personnel and Partner Institutions, or an incomplete list, will be deemed non-compliant and returned without review.

Transitions Option proposals: Projects with Trustworthy Computing Systems and/or Social, Behavioral and Economic Science perspectives (i.e., without a Transition to Practice perspective or Cybersecurity Education perspective) may include a Transitions option. Proposals submitted with a Transitions option MUST include a supplemental document of up to five pages in order for the option to be considered for funding. This document should describe how successful proposed research results are to be further developed, matured, and experimentally deployed in organizations, networks and end systems. It should also include an option budget that indicates what additional funds would be needed to carry out the Transitions option. The budget may be no larger than \$167,000 for small projects, \$400,000 for medium projects, and up to \$750,000 for frontier projects.

Note that the proposal budget sheets must not include the additional items to be funded should the Transitions option be funded. Should a decision be made to fund the option, the PI or PIs will be asked to submit a revised budget.

Collaboration Plan: 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, collaborative Medium proposals and all Frontier proposals must include a Collaboration Plan. Such proposals can add up to 3 additional pages 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 collaborative Medium proposal or a Frontier proposal does not include a Collaboration Plan, that proposal will be deemed non-compliant and returned without review.**

NOTE: Proposals submitted for the SBE perspective (only) may be submitted to the Small and Medium categories. Proposals with an SBE perspective that also include a Trustworthy Computing or Transition to Practice perspective may be submitted to the Frontiers category, as well as to the Small or Medium categories.

Allowed Combinations of Perspectives and Option: As noted above, not all combinations of perspectives are allowed, and not all combinations may have Transitions options. The following table is a synopsis of the above.

Size	Single Perspectives Allowed	Double Perspectives Allowed	Triple Perspectives Allowed	Base max	Option max	Project Description Page limit **
Education without option	EDU	None	None	\$300K	N/A	15
Small without option	TWC TTP SBE	Any two of TWC, SBE, TTP	All three of TWC, SBE, TTP	\$500K	N/A	15
Small with option	TWC SBE	TWC SBE or SBE TWC only	None	\$500K	\$167K	15 +5 page Supplemental Doc for Option
Medium without option	TWC TTP SBE	Any two of TWC, SBE, TTP	All three of TWC, SBE, TTP	\$1.2M	N/A	15
Medium with option	TWC SBE	TWC SBE or SBE TWC only	None	\$1.2M	\$400K	15 +5 page Supplemental Doc for Option
Frontier without option	TWC TTP	Any two of TWC, SBE, TTP	All three of TWC, SBE, TTP	\$10M	N/A	20
Frontier with option	TWC	TWC SBE or SBE TWC only	None	\$10M	\$750K	20 +5 page Supplemental Doc for Option

** Collaborative Medium proposals and all Frontier proposals are allowed an additional 3 pages in the project description for the

required collaboration plan. Collaborative Small proposals do not require this, but one can be supplied if desired.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Budgets for Education, Small, and Medium projects must include funding for one or more project representatives (PI/co-PI/senior researcher or NSF-approved replacement) to attend the first SaTC PI meeting held after the beginning of the award. Budgets for Frontier projects must include funding for one or more project representatives (PI/co-PI/senior researcher or NSF-approved replacement) to attend a SaTC PI meeting to be held every other year for the duration of the project. The first PI meeting for awards made under this solicitation is expected in 2014.

C. Due Dates

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

November 15, 2012 - November 30, 2012

MEDIUM Projects

December 01, 2012 - December 14, 2012

SMALL Projects

December 01, 2012 - December 14, 2012

CYBERSECURITY EDUCATION Projects

January 16, 2013 - January 30, 2013

FRONTIER Projects

September 15, 2013 - September 30, 2013

September 15 - September 30, Annually Thereafter

MEDIUM Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

SMALL Projects

December 01, 2013 - December 16, 2013

December 1 - December 15, Annually Thereafter

CYBERSECURITY EDUCATION Projects

November 01, 2014 - November 17, 2014

November 1 - November 15, Annually Thereafter

FRONTIER Projects

D. FastLane/Grants.gov Requirements

- For Proposals Submitted Via FastLane:

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

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

- For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program 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://www.nsf.gov/bfa/dias/policy/meritreview/>.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years (FY) 2011-2016*. 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 core strategies 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 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 variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening 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

Proposals may be submitted with one or more of the following perspectives: Trustworthy Computing and Systems; Social, Behavioral and Economics; Transition to Practice. Proposals for small or medium projects that do not have a Transition to Practice perspective can include an optional Transitions phase.

Proposals submitted with a Social, Behavioral and Economic perspective will be evaluated with careful attention to the following:

- The mutual application of, and contribution to, basic Social, Behavioral and Economic science research.
- The generalizability of the research to multiple cyber security settings.
- The ultimate contribution to the construction of institutions that induce optimal behavior.
- The value of the research toward creating a secure and trustworthy cyberspace.

Proposals submitted with a Transition to Practice perspective will be evaluated with careful attention to the following:

- The expected impact on the deployed environment described in the proposal.
- The extent to which the value of the proposed cybersecurity research and development is described in the context of a needed capability required by science and engineering, and potential impact across a broader segment of the NSF community.
- The feasibility, utility, and interoperability of the capability in its proposed operational role.
- A project plan that addresses in its goals and milestones the demonstration and evaluation of a working system in the target environment.
- Tangible metrics described to evaluate the success of the capabilities developed, and the steps necessary to take the system from prototype status to production use.

Proposals submitted with a Transitions option will be evaluated with careful attention to the following:

- The expected impact on the deployed environment described in the supplemental document.
- The extent to which the value of the proposed cybersecurity research and development is described in the context of a needed capability and potential impact.
- The feasibility, utility, and interoperability of the capability in its proposed operational role.
- An option plan that addresses in its goals and milestones the demonstration and evaluation of a working system in the target environment.
- Tangible metrics described to evaluate the success of the capabilities developed, and the steps necessary to take the system from prototype status to production use.
- The appropriateness of the budget for the option plan. The supplemental document should explain how the additional budget will be used to execute the option plan.

B. Review and Selection Process

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

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

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

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

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

Special Award Conditions:

For Education, Small, and Medium awards, special award conditions will require that at least one representative (PI/co-PI/senior researchers or NSF-approved replacement) from each SaTC project attend the first SaTC PI meeting held after the beginning of the award. For Frontier awards, special award conditions will require that at least one representative (PI/co-PI/senior researchers or NSF-approved replacement) from each SaTC project attend a SaTC PI meeting to be held every other year, for the duration of the project. The first PI meeting for awards made under this solicitation is expected in 2014.

C. Reporting Requirements

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

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

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:

- Jeremy Epstein, Program Director, CISE/CNS, 1175, telephone: (703) 292-8338, email: jepstein@nsf.gov
- Samuel Weber, Program Director, CISE/CNS, 1175, telephone: (703) 292-7096, email: sweber@nsf.gov
- Kevin Thompson, Program Director, OCI, 1145, telephone: (703) 292-4220, email: kthomps@nsf.gov
- Peter Muhlberger, Program Director, SBE/SES, 972, telephone: (703) 292-7848, email: pmuhlber@nsf.gov
- Andrew D. Pollington, Program Director, MPS/DMS, 1025, telephone: (703) 292-4878, email: adpollin@nsf.gov
- Nina Amla, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: namla@nsf.gov
- Sol Greenspan, Program Director, CISE/CCF, 1115, telephone: (703) 292-8910, email: sgreensp@nsf.gov
- Vijayalakshmi (Vijay) Atluri, Program Director, CISE/IIS, 1125, telephone: (703) 292-8930, email: vatluri@nsf.gov
- Victor P. Piotrowski, Program Director, EHR/DUE, 865, telephone: (703) 292-5141, email: vp Piotrow@nsf.gov
- Zhi (Gerry) Tian, Program Director, ENG/ECCS, 525, telephone: (703) 292-2210, email: ztian@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.

SaTC Questions: satc@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, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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: nspubs@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
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

[Policies and Important Links](#) | [Privacy](#) | [FOIA](#) | [Help](#) | [Contact NSF](#) | [Contact Web Master](#) | [SiteMap](#)



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated:
11/07/06
[Text Only](#)