CISE Research Infrastructure (CRI)

PROGRAM SOLICITATION
NSF 15-590

REPLACES DOCUMENT(S):
NSF 14-593

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

Preliminary Proposal Due Date(s) ***(required)*** (due by 5 p.m. submitter's local time):

November 10, 2015

Second Tuesday in November, Annually Thereafter

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

January 20, 2016

Third Wednesday in January, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

This is a revision of NSF 14-593. The revisions include:

1. New due dates. Requirement of a preliminary proposal submission prior to submission of a full CRI proposal.
2. Addition of a fourth Community Infrastructure (CI) track to provide for ongoing operations of current community infrastructure projects that have proven value to the community so that they can implement a plan to move towards long-term community sustainability (CI-SUSTAIN). Infrastructures that have received prior Community Infrastructure Enhancement (CI-EN) or legacy (such as CI-ADDO-EN) awards must submit any new CRI proposals to this track.
3. Allowing for 18-month budgets for CI Planning (CI-P) projects.
4. Addition of a requirement that CI proposals include funds in their budgets to attend the annual CI principal investigators (PI) meeting.
5. Revision of the maximum budget limit for CI proposals and awards, now $2.5 million.
6. Addition of language to emphasize the use of existing infrastructure such as CRI community resources or Cloud resources when possible. PIs must clearly demonstrate that projects cannot be implemented on other resources.
7. New requirement that projects pursuing Big Data as the research focus clearly show the Big Data to which the researchers will have access, and provide a more focused research agenda related to Big Data.
8. Revisions to the Proposal Preparation Instructions, including (a) a requirement for a section titled “Broader Impacts” within the Project Description section of a proposal, (b) clarification of what must be included as part of “Results from Prior NSF Support” within the Project Description section, and (c) clarification of what may be submitted as a Letter of Collaboration and/or Commitment in the Supplementary Documents section.

Any proposal 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:

CISE Research Infrastructure (CRI)

Synopsis of Program:

The CISE Research Infrastructure (CRI) program drives discovery and learning in the core CISE disciplines of the three participating CISE divisions by supporting the creation and enhancement of world-class research infrastructure that will support focused research agendas in computer and information science and engineering. This infrastructure will enable CISE researchers to advance the frontiers of CISE research. Further, through the CRI program CISE seeks to ensure that individuals from a diverse range of academic institutions, including minority-serving and predominantly undergraduate institutions, have access to such infrastructure.

The CRI program supports two classes of awards:

- **Institutional Infrastructure (II)** awards support the creation of **new (II-NEW)** CISE research infrastructure

or the **enhancement (II-EN)** of existing CISE research infrastructure to enable world-class CISE research opportunities at the awardee and collaborating institutions.

- **Community Infrastructure (CI)** awards support the **planning (CI-P)** for new CISE community research infrastructure, the **creation of new (CI-NEW) CISE research infrastructure**, the **enhancement (CI-EN) of existing CISE infrastructure**, or the **sustainment (CI-SUSTAIN) of existing CISE community infrastructure** to enable world-class CISE research opportunities for broad-based communities of CISE researchers that extend well beyond the awardee institutions. Each CI award may support the operation of such infrastructure, ensuring that the awardee institution(s) is (are) well positioned to provide a high quality of service to CISE community researchers expected to use the infrastructure to realize their research goals.

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.

- Harriet G. Taylor, Lead Program Director, CNS, 1175, telephone: (703) 292-8950, email: htaylor@nsf.gov
- Wendy Nilsen, Program Director, IIS, 1125, telephone: (703) 292-2568, email: wnilsen@nsf.gov
- Tao Li, Program Director, CCF, 1115, telephone: (703) 292-8238, email: taoli@nsf.gov
- Mimi McClure, Program Director, CNS, 1145, telephone: (703) 292-8950, email: mmcclure@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 25 to 30

With up to 20 Institutional Infrastructure (II) awards and up to 10 Community Infrastructure (CI) awards in each competition. The majority of the II awards will be made in the $200,000 - $750,000 range, though a small number of II awards may be made in the $750,000 - $1,000,000 range. The majority of the CI awards will be made in the $500,000 - $1,000,000 range, though a very small number of CI awards may be made in the $1,000,000 - $2,500,000 range. The majority of the Community Infrastructure Planning (CI-P) awards will be made in the $50,000 - $100,000 range.

Anticipated Funding Amount: $18,000,000

annually, subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

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

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: 2

In each annual competition, an individual may participate in at most two proposals, across all classes, as PI, Co-PI, or Senior Personnel.

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

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- **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:**

  Not Applicable

C. Due Dates

- **Preliminary Proposal Due Date(s) *(required)*** (due by 5 p.m. submitter's local time):

  November 10, 2015

  Second Tuesday in November, Annually Thereafter

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

  January 20, 2016

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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

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

Since its inception, the National Science Foundation (NSF) has supported the development of research infrastructure in order to advance the frontiers of science and engineering. These research infrastructure investments enable an academic science and engineering research enterprise that continues to be among the world's best. Similarly, NSF's Directorate for Computer and Information Science and Engineering (CISE) has a tradition of supporting CISE research infrastructure to enable transformative research at the frontiers of core CISE research disciplines and to provide unique opportunities for current and future generations of CISE researchers. The CISE Research Infrastructure (CRI) program draws on the rapidly evolving nature of the CISE disciplines and the unique infrastructure needs of CISE researchers to explore and extend the boundaries of CISE research frontiers.

II. PROGRAM DESCRIPTION

With its CISE Research Infrastructure (CRI) program, CISE drives discovery and learning in the core CISE disciplines covered by the three participating CISE divisions through support for the creation and enhancement of world-class research infrastructure that will enable focused research agendas in computer science. Further, through the CRI program, CISE seeks to ensure that individuals from a diverse range of academic institutions, including minority-serving and predominantly undergraduate institutions, have access to such infrastructure.

Examples of research infrastructure of interest to the program include, but are not limited to: systems of security and monitoring devices, linguistically annotated electronic language and vision corpora, spectrum and protocol analyzers, system testbeds, suites of robots, clusters of graphic processing units, software libraries and tools, networks of wireless and mobile devices, programmable network components, integrated systems of sensors, data repositories and visualization capabilities. These computing infrastructure resources (and others not listed here) are expected to enable unique and compelling research opportunities otherwise inaccessible to the core CISE research community.

Cognizant of the diversity of research infrastructure needs in the CISE research community, the CRI program supports two classes of projects as defined below.

- **Institutional Infrastructure**

Each Institutional Infrastructure (II) award supports the creation of **new (II-NEW)** CISE research infrastructure or the **enhancement (II-EN)** of existing CISE research infrastructure. The proposed research infrastructure must enable compelling new research opportunities ***for the proposing PI or team of PIs and associated students and collaborators*** (i.e., for individuals at the awardee and collaborating institutions). II proposals involving multiple investigators from one or more departments and/or institutions are welcome. Projects must include substantial involvement of CISE researchers and enable projects with a **clear research focus** related to the core CISE disciplines. II proposals that are led by or include 2-year, predominantly undergraduate, and/or minority-serving institutions are especially encouraged. II proposals may request up to $1 million total for project durations not to exceed 3 years.

- **Community Infrastructure**

Each Community Infrastructure (CI) award supports:

- **planning (CI-P)** for CISE community research infrastructure,
- **creation of new (CI-NEW)** CISE research infrastructure,
- **enhancement of existing (CI-EN)** CISE research infrastructure, or
- **sustainment of existing (CI-SUSTAIN)** CISE research infrastructure for the long term,

in order to provide compelling new research opportunities ***for a broad-based community of CISE researchers that extends well beyond the awardee institution(s)*****.** Furthermore, each CI award may support the operation of such infrastructure, ensuring that the awardee institution(s) is well positioned to provide a high quality of service to CISE community researchers expected to use the infrastructure to realize their research goals. CI projects should include a vision for future long-term community sustainability and operation of the infrastructure. Projects must include substantial involvement of CISE researchers and enable a **focused research agenda** related to the core CISE disciplines. CI proposals must provide compelling evidence that a diverse community of investigators will find the proposed infrastructure valuable to their research endeavors.

Support for CI projects is provided in four award categories:

- CI Planning (CI-P): Will fund grants of up to $100,000 for durations of up to 1.5 years to prepare for the submission of a CI-NEW or CI-EN proposal; and
- CI New (CI-NEW): Will fund grants of up to $2.5 million for durations of up to 3 years to create new CISE research infrastructure (NSF will provide no more than $250,000 per year for operating the infrastructure);
- CI Enhancement (CI-EN): Will fund grants of up to $2.5 million for durations of up to 3 years to enhance existing CISE research infrastructure (NSF will provide no more than $250,000 per year for operating the infrastructure); and
- CI Sustainability (CI-SUSTAIN): Will fund grants of up to $1 million for durations of up to 3 years to provide, for an existing infrastructure that is of value to the community, resources for (a) continued operation and (b) the implementation of a credible plan for achieving community sustainability at the end of the 3 years of funding (NSF will provide no more than $250,000 per year for operating the infrastructure). Projects that have received prior CI-EN awards (or legacy awards such as CI-ADDO-EN) must use this route for continued CRI funding. Resources that receive a CI-SUSTAIN award are not eligible for any future funding from the CRI program.

Organizations may submit CI-NEW and CI-EN proposals without having previously received CI-P grants. However, it is often the

case that CI-NEW proposals benefit from a significant planning activity, often via a CI-P award. In particular, investigators considering new CI projects should ensure that their proposed projects are sufficiently well-developed and based on prototypes or preliminary investigations.

The receipt of a CI-P grant does not guarantee support for a subsequent CI-NEW or CI-EN proposal.

Projects that involve enhancements of either institutional or community infrastructure must show clear evidence of:

- Success of the initial implementation;
- Usage by a diverse population of CISE researchers;
- Need for and benefits of the enhancement; and
- CISE community support for the enhancement.

Successful CISE Research Infrastructure projects often:

- Provide infrastructure that enables research with a **clear intellectual focus** related to the CISE core disciplines that the three participating CISE divisions support. A clear research agenda that is enabled by the implementation of the infrastructure is the central element of a successful CRI project. In particular, each CRI project demonstrates a clearly focused research agenda associated with a group of research faculty with expertise in the particular CISE sub-disciplinary focus area.
- Involve participation by a group of CISE-focused researchers and leadership by CISE discipline researchers. Projects may enable other faculty and interdisciplinary groups, but clear CISE participation, involvement, and interest in the research is essential.
- Enable innovative CISE research that is not possible without the infrastructure and that support emerging CISE research frontiers.

While educational benefits and outreach to a diverse group of researchers are also desirable elements of successful projects, projects that do not enable CISE disciplinary research are not responsive to the CRI solicitation. The primary motivations and outcomes from CRI funding must be related to potential research outcomes rather than potential educational benefits.

The CISE Research Infrastructure program is a special program offered by the CISE Directorate to focus on the unique infrastructure needs of CISE disciplinary researchers. CRI is about enabling change and transformative research in CISE core disciplines. CRI does not typically support upgrades of university computing facilities or infrastructure for groups that are primarily made up of non-CISE researchers.

CRI seeks projects that support a focused research agenda related to the CISE core disciplines; the focus must be clear and not simply computer science broadly across a range of disciplines. The emergence of Big Data and its involvement in research is now driving the need to upgrade and enhance infrastructure at many institutions. CRI needs to invest wisely in such infrastructure and support those projects that enable a compelling and focused research agenda related to Big Data and any associated data science methodologies. CRI proposals that are based on Big Data as the underlying research driver for the infrastructure must clearly describe a more focused research agenda related to specific types of Big Data and detail the Big Data to which the researchers involved in the associated research projects have access or reasonably expect to have access if the infrastructure is developed, enhanced, or sustained.

Likewise, the past years have seen the emergence of a number of community resources and testbeds funded through CRI, NSF, and other sources to support CISE research. For example, cloud computing resources such as NSF Future Cloud as well as the collection of cloud resources now available beyond those supported by NSF offer excellent opportunities for investigations and data management that do not require significant additional infrastructure investments. Researchers should first consider use of currently available resources before submitting a CRI proposal. All CRI proposals must clearly demonstrate that the requirements of the proposed research agenda demand the new or enhanced infrastructure requested in the CRI proposal and cannot be accomplished using other existing resources.

Since CRI does not typically support researchers in other disciplines who are simply employing existing computing and computational science approaches in their research, these researchers might look to infrastructure programs in their related NSF Directorate for possible support. Other NSF infrastructure programs that might be appropriate include: those offered by CISE's Division of Advanced Cyberinfrastructure (ACI) such as Campus Cyberinfrastructure - Data, Networking, and Innovation Program (CC*DNI), and Software Infrastructure for Sustained Innovation – S2I2 (SI2-S2I2), as well as the NSF Major Research Instrumentation (MRI) program.

III. AWARD INFORMATION

NSF expects to make the following types of award(s): Standard or Continuing Grants. Up to 20 Institutional Infrastructure (II) awards and up to 10 Community Infrastructure (CI) awards are anticipated in each competition. The majority of the II awards will be made in the $200,000 - $750,000 range, though a small number of II awards may be made in the $750,000 - $1,000,000 range. The majority of the CI awards will be made in the $500,000 - $1,000,000 range, though a very small number of CI awards may be made in the $1,000,000 - $2,500,000 range. The majority of the Community Infrastructure Planning (CI-P) awards will be made in the $50,000 - $100,000 range.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

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

professional societies and similar organizations in the U.S. associated with educational or research activities.

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: 2

In each annual competition, an individual may participate in at most two proposals, across all classes, as PI, Co-PI, or Senior Personnel.

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

Additional Eligibility Info:

Infrastructures that have received prior CI-EN or legacy (e.g., CI-ADDO-EN) awards may only submit proposals to the CI-SUSTAIN track. Resources that receive a CI-SUSTAIN award are not eligible for any future funding from the CRI program. The resource must either be transitioned to long-term community sustainment or seek other sources of funding at the end of the CI-SUSTAIN funding.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals *(required)*: Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

Submitters will receive feedback from program staff indicating either **encourage** or **discourage**. An **encourage** finding generally indicates that the proposal appears to be responsive to the CRI program guidelines and is a candidate for further development relative to the CRI solicitation. A **discourage** finding generally indicates that the project is typically not responsive to the CRI program, is more suited to another NSF opportunity, or has serious conceptual flaws that would not benefit from further development as a CRI submission. The feedback provided pursuant to the preliminary proposal is advisory only; submitters of both “encouraged” and “discouraged” preliminary proposals are eligible to submit full proposals.

Submission of a Preliminary Proposal is required to be eligible to submit a Full Proposal. Preliminary proposals must be submitted, via FastLane, by 5 p.m. proposer's local time on the due date for preliminary proposals.

Preliminary proposals are started in the same way as new full proposals.

- Proposers must be sure to check the box “If this is a preliminary proposal then check here” in the middle of the cover sheet.

This box appears on the cover sheet template just under the section labeled “Previous NSF Award.” Check the box to indicate that you are submitting a preliminary proposal and then submit the three pieces (cover sheet, project description, and one biographical sketch) as detailed below.

For collaborative projects, a single preliminary proposal should be submitted by the lead institution only. The collaborative partners should be indicated in the Collaborative Partners section of the preliminary proposal as described below.

Required components of the preliminary proposal are given below. Page limitations given here will be strictly enforced. Proposers should review the most current NSF *Grant Proposal Guide* (GPG) for specific information on signatures and format for the required sections.

The preliminary proposal should consist of three elements: cover sheet, project description, and bio-sketch. No other sections are required or should be included in the preliminary proposal.:

1. **Cover Sheet.** The PI and all Co-PIs should be indicated. The budget indicated on the Cover Sheet should be the overall project budget total including all collaborative pieces. The Project Title on the Cover Sheet should begin with **CRI Pre-proposal:**, followed by the acronym for the CRI project type (**II-New**, **II-EN**, **CI-P**, **CI-New**, **CI-EN**, or **CI-SUSTAIN**), followed by a colon, followed by the project title.
2. **Project Description (2-page limit).** Start the Project Description with:
    - **Project title;**
    - **Project type** (II-New, II-EN, CI-P, CI-New, CI-EN, or CI-SUSTAIN)**;**
    - **Collaborative partners:** All collaborative partners should be identified, including PIs and Co-PIs of the collaborative partners with their institutional and departmental affiliations;
    - **CISE core division** (CCF, CNS, IIS) most relevant for the submission – the CISE division the proposal will be submitted to; and
    - **Three keyword descriptors** for the research focus that the requested infrastructure will enable.

    The Project Description should then have the following clearly labeled sections:

    a. **A concise description of the infrastructure to be developed, enhanced, or sustained.** This includes a description of major equipment needs for the project as well as other significant costs. Projects that involve enhancements to, or sustainment of, existing infrastructures should include information about the existing

resources.

b. **The CISE Research Focus.** This section describes the research focus that is enabled by the infrastructure, the importance of the research problems to advancing CISE research frontiers, and the expertise of the research team relative to the focused research thrust. The description should identify the project team and detail each member's contributions to the project as well as specific expertise relative to the proposed focused research agenda. Note that Big Data and computational science across a variety of disciplines need more specific research focus descriptions including the specific data that are involved and available and the specific research goals that advance computational science, respectively, as opposed to simply employing Big Data and computational science techniques in a broad range of applications.
c. **Sample research project**. A short (2-3 sentences) summary of one potential research project should be included.
d. **The nature of the community involvement (required for CI-P, CI-New, CI-EN, or CI-SUSTAIN projects).** This section demonstrates the community involvement in the creation, enhancement, evaluation, and use of the resource. Describe the research community involved in the project. CI-New projects should show the community involvement and demand for the project as well as indicate the community commitment to establishing and using the infrastructure. CI-EN and CI-SUSTAIN projects should describe community usage of the infrastructure as well as community involvement in enhancement and sustainment efforts.
e. **The relevance to CISE.** This section should include:
    - A list of specific CISE researchers who are involved in the leadership of the project and in the development of the infrastructure (including any enhancement or sustainment plan, as appropriate);
    - A list of the CISE researchers communities that will benefit from the infrastructure; and
    - A list of any prior CISE funding the infrastructure has received (enhancement projects should also include the approximate date when the infrastructure involved was established).

3. **Biographical Sketch (2-page limit)**. A biographical sketch is required for the PI on the proposal or on the lead proposal for collaborative projects.

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.

The following supplements guidance found in the GPG and/or NSF Grants.gov Application Guide.

Proposal Titles: Proposal titles must begin with an acronym that indicates the type of CRI proposal being submitted. Select an acronym from the following list:

II-NEW: Institutional Infrastructure proposals requesting support for new CISE research infrastructure;

II-EN: Institutional Infrastructure proposals requesting support to enhance existing CISE research infrastructure;

CI-P: Community Infrastructure Planning proposals requesting support to prepare for future Community Infrastructure NEW (CI-NEW) or Community Infrastructure Enhancement (CI-EN) proposals;

CI-NEW: Community Infrastructure proposals requesting support to create new CISE research infrastructure; or

CI-EN: Community Infrastructure Enhancement proposals requesting support to enhance existing CISE research infrastructure.

CI-SUSTAIN: Community Infrastructure Sustainment projects requesting support for continued operations while a significant plan for achieving community sustainability is implemented.

The acronym should be followed with a colon, then the title of your project. For example, if you are submitting a proposal to enhance existing institutional infrastructure, then your title would be **II-EN: Title**.

Project Summary: The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity.

Provide 3-5 high-level keyword descriptors for the project at the end of the overview in the Project Summary. Include descriptors of the CISE core discipline(s) that is (are) most closely related to the intellectual focus of the research that the infrastructure will enable. You may also include a basic descriptor of the type of infrastructure. CISE personnel will use this information in implementing the merit review process. Keywords should be prefaced with "Keywords" followed by a colon and each keyword should be separated by semi-colons.

Project Description: The preparation instructions for Institutional Infrastructure and Community Infrastructure proposals are different. PIs are encouraged to read the following instructions carefully when preparing their proposals.

Institutional Infrastructure (II) Proposals:

Within the **15 pages** allocated for the Project Description, describe the:

- Proposed CISE research infrastructure and its estimated lifetime, noting whether it is new infrastructure to be created or existing infrastructure to be enhanced;
- Compelling new CISE research opportunities that will result from the availability of the proposed infrastructure;
- Researchers, educators, and students (including affiliated institutions) who will benefit from the proposed infrastructure creation or enhancement, including the synergies in their interests;
- CISE disciplines that will benefit from the infrastructure and CISE-centric research groups within the participating institutions that will use the infrastructure;
- Existing related resources along with a justification that the proposed research cannot be accomplished with these resources at the institution or elsewhere;
- Samples of focused research projects or agendas that the infrastructure will enable (note that the novelty and innovative aspects must be evident along with clear evidence that the proposed infrastructure is essential to moving CISE research frontiers forward);
- Awardee institution(s) commitment to operating and maintaining the infrastructure for its estimated useful life; and
- Detailed project management plan, with timeline, to create and deploy the new or enhance the existing research infrastructure.

If the proposed activity is for the **enhancement of existing infrastructure (II-EN),** in addition to describing the new research and education opportunities afforded by the proposed enhancement, also provide evidence of:

- Prior research and education contributions the infrastructure enabled and the researchers, educators and students it served [evidence of prior contributions may include innovative research results, refereed publications and theses that used the infrastructure (identifying those without co-authors from the proposing institutions), use by courses, courseware developed, software tool development, dissemination and use statistics (e.g., numbers of users, citations, etc.), technology transfer, and other government or industry support, etc.];
- Outreach to a diverse population of researchers;
- Community satisfaction with the resource and community support for the proposed enhancement; and
- Institutional plans to provide long-term sustainability of the infrastructure.

Community Infrastructure (CI) Proposals:

For CI Planning (CI-P) proposals, within the **15 pages** allocated for the Project Description, describe the:

- Research infrastructure envisioned, whether it is new infrastructure to be created or existing infrastructure to be enhanced along with the rational and need for the infrastructure;
- Communities that will use the proposed NEW infrastructure or that have used the existing infrastructure;
- Compelling new CISE research opportunities enabled by the infrastructure;
- CISE sub-disciplines that will benefit from the infrastructure and CISE-centric research groups that will use the infrastructure;
- Existing related resources along with a justification that the proposed research cannot be accomplished with these resources at the institution or elsewhere;
- Planning activities and timeline, including ways in which the related CISE research community will be involved in the design and creation of the infrastructure;
- Clear identification of individuals involved in the planning process and associated community interactions;
- Evidence that the new or enhanced infrastructure has community support and that any planned extensions meet the needs of the community (note that planning proposals for future CI-EN projects should include evidence that the current infrastructure that is to be enhanced has been used by CISE research communities and that these communities now desire the extensions envisioned); and
- Indications of plans for a future CI-NEW or CI-EN proposal (the timeline and activities should be clearly arranged to align with future CRI submission dates and criteria).

For CI-NEW or CI-EN proposals, within the **15 pages** allocated for the Project Description, describe the:

- Proposed CISE research infrastructure and its estimated lifetime, noting whether it is new infrastructure to be created and operated or existing infrastructure to be enhanced and operated;
- Compelling new CISE research opportunities enabled by the proposed infrastructure (including a description of the steps taken to identify the research opportunities enabled by the infrastructure as well as evidence that a diverse community of users plan to use the capabilities provided);
- CISE sub-disciplines that will benefit from the infrastructure and CISE-centric research groups within the participating institutions that will use the infrastructure;
- Existing related resources along with a justification that the proposed research cannot be accomplished with these resources at the institution or elsewhere;
- Samples of focused research projects or agendas that the infrastructure will enable (note that the novelty and innovative aspects of the research must be evident along with clear evidence that the proposed infrastructure is essential to moving CISE research frontiers forward);
- Quality of service commitment to the relevant CISE research community;
- Means by which user satisfaction will be evaluated and used to refine and improve subsequent infrastructure operations;
- Plans for outreach to ensure that a broad community of users is engaged;
- Community plans to provide long-term sustainability of the infrastructure;

- Qualifications of the PIs and the project team to manage the creation or enhancement and operations of the research infrastructure in support of its users; and
- Detailed project management plan, including a timeline, that outlines all steps to be undertaken to acquire, develop, and/or operate the research infrastructure, and identify the parties responsible for each major task.

If the proposed activity is for the **enhancement of existing infrastructure (CI-EN)**, in addition to describing the new research and education opportunities afforded by the proposed enhancement also provide evidence of:

- Prior research and education contributions the infrastructure enabled and the researchers, educators and students it served [evidence of prior contributions may include innovative research results, refereed publications and theses that used the infrastructure (identifying those without co-authors from the proposing institutions), use by courses, courseware developed, software tool development, dissemination and use statistics (e.g., numbers of users, citations, etc.), technology transfer, and other government or industry support, etc.];
- Outreach to a diverse population of researchers;
- Community satisfaction with the resource and community support for the proposed enhancement; and

- Community plans to provide long-term sustainability of the infrastructure.

For CI-SUSTAIN proposals, within the **15 pages** allocated for the Project Description, describe the

- Basic infrastructure with its development history;

- CISE sub-disciplines that have benefited from the infrastructure and CISE researchers involved in the development and leadership roles;
- Prior research and education contributions the infrastructure enabled and the researchers, educators and students it served [evidence of prior contributions may include innovative research results, refereed publications and theses that used the infrastructure (identifying those without co-authors from the proposing institutions), use by courses, courseware developed, software tool development, dissemination and use statistics (e.g., numbers of users, citations, etc.), technology transfer, and other government or industry support, etc.];
- Outreach to a diverse population of researchers;
- Community satisfaction with the existing resource and community support for any proposed enhancements as well as sustained operation (note that the resource must demonstrate that it is of value to the community through simply funding operations); and
- Coherent and detailed plan for achieving community sustainability of the infrastructure during the three years of funding of the project. This plan should include concrete steps, communities involved, and steps that will ensure success of the plan. The proposal should also describe any prior steps that have been taken towards community sustainability and their results. It should also describe the rationale for the approach and the factors that indicate that the plan can be successful.

If the proposed infrastructure is related to previously NSF-funded infrastructure, describe the extent to which the previously funded infrastructure will be integrated with the new infrastructure. Describe how funds remaining from earlier NSF grants for related infrastructure will be integrated with the requested award.

Infrastructures that have received prior CI-EN or legacy (e.g., CI-ADDO-EN) awards may only submit proposals to the CI-SUSTAIN track. Resources that receive a CI-SUSTAIN award are not eligible for any future funding from the CRI program. The resource must either be transitioned to long-term community sustainment or seek other sources of funding at the end of the CI-SUSTAIN funding.

CI proposals should also include a well-reasoned budget justification that clearly distinguishes the costs to (1) acquire, develop and deploy the new or enhanced infrastructure; and (2) operate the proposed infrastructure. (Note that NSF will support operations at levels not to exceed $250,000 each year.)

Proposers are reminded that, as specified in GPG Chapter II.C.2.d:

- **The Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts."** This section should provide a discussion of the broader impacts of the proposed activities.
- **Results from Prior NSF Support: If any PI or co-PI identified on the project has received NSF funding (including any current funding) in the past five years, the Project Description must contain information on the award(s), irrespective of whether the support was directly related to the proposal or not.** In cases where the PI or co-PI has received *more than one award* (excluding amendments), they need only report on the one award most closely related to the proposal. Funding includes not just salary support, but any funding awarded by NSF. Please refer to the GPG for details about the information that must be provided. **Note that these results must from prior NSF support be separately described under two distinct headings, "Intellectual Merit" and "Broader Impacts."**

Proposals without these two distinct sections (including the heading "Broader Impacts") within the Project Description may be returned without review.

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

(1) *List of Project Personnel and Partner Institutions (Note: In collaborative proposals, the lead institution should provide this information for all participants):*

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. 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 Community College; Paid Consultant

5. Susan White; DEF Corporation; Unpaid Collaborator

6. Tim Green; ZZZ University; Subawardee

(2) A list of past and present Collaborators not related to this proposal (Note: In collaborative proposals, the lead institution should provide this information for all participants):

Provide current, accurate information for **all active or recent collaborators** of personnel listed in (1) above. NSF staff will use this information in the merit review process to manage conflicts of interest. This list -- distinct from (1) above -- must include all active or recent collaborators of all personnel involved with the proposed project. Collaborators include any individual with whom any member of the project team -- including PIs, Co-PIs, Senior Personnel, paid/unpaid Consultants or Collaborators, Subawardees, Postdocs, and project-level advisory committee members -- has collaborated on a project, book, article, report, or paper within the preceding 48 months; or co-edited a journal, compendium, or conference proceedings within the preceding 24 months. This list should include (in this order) Full name and Organization(s), with each item separated by a semi-colon. Each person listed should start a new numbered line. The following is a sample format; other similar formats are acceptable.

1. Collaborators for Mary Smith; XYZ University; PI
    1. Helen Gupta; ABC University

    2. John Jones; University of PQR

    3. Fred Gonzales; DEF Corporation

    4. Susan White; DEF Corporation

2. Collaborators for John Jones; University of PQR; Senior Personnel
    1. Tim Green; ZZZ University

    2. Ping Chang, ZZZ University

    3. Mary Smith; XYZ University

3. Collaborators for Jane Brown; XYZ University; Postdoc
    1. Fred Gonzales; DEF Corporation

4. Collaborators for Bob Adams; ABC Community College; Paid Consultant
    1. None

5. Collaborators for Susan White; DEF Corporation; Unpaid Collaborator
    1. Mary Smith; XYZ University

    2. Harry Nguyen; Welldone Institution

6. Collaborators for Tim Green; ZZZ University; Subawardee
    1. John Jones; University of PQR

NOTE: The list of collaborators includes all current and past (see above timelines) projects for all participants in the proposal. It is not a list of the collaborators for the given proposal; this should be provided pursuant to item (1) of Supplementary Documents above.

(3) Data Management Plan (required):

Proposals must include a supplementary document of no more than two pages labeled "Data Management Plan." This supplementary document should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results.

See Chapter II.C.2.j of the GPG for full policy implementation.

For additional information see: http://www.nsf.gov/bfa/dias/policy/dmp.jsp.

For specific guidance for proposals submitted to the Directorate for Computer and Information Science and Engineering (CISE) see: http://www.nsf.gov/cise/cise_dmp.jsp.

Proposals that include Data Management Plans exceeding two pages in length will be returned without review.

(4) Documentation of collaborative arrangements of significance to the proposal through Letters of Collaboration:

There are two types of collaboration, one involving individuals/organizations that are included in the budget, and the other involving individuals/organizations that are not included in the budget. Collaborations that are included in the budget should be described in the Project Description. Any substantial collaboration with individuals/organizations not included in the budget should be described in the Facilities, Equipment and Other Resources section of the proposal (see GPG Chapter II.C.2.i). In either case, whether or not the collaborator is included in the budget, **a letter of collaboration from each named participating organization must be provided at the time of submission of the proposal. Such letters must explicitly state the nature of the collaboration, appear on the organization's letterhead and be signed by the appropriate organizational representative.**

Please note that letters of support may not be submitted. Such letters do not document collaborative arrangements of significance to the project, but primarily convey a sense of enthusiasm for the project and/or highlight the qualifications of the PI or co-PI. **Reviewers will be instructed not to consider these letters of support in reviewing the merits of the proposal.**

(5) Other specialized information:

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

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

No other supplementary documents, except as permitted by the NSF Grant Proposal Guide, are allowed.

The following table is a synopsis of the above:

CRI Project Type	Maximum Funding	Operation Max	Expectations	Characteristics
Institutional Infrastructure - New (II-NEW)	$1M	N/A	Document the need for the new infrastructure in light of existing infrastructure available within and outside the participating institution (s). Demonstrate	Infrastructure primarily benefits research communities at the institutions of the PI or collaborative PIs. Infrastructure enables

			CISE research community support within the participating institutions. Show how the infrastructure will enable innovative CISE disciplinary research.	compelling research for CISE researchers that may extend the frontiers of the core CISE disciplines.
Institutional Infrastructure - Enhancement (II-EN)	$1M	N/A	Document the need and support for the enhancement within the institution's communities. Demonstrate the success of the initial implementation. Demonstrate CISE research community support within the participating institutions. Show how the infrastructure will enable innovative CISE disciplinary research.	Same as above
Community Infrastructure - Planning (CI-P)	$100K	N/A	Specify a concrete planning strategy, timeline, and set of activities for developing a future full CRI proposal. Describe a vision for the infrastructure, including possible new research opportunities that could be realized. Justify the need for the infrastructure as well as CISE community support for the infrastructure. Show how CISE researchers will be involved in the planning as well as future development activities.	Infrastructure benefits a broad-based community of CISE researchers that extends well beyond awardee institutions. Proposal includes outreach to communities and commitment to high-quality service. Infrastructure enables compelling research for CISE researchers that may extend the frontiers of the core CISE disciplines.
Community Infrastructure - New (CI-NEW)	$2.5M	$250K	Document the need for the new infrastructure in light of existing infrastructure available to the relevant CISE research communities.	Infrastructure benefits a broad-based community of CISE researchers that extends well beyond awardee institutions.

			Demonstrate CISE research community support within the participating institutions. Show how the infrastructure will enable innovative CISE disciplinary research.	Proposal includes outreach to communities and commitment to high-quality service. Infrastructure enables compelling research for CISE researchers that may extend the frontiers of the core CISE disciplines.
Community Infrastructure - Enhancement (CI-EN)	$2.5M	$250K	Document the need, and support for, the enhancement within the relevant communities. Demonstrate the success of the initial implementation. Document support from, and use by, the CISE research community beyond participating institutions. Show how the infrastructure will enable innovative CISE disciplinary research.	Same as above
Community Infrastructure - Sustainment (CI-SUSTAIN)	$1M	$250K	Demonstrate the success of the resource and use by the community. Document support from, and use by, the CISE research community beyond participating institutions. Justify the value of continuing operations without enhancement or with the proposed enhancements. Provide a credible plan for moving to long-term community sustainability. Ensure that funds to engage the community to implement this plan are reflected in the	Sustained operations of existing CISE infrastructure of proven value to the research community. Credible plan during the three years of funding to move to long-term community sustainability for the resource. Resources that have had a prior CI-EN award must use this route for continued funding.

			project budget.	

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

The CRI program funds the development and implementation of CISE-centric research infrastructure. CRI does not fund the associated research that is subsequently enabled by the infrastructure. Typically CRI provides at most modest funds for faculty directly related to faculty involvement in the development and implementation of the infrastructure. Likewise CRI only supports funds for graduate students and other technical support essential to the development of the infrastructure. Projects requesting graduate student support should request limited, if any, faculty support as needed to establish the infrastructure. Any proposal requesting direct student support in operations and maintenance or development efforts must justify that involvement in terms of both project needs and the training of the next generation of instrumentalists (reviewers will be asked to evaluate the appropriateness of this type of involvement). Modest operational funds may be included for community infrastructure. Universities must assume operational costs for institutional infrastructure and demonstrate a clear commitment and plan to maintain and operate the infrastructure after the end of the CRI funding.

For II and CI projects, the CRI program supports:

- The acquisition and/or development of new software tools, equipment, testbeds, resources, platforms, etc.;
- The enhancement (through acquisition and/or development) of existing software tools, equipment, testbeds, resources, platforms, etc.;
- Travel expenses necessary for coordination of multi-institutional projects;
- Technical personnel essential to the successful design, acquisition, development, and deployment of the proposed research infrastructure; and
- Postdocs, graduate and/or undergraduate students to participate in the design, acquisition and/or development of the proposed research infrastructure.

For CI projects ONLY, CRI supports:

- Professional staff critical to the operation of the infrastructure, including providing effective user support;
- Postdocs, graduate and/or undergraduate students to participate in the operation and assessment of the infrastructure as long as these activities do *not* constitute research;
- Outreach and participation activities like workshops or training activities that broaden participation and prepare researchers, educators and students to use the proposed infrastructure effectively;
- Assessment activities that evaluate project outcomes; and
- Attendance by the PI (and co-PIs as desired by the project team) at an annual CRI community infrastructure PI meeting (at least $1,500 per year must be included in the project budget for this purpose).

The CRI program will ***not*** provide support for the following items:

- General-purpose personal computing equipment, office equipment, software, databases, etc.;
- Individual research enabled by the infrastructure; or
- Travel to present research results.

C. Due Dates

- **Preliminary Proposal Due Date(s)** ***(required)*** (due by 5 p.m. submitter's local time):

  November 10, 2015

  Second Tuesday in November, Annually Thereafter

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

  January 20, 2016

  Third Wednesday in January, Annually Thereafter

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://www.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

Within the context of the Intellectual Merit and Broader Impacts criteria, reviewers will be asked to consider the following issues when preparing their reviews:

For Institutional Infrastructure (II) proposals:

- Does the proposal provide convincing evidence that the proposed infrastructure will result in compelling new CISE research and education opportunities?
- How well does the proposed research focus fit with CISE core disciplines? Are CISE researchers involved in an integral way, particularly in leadership positions?
- Does the proposal provide plans for use by a diverse group of researchers?
- Does the proposing institution(s) provide a convincing case of their commitment to maintain and operate the infrastructure for its useful life?
- Is the project management plan, including timeline, costs, and personnel, realistic?

For Community Infrastructure Planning (CI-P) proposals:

- Does the proposal provide convincing evidence that the proposed infrastructure will result in compelling new CISE research and education opportunities?
- How well does the proposed research focus that the infrastructure enables fit with CISE core disciplines? Are CISE researchers involved in an integral way in the CRI project, particularly in leadership positions?
- Does the proposal provide evidence of community need for the infrastructure as well as community involvement in the design and implementation of the infrastructure?
- Is there clear evidence that the new infrastructure or the enhanced infrastructure meets the needs of the community that is involved and that the community supports the development of the infrastructure? Has any existing infrastructure been used successfully by the community, particularly CISE researchers?
- Is there a sound project management plan, including timeline and personnel?
- Is the planning focused around preparation for a full infrastructure implementation and submission of a future CI-New or CI-EN proposal?

For Community Infrastructure NEW (CI-New) and Community Infrastructure Enhancement (CI-EN) proposals:

- Does the proposal provide convincing evidence that the research infrastructure will result in compelling new research and education opportunities?
- How well does the proposed research focus fit with CISE core disciplines? Are CISE researchers involved in an integral way, particularly in leadership positions?
- Does the proposal provide convincing evidence that a diverse community of users plans to use the capabilities provided?
- Is there existing similar infrastructure that is available to the community? How is this infrastructure different, and is development of the new infrastructure or enhancement of the existing infrastructure justified with respect to other existing infrastructure available to the community?
- Have the PIs convincingly demonstrated that the project team has the skills necessary to acquire, develop, and/or operate

community research infrastructure so as to provide a high level of service and support for a broadly-based community of users?
- Is the project management plan, including timeline, costs, and personnel, realistic?
- To what extent does the proposal convincingly describe the means by which user satisfaction will be evaluated and used to refine and improve subsequent infrastructure services and operations?
- If the proposal is for new community infrastructure, has the team demonstrated community support for the infrastructure and plans for community involvement in the development and future use of the infrastructure?
- If the proposal describes plans to enhance existing infrastructure, determine the extent to which:
    - The proposal builds a convincing case that the existing infrastructure has enabled compelling research and education opportunities. Evidence of this may include innovative research results, refereed publications and theses that used the infrastructure [note those without co-authors from the proposing institution(s)], use by courses, courseware developed, software tool development, dissemination and use, technology transfer, and other government or industry support, etc.;

    - The PIs convincingly demonstrated that they have provided a high level of user support for a broad-based research and education community.

For Community Infrastructure Sustainment (CI-SUSTAIN) proposals:

- Does the proposal provide convincing evidence that the research infrastructure has resulted in compelling new research and education opportunities?
- How well does the proposed research focus fit with CISE core disciplines? Are CISE researchers involved in an integral way, particularly in leadership positions?
- Does the proposal provide convincing evidence that a diverse community of users plans to use the capabilities provided?
- Have the PIs convincingly demonstrated that the project team has the skills necessary to acquire, develop, and/or operate community research infrastructure so as to provide a high level of service and support for a broadly-based community of users?
- Is the project management plan, including timeline, costs, and personnel, realistic?
- Determine the extent to which:
    - The proposal builds a convincing case that the existing infrastructure has enabled compelling research and education opportunities. Evidence of this may include innovative research results, refereed publications and theses that used the infrastructure [note those without co-authors from the proposing institution(s)], use by courses, courseware developed, software tool development, dissemination and use, technology transfer, and other government or industry support, etc.;

    - The PIs convincingly demonstrate that they have provided a high level of user support for a broad-based research and education community.

- Is there a credible plan for achieving long-term community sustainability at the end of the CRI funding? Are the steps in the plan realistic and appropriate? Is the community involved in an integral way in the implementation of the plan?
- Is there evidence that the resource is of value to the community through simply funding continued operations while moving toward long-term community sustainment?

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 generally be completed and submitted by each reviewer and/or panel. 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 no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 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:

- Harriet G. Taylor, Lead Program Director, CNS, 1175, telephone: (703) 292-8950, email: htaylor@nsf.gov
- Wendy Nilsen, Program Director, IIS, 1125, telephone: (703) 292-2568, email: wnilsen@nsf.gov
- Tao Li, Program Director, CCF, 1115, telephone: (703) 292-8238, email: taoli@nsf.gov
- Mimi McClure, Program Director, CNS, 1145, telephone: (703) 292-8950, email: mmcclure@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information),

programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "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.

Related Programs:

NSF provides funding opportunities for the computing community via the following programs and their solicitations:

Discovery Research Programs

Computer and Network Systems (CNS): Core Programs, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12765&org=CNS&from=home

Information and Intelligent Systems (IIS): Core Programs, http://nsf.gov/funding/pgm_summ.jsp?pims_id=13707

Computing and Communication Foundations (CCF): Core Programs, http://nsf.gov/funding/pgm_summ.jsp?pims_id=503220

Algorithms in the Field, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505125&org=CCF&from=home

CAREER: Faculty Early Career Development, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503214&org=CISE*

CISE-MPS Interdisciplinary Faculty Program in Quantum Information Science,*http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504743&org=CISE*

Collaborative Research in Computational Neuroscience (CRCNS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5147&org=CISE*

Computer & Information Science and Engineering Research Initiation Initiative (CRII), http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504952&org=CISE&sel_org=CISE&from=fund

Critical Techniques and Technologies for Advancing Big Data Science and Engineering (BIGDATA), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504767&org=CISE*

Cultivating Cultures for Ethical STEM (CCE STEM), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505027&org=CISE*

Cyber-Innovation for Sustainability Science and Engineering (CyberSEES),*http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504829&org=CISE*

Cyber-Physical Systems (CPS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503286&org=CISE*

Engineering Research Centers (ERCs), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5502&org=CISE*

Enhancing Access to the Radio Spectrum (EARS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503480&org=CISE*

Expeditions in Computing, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503169&org=CISE*

Exploiting Parallelism and Scalability (XPS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504842&org=CISE*

Grant Opportunities for Academic Liaison with Industry (GOALI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504699&org=CISE*

Industry/University Cooperative Research Centers Program (I/UCRC), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5501&org=CISE*

Integrative Strategies for Understanding Neural and Cognitive Systems (NSF-NCS), http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505132&org=CISE&sel_org=CISE&from=fund

NSF Innovation Corps (I-Corps), http://www.nsf.gov/news/special_reports/i-corps/

National Robotics Initiative (NRI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503641&org=CISE*

Partnerships for International Research and Education (PIRE), http://nsf.gov/funding/pgm_summ.jsp?pims_id=505038

Critical Resilient Interdependent Infrastructure Systems and Processes (CRISP), http://nsf.gov/funding/pgm_summ.jsp?pims_id=505180 Science and Technology Centers (STC), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5541&org=CISE*

Science of Learning Centers (SLC), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5567&org=CISE*

Secure and Trustworthy Cyberspace (SaTC), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504709&org=CISE*

Smart and Connected Health (SCH), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504739&org=CISE*

United States-Israel Collaboration in Computer Science (USICCS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504828&org=CISE*

Education and Workforce Development Programs

ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering

Careers, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383&org=CISE*

Advanced Technological Education (ATE), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5464&org=CISE*

CyberCorps(R): Scholarship for Service (SFS), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504991&org=CISE*

Cyberlearning and Future Learning Technologies, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504984&org=CISE*

Discovery Research K-12 (DRK-12), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047&org=CISE*

East Asia and Pacific Summer Institutes for US Graduate Students (EAPSI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5284&org=CISE*

Graduate Research Fellowship Program (GRFP), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201&org=CISE*

Improving Undergraduate STEM Education (IUSE: EHR), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505082&org=CISE*

Information Technology Experiences for Students and Teachers (ITEST), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5467&org=CISE*

International Research Experiences for Students (IRES), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12831&org=CISE*

NSF Research Traineeship Program, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505015&org=CISE*

NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5257&org=CISE*

Research Experiences for Teachers (RET) in Engineering and Computer Science, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505170&org=CISE*

Research Experiences for Undergraduates (REU), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&org=CISE*

STEM + Computing (STEM+C) Partnerships, *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505006&org=CISE*

Research Infrastructure Programs

Campus Cyberinfrastructure -- Data, Networking, and Innovation Program (CC*DNI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504748&org=CISE*

CISE Research Infrastructure (CRI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12810&org=CISE*

Major Research Instrumentation (MRI), *http://www.nsf.gov/od/iia/programs/mri/*

Software Infrastructure for Sustained Innovation -- SSE & SSI (SI^2 -- SSE&SSI), *http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504865&org=CISE*

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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:

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