Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications (BD Spokes)

PROGRAM SOLICITATION
NSF 16-510

National Science Foundation

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Social, Behavioral & Economic Sciences

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

January 12, 2016

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

February 25, 2016

IMPORTANT INFORMATION AND REVISION NOTES

This solicitation extends the BD Hubs network established by the *Big Data Regional Innovation Hubs (BD Hubs): Accelerating the Big Data Innovation Ecosystem* solicitation (NSF 15-562) by establishing multi-institutional and multi-sector collaborative "BD Spokes."

All proposals to this solicitation must include a letter of collaboration from a BD Hub coordinating institution. **Any proposals not including a letter of collaboration from a BD Hub coordinating institution will be returned without review. No exceptions will be made.**

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

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

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications (BD Spokes)

Synopsis of Program:

In 2012, the Administration announced the National Big Data Research and Development Initiative to address some of the Nation's most pressing R&D challenges in extracting knowledge and insights from large, complex collections of digital data. To this end, NSF's Directorate for Computer and Information Science and Engineering (CISE) initiated the National Network of Big Data Regional Innovation Hubs (BD Hubs) program to foster multi-sector collaborations among academia, industry, and government. Four BD Hubs have been established, one each in the *Midwest*, *Northeast*, *South*, and *West* regions of the country (see Introduction for regional definitions). The BD Hubs are expected to serve a convening and coordinating role—helping to bring together a wide range of Big Data stakeholders in order to connect solution seekers with solution providers.

This *Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications (BD Spokes)* solicitation extends the BD Hubs network by establishing multi-institutional and multi-sector collaborations (i.e., across academia, industry, government, non-profits, etc.) focused on topics of specific interest to a given region, which build upon the capabilities and strengths of said region. Working in concert with the corresponding regional BD Hub, a BD Spoke would work on a particular topic that requires Big Data approaches and solutions. Each BD Spoke would function similar to a BD Hub—in that it will take on a convening and coordinating roll as opposed to primarily carrying out research—but with a narrower and goal-driven scope. The set of activities managed by a BD Spoke would ensure that progress is made toward providing solutions in the chosen topic area, including, for example, gathering important stakeholders via forums, meetings, workshops, etc.; engaging with end users and solution providers via competitions, community challenges, etc.; and forming multi-disciplinary teams to tackle questions no single field can solve alone. The regional BD Hub Steering Committee will provide general guidance to the BD Spoke and assist the BD Spoke in coordinating with the national BD Hub network, other BD Spokes, and the broader innovation ecosystem.

The Big Data activities of a BD Spoke will be guided by the following broad themes:

- Accelerating progress towards addressing societal grand challenges relevant to regional and national priority areas;
- Helping automate the Big Data lifecycle; and
- Enabling access to and increasing use of important and valuable available data assets, also including international data sets, where relevant.

This solicitation covers one aspect of NSF's overall Big Data R&D portfolio, which includes: research; infrastructure development and provisioning; education and workforce development; and community engagement. Prior to preparing a proposal in response to this or any other Big Data-related solicitation, applicants are strongly encouraged to review the solicitation requirements and consult with cognizant NSF program officers to determine appropriateness of fit. For example, this solicitation funds the formation of BD Spokes, as well as planning grants for future BD Spokes proposals, which will primarily carry out collaboration and partnership building activities, and will require a topical and collaborative linkage with a specific BD Hub. This solicitation is not meant to fund proposals where fundamental research is the primary activity. If research is a substantial portion of the proposed activities, please consult with the cognizant NSF program officer of this solicitation. For example, the NSF *Critical Techniques and Technologies for Advancing Foundations and Applications of Big Data Science & Engineering* (BIGDATA) solicitation may be more relevant for those seeking basic research funding in Foundations and Innovative Applications related to Big Data. Similarly, basic privacy research proposals would be more suited to NSF's Secure And Trustworthy Cyberspace (SaTC) program.

All proposals to this solicitation must include a letter of collaboration from a BD Hub coordinating institution. **Any proposals not including a letter of collaboration from a BD Hub coordinating institution will be returned without review. No exceptions will be made.**

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.

- Fen Zhao, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-7344, email: fzhao@nsf.gov

- Earnestine Psalmonds, Directorate for Education & Human Resources, telephone: (703) 292-8630, email: epsalmon@nsf.gov

- Heng Xu, Directorate for Social, Behavioral and Economic Sciences, telephone: (703) 292-8643, email: hxu@nsf.gov

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

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

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 19

Spoke Grants - Approximately 9 BD Spoke grants are anticipated through this solicitation.

Planning Grants - Approximately 10 planning grant awards are expected to be funded.

The total number of spokes and planning grants will be subject to panel reviews and availability of funds.

Anticipated Funding Amount: $10,000,000

Each BD Spoke will be funded up to a maximum of $1,000,000 total for up to 3 years, subject to the availability of funds.

Each planning grant will be funded up to a maximum of $100,000 total for up to 1 year, 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.
- State and Local Governments: State educational offices or organizations and local school districts.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An investigator may participate as PI or Co-PI in no more than 1 proposal submitted in response to this solicitation.

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

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.

- **Preliminary Proposal Submission:** Not required

- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:**

  Inclusion of voluntary committed cost sharing is prohibited.

- **Indirect Cost (F&A) Limitations:**

  Not Applicable

- **Other Budgetary Limitations:**

  Not Applicable

C. Due Dates

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

  January 12, 2016

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

  February 25, 2016

Proposal Review Information Criteria

Merit Review Criteria:

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

Award Administration Information

Award Conditions:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

TABLE OF CONTENTS

I. INTRODUCTION

As part of the Administration's overarching Big Data R&D Initiative launched in 2012, NSF's Directorate for Computer and Information Science and Engineering (CISE) recently funded a national network of "Big Data Regional Innovation Hubs" (BD Hubs). Interested stakeholders participated in a series of regional charrettes—intensive one-day workshops to form collaborations representative of their regions, and to brainstorm on ideas leading toward the preparation of proposals for the BD Hubs within their respective regions. Discussions and outcomes from these events are available within a HUBzero community portal at https://bdhub.info.

The BD Hubs and Spokes network will serve convening and coordinating roles to help bring together a wide range of Big Data stakeholders in order to connect solution seekers with solution providers. Such a brain trust is expected to augment and ideate new research efforts via forums, meetings, workshops, challenges, and other convening activities.

The regional breakdowns, coordinating institution(s), and points of contact for each BD Hub follow below (geographical regions adapted from https://www.census.gov/econ/census/help/geography/regions_and_divisions.html).

NORTHEAST: This region includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

- Coordinating Institution: Columbia University
- Point of Contact: NortheastBDHub@columbia.edu

MIDWEST: This region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

- Coordinating Institution: University of Illinois at Urbana-Champaign
- Point of Contact: bdhub-info@ncsa.illinois.edu

SOUTH: This region includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

- Coordinating Institutions: Georgia Institute of Technology, University of North Carolina at Chapel Hill
- Points of Contact: info@southbdhub.org

WEST: This region includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

- Coordinating Institutions: University of California-San Diego, University of Washington, University of California-Berkeley
- Point of Contact: WesternBDHub@SDSC.edu

This solicitation aims to augment the BD Hubs by establishing a series of *Big Data Spokes (BD Spokes)*, with each BD Spoke proposing activities on a topic that aligns with the priorities identified by the corresponding BD Hub. BD Spokes must work in close concert with the regional BD Hub to formulate their research agenda and plan their activities. BD Spokes are expected to be action-oriented, making measurable progress towards specific goals within their topic area, using Big Data technologies. Some of the topic areas that were already identified in the regional charrettes include, but are not restricted to, Transportation, Health, Energy, Public Safety, Education, and Smart and Connected Communities more broadly.

II. PROGRAM DESCRIPTION

Overarching Themes

This BD Spokes solicitation supports Big Data activities in a specific topic area of interest to a corresponding regional BD Hub. The activities of a BD Spoke should address one or more of the following Big Data Innovation themes:

- *Accelerating progress towards societal grand challenges relevant to regional and national priority areas.* Due to the pervasiveness of Big Data in virtually all national priority areas, the BD Spokes have the opportunity to bring rapid change in application areas, by facilitating the creation of interdisciplinary and multidisciplinary data-intensive teams.
- *Helping to automate the Big Data lifecycle.* Managing the end-to-end lifecycle of Big Data assets can be a tedious and manual task. Steps in the data lifecycle include: ingestion, validation, curation, quality assessment, anonymization, publication, active data management, and analysis (including information extraction, visualization, and annotation). Automated (or, semi-automated) techniques are needed in order to keep up with the rapid data rates, large volumes, and immense heterogeneity of Big Data. Automation may also aid the reproducibility of data processing and analysis workflows. The data challenges and lessons learned by a BD Spoke on such automation efforts are expected to be shared with the BD Spoke's stakeholders as well as more broadly across the network of BD Hubs and Spokes.
- *Enabling access to and increasing the use of important and valuable available data assets, also including international data*

sets, where relevant. Many valuable data sets are underutilized, and results from the analysis of such data are not shared, due to a variety of actual or perceived costs, including cost of curation, cost of data reuse, attribution and intellectual property considerations, etc. One of the desirable roles for a BD Spoke is as a catalyst for organizing and sharing datasets and related data services among a larger set of stakeholders, across disciplinary areas, within the geographic region, or across the national community. BD Spokes are expected to play an important role in supporting and promulgating open data and open source software policies within their projects—at the Hub-level, and across Spokes—to further facilitate the sharing of data and outcomes of analyses.

The results from individual BD Spoke activities must also contribute to the education and training missions of the corresponding BD Hub—which is a key component of BD Hub's activities. For example, efforts could include educating researchers on Big Data tools and techniques used and/or processes followed by the BD Spoke, or engaging the public to facilitate broader impact of the work undertaken by the BD Spoke as well as obtain input, where relevant.

Relationship to BD Hub and Associated Support

Proposals submitted in response to this solicitation should be from organizations that have past successful experiences engaging in Big Data innovation activities. Proposals must identify the need to be formally connected to a regional BD Hub and reasons why the proposed activities will not be feasible to accomplish independent of the BD Hubs ecosystem. It is expected that a given BD Spoke proposer would have engaged in serious and in-depth discussions with its corresponding BD Hub principals and Steering Committee prior to proceeding with the proposals. Both Planning and BD Spoke proposals must seek formal approval from the regional BD Hub Steering Committee in the form of a Letter of Collaboration (see Proposal Preparation and Submission Instructions).

Missions and Activities

BD Spokes proposals must articulate a clear focus within a specific Big Data topic or application area, while highlighting their Big Data Innovation theme. All BD Spokes must have clearly defined mission statements with goals and corresponding metrics of success. Some templates illustrating the specificity and level of detail for missions include, but are not limited to, the following:

- Use a specific set of analytical tools to improve the lead time for predictions of certain critical regional indicators by a given percentage.
- Given a specific set of high value data sets that were previously siloed and, therefore, usable only within a single research group or institution, make them available to a broader set of groups, or to the public at large, along with appropriate privacy and access control mechanisms.
- Adapt specified Big Data technologies to automate previously tedious and manual data collection and curation processes for specific types of data in a given field of science.
- For a specific genre of data, introduce new types of (automated) analytics—which were previously tedious to perform and manual in nature—that can be performed with minimal human intervention.

BD Spokes can initiate many different kinds of activities in support of their mission goals. The BD Spokes role is meant to convene stakeholders to augment and spawn new research efforts as opposed to directly carrying out traditional research. Potential activities for BD Spokes include, but are not limited to:

- Accelerating the ideation and development of Big Data solutions relevant to its mission by convening stakeholders across sectors (e.g., academic, industry, non-profits, etc.) to partner in results-driven programs and projects;
- Driving successful pilot programs by acting as a matchmaker between the various academic, industry, and community stakeholders;
- Engaging stakeholders across the region—including solution providers and end users—to enable dialogue, share best practices, and/or set standards for data access, data formats, metadata, etc.; and
- Connecting critical data resources to stakeholders that can best utilize them to fulfill the BD Spoke mission.

Note that BD Spokes funding from this solicitation is not intended to primarily support research activities. Rather, the goal of the program is to enhance and amplify collaborative efforts focused on achieving specific mission-based goals. For example, BD Spokes funding could support staff efforts in maintenance and/or improvement of existing data assets; integration of siloed datasets; analytics using existing high-value data assets, or of datasets made available via the efforts of a given BD Spoke; curation efforts; and workshops, travel, and other activities to support the collaborative and community-building nature of the BD Spokes. For further clarification on the scope of BD Spoke activities, please contact the cognizant program officer.

Topics and Application Areas

Proposed BD Spoke projects are expected to focus on their articulated regional challenges and opportunities. In particular, this solicitation welcomes submissions addressing the following areas of emphasis:

- *Neuroscience*: Engage questions and opportunities in neuroscience that leverage BD Hub resources, such as enabling large scale, integrative modeling, sharing of diverse data and resources, and other neuroscience and neurotechnology approaches that require very large-scale, complex, or diverse data. Connections to other NSF programs on neuroscience research (www.nsf.gov/brain/) are welcomed.
- *Replicability and Reproducibility in Data Science*: Facilitate robust and reliable science by improving the replicability and reproducibility of research instruments, procedures, codes and results.
- *Smart and Connected Communities*: Stimulate innovative applications and services to enable more livable, workable, sustainable, and connected communities (www.nsf.gov/pubs/2015/nsf15120/nsf15120.jsp).
- *Data Privacy*: Ensure transparency by helping to identify when and how the data collected are being used; as sensor technologies collect more information, data is often reused and combined with other data in ways that go beyond the intent of the original collection.
- *Data Intensive Research in the Social, Behavioral, and Economic Sciences*: Accelerate research infrastructure and frameworks that integrate and operate on data from multiple sources including administrative data; scientific instruments from large-scale surveys, brain research, large-scale simulations, etc.; digitally-authored media, including text, images, audio, and emails; and streaming data from weblogs, videos, and financial/commercial transactions.
- *Education:* Support innovations in software infrastructure and use of data sets, and training, that facilitate research on STEM learning and learning environments, STEM workforce development, and broadening participation in STEM.

The areas emphasized above in no way preclude submission of proposals concerning other topics. Any topic deemed appropriate and approved by coordinating a BD Hub is welcome.

NSF recognizes that Big Data are global due to the way they are collected and analyzed and, hence, encourages international collaborations that will enhance the capacity and capabilities of the BD Hubs and Spokes for the proposed BD innovation theme.

Award Types

BD Spokes Planning Grants: These are proposals with total budgets (including indirect costs) not exceeding $100,000 over a period of up to 1 year. They are meant to assist with planning of future BD Spokes proposals. Planning projects may generate proofs-of-concept, bring together stakeholders (e.g., via workshops, events, etc.), and/or build capacity for future BD Spokes activities.

BD Spokes Grants: Proposals with total budgets (including indirect costs) not exceeding $1,000,000 over a period of up to 3 years. These are intended for collaborative projects, involving multiple institutions, for establishing BD Spokes on specific topics/themes related to Big Data innovation.

For both types of projects, the budget must be clearly justified and must be commensurate with the goals of the effort.

III. AWARD INFORMATION

Estimated number of awards and average award size/duration are subject to the availability of funds. The anticipated program budget will be up to $10,000,000, also subject to the availability of funds.

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.
- State and Local Governments: State educational offices or organizations and local school districts.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

An investigator may participate as PI or Co-PI in no more than 1 proposal submitted in response to this solicitation.

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

Additional Eligibility Info:

NSF welcomes proposals that include for-profit organizations or Federally Funded Research and Development Centers (FFRDCs). **However, such organizations may only participate as subawardees or unfunded collaborators.**

The BD Hubs represent four defined geographic regions, namely the Northeast, Midwest, South, and West, of the United States, as defined in the Introduction; however, institutions involved in a BD Spoke need not be physically located within the defined region of a certain BD Hub. The topic of the BD Spoke, and its relevance to the coordinating BD Hub region will be considered, not necessarily the location of the proposing organization.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required)*:

Potential proposers may not submit a full BD Spoke nor a planning grant proposal without first submitting a corresponding Letter of Intent (LOI), compliant with the instructions below, by the LOI deadline. Submitting a Letter of Intent does not oblige potential proposers to submit a full proposal. If a collaborative proposal is planned, a single LOI should be submitted by the lead institution only. LOIs are not subject to merit review but are used for internal planning purposes. Investigators should not expect to receive any feedback on their LOIs. An individual may participate as PI or Co-PI in only one LOI in response to this solicitation, but there is no limit on the number of LOIs from any given institution.

Each letter must include the following information:

1. In the Project PI and Senior Personnel sections, list the full names and institutional affiliations for all PIs, Co-PIs, and senior personnel on the project, including all collaborative proposals and subawardees. If there is not enough room in the section, the most involved members of the project may be listed. The point of contact for NSF inquiries must be the same as the

project PI, with the project PI's e-mail address.

2. In the Participating Organizations section, list all of the institutions involved in the project. If there is not enough room in the section, only the most involved organizations may be listed.
3. In the "Synopsis" data field, provide a synopsis that describes the work in sufficient detail to convey the Topics and Application Areas being addressed (see Program Description for more information) so as to permit an appropriate selection of potential reviewers. (limit: 2500 characters)
4. All teams submitting letters of intent are expected to have communicated and received preliminary approval from an executive director of a collaborating BD Hub to move forward with the collaborative development of a full proposal. For those that have this approval, please enter the following statement in the "Collaborating BD Hub" text box, identifying the specific region of service: "I have communicated with the [Choose one: Midwest/Northeast/South/West] BD Hub and they have granted me approval to move forward with the development of a full proposal."
5. In the "Overarching Themes" data field, please list one or more of the three themes in the solicitation that your project will address (i.e., Progress towards grand challenges; Automating the Big Data lifecycle; Enabling access to data assets). (Limit: 255 characters)
6. In the "Topical/Domain Areas" field, briefly list the topical areas and/or domains that your project will address. (Limit: 255 characters)

Letter of Intent Preparation Instructions:

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

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent.
- A Minimum of 0 and Maximum of 4 Other Senior Project Personnel are allowed
- A Minimum of 0 and Maximum of 20 Other Participating Organizations are allowed
- Collaborating BD Hub is required when submitting Letters of Intent
- Overarching Themes is required when submitting Letters of Intent
- Topical/Domain Areas is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is not allowed

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

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

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.5 of the Grant Proposal Guide provides additional information on collaborative proposals.

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

Proposal titles must take the form **BD Spokes: TYPE: REGION: Title**, where **TYPE** is replaced by the award type (Planning or Spoke), and REGION is replaced by the region of service for the proposed BD Spoke. For example, a BD Spoke planning activity proposed for the South region would have the title **BD Spokes: PLANNING: SOUTH: Title**. Titles of collaborative proposals should be prepared in a similar manner, but should also include "Collaborative" immediately after the region. For example, the title of a collaborative BD Spoke proposal for the West region would be **BD Spokes: SPOKE: WEST: Collaborative: Title**.

The regional breakdown, coordinating institution(s), and point(s) of contact (POC) for each BD Hub are listed below.

NORTHEAST: This region includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

- Coordinating Institution: Columbia University
- Point of Contact: NortheastBDHub@columbia.edu

MIDWEST: This region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

- Coordinating Institution: University of Illinois at Urbana-Champaign
- Point of Contact: bdhub-info@ncsa.illinois.edu

SOUTH: This region includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

- Coordinating Institutions: Georgia Institute of Technology, University of North Carolina at Chapel Hill
- Points of Contact: info@southbdhub.org

WEST: This region includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

- Coordinating Institutions: University of California-San Diego, University of Washington, University of California-Berkeley

- Point of Contact: WesternBDHub@SDSC.edu

Project Summary (1-page limit, 4,600 characters in total for all three text boxes): At the top of the Overview text box, enter the title of the BD Spoke project, the name of the PI and the lead institution. Provide a summary description of the project, including a mission statement if the proposal is for a BD Spoke. In the separate text boxes, provide a succinct summary of the intellectual merit and broader impacts of the proposed project. **Proposals that do not address the intellectual merit and broader impacts of the proposed project in separate statements within the project summary will be returned without review.** All project summaries must include a list of three to six keywords at the end of the broader impacts text box.

Project Description for Planning Grants (limited to 5 pages): For planning grant proposals, project descriptions must be structured according to the sequence of sections described below. **Proposals that do include the sections listed below will be returned without review.**

Goals and activities: Planning grant proposals must articulate a goal for the proposed project as well as the activities necessary to attain said goal. This includes, but is not limited to, workshops, events, and/or capacity building for future projects. The Project Description must provide a discussion on how the stated goals of the planning activity will be evaluated, including what constitutes success.

Broader Impacts of the Proposed Work: The Project Description must provide a discussion of the broader impacts of the proposed activities. NSF values the advancement of scientific knowledge and activities that contribute to the 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.

Roles and Responsibilities: The Project Description must list the specific roles of the collaborating institutions involved.

Collaboration with host BD Hub: The Project Description must describe the relationship with its BD Hub Steering Committee (i.e., a reporting structure).

Project Description for BD Spokes Grants (limited to 15 pages): BD Spokes grant proposals must be structured according to the sequence of sections described below. **Proposals that do include the sections listed below will be returned without review.**

Mission Statement: The Project Description must begin with a concise statement of the project vision, situating an integrative, collaborative project within a clearly articulated context of larger regional goals. The mission statement should include what challenges must be overcome to achieve the vision and the activities that will be undertaken towards said vision.

Broader Impacts of the Proposed Work: The Project Description must provide a discussion of the broader impacts of the proposed activities. NSF values the advancement of scientific knowledge and activities that contribute to the 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.

Roles and Responsibilities: The Project Description must list the specific roles of the collaborating universities, industry partners, government agencies, non-profits and other organizations involved.

Management of BD Spoke and collaboration with host BD Hub: The Project Description must articulate how the BD Spoke will be managed and integrated into BD Hub activities.

Necessity of a BD Hub: Why can the proposed activity only happen given the resources of a BD Hub? A description of the BD Spoke's relationship with its BD Hub Steering Committee (i.e., a reporting structure) must also be stated.

Evaluation plan: The Project Description must include a discussion on how the stated goals of the BD Spoke will be evaluated, including what constitutes success. This is especially important if the BD Spoke will be deemed "complete" after successful completion of stated goals (see "Long-term sustainability," below).

Long-term sustainability: If the proposed BD Spoke is expected to become a long-term resource for its region of service, the Project Description must include a discussion of how the BD Spoke will sustain its efforts after the award period.

Education: The Project Description should explicitly state how the BD Spoke will augment the education and training efforts of its BD Hub.

Results from Prior NSF Support: The Project Description should include results from prior NSF support, as specified in the GPG II.C.d.(iii), with broader impacts from the work(s) included.

Supplementary Documents: Supplementary documents are limited to the specific types of documentation listed in the GPG, with a few exceptions, as specified below. **Any special information or supplementary documentation that has not been explicitly allowed in the GPG or this solicitation, such as article reprints or preprints, or appendices, will not be considered during the review process and may result in the proposal being returned without review.**

- **Letter of Collaboration from a BD Hub.** Each proposal must be approved by the Steering Committee of a BD Hub, and this approval must be documented by a Letter of Collaboration (see GPG Chapter II.C.2.d(iv) for details). This Letter of Collaboration should be signed by the Executive Director(s) of the BD Hub approving the proposal (or by the lead PI of the BD Hub, in case the Executive Director has not yet been appointed). The letter from the BD Hub organization must describe how the proposed spoke project will reinforce the current Hub priority areas. If the proposed spoke area is not originally listed as a priority by a BD Hub, the Letter of Collaboration must lay out reasons for initiating new priority areas. Any BD Spoke that would require more substantial logistical support from its corresponding BD Hub is urged to include a BD Hub coordinating institution as a collaborative proposal or subawardee so as to set aside funds for that support in the proposal.
- **Letters of Collaboration.** Documentation of additional collaborative arrangements of significance to the proposal through Letters of Collaboration should be included (see GPG Chapter II.C.2.d.(iv) for details). All Letters of Collaboration, including those from international collaborators, must provide specific information regarding the collaboration, including whether it involves sharing resources (data, access to computational resources, or use of other equipment), time and effort, etc. No other type of letter can be provided. The lead institution provides the Letters of Collaboration. Collaborators submitting

collaborative proposals are not expected to submit letters of collaboration in addition to the proposal itself.

- **Data Management Plan.** Proposals must include as a supplementary document a Data Management Plan of no more than two pages. This supplement is provided in full by the lead institution. The Data Management Plan should describe how the project will manage its data and software and share its research results (including software). The Data Management Plan will be evaluated using NSF review criteria. Data management requirements and plans specific to the Directorate, Office, Division, Program, or other NSF unit, relevant to a proposal are available at http://www.nsf.gov/bfa/dias/policy/dmp.jsp.

    Proposals that focus on the "Data Intensive Research in the Social, Behavioral, and Economic Sciences" topic area should consider the guidance for Data Management plans for the SBE Directorate, available at http://www.nsf.gov/sbe/sbe_data_management_plan.jsp. Proposals that focus on the "Education" topic area should consider the guidance for Data Management Plans for the EHR Directorate, available at https://www.nsf.gov/bfa/dias/policy/dmpdocs/ehr.pdf. All other proposals should follow the guidance for CISE Directorate, available at http://www.nsf.gov/cise/cise_dmp.jsp

    The plan may include information on:
    - The types of data, software, curriculum materials, and other materials to be produced in the course of the project;
    - The standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
    - Policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
    - Policies and provisions for re-use, re-distribution, and the production of derivatives;
    - Plans for archiving data, samples, and other research products, and for preservation of access to them.
- **The Software Sharing Plan** (with appropriate timelines) is an optional 1-2 page addendum to the Data Management Plan. There is no prescribed single license for software produced through grants responding to this announcement. However, the Program does have goals for software dissemination, and reviewers will be instructed to evaluate the dissemination plan relative to these goals, as appropriate:
    - The software should be freely available to science and engineering researchers and educators in the non-profit sector, such as institutions of education, research institutions, and government laboratories.
    - The terms of software availability should permit the dissemination and commercialization of enhanced or customized versions of the software, or incorporation of the software or pieces of it into other software packages.
    - To preserve utility to the community, the software should be transferable so that another individual or team can continue development in the event that the original investigators are unwilling or unable to do so.
    - The terms of software availability should include the ability of researchers to modify the source code and to share modifications with other colleagues. An applicant should take responsibility for creating the original and subsequent official versions of a piece of software.
    - To further enhance the potential impact of their software, applicants may consider proposing a plan to manage and disseminate the improvements or customizations of their tools and resources by others. This proposal may include a plan to incorporate the enhancements into the official core software, may involve the creation of an infrastructure for plug-ins, or may describe some other solution.
    - If a particular license is selected for the software distribution, it should be specified in the proposal. If an open-source license is not selected, the proposal should explain why this decision was made.
- **Postdoctoral Mentoring Plan.** This one-page supplementary document, describing how postdoctoral researchers will be mentored, **is required of all proposals that will provide funding to postdoctoral researchers.** The lead institution provides this mentoring plan for the entire project. Reviewers will be asked to review the mentoring plan, as appropriate.

- A list of Project Personnel and Partner Organizations (note: in collaborative proposals, only the lead institution should provide this information). Provide current, accurate information for all personnel and organizations 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, project-level advisory committee members, and writers of letters of support. This list should be numbered and include (in this order) Full name, Organization(s), and Role in the project, with each item separated by a semi-colon. Each person listed should start a new numbered line. For example:

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

Proposals that are missing required supplementary documents as specified above will be returned without review.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

It is expected that appropriate senior personnel (including PI and co-PIs as appropriate) from each funded project will coordinate with their respective BD Hub to attend an annual national meeting of all BD Hubs and present their activities and outcomes. Proposals should budget for these individuals to attend this annual meeting, including funds for travel and subsistence for this event.

C. Due Dates

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

    January 12, 2016

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

    February 25, 2016

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

NSF reviewers will address the degree to which the proposed BD Spoke:

- Will impact Big Data innovation and/or the application area of the BD Spoke's mission;
- Needs the support and infrastructure of the BD Hub network to carry out its mission and the effectiveness of its plans to coordinate with the host BD Hub;
- Has a feasible mission (given the Spoke's participants, planned activities, and management plan) that aligns with the relevant BD Hub's priorities; and
- Will aid education and training of the Big Data workforce as well as related external groups such as end users, students or managers, and contribute to the education and training plan of the regional BD Hub.

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:

- Fen Zhao, Directorate for Computer and Information Science and Engineering, telephone: (703) 292-7344, email: fzhao@nsf.gov

- Earnestine Psalmonds, Directorate for Education & Human Resources, telephone: (703) 292-8630, email: epsalmon@nsf.gov

- Heng Xu, Directorate for Social, Behavioral and Economic Sciences, telephone: (703) 292-8643, email: hxu@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.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

- **For General Information** (NSF Information Center)**:** (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

  Send an e-mail to: nsfpubs@nsf.gov

  or telephone: (703) 292-7827

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

Suzanne H. Plimpton
Reports Clearance Officer
Office of the General Counsel
National Science Foundation
Arlington, VA 22230

Policies and Important Links | Privacy | FOIA | Help | Contact NSF | Contact Web Master | SiteMap

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

Text Only