

# Innovation Corps - Regional Node Program (I-Corps Node)

## PROGRAM SOLICITATION

NSF 12-586



### National Science Foundation

Office of International and Integrative Activities

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering  
Division of Advanced Cyberinfrastructure

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social, Behavioral & Economic Sciences

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

October 19, 2012

April 18, 2014

April 17, 2015

## SUMMARY OF PROGRAM REQUIREMENTS

### General Information

#### Program Title:

Innovation Corps - Regional Node Program (I-Corps Node)

#### Synopsis of Program:

The National Science Foundation (NSF) seeks to develop and nurture a national innovation ecosystem that builds upon fundamental research to guide the output of scientific discoveries closer to the development of technologies, products and processes that benefit society.

The National Science Foundation plans to build upon the I-Corps program and establish a National Innovation Network comprised of I-Corps Regional Nodes that will support the needs for innovation research and education. NSF is seeking to build a network of regional nodes that will work cooperatively to establish, utilize and sustain a national innovation ecosystem that further enhances the development of technologies, products and processes that benefit society. The interconnected nodes of this network may be diverse in research areas, resources, tools, programs, capabilities, and in geographic locations - while the network will have the flexibility to grow or reconfigure as needs arise. I-Corps Regional Nodes will foster understanding on how to: 1) identify, develop and support promising ideas that can generate value, 2) create and implement tools and resources that enhance our nation's innovation capacity, 3) gather, analyze, evaluate and utilize the data and insight resulting from the experiences of those participating in the I-Corps program and 4) share and leverage effective innovation practices on a national scale - to improve the quality of life for the U.S. citizenry.

#### 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.

- Don L. Millard, telephone: (703) 292-4620, email: [dmillard@nsf.gov](mailto:dmillard@nsf.gov)

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.079 --- International and Integrative Activities (IIA)

### Award Information

**Anticipated Type of Award:** Continuing Grant

**Estimated Number of Awards:** 4

**Anticipated Funding Amount:** \$2,000,000

Single-institution Proposer: \$350,000 per year for up to three years

Two-institution Team: \$750,000 per year for up to three years

Three-institution Team: \$1.25 million per year for up to three years

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

## Eligibility Information

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### 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.

### Who May Serve as PI:

The PI must be an academic Administrative Lead at the level of Dean or higher.

**Limit on Number of Proposals per Organization:** 1

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

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **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](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)).

### B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

### C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
  - October 19, 2012
  - April 18, 2014
  - April 17, 2015

## Proposal Review Information Criteria

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

## Award Administration Information

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

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

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## I. INTRODUCTION

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America's prosperity has originated in part from the ability to capitalize economically on ground-breaking discoveries from science and engineering research. Simultaneously, a knowledgeable, creative workforce has maintained the country's global leadership in critical areas of technology. These important discoveries and capable workforce resulted from substantial, sustained investment in science and engineering. A strong capacity for translating fundamental scientific discoveries into powerful engines of innovation is essential to maintain our competitive edge in the future.

The National Science Foundation (NSF) supports fundamental research and education in science and engineering. NSF's dual role, unique among government agencies, results in new knowledge and tools as well as a capable, innovative workforce. These complementary building blocks of innovation have led to revolutionary technological advances and wholly new industries.

Through this initiative, NSF seeks to develop and nurture a national innovation ecosystem that builds upon fundamental research to guide the output of scientific discoveries closer to the development of technologies, products and processes that benefit society.

## II. PROGRAM DESCRIPTION

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I-Corps Regional Nodes must contribute to the National Innovation Network in the following three ways:

### **Level 1 Contribution - I-Corps Regional Training:**

Nodes will demonstrate the capacity to deliver an innovation-enhancing training program based on the hypothesis/validation "Customer Development" curriculum used to support NSF I-Corps teams (see [www.nsf.gov/i-corps](http://www.nsf.gov/i-corps)).

The training will be offered at least once a year to institutions' research/academic community across disciplines. The selection and makeup of the participating teams will be coordinated by the I-Corps Regional Node and may include students, faculty, researchers and other local and regional stakeholders. The instructor team must consist of at least three trainers. In addition to the instructors, at least three members from the local investment community must be identified as potential volunteers for the training. When an I-Corps Regional Node award is made, the instructor-team will be required to participate in at least one NSF I-Corps cohort, delivered at an existing I-Corps Node, prior to delivering the training at their own site.

It is expected that assessment and evaluation data, resulting from the I-Corps regional training activities, will be openly shared among other NSF-awarded Innovation Corps nodes.

NOTE: NSF may call upon I-Corps Regional Nodes up to twice a year to host approximately 25-30 I-Corps teams in the delivery of the NSF-selected I-Corps curriculum. If NSF requests a Node to deliver the standard I-Corps curriculum, the I-Corps Regional Node will collaborate with NSF or an NSF designee to provide the I-Corps training. The budget for delivering the I-Corps curriculum will be negotiated at the time that such a request is made and should not be included as part of the response to the current solicitation.

### **Level 2 Contribution - I-Corps Node Regional Infrastructure:**

I-Corps Regional Nodes will develop near-term tools and resources that will impact and expand the benefits of the entire I-Corps program within a 2-3 year timeframe.

Proposers are expected to identify models, to be leveraged for broad dissemination and implementation, of effective innovation content, curricula, and teaching/learning practices - detailing the specific activities, goals and measureable outcomes that will be associated with the proposed efforts. In addition, nodes will be required to develop and submit/utilize a logic model that describes the aspects of the proposed effort (e.g., inputs, activities, outputs and outcomes) and the associated data that will be used to measure

any commensurate change/success/achievement. Proposers should consider how such activities will benefit the innovation network and how other nodes would be able to utilize/leverage their prospective Level 2 contributions.

Level 2 efforts should also address the issues associated with accelerating the diffusion/adaption/adoption of effective innovation practices in the national ecosystem, while further building entrepreneurial capacity in the node environments. Specific geographic locations may not have all that is necessary to create successful outcomes in a particular technology area. The innovation network, along with its nodes and effective linkages, can help foster connections to such an area and, ultimately, help produce success at scale.

### **Level 3 Contribution - I-Corps Node Blue Sky Research:**

I-Corps Regional Nodes will identify and pursue longer-term (5+ year) research and development projects that meet the goals of the I-Corps program.

I-Corps Regional Nodes will be expected to leverage and analyze data from Level 1 and Level 2 contributions. Key activities will focus on: 1) developing an understanding of how institutions can improve support for innovation ecosystems; 2) sharing and developing methods for successfully scaling effective practices and models that foster innovation; 3) exploring how the National Innovation Network can enable new collaborations among geographic regions to support commercialization--independent of geographic locations; 4) examining and tracking the I-Corps teams' dynamics, activities and outcomes; and 5) identifying and proposing improvements to the I-Corps curriculum materials, training practices, and National Innovation Network utilization.

### **Considerations for Network Nodes**

The I-Corps Regional Nodes in the National Innovation Network will have considerable autonomy in their operation, management, and oversight as part of the overall network. Each institution must commit to providing the necessary infrastructure, including appropriate personnel, equipment and facilities, in support of a networked community. Nodes must embrace a culture of open access to data, educators, researchers and mechanisms for encouraging non-traditional participants from diverse disciplines.

Proposers are encouraged to form partnerships among regional institutions. Collaborations of up to three institutions are encouraged. When more than one institution is involved, a plan for unified leadership across the institutions must be provided.

### **Coordinating Features of the Regional Nodes**

Nodes should have the following features:

- Coordination of innovation research, education, outreach and commercial development programs across the network;
- Appropriate mixture of geographically distributed personnel and institutions that provide diverse and complementary capabilities to support current and anticipated needs for fostering innovation across a broad spectrum of science and engineering domains;
- Effective management structure to ensure close linkage and cooperation among the nodes such that they operate as a cohesive national network;
- Seamless methods of network operation that support projects across the network, through development and utilization of compatible internet-based networking/collaboration tools;
- Dissemination of shared knowledge to research and development communities;
- Promotion of diversity among students, faculty, staff, management, and outreach activities;
- Methods for assessment and metrics of node/network performance and impact;
- Planning processes to accommodate emerging areas and future growth of external/internal node participants, including adding new participants to, or dropping existing participants from, the network; and
- Fostering of additional support from non-NSF sources, including other Federal agencies, State governments, and the private sector.

Proposals must clearly demonstrate an ability and willingness to enable these features.

## **III. AWARD INFORMATION**

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Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.

## **IV. ELIGIBILITY INFORMATION**

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### **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.

### **Who May Serve as PI:**

The PI must be an academic Administrative Lead at the level of Dean or higher.

### **Limit on Number of Proposals per Organization: 1**

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

### **Additional Eligibility Info:**

A competitive proposal for an I-Corps Node will be led by an institution having an already existing unit whose goal is to assist faculty, students and other academic personnel to engage in entrepreneurial activities and transition scientific and technological innovations. Such units are typically called: innovation centers, entrepreneurial centers,

technology incubators, etc. Their mission is to provide resources to individuals and teams in the form of space, seed funding, entrepreneurial mentoring, curriculum, or other assets needed to transition technology into the marketplace.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov). Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: ([http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

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

**Collaborative Proposals.** All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

**Important Proposal Preparation Information:** FastLane will check for required sections of the full proposal, in accordance with *Grant Proposal Guide* (GPG) instructions described in Chapter II.C.2. The GPG requires submission of: Project Summary; Project Description; References Cited; Biographical Sketch(es); Budget; Budget Justification; Current and Pending Support; Facilities, Equipment & Other Resources; Data Management Plan; and Postdoctoral Mentoring Plan, if applicable. If a required section is missing, **FastLane will not accept the proposal.**

Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions. If the solicitation instructions do not require a GPG-required section to be included in the proposal, insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your proposal.

*Please note that per guidance in the GPG, the Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities. Unless otherwise specified in this solicitation, you can decide where to include this section within the Project Description.*

Proposals submitted to the I-Corps Regional Nodes Program deviate from the traditional format of a research proposal as described in NSF's GPG.

An I-Corps Regional Node proposal consists of the following parts:

*Cover Sheet:*

The cover sheet is automatically generated by FastLane or Grants.gov based on information entered into the "Cover Sheet."

**Please note: The title should include, as a prefix, the name I-Corps Node. For example:**

**"I-Corps Node: Smytheson Center for Entrepreneurism"**

*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. The proposal must contain a summary of the proposed activity suitable for publication, not more than one page in length. It should not be an abstract of the proposal, but rather a self-contained description of the activity that would result if the proposal were funded. The summary should be written in the third person and include a statement of objectives and methods to be employed. It should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader.

*Table of Contents:*

The table of contents is automatically generated by FastLane or Grants.gov.

*Project Description:*

An I-Corps Regional Node proposal should include information organized in the most effective way to present a compelling story about why the proposed Node should be funded and why it will be effective at all three levels described above. The Project Description is limited to 15 pages and should address the bulleted topics.

**Level 1 Contribution - I-Corps Regional Training**

Please describe:

- How your current entrepreneur/innovation center is managed and functions, including lead personnel;
- The physical facilities, available resources and staffing;
- How you recruit individuals or teams to receive support from your center, how they are vetted, the number of individuals or teams assisted each year;
- The role of your institution's faculty and in-residence personnel;
- The role of venture capitalists and mentors and how you recruit members from the local investment community to participate in your Node's activities;
- Your capacity to deliver an innovation-enhancing training program (in terms of instruction and curriculum);
- How your center's teaching faculty are recruited and evaluated;
- The technology innovation practices, resources provided, entrepreneurial training, mentoring, commercialization launches, coaching, and curriculum used in your center;
- How processes and practices would change or be augmented to support the activity of an NSF I-Corps Regional Node;
- Noteworthy start-up success stories, competitions that were held, and publicity your center or projects have received;
- The assessment/evaluation data you collect and the follow-up you do with respect to projects that have been supported and/or launched by your center;
- A plan for the promotion of diversity among students, faculty, staff and management.

## **Level 2 Contribution - I-Corps Node Regional Infrastructure**

Please describe:

- Coordination of innovation research, education, outreach and commercial development programs across the network;
- Mixture of geographically-distributed personnel and institutions that provide diverse and complementary capabilities to support current and anticipated needs for fostering innovation across a broad spectrum of science and engineering domains;
- Management structure to ensure close linkage and cooperation among the nodes such that they operate as a cohesive national network;
- If the node team consists of multiple institutions, describe how the team plans to manage across administrative boundaries;
- A plan for fostering additional support from non-NSF sources, including other Federal agencies, state governments, and the private sector;
- A plan for seamless methods of network operation that support projects across the network, through development and utilization of compatible internet-based networking/collaboration tools;
- Models of effective innovation content, curricula, and teaching/learning practices that will be implemented and disseminated;
- Approaches to accelerating the diffusion/adaption/adoption of effective innovation practices in the national ecosystem;
- Specific activities, goals, and measurable outcomes that will be associated with the proposed efforts;
- Data that will be used to measure any commensurate change/success/achievement;
- Methods for assessment and metrics of node/network performance and impact;
- Other near-term contributions.

## **Level 3 Contribution - I-Corps Node Blue Sky Research**

Please describe:

- Long-term research and development projects that meet the goals of the I-Corps program;
- Planning process to accommodate emerging areas and future growth of external/internal node participants, including adding new Nodes to, or dropping existing Nodes from, the network;
- Methods for developing, sharing, and successfully scaling effective practices and models that foster innovation;
- How the network can enable new collaborations among geographic regions to support commercialization opportunity development;
- How the I-Corps teams' dynamics, activities and outcomes will be examined and tracked;
- How the materials, training practices, and other aspects of I-Corps curriculum will be assessed and disseminated;
- Other areas of activity focused on long-term deliverables.

*Please note that per guidance in the GPG, the Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities. You can decide where to include this section within the Project Description.*

### *References Cited*

Provide a comprehensive listing of relevant reference sources.

### *Biographical sketches*

A biographical sketch for each team member (two pages maximum per team member) must be provided, highlighting technical expertise and track records in successful technology and business development and be prepared in accordance with the requirements specified in the GPG. Exhaustive academic resumes are not appropriate.

Biographical sketches for non-compensated resources who will provide oversight for Level II and Level III activity and may contribute to the training effort of Level I activity.

### *Proposal Budget and Budget Justification*

Funding for the Innovation Corps Regional Node Program is limited to a maximum of \$1.25 million per year for a three-institution team; \$750,000 per year for two-institution teams and \$350,000 per year for single institution applicants. The award duration will not exceed three years.

The budget should include funds for Principal Investigator (PI) travel to one I-Corps Node meeting per year.

The I-Corps Regional Node Program will not fund legal expenses for commercialization.

### *Current and Pending Support*

The proposal should provide information regarding all research to which the PI and Co-PIs have committed time or have planned to commit time. If none, state NONE. **Current and Pending Support must be uploaded for each of the team member. Note that this proposal is considered "pending" and therefore MUST appear on each Current and Pending Support submission.**

## Facilities, Equipment, and Other Resources

Discuss requirements for and the availability of equipment, instrumentation, and facilities required for the proposed project. The description should be narrative in nature and must not include any quantifiable financial information.

### Supplementary Documents:

Letters of commitment from local and regional stakeholders (not to exceed 3).

## B. Budgetary Information

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

## C. Due Dates

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

October 19, 2012

April 18, 2014

April 17, 2015

## D. FastLane/Grants.gov Requirements

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### 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](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

### 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](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

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

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

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

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years \(FY\) 2011-2016](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where

individuals may concurrently assume responsibilities as researchers, educators, and students, and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the variety of learning perspectives.

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

## A. Merit Review Principles and Criteria

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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

In addition to the standard review criteria, a demonstrated command of the currently-deployed I-Corps curriculum will be part of the consideration process. Because I-Corps Regional Nodes will support cross-discipline teams, a demonstration of support from institution leadership will be an important consideration in the review of I-Corps Regional Node proposals.

Coordinating Features of the Regional Nodes are also important aspects. Consequently, proposals must clearly demonstrate an ability and willingness to enable these:

- Coordination of innovation research, education, outreach and commercial development programs across the network;
- Appropriate mixture of geographically distributed personnel and institutions that provide diverse and complementary capabilities to support current and anticipated needs for fostering innovation across a broad spectrum of science and engineering domains;
- Effective management structure to ensure close linkage and cooperation among the nodes such that they operate as a cohesive national network;
- Seamless methods of network operation that support projects across the network, through development and utilization of compatible internet-based networking/collaboration tools;
- Dissemination of shared knowledge to research and development communities;
- Promotion of diversity among students, faculty, staff, management, and outreach activities;
- Methods for assessment and metrics of node/network performance and impact;
- Planning processes to accommodate emerging areas and future growth of external/internal node participants, including adding new participants to, or dropping existing participants from, the network; and
- Fostering of additional support from non-NSF sources, including other Federal agencies, State governments, and the private sector.

## B. Review and Selection Process

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Proposals submitted in response to this program solicitation will be reviewed by Panel Review.

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will be completed and submitted by each reviewer. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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

### B. Award Conditions

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An NSF award consists of: (1) the award 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](http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

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

## C. Reporting Requirements

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

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

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

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

## VIII. AGENCY CONTACTS

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*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:

- Don L. Millard, telephone: (703) 292-4620, email: [dmillard@nsf.gov](mailto:dmillard@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

For questions relating to Grants.gov contact:

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

## IX. OTHER INFORMATION

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The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "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 at [https://public.govdelivery.com/accounts/USNSF/subscriber/new?topic\\_id=USNSF\\_179](https://public.govdelivery.com/accounts/USNSF/subscriber/new?topic_id=USNSF_179).

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 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](mailto: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

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