EPSCoR Research Infrastructure Improvement Track 4: EPSCoR Research Fellows (RII Track-4)

PROGRAM SOLICITATION
NSF 17-509

National Science Foundation

Office of Integrative Activities

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

February 28, 2017

IMPORTANT INFORMATION AND REVISION NOTES

- The following EPSCoR jurisdictions are RII-eligible for the FY 2017 RII Track-4 competition: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, US Virgin Islands, West Virginia, and Wyoming.
- There is a limit of three proposals from each submitting organization.
- Principal Investigators (PIs) must be non-tenured faculty (or equivalent) whose primary appointment is at the submitting organization. No co-PIs are allowed.
- Host sites for fellowship projects must be located within the United States, its territories, or possessions. Host sites may be a government laboratory, a Federally Funded Research and Development Center (FFRDC), a commercial or non-profit research center, or an academic institution.
- The project title must begin with "RII Track-4:" and follow with an informative title in the topic area.
- Awards may not exceed $300,000 over a two-year period. Funds may be used to cover the following direct costs: salary for the PI and one additional researcher; travel and living expenses for the PI and one additional researcher; and other research-related expenses. Budgets must include indirect costs at the applicable US federally negotiated rate(s).
- Page limits apply. See Section V.
- Letters of support are required. See Section V.A.10.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 17-1), which is effective for proposals submitted, or due, on or after January 30, 2017. Please be advised that proposers who opt to submit prior to January 30, 2017, must also follow the guidelines contained in NSF 17-1.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

EPSCoR Research Infrastructure Improvement Track 4: EPSCoR Research Fellows (RII Track-4)

Synopsis of Program:

The Experimental Program to Stimulate Competitive Research (EPSCoR) is designed to fulfill the mandate of the National Science Foundation (NSF) to promote scientific progress nationwide. A jurisdiction is eligible to participate in EPSCoR programs if its level of NSF research support is equal to or less than 0.75 percent of the total NSF research and related activities budget for the most recent three-year period (FY 2016 Eligibility Table). Through this program, NSF establishes partnerships with government, higher education, and industry that are designed to effect sustainable improvements in a jurisdiction's research infrastructure, Research and Development (R&D) capacity, and hence, its R&D competitiveness.

RII Track-4 provides opportunities for non-tenured investigators to further develop their individual research potential through extended collaborative visits to the nation's premier private, governmental, or academic research centers. Through these visits, the EPSCoR Research Fellows will be able to learn new techniques, benefit from access to unique equipment and facilities, and shift their research toward transformative new directions. The experience gained through the fellowship is intended to provide a foundation for research collaborations that span the recipient's entire career. These benefits to the Fellows are also expected to in turn enhance the research capacity of their institutions and jurisdictions. PIs must hold a non-tenured faculty appointment or its close equivalent, either in the form of a pre-tenure tenure-track position or a long-term non-tenure-track position.

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.

- Timothy M. VanReken, telephone: (703)292-7378, email: tvanreke@nsf.gov

- Sean C. Kennan, telephone: (703) 292-7575, email: skennan@nsf.gov

- Jose Muñoz, telephone: (703) 292-8003, email: jmunoz@nsf.gov

- Uma D. Venkateswaran, telephone: (703) 292-7732, email: uvenkate@nsf.gov

- C. Susan Weiler, telephone: (703) 292-8683, email: sweiler@nsf.gov

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

- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 10

Anticipated Funding Amount: $3,000,000

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

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- The following EPSCoR jurisdictions are RII-eligible for the FY 2017 RII Track-4 competition: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, US Virgin Islands, West Virginia, and Wyoming.

  Proposals may only be submitted by organizations located in RII-eligible jurisdictions, as follows:

  - Institutions of higher education (Ph.D.-granting and non-Ph.D.-granting), acting on behalf of their faculty members, that are accredited in and have a campus in the United States, its territories or possessions. Distinct academic campuses (e.g., that award their own degrees, have independent administrative structures, admissions policies, alumni associations, etc.) within multi-campus systems qualify as separate submission-eligible institutions.
  - Not-for-profit, non-degree-granting domestic U.S. organizations, acting on behalf of their employees, that include (but are not limited to) independent museums and science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the Nation's research or educational activities. These organizations must have an independent, permanent administrative organization (e.g., an Office of Sponsored Projects) located in the United States, its territories or possessions, and have 501(c)(3) tax status.

Who May Serve as PI:

- PIs of proposed RII Track-4 projects must have their primary appointment with the submitting organization.
- PIs must hold a non-tenured faculty appointment, or its close equivalent. This may be in the form of a pre-tenure tenure-track position or a long-term non-tenure-track position. Persons holding transitional (< 3 years) fixed-term postdoctoral appointments are not eligible for this program.
- Only single-PI proposals will be considered. No co-PIs should be included on the proposal.

Limit on Number of Proposals per Organization: 3

Only three RII Track-4 proposals may be submitted in response to this solicitation by any single organization in a RII-eligible jurisdiction. If more than three proposals are received from any single institution for the RII Track-4 competition, all proposals from that institution are subject to Return Without Review.

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

An investigator may serve as PI on only one proposal submitted in response to this solicitation.

Proposal Preparation and Submission Instructions

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* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp.
  - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and*

Submission of NSF Applications via Grants.gov guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

  Inclusion of voluntary committed cost sharing is prohibited.

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

  Not Applicable

- **Other Budgetary Limitations:**

  Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

  February 28, 2017

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.

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I. INTRODUCTION

A. EPSCoR Mission and Goals

The mission of EPSCoR is to assist the National Science Foundation in its statutory function "to strengthen research and education in science and engineering throughout the United States and to avoid undue concentration of such research and education." EPSCoR goals are to:

- Catalyze the development of research capabilities and the creation of new knowledge that expands jurisdictions' contributions to scientific discovery, innovation, learning, and knowledge-based prosperity;
- Establish sustainable Science, Technology, Engineering, and Mathematics (STEM) education, training, and professional development pathways that advance jurisdiction-identified research areas and workforce development;
- Broaden direct participation of demographically diverse individuals, institutions, and organizations in the project's science and engineering research and education initiatives;
- Effect sustainable engagement of project participants and partners, the jurisdictions, the national research community, and the general public through data-sharing, communication, outreach, and dissemination; and
- Impact research, education, and economic development beyond the project at academic, government, and private sector levels.

B. Criteria for Eligibility to Participate in the Research Infrastructure Improvement, Track 4: EPSCoR Research Fellows (RII Track-4)

The following EPSCoR jurisdictions are RII-eligible for the FY 2017 RII Track-4 competition: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, US Virgin Islands, West Virginia, and Wyoming.

Persons who hold either non-tenured faculty positions at institutions of higher education within EPSCoR jurisdictions or closely similar positions at other eligible organizations may participate in RII Track-4. Non-tenured faculty members include both those who hold tenure-track appointments but have not yet received tenure, and those who hold long-term non-tenure-track positions. Persons who hold transitional (<3 years) fixed-term postdoctoral appointments are not eligible to apply. Questions regarding PI eligibility for RII Track-4 should be directed toward the NSF EPSCoR program staff.

C. RII Track-4 Program

Developing the full potential of its science and engineering research workforce is critical to the long-term competitiveness of EPSCoR jurisdictions and the nation overall. To realize this potential, it is often worthwhile for researchers to spend periods of time at other institutions, forming deep collaborative connections that can be sustained for years beyond. The benefits of such an experience may be particularly beneficial to those researchers who are not yet firmly established in their careers.

This Research Infrastructure Improvement, Track 4: EPSCoR Research Fellows (RII Track-4) solicitation provides an opportunity for non-tenured faculty or those in closely similar positions to spend extended periods of time at the nation's premier research facilities. The fellowship period may be used to initiate new collaborative partnerships, to continue existing ones, or to make use of unique equipment not available at the PI's home institution. Any research topic within NSF's traditional portfolio will be considered for support. The fellowship host site may be any academic, governmental, commercial, or non-profit research facility within the United States or its territories.

EPSCoR support of a RII Track-4 activity should not duplicate support from any other available federal, jurisdictional, or institutional resources. The support should contribute to both the PI's research capacity and to the improvement of their institution's scientific competitiveness more broadly.

II. PROGRAM DESCRIPTION

The primary driver for RII Track-4 investments is the desire to increase the competitiveness of EPSCoR-eligible institutions by catalyzing and strengthening the research programs of their talented non-tenured faculty. Over the long term, RII Track-4 investments are expected to result in sustained improvements in the individual research competitiveness of its awardees, and to stimulate broader improvements to the research capacity of the awardees' institutions and jurisdictions. Proposals must include a strong rationale that each of these goals will be met.

RII Track-4 awards will provide support for Principal Investigators (PIs) to spend extended periods of time at premier research facilities within the United States and its territories (the "host site"). Up to six months of salary support will be provided to the PI for the period of her/his fellowship visit(s). In addition, each award will provide support for the PI's travel between the home institution and host site as well as living expenses while at the host site. Up to six months of salary support and travel and living expenses may also be requested for one additional trainee-level researcher (typically a graduate student or postdoctoral member of the PI's group). A small amount of additional support will be allowed to cover direct costs associated with the work to be completed at the host site (*e.g.*, purchasing supplies, shipping equipment, publication costs, etc.).

Successful RII Track-4 proposals will present exciting, vibrant fellowship ideas that have potential to transform the PI's individual career trajectory and more broadly impact his/her research field, institution, and jurisdiction. Proposals may focus on any area of science or engineering that NSF supports. All proposals should include motivation and context for the work to be conducted, the PI's specific plans for the fellowship period, and a discussion for how the benefits gained from the fellowship would be sustained beyond the award period (*e.g.*, by including plans for future proposal submissions). Note that in all instances, clear specifications of research goals, performance metrics, and a project timetable are requirements for EPSCoR support. It is also crucial that the proposals explain clearly how the RII Track-4 award will benefit the work – what specific opportunities will be made possible *via* the PI's extended visit(s) to the host site?

Host sites may be academic institutions, government laboratories, Federally Funded Research and Development Centers (FFRDCs), or commercial or non-profit research centers. Host sites must be located within the United States or its territories. Only a single host site may be identified in the proposal – PIs are not allowed to split their fellowship period between two or more host sites. RII Track-4 is intended to provide opportunities for PIs to work at facilities of national prominence that would not otherwise be possible without the Fellowship. For this reason, host sites are generally expected to be outside of the PI's home jurisdiction and located at such a distance from the PI's home institution as to make temporary relocation necessary for the fellowship period. If a PI proposes a host site that does not meet these conditions, she/he is expected to provide a persuasive case for why the RII Track-4 funds are needed for the proposed work to occur. In all cases, the partnership and support of the host site is critical to the success of the RII Track-4 projects; it is expected that proposals will clearly establish the parameters for this partnership. One or more primary research collaborators should be identified who will work with the PI at the host site to ensure that the goals of the fellowship are met.

Proposals must include Letters of Support from the primary research collaborators confirming their support of the effort. An additional Letter of Support is required from an appropriate host site administrator verifying that the PI will be provided with whatever site access is necessary to complete the project as proposed.

It is expected that successful RII Track-4 projects will provide direct benefits to the PIs and broader indirect benefits to the PIs' home institutions. Realizing these benefits depend critically on the PIs' achieving long-term success at her/his home institution, and maintaining the support of the institution in that process. With this in mind, it is important that the PI of each RII Track-4 proposal discusses his/her fellowship plans with his/her administrative supervisors (i.e., the department chair and/or dean) to ensure that the plans are compatible with the institution's short-term needs and that the fellowship will not negatively impact the PI's long-term career trajectory at their home institution. Each RII Track-4 proposal must include a Letter of Support from the PI's administrative supervisor confirming support of the project and verifying that any needed release time will be provided.

The proposed RII Track-4 activity should not duplicate any other activity supported by federal, jurisdictional, or institutional resources. However, RII Track-4 activities may leverage and build upon existing research infrastructure.

Eligible Organizations and Activities

In all cases, the PIs of proposed EPSCoR RII Track-4 projects must have their primary affiliation with institutions of higher education, agencies, or organizations within eligible EPSCoR jurisdictions. In addition, all activities carried out under an EPSCoR award are subject to the restrictions concerning eligible STEM disciplines and activities detailed in the NSF PAPPG found on the NSF website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp.

III. AWARD INFORMATION

RII Track-4 awards will be made as standard grants. The award amount will not exceed $300,000 and the project duration will not exceed 24 months. Program budget, number of awards, and average award size/duration are subject to the quality of proposals and availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- The following EPSCoR jurisdictions are RII-eligible for the FY 2017 RII Track-4 competition: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, US Virgin Islands, West Virginia, and Wyoming.

Proposals may only be submitted by organizations located in RII-eligible jurisdictions, as follows:

- Institutions of higher education (Ph.D.-granting and non-Ph.D.-granting), acting on behalf of their faculty members, that are accredited in and have a campus in the United States, its territories or possessions. Distinct academic campuses (e.g., that award their own degrees, have independent administrative structures, admissions policies, alumni associations, etc.) within multi-campus systems qualify as separate submission-eligible institutions.
- Not-for-profit, non-degree-granting domestic U.S. organizations, acting on behalf of their employees, that include (but are not limited to) independent museums and science centers, observatories, research laboratories, professional societies, and similar organizations that are directly associated with the Nation's research or educational activities. These organizations must have an independent, permanent administrative organization (e.g., an Office of Sponsored Projects) located in the United States, its territories or possessions, and have 501(c)(3) tax status.

Who May Serve as PI:

- PIs of proposed RII Track-4 projects must have their primary appointment with the submitting organization.
- PIs must hold a non-tenured faculty appointment, or its close equivalent. This may be in the form of a pre-tenure tenure-track position or a long-term non-tenure-track position. Persons holding transitional (< 3 years) fixed-term postdoctoral appointments are not eligible for this program.
- Only single-PI proposals will be considered. No co-PIs should be included on the proposal.

Limit on Number of Proposals per Organization: 3

Only three RII Track-4 proposals may be submitted in response to this solicitation by any single organization in a RII-eligible jurisdiction. If more than three proposals are received from any single institution for the RII Track-4 competition, all proposals from that institution are subject to Return Without Review.

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

An investigator may serve as PI on only one proposal submitted in response to this solicitation.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

The following instructions are specific to proposals submitted to the Research Infrastructure Improvement Program, Track 4: EPSCoR Research Fellows (RII Track-4) competition and supplement the NSF PAPPG and NSF Grants.gov Application Guide:

- The proposal section labeled Project Description may not exceed **10 pages**, including text as well as any graphic or illustrative materials. Proposals that exceed the page limitations or that do not contain all items described below may be returned without review.

The Research proposal type must be selected in the proposal preparation module in FastLane

The RII Track-4 proposal must include the following elements:

1. NSF Cover Sheet. The project title must begin with "RII Track-4:" and follow with an informative title in the topic area. Note that approvals for studies involving human subjects or vertebrate animals are not required at proposal submission; however, these approvals must be in place before any award can be made.

2. Project Summary (1 page maximum). Provide an overview, which briefly describes: the vision and goals of the fellowship project; the role of the host site and its personnel in achieving the project's vision and goals; a summary of the objectives and methods to be employed; the expected impacts of the proposed activities; and plans for sustaining the project's impacts beyond the award period. In separate statements provide a succinct summary of the intellectual merit and broader impacts of the project. The summary must also identify the proposed host site and primary research collaborator(s). Proposals that do not contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts *will not be accepted by FastLane or will be returned without review*.

3. Table of Contents. The Table of Contents is automatically generated and cannot be edited.

4. Project Description (10 pages maximum). The project description is the centerpiece of the RII Track-4 proposal. This section should present the proposed activities in a clear, compelling way and describe how the activities will lead to long-lasting impacts for both the PI's career and the home institution. In addition to the requirements contained in PAPPG Chapter II C.2.d, the project description must articulate the motivation and context for the proposed work using language understandable to a broad scientific audience. The goals and objectives for the fellowship project should be clearly stated, and the research plan for achieving the goals and objectives should be presented in sufficient detail to allow reviewers to judge the proposal fairly. It is crucial that the proposal explain clearly how the PI will benefit from the unique opportunities provided by the RII Track-4 fellowship. Specifically, the proposal should detail both the role of the host site in achieving the research goals and objectives and how the benefits gained from the fellowship will be sustained for both the PI and the home institution beyond the award period.

A timeline for meeting the project goals and objectives must be included. The requested NSF support should be consistent with the project's proposed scope and activities. Proposals must include a section detailing the Results from Prior NSF Support; for PIs with no prior NSF support, a simple statement to that effect is sufficient.

5. References Cited. References cited in the project description should be listed in this section. See PAPPG Chapter II Section C.2.e. While there is no established page limitation for the references, this section must include bibliographic citations only and must not be used to provide parenthetical information beyond the page limits of the Project Description.

6. Biographical Sketch. Include a biographical sketch for the PI according to standard NSF grant proposal guidelines.

7. Budget Pages and Budget Justification. The budget should be consistent with and appropriate to the scope of the activities presented in the project description. Prepare budget pages for each year of support and a budget justification (not to exceed three pages). Because travel and living expenses represent major components of the RII Track-4 budget, PIs should be prepared to provide upon request sufficient documentation to justify the requested budget.

8. Current and Pending Support. List the current and pending support for the PI. Include this proposal at the top of the list of current and pending support. See PAPPG Chapter II Section C.2.h.

9. Facilities, Equipment, and Other Resources. The PI should provide a description of the relevant facilities, equipment, and other resources. Only the PI's resources should be described, with emphasis on those resources needed for the project's work and especially any equipment that will be transported for use at the host site. Any facilities, equipment, and other resources that belong to the host site and needed for the project should be described in the project description rather than in this section. See PAPPG Chapter II Section C.2.i.

10. Supplementary Documentation (in addition to those required by the PAPPG)

- At least one Letter of Support must be included from individuals in each of the following three categories. Where appropriate, more than one letter may be submitted for any or all of the categories.

    1. From the appropriate supervisory administrator at the PI's home institution. Typically this would be the Department Chair or Dean for a faculty member at an academic institution. The purpose of this letter is to confirm the administrator's support of the PI's plans and particularly to verify that the PI will receive release time from other academic duties to complete the project as proposed;
    2. From the identified primary research collaborator(s) at the host site. The purpose of this letter is to confirm support of the proposed collaborative research activities; and
    3. From the appropriate administrative managers at the host institution. The purpose of this letter is to confirm that all necessary logistical arrangements (site access, office space, cyber connectivity) will be made for the PI's potential visit(s) to ensure that the project may proceed as proposed.

- No Letters of Support are allowed other than those fitting in the above categories.
- A Postdoctoral Mentoring Plan is required if support is requested for a postdoctoral researcher's participation in the project.

11. Single-Copy Documents. As required by the PAPPG, the PI must include a single-copy document detailing their collaborations and other affiliations.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

- Funding requests can be for durations of up to 2 years (24 months). Total funds requested may not exceed $300,000.
- Budgets may include up to six months of salary and fringe benefit support for the PI. Support may be for academic, calendar, or summer months. Up to six months of salary and fringe benefit support (including tuition if appropriate) is also allowed for one additional trainee-level participant.
- Travel expenses for the PI and one additional trainee-level researcher may be requested solely for travel between the PI's home institution and the host site. Multiple trips between the two sites are allowed, however the total budget for travel expenses may not exceed $20,000.
- Living expenses for the PI and one additional trainee-level researcher are allowed during time spent at the host site. Living expense charges (Lodging, Meals, and Incidental Expenses) may not exceed the *per diem* rates set by the United States General Services Administration (GSA) for the host site location. The total budget for living expenses may not exceed $50,000.
- Up to $10,000 in additional direct costs are allowed. These funds may be used for shipping equipment, purchasing supplies, and other similar uses directly related to the research activities at the host site.
- Host institutions are not eligible to receive funds under this award. The sole exception is for living expenses, which may include lodging, meals, and incidental expenses. If funds are to be used to pay living expenses to the host institution, the expected costs should be budgeted as travel expenses (and not as a subaward).

C. Due Dates

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

    February 28, 2017

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 PAPPG 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. (PAPPG 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 PAPPG 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

Reviewers for the RII Track-4 competition will also be asked to review each proposal with respect to these specific questions as they relate to intellectual merit and broader impacts:

- Does the proposal provide clear specifications of research goals, performance metrics, and a project timetable?
- Does the proposal make a compelling case for how the PI will benefit as a result of the fellowship both during the period of the award and beyond?
- Does the proposal provide clear evidence that the home institution is supportive of the effort and that there are identifiable benefits to the home institution and/or jurisdiction?
- Does the host site commit appropriate resources, both scientific and logistic, to lend confidence that the fellowship project will be successful?

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 *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp.

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 Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp.

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:

- Timothy M. VanReken, telephone: (703)292-7378, email: tvanreke@nsf.gov

- Sean C. Kennan, telephone: (703) 292-7575, email: skennan@nsf.gov

- Jose Muñoz, telephone: (703) 292-8003, email: jmunoz@nsf.gov

- Uma D. Venkateswaran, telephone: (703) 292-7732, email: uvenkate@nsf.gov

- C. Susan Weiler, telephone: (703) 292-8683, email: sweiler@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 (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 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**   (703) 292-5111
  (NSF Information Center)**:**

- **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.

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