

## Mathematical Sciences Postdoctoral Research Fellowships (MSPRF)

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### PROGRAM SOLICITATION

NSF 16-558

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### REPLACES DOCUMENT(S):

NSF 14-582

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National Science Foundation

Directorate for Mathematical & Physical Sciences  
Division of Mathematical Sciences

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

October 19, 2016

Third Wednesday in October, Annually Thereafter

### IMPORTANT INFORMATION AND REVISION NOTES

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This revision specifies new proposal requirements for the (uncommon) case in which a prospective Fellow anticipates a long-term absence from the host institution during the first year of a fellowship.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 19-1](#)), which is effective for proposals submitted, or due, on or after February 25, 2019.

### SUMMARY OF PROGRAM REQUIREMENTS

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#### General Information

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**Program Title:**

Mathematical Sciences Postdoctoral Research Fellowships (MSPRF)

**Synopsis of Program:**

The purpose of the Mathematical Sciences Postdoctoral Research Fellowships (MSPRF) is to support future leaders in mathematics and statistics by facilitating their participation in postdoctoral research environments that will have maximal impact on their future scientific development. There are two options for awardees: Research Fellowship and Research Instructorship. Awards will support research in areas of mathematics and statistics, including applications to other disciplines.

**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.*

- Andrew D. Pollington, telephone: (703) 292-4878, email: [adpollin@nsf.gov](mailto:adpollin@nsf.gov)
- Stefaan G. De Winter, telephone: (703) 292-2599, email: [sgdewint@nsf.gov](mailto:sgdewint@nsf.gov)
- Tiziana Giorgi, telephone: (703) 292-8090, email: [tgiorgi@nsf.gov](mailto:tgiorgi@nsf.gov)
- Yuliya Gorb, telephone: (703) 292-2113, email: [ygorb@nsf.gov](mailto:ygorb@nsf.gov)
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- Krishnan Shankar, telephone: (703) 292-4703, email: [kshankar@nsf.gov](mailto:kshankar@nsf.gov)
- Sandra Spiroff, telephone: (703) 292-8069, email: [sspiroff@nsf.gov](mailto:sspiroff@nsf.gov)
- Jeremy Tyson, E 8423, telephone: (703) 292-7210, email: [jtyson@nsf.gov](mailto:jtyson@nsf.gov)

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

- 47.049 --- Mathematical and Physical Sciences

## Award Information

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**Anticipated Type of Award:** Fellowship

**Estimated Number of Awards:** 30 to 33

**Anticipated Funding Amount:** \$5,000,000

subject to availability of funds

## Eligibility Information

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### Who May Submit Proposals:

Proposals may only be submitted by the following:

- The Mathematical Sciences Postdoctoral Research Fellowships are awards to individuals, and applications are submitted directly by the applicant to the NSF. Fellows must affiliate with institutions or organizations (e.g., colleges and universities, government and national laboratories and facilities, privately sponsored nonprofit institutes and museums, and for-profit organizations under certain conditions). Applications with international host institution affiliations are eligible for support, and additional funding from the Office of International Science and Engineering may be available for awards with international host institutions.

### Who May Serve as PI:

An individual is eligible to submit a proposal to this program if **all** the following criteria are met:

- Must, at the time of submission, be a U.S. citizen, U.S. national, or a legally admitted permanent resident alien of the United States;
- May not have held the doctoral degree more than 2 years as of January 1 of the year of the award;
- Must propose research in an area of mathematics or statistics;
- May not have previously been a principal investigator or co-principal investigator of an NSF award (other than a graduate research fellowship or an award in support of a conference or workshop);
- May not submit a research plan duplicated in another NSF proposal;
- Must not have previously been offered an award by the MSPRF program; and
- Must have a doctoral degree conferred before the postdoctoral appointment start date.

### Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

One application per person per year.

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

### 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):  
October 19, 2016

Third Wednesday in October, Annually Thereafter

## Proposal Review Information Criteria

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### Merit Review Criteria:

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

## Award Administration Information

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### Award Conditions:

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

### Reporting Requirements:

Additional reporting requirements apply. Please see the full text of this solicitation for further information.

## TABLE OF CONTENTS

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### Summary of Program Requirements

- I. **Introduction**
- II. **Program Description**
- III. **Award Information**
- IV. **Eligibility Information**
- V. **Proposal Preparation and Submission Instructions**
  - A. Proposal Preparation Instructions
  - B. Budgetary Information
  - C. Due Dates
  - D. FastLane Requirements
- VI. **NSF Proposal Processing and Review Procedures**
  - A. Merit Review Principles and Criteria
  - B. Review and Selection Process
- VII. **Award Administration Information**
  - A. Notification of the Award
  - B. Award Conditions
  - C. Reporting Requirements
- VIII. **Agency Contacts**
- IX. **Other Information**

## I. INTRODUCTION

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As researchers in the mathematical sciences expand their interactions with other disciplines, and as the interplay increases among the various areas of mathematics and statistics, opportunities for postdoctoral research and training become increasingly important. Postdoctoral fellowships are designed to provide increased flexibility for awardees in choosing research environments that will have maximal impact on their future scientific development. Awards of these fellowships will support research in areas of mathematics and statistics, including applications to other disciplines. The proposed research must be in an area of mathematics and statistics.

## II. PROGRAM DESCRIPTION

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The purpose of the Mathematical Sciences Postdoctoral Research Fellowships (MSPRF) is to provide flexibility for a Fellow to pursue a research program in the mathematical sciences in a postdoctoral research environment that will have maximal impact on the Fellow's scientific development. The Fellow will affiliate with a host institution during the entire tenure of the fellowship and select a sponsoring scientist who will provide mentoring and guidance for both the research and training proposed by the applicant. The applicant is responsible for making prior arrangements with the sponsoring scientist.

The Fellow will have two options for holding the fellowship:

1. The Research Fellowship option provides full-time support for any eighteen academic-year months in a three-year period, in intervals not shorter than three consecutive months;
2. The Research Instructorship option provides a combination of full-time and half-time support over a period of three academic years, usually one academic year full-time followed by two academic years half-time. This option allows the Fellow the opportunity to gain teaching experience during the two half-time academic years. The full-time fellowship support will be provided during the first year except in extremely unusual circumstances, with any

exception subject to approval by the managing program director.

Under both options the award includes six summer months of support.

The MSPRF program is designed to foster close collaboration between the Fellow and the sponsoring scientist, to promote the Fellow's professional development. For this reason, long-term absences of the Fellow from the host institution, unless accompanied by the sponsoring scientist, are not generally compatible with the intent of the MSPRF program, and any such absence longer than one month in duration must be approved in advance by the cognizant program director. If the Fellow plans an absence from the host institution of duration longer than one month during the first year of the Fellowship, the MSPRF proposal must fully describe in a supplementary document the rationale and plans for such an absence. Plans for long-term absences (which are expected to be uncommon) are subject to review together with the rest of the proposal. Program directors will not approve long-term absences of the Fellow from the host institution, unaccompanied by the sponsoring scientist, during the first year of a Fellowship unless plans for the long-term absence are spelled out in the proposal.

### III. AWARD INFORMATION

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Fellowship awards are for a total of \$150,000, with a possible additional allowance of up to \$20,000 for awards with international host institutions. The anticipated date of awards is April in the year following the application deadline.

#### DURATION/TENURE AND STIPEND/ALLOWANCES

##### A. Duration and Tenure

The duration of a Fellowship award is 48 months, during which stipend support is provided for 24 months (18 academic-year months plus 6 summer months).

The Fellow selects either the Research Fellowship or Research Instructorship option at the time of the application. However, the Fellow may choose to exercise the Research Instructorship option at any time before beginning the postdoctoral appointment with the approval of the cognizant NSF program director.

For the Fellowship option the award provides two academic years of full-time support. For the Instructorship option the award provides one academic year of full-time support (except in unusual circumstances, this will be the first year of the fellowship) and two academic years of half-time support. The appointment period also includes three two-month summer periods, which generally will immediately precede or immediately follow an academic year of support. No more than two summer months of support may be received during any calendar year. The postdoctoral appointment must start between June 1 and October 1 of the year of the award. The doctoral degree must be conferred before the start date of the appointment.

Within the 48-month Fellowship period, up to two months may be used for paid leave, including parental or family leave. The two months of paid leave cannot be used to increase the level of NSF support. NSF enables career-life balance through a variety of mechanisms. For more information, please see <https://www.nsf.gov/career-life-balance/>.

Fellowships may not be renewed.

##### B. Stipend and Allowances

The total Fellowship amount is \$150,000 and consists of three separate types of payments.

1. A monthly stipend of \$5,000 for full-time support or \$2,500 for half-time support is paid directly to the Fellow as an electronic funds transfer into a personal account at a financial institution.
2. A research allowance of \$12,000 is paid as a lump sum to the Fellow in the same manner for expenses directly related to the conduct of the research, such as materials and supplies, subscription fees and recovery costs for databases, travel, and publication expenses. The Fellow should keep records to document the expenditures.
3. An annual benefit allowance of \$9,000, paid in the first two years of the award, in support of fringe benefits, including health insurance provided through either a group plan offered by the host organization or an individual plan secured by the Fellow, dental and/or vision insurance, disability insurance, retirement, dependent care, and moving expenses.

### IV. ELIGIBILITY INFORMATION

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#### Who May Submit Proposals:

Proposals may only be submitted by the following:

- The Mathematical Sciences Postdoctoral Research Fellowships are awards to individuals, and applications are submitted directly by the applicant to the NSF. Fellows must affiliate with institutions or organizations (e.g., colleges and universities, government and national laboratories and facilities, privately sponsored nonprofit institutes and museums, and for-profit organizations under certain conditions). Applications with international host institution affiliations are eligible for support, and additional funding from the Office of International Science and Engineering may be available for awards with international host institutions.

#### Who May Serve as PI:

An individual is eligible to submit a proposal to this program if **all** the following criteria are met:

- Must, at the time of submission, be a U.S. citizen, U.S. national, or a legally admitted permanent resident alien of the United States;

- May not have held the doctoral degree more than 2 years as of January 1 of the year of the award;
- Must propose research in an area of mathematics or statistics;
- May not have previously been a principal investigator or co-principal investigator of an NSF award (other than a graduate research fellowship or an award in support of a conference or workshop);
- May not submit a research plan duplicated in another NSF proposal;
- Must not have previously been offered an award by the MSPRF program; and
- Must have a doctoral degree conferred before the postdoctoral appointment start date.

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

There are no restrictions or limits.

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

One application per person per year.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### A. Proposal Preparation Instructions

**Full Proposal Instructions:** Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Proposal & Award Policies & Procedures Guide (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg). Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 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.

Mathematical Sciences Research Fellowship Program applications must be submitted electronically using the NSF FastLane system. Only one application is permitted per person per year. An application consists of many parts, and requires input from the applicant, the sponsoring scientist, and the authors of reference letters. Applicants are advised to begin the application well in advance of the deadline and to submit as early as possible. FastLane procedures allow applicants to save partially completed proposals for future completion and submission.

**FastLane Registration for Fellowship Applicants**

Before starting an application in FastLane, **an applicant must register as an Individual Researcher**. This means that the applicant functions as his or her own institution, and the application must be submitted in FastLane by the applicant, not by the applicant's institutional Sponsored Research Office (SRO). This also means that the applicant serves as his or her own SRO for purposes of any research administration functions in FastLane.

To begin the application process, access FastLane at <https://www.fastlane.nsf.gov>. Select *Postdoctoral Fellowships and Other Programs*. Select GO next to "Individual Registration." Fill in all the required fields. Select *Submit*. As soon as you select *Approve* on the next screen, your password will be submitted for activation and you will receive an email confirming approval.

**FastLane Instructions for Fellowship Applicants**

Detailed instructions for completing a *Mathematical Sciences Postdoctoral Research Fellowship* application are available by accessing the [FastLane](#) homepage and clicking on the link for *Postdoctoral Fellowships and Other Programs*. On this page, click on "I am an Applicant" and then select "Mathematical Sciences Postdoctoral Research Fellowships." Click on "How to Apply." This will lead to a document with detailed instructions.

**A complete postdoctoral fellowship application consists of the following** (Note: *The entire application, with the exception of the letters of reference, must be submitted by the fellowship applicant in FastLane*):

- NSF cover page;
- FastLane application forms;
- Project Summary (1 page limit) of the proposed research and training activities, including specific and separate statements in the Overview, Intellectual Merit, and Broader Impacts sections;
- Project Description (5 page limit), which addresses what the applicant hopes to accomplish during the fellowship period and how it relates to the applicant's career goals. The Project Description should be written with both specialists and non-specialists in mind. The Project Description consists of:
  - an introduction or background section;
  - a description of past accomplishments;
  - a statement of research objectives, methods, and significance;
  - an explanation of how the fellowship activities will enhance the applicant's career development;
  - a justification of the choice of sponsoring scientist and host institution; and
  - a separate section within the narrative that discusses the broader impacts of the proposed activities.
- References Cited (no page limit);
- Biographical Sketch (2 page limit), following the instructions in the Proposal & Award Policies & Procedures Guide (PAPPG) for senior personnel;
- Supplementary Documentation consisting of:
  - The sponsoring scientist statement (3 page limit). The sponsoring scientist's statement should provide the information requested in the Instructions for Sponsoring Scientists section below and should NOT be a letter of recommendation. The sponsoring scientist will send the statement to the applicant who will then upload the statement into the application.
  - Data management plan. *All* applications *must* include a supplementary document of no more than two pages labeled "Data Management Plan." Describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans.
  - Plan for long-term absence (if applicable; 1 page limit). If the Fellow plans an absence from the host institution of duration longer than one

month during the first year of the fellowship, fully describe the rationale and plans for such an absence.

- Three or four letters of reference. One reference letter should be from the doctoral adviser and the other letters should be from scientists who know the applicant and/or the applicant's research well. FastLane submission by the authors of the reference letters is required. **The sponsoring scientist is not allowed to serve as an author of a reference letter, unless the sponsoring scientist is also the applicant's doctoral adviser.**

#### FastLane Instructions for Sponsoring Scientists

The sponsoring scientist's statement is meant to show how the host and host institution will provide a vibrant and supportive environment for the Fellow's proposed research and training activities and provide a basis for the Fellow's future independent research career. Therefore, the statement should include a specific mentoring plan. The statement should address the following:

- the expected availability of the sponsoring scientist for consultation during the requested tenure period;
- the role that the sponsoring scientist will play in the professional development of the Fellow;
- the opportunities for training and research at the host institution that will be of particular benefit to the Fellow;
- the appropriateness of the match between the sponsoring scientist and the Fellow; and
- how the sponsoring scientist expects to benefit from the experience of supervising the Fellow.

Sponsors are not expected to provide all the mentoring themselves and may call on resources available on campus or through other organizations.

The statement is limited to 3 pages. The statement should **NOT** be a letter of recommendation. While it may describe the applicant's research achievements and future research goals and how they align with those of the sponsoring scientist, it may not include language evaluating the applicant or the applicant's research program. It should not include any comparisons of the applicant with other researchers.

The statement should also include the name, title, department, email address, and telephone number of the sponsoring scientist, as well as the address and phone number of the sponsoring scientist's department at the host institution.

#### FastLane Instructions for Authors of Reference Letters

To prepare and submit the reference letters, the author must receive from the applicant the applicant's Temporary Proposal Number and a password. The Temporary Proposal Number is used to provide secure access to the FastLane application for preparing and submitting the reference letters. Access is limited to those to whom the applicant gives the Temporary Proposal Number. This number links the letter of reference to the application.

Access the FastLane homepage (<https://www.fastlane.nsf.gov>) and click on the link for *Postdoctoral Fellowships and Other Programs*. Click on "I am a Letter of Reference Writer." Enter your last name, the applicant's Temporary Proposal Number, and the password the applicant has sent you. Click on Create/Submit Letter of Reference.

Questions may be directed by e-mail to [dmsfl@nsf.gov](mailto:dmsfl@nsf.gov) or [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

#### FastLane Instructions for Cover Sheet

Proposers are reminded to identify the NSF publication number (located on the first page of this document) 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.

## B. Budgetary Information

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#### Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

#### Other Budgetary Limitations:

The fellowship application does not require an itemized budget.

## C. Due Dates

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

October 19, 2016

Third Wednesday in October, Annually Thereafter

## D. FastLane Requirements

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Proposers are required to prepare and submit all proposals for this program solicitation through use of the NSF FastLane system. Detailed instructions regarding the technical aspects of proposal preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](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.

**Submission of Electronically Signed Cover Sheets.** The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see PAPPG Chapter II.C.1.d for a listing of the certifications). The AOR must provide the required electronic certifications at the time of proposal submission. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

## 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 PAPPG Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: [https://www.nsf.gov/bfa/dias/policy/merit\\_review/](https://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 *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. 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

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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. (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**

The evaluation of applicants will be based on ability and potential as evidenced by past research and the reference letters; suitability and availability of the sponsoring scientist and other colleagues, as well as other conditions at the proposed host institution such as adequate space, basic services, and supplies; likely impact of the sponsoring scientist and the host institution on the scientific development of the applicant; scientific quality of the research likely to emerge; and the potential of the applicant's contributions to the Foundation's education and human resource goals. Applications will be evaluated by a panel of mathematical scientists. The panel will be advised to take into consideration NSF's goal to broaden participation.

No written reviews are generated during the review process for this program, so the applicant will not receive copies of reviews for proposals submitted to this program solicitation. However, the applicant will receive a summary prepared by the review panel that includes the ratings assigned by individual reviewers and indicates the relative ranking of the application among those under the panel's consideration.

The selection of Fellows will be made by the National Science Foundation, and applicants may expect to be notified by e-mail in late January or early February.

## **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 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 is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. The proposer will receive an explanation of the decision to award or decline funding.

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

## **VII. AWARD ADMINISTRATION INFORMATION**

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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; (3) the application referenced in the award notice; (4) the applicable award conditions and (5) any NSF funding opportunity or other NSF issuance that may be incorporated by reference in the award notice. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically via e-mail.

#### **Special Award Conditions:**

All awards are made subject to the general provisions in the brochure entitled Information for Mathematical Sciences Postdoctoral Research Fellows, which will be mailed to successful applicants. The information contained in the brochure is summarized below.

All arrangements for affiliation with the chosen fellowship institution(s) are the responsibility of the Fellow.

If the Research Fellowship option is chosen, Fellows will be expected to devote full time to appropriate scientific research during the appointment period of the fellowship, and to pursue the program for which the fellowship was awarded. Institutions may supplement fellowship stipends without prior approval from the Foundation provided that such is done in accordance with established institutional policies. Supplementation may be given only if there is no requirement for duties in addition to normal fellowship activities, and may involve teaching only to the extent of conducting or participating in seminars directly related to the fellowship activities and research program.

If the Fellow chooses the Research Instructorship option, Fellows will be expected to devote half time to appropriate scientific research during the appointment period of the fellowship. The institution at which the Fellow plans to hold the Instructorship must agree to provide a half-time position with a teaching load not to exceed the equivalent of three teaching hours per semester for the academic year period during which half-time NSF support is received. This agreement need not be obtained until after the awards are announced; lack of such an agreement at the time of the application will not adversely affect the evaluation.

For either the Research Fellowship or the Research Instructorship option, the host institution's faculty should have competence in the Fellow's research area, and a member of the institution's faculty must agree to serve in the role of sponsoring scientist.

Changes in the host institution will be approved only under extremely unusual and compelling circumstances. Since the likely impact of both the sponsoring scientist and the host institution on the professional development of the applicant is an important factor in the evaluation process, the selection of these will normally be viewed as a commitment on the part of the applicant to fulfill the plan for research as outlined in the application. Securing a position at an institution other than the proposed host institution is not considered an "extremely unusual and compelling circumstance."

Under certain circumstances it might be desirable for portions of the work to be done at foreign institutions. Approval to do so must be obtained in advance from both the sponsoring scientist and the cognizant NSF program officer.

In exceptional circumstances, applications for less than full-time postdoctoral support, with reduced stipends, will be considered. Requests for such must be made in the original application, and applicants must agree to accept remuneration from no other source while on a part-time appointment. Major changes in the plan of scientific research, in the appointment period, or in fellowship institution require prior Foundation approval. After an award is made, the dollar amount and length of the appointment are not subject to increase except as indicated above.

In the context of the brochure's guidelines, funds that the institution has obtained from external (including federal) sources may be considered as institutional funds. NSF awards may be used for supplementation of stipends in an amount not to exceed \$1,000 per year.

## **C. Reporting Requirements**

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No later than 120 days following expiration of the fellowship, the Fellow is required to submit a project outcomes report for the general public. Failure to provide the project outcomes report will delay NSF review and processing of any pending proposals for the Fellow.

The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the Fellow.

Within 90 days after termination of the fellowship, the Fellow is required to submit both a termination certificate and a final report. The termination certificate will be provided to the Fellow by NSF. No additional annual reports will be required.

## **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:

- Andrew D. Pollington, telephone: (703) 292-4878, email: [adpollin@nsf.gov](mailto:adpollin@nsf.gov)
- Stefaan G. De Winter, telephone: (703) 292-2599, email: [sgdewint@nsf.gov](mailto:sgdewint@nsf.gov)
- Tiziana Giorgi, telephone: (703) 292-8090, email: [tgiorgi@nsf.gov](mailto:tgiorgi@nsf.gov)
- Yuliya Gorb, telephone: (703) 292-2113, email: [ygorb@nsf.gov](mailto:ygorb@nsf.gov)
- Edsel A. Pena, telephone: (703) 292-8080, email: [epena@nsf.gov](mailto:epena@nsf.gov)
- Krishnan Shankar, telephone: (703) 292-4703, email: [kshankar@nsf.gov](mailto:kshankar@nsf.gov)
- Sandra Spiroff, telephone: (703) 292-8069, email: [sspiroff@nsf.gov](mailto:sspiroff@nsf.gov)

- Jeremy Tyson, E 8423, telephone: (703) 292-7210, email: [jtyson@nsf.gov](mailto:jtyson@nsf.gov)

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188

FastLane Help Desk e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

Research.gov Help Desk e-mail: [rgov@nsf.gov](mailto:rgov@nsf.gov)

## IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "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 <https://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 (FASSED)* 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 <https://www.nsf.gov>

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **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) 292-8134
- **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 [System of Record Notices](#), NSF-50, "Principal Investigator/Proposal File and Associated Records," and NSF-51, "Reviewer/Proposal File and Associated Records." 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 3145-0023. Public reporting burden for this collection of information is estimated to average 12 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  
Policy Office, Division of Institution and Award Support  
Office of Budget, Finance, and Award Management  
National Science Foundation  
Alexandria, VA 22314

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