

NSF 23-603: Mathematical Sciences Postdoctoral Research Fellowships (MSPRF)

Program Solicitation

Document Information

Document History

- **Posted:** July 13, 2023
- **Replaces:** [NSF 22-619](#)

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National Science Foundation
Directorate for Mathematical and Physical Sciences
Division of Mathematical Sciences

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

October 18, 2023

Third Wednesday in October, Annually Thereafter

October 18, 2024



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Important Information And Revision Notes

Proposals must be prepared and submitted through Research.gov. The proposal preparation instructions have been revised significantly. Please read them carefully as some requirements have changed.

Reference letters are required. Reference letter authors must have an NSF account in Research.gov to access the Reference Letter Submission module and submit a reference letter. See Section V.A for additional information.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

Summary Of Program Requirements

General Information

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 Instructor-ship. 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.

- Stefaan G. De Winter, telephone: (703) 292-2599, email: sgdewint@nsf.gov
- Amina Eladdadi, telephone: (703) 292-8128, email: aeladdad@nsf.gov
- Dmitry Golovaty, telephone: (703) 292-2117, email: dgolov@nsf.gov

- Eriko Hironaka, telephone: (703) 292-7041, email: ehironak@nsf.gov
- Wing Suet Li, telephone: (703) 292-4630, email: winli@nsf.gov
- Andrew D. Pollington, telephone: (703) 292-4878, email: adpollin@nsf.gov
- Elizabeth Wilmer, telephone: (703) 292-7021, email: ewilmer@nsf.gov

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

- 47.049 --- Mathematical and Physical Sciences

Award Information

Anticipated Type of Award: Fellowship

Estimated Number of Awards: 35 to 45

Anticipated Funding Amount: \$8,500,000 subject to availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- The Mathematical Sciences Postdoctoral Research Fellowships are awards to individuals, and proposals are submitted directly by the fellowship proposer to NSF. Fellows must affiliate with institutions or organizations (e.g., Institutions of Higher Education (IHEs), government and national laboratories and facilities, privately sponsored nonprofit institutes and museums, and for-profit organizations under certain conditions).

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.

Proposals that fail to meet the above eligibility requirements will be returned without review.

By signing and submitting the proposal, the fellowship candidate is certifying that they meet the eligibility criteria specified in this program solicitation. Willful provision of false information in this request and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

Limit on Number of Proposals per Organization:

Only individuals may submit proposals. There is no limit on the number of fellows that an institution may host.

Limit on Number of Proposals per PI or co-PI:

One proposal per individual per year.

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 Research.gov: *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=pappg.

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

Not Applicable
- **Other Budgetary Limitations:**

Not Applicable

C. Due Dates

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

October 18, 2023

Third Wednesday in October, Annually Thereafter

October 18, 2024

Proposal Review Information Criteria**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**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.

I. Introduction

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

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 Fellow. The Fellow 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 Instructor-ship 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 typically 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

Fellowship awards are for a total of \$190,000, subject to availability of funds.. The anticipated date of awards is April in the year following the proposal 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 Instructor-ship option at the time of proposal submission. However, the Fellow may choose to exercise the Research Instructor-ship 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 Instructor-ship 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.

Fellowships may not be renewed.

B. Stipend and Allowances

The total Fellowship amount is \$190,000 and consists of two separate types of payments.

(1) A monthly stipend of \$5,833 (up to \$70,000 annually) for full-time support (or \$2,917 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 total allowance of \$50,000 is paid in lump sums of \$30,000 and \$20,000 in the first and second Fellowship years, respectively, 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, and/or
- expenses in support of fringe benefits, including but not limited to 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 savings, dependent care, and moving expenses.

IV. Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- The Mathematical Sciences Postdoctoral Research Fellowships are awards to individuals, and proposals are submitted directly by the fellowship proposer to NSF. Fellows must affiliate with institutions or organizations (e.g., Institutions of Higher Education (IHEs), government and national laboratories and facilities, privately sponsored nonprofit institutes and museums, and for-profit organizations under certain conditions).

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.

Proposals that fail to meet the above eligibility requirements will be returned without review.

By signing and submitting the proposal, the fellowship candidate is certifying that they meet the eligibility criteria specified in this program solicitation. Willful provision of false information in this request and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

Limit on Number of Proposals per Organization:

Only individuals may submit proposals. There is no limit on the number of fellows that an institution may host.

Limit on Number of Proposals per PI or co-PI:

One proposal per individual per year.

V. Proposal Preparation And Submission Instructions

A. Proposal Preparation Instructions

Full Proposal Instructions: Proposers must submit proposals in response to this Program Solicitation via Research.gov.

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. 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. 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. The Prepare New Proposal setup will prompt you for the program solicitation number. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

See PAPPG Chapter II.D.2 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 PAPPG instructions.

Proposals submitted to the Mathematical Sciences Research Fellowship Program must be submitted electronically through Research.gov. Only one proposal is permitted per individual per deadline. A full proposal consists of many parts and requires input from the fellowship candidate, the proposed sponsoring scientist, the authors of reference letters, and the proposed host institution(s). Proposers are strongly urged to begin the proposal well in advance of the submission deadline and to submit as early as possible. Partially completed proposals may be saved for future completion and submission. Proposers are advised to start submissions early to allow reference writers sufficient time to submit the required letters, and to allow sufficient time to complete and upload all required components. The submission of incomplete or late proposals is not permitted. All proposal components must be completely uploaded by 5:00 PM (submitter's local time) on the proposal deadline.

Registration for Fellowship Proposers

Before starting proposal preparation, a proposer must register as a [new individual in Research.gov](#). Fellowship proposals must be submitted by the Fellowship proposer, not by the proposer's current or proposed organizational Sponsored Projects Office (SPO). The proposer serves as his/her own SPO and Authorized Organizational Representative (AOR) for the purposes of any research administration functions in Research.gov.

Fellowship Proposal Instructions

Proposals must include all of the required sections of a full research proposal submitted to NSF as specified in Chapter II.D.2 of the PAPPG. In cases where requirements given in this document supplement or deviate from the instructions provided in the PAPPG, this solicitation takes precedence. All page limitations include pictures, figures, tables, graphics,

etc. Proposers are urged to take special care to strictly adhere to page limitations. Proposals that do not conform to the requirements will not be accepted or will be returned without review.

Proposal Set-Up: Select "Prepare New Full Proposal" in Research.gov. The Fellowship Candidate/PI must select the "I am a Proposed Postdoctoral Fellow (Postdoctoral Fellowship Proposal)" option to initiate a postdoctoral fellowship proposal. If you do not see an option to apply as a Proposed Postdoctoral Fellow, this means you do not have the Proposed Postdoctoral Fellow role. Please add this role under "My Profile" and allow up to 30 minutes for the role to take effect.

Search for and select this solicitation title in Step 1 of the Full Proposal wizard. The information in Step 2 and Step 3 is pre-populated by the system. In Step 4, add a descriptive title of the research following the prepended text "Postdoctoral Fellowship: MSPRF:"

Personnel Documents: The fellowship candidate is automatically designated as the PI in Research.gov.

The primary sponsoring scientist must be identified on the proposal. This is done by going to the Personnel Documents section, clicking on the "Add Sponsoring Scientist" tab and entering the individual's NSF ID or Email or Personnel name and Organization. A Biographical Sketch and Current and Pending (Other) Support is not required to be included for the sponsoring scientist.

The following instructions supplement or deviate from the guidance in the NSF PAPPG.

For the purposes of this solicitation, NSF expects that the Fellow and the sponsoring scientist will collaborate on most sections of the proposal.

A complete postdoctoral fellowship proposal consists of the following (Note: *The entire proposal, with the exception of the letters of reference, must be submitted by the prospective fellow in Research.gov*):

- NSF Cover Sheet: A requested start date must be entered. It must be between June 1 and October 1 of the year of the award. The proposed duration for a postdoctoral fellowship proposal is pre-populated, read-only (i.e., not editable), and aligns with the program solicitation selected when initiating the proposal in Research.gov.
- In the Primary Place of Performance section, enter the primary host institution information. Complete any other sections as appropriate and applicable.
- Application forms: These forms are available in the Research.gov module for this solicitation and collect information on, among other things, the sponsoring scientist, host institution, math subject classification, etc.
- Project Description (5 page limit), which addresses what the Fellow hopes to accomplish during the fellowship period and how it relates to the proposer'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 proposer's career development;
 - a justification of the choice of sponsoring scientist and host institution; and
 - a separate section within the narrative labeled "Broader Impacts" that discusses the broader impacts of the proposed activities.
- Budget: In Research.gov, the budget section includes the pre-populated stipend and fellowship allowance based on the requirements of this solicitation. The budget section does not display on the proposal main page after the proposal has been created but can be viewed by clicking Print Proposal. When the proposal is submitted, the budget will display as read-only and will be accessible from the proposal main page. The budget section is editable during a proposal file update/budget revision; do not edit the budget unless instructed to do so by NSF.
- Data Management Plan. *All proposals must* include a Data Management Plan 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.

- Reference Letters: Three reference letters are required to be submitted but up to four reference letters may be submitted. One reference letter should be from the doctoral adviser and the other letters should be from scientists who know the proposer and/or the proposer's research well. Research.gov 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 proposer's doctoral adviser.**
 - The proposer will add each nominated reference letter author in the section labeled "Reference Letter Request(s)" in Research.gov. Each nominated reference letter author will receive a system-generated email with an Invitation Code to access the Reference Letter Submission module in Research.gov. Reference letters are submitted directly in the Reference Letter Submission module by the authors and are not uploaded in the proposal by the proposer. Nominated reference letter authors without an NSF account can use the "Register" feature at the top of the Research.gov to create an NSF account. Reference letter authors can refer to the "[Register for a New NSF Account](#)" video tutorial (3:36 minutes) or "[Register for a New NSF Account](#)" job aid for step-by-step registration instructions and associated screenshots. Additional guidance for reference letter authors will be available on the Research.gov About Proposal Preparation and Submission page.
- Sponsoring Scientist Statement (3 page limit). The sponsoring scientist's statement should provide the information requested in the Instructions for Sponsoring Scientist's section below. The sponsoring scientist will send the statement as to the proposer who will then upload the statement as a PDF into the proposal in the "Sponsoring Scientist Statement" section in Research.gov.

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 proposer's research achievements and future research goals and how they align with those of the sponsoring scientist, it may not include language evaluating the proposer or the proposer's research program. It should not include any comparisons of the proposer 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.

- Other Supplementary Documents:
 - 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.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

October 18, 2023

Third Wednesday in October, Annually Thereafter

October 18, 2024

D. Research.gov Requirements

Proposers are required to prepare and submit all proposals for this program solicitation through use of the NSF Research.gov system.

Before starting proposal preparation, the proposer must be registered as an individual. To register as a new individual in Research.gov, access the [Research.gov New Account Management System](#). To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubm For Research.gov user support, call the Research.gov Help Desk at 1-800-673-6188 or e-mail rgov@nsf.gov. The Research.gov Help Desk answers general technical questions related to the use of the Research.gov 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.

Submitting the Proposal: Fellowship proposals must be submitted by the Fellowship candidate, not by the Fellowship candidate's current or proposed organizational Sponsored Projects Office (SPO). The Fellowship candidate serves as his/her own SPO and Authorized Organizational Representative (AOR) for the purposes of any research administration functions in Research.gov. As such, the Fellowship candidate, serving as the SPO/AOR must electronically sign and submit the proposal using the Sign and Submit button in Research.gov. The Fellowship candidate is signing on his/her own behalf and by signing the proposal NSF is in no way inferring that the proposer has assumed organizational status. Further instructions regarding this process are available on the Research.gov website: <https://www.research.gov/research-web/>.

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: 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 [Leading the World in Discovery and Innovation, STEM Talent Development and the Delivery of Benefits from Research - NSF](#)

Strategic Plan for Fiscal Years (FY) 2022 - 2026. 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.D.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.D.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 other underrepresented groups 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 proposers 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 proposer; scientific quality of the research likely to emerge; and the potential of the proposer's contributions to the Foundation's education and human resource goals. Proposals 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 proposer will not receive copies of reviews for proposals submitted to this program solicitation. However, the proposer will receive a summary prepared by the review panel that includes the ratings assigned by individual reviewers and indicates the relative ranking of the proposal among those under the panel's consideration.

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

B. Review and Selection Process

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

A. Notification of the Award

Notification of the award is made to *the individual* by an NSF Grants and Agreements Officer. Individuals 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 individual. (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; (3) the proposal 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:

By accepting a fellowship award made pursuant to this solicitation, the fellow agrees to abide by the affiliated institution's policies or codes of conduct. The fellow further agrees to notify NSF's Office of Equity and Civil Rights (OECR) if, pursuant to a complaint made under federal or state law or the institution's policies or codes of conduct relating to sexual harassment, other forms of harassment, or sexual assault, the fellow is subjected to any "administrative leave/administrative action," (defined below) or is the subject of any "finding/determination" (defined below). Failure to so notify NSF may result in termination of the fellowship.

"Administrative leave/administrative action" is defined as any temporary/interim suspension or permanent "removal of the fellow, or any administrative action imposed on the fellow by the institution under the institution's policies or codes of conduct, federal or state statutes, regulations, or executive orders, relating to activities, including but not limited to the following: teaching, advising, mentoring, research, management/administrative duties, or presence on campus.

"Finding/determination" is defined as the final disposition of a matter involving sexual harassment or other form of harassment under the institution's policies and processes, to include the exhaustion of permissible appeals exercised by the fellow, or a conviction of a sexual offense in a criminal court of law.

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 proposers. 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 Instructor-ship 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 Instructor-ship 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 proposal submission will not adversely affect the evaluation.

For either the Research Fellowship or the Research Instructor-ship 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 proposer is an important factor in the evaluation process, the selection of these will normally be viewed as a commitment on the part of the proposer to fulfill the plan for research as outlined in the proposal. 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, proposals for less than full-time postdoctoral support, with reduced stipends, will be considered. Requests for such must be made in the original proposal, and proposers 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 \$2,000 per year.

C. Reporting Requirements

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

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:

- Stefaan G. De Winter, telephone: (703) 292-2599, email: sgdewint@nsf.gov
- Amina Eladdadi, telephone: (703) 292-8128, email: aeladdad@nsf.gov
- Dmitry Golovaty, telephone: (703) 292-2117, email: dgolovat@nsf.gov
- Eriko Hironaka, telephone: (703) 292-7041, email: ehironak@nsf.gov
- Wing Suet Li, telephone: (703) 292-4630, email: winli@nsf.gov
- Andrew D. Pollington, telephone: (703) 292-4878, email: adpollin@nsf.gov
- Elizabeth Wilmer, telephone: (703) 292-7021, email: ewilmer@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-381-1532
- Research.gov Help Desk e-mail: 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](#).

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.F.7 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
 - 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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[Plain language](#) |



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