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Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowships (MPS-Ascend)

PROGRAM SOLICITATION NSF 21-573



National Science Foundation

Directorate for Mathematical and Physical Sciences
Division of Astronomical Sciences
Division of Chemistry
Division of Materials Research
Division of Mathematical Sciences
Division of Physics

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

June 15, 2021

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 20-1](#)), which is effective for proposals submitted, or due, on or after June 1, 2020.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowships (MPS-Ascend)

Synopsis of Program:

The purpose of the Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowship (MPS-Ascend) program is to support postdoctoral Fellows who will broaden the participation of groups that are underrepresented in MPS fields in the U.S. including Blacks or African Americans, Hispanics, Latinos, and Native Americans (to include Alaska Natives, Native Hawaiians or other Native Pacific Islanders) as future leaders in MPS fields. The program is intended to recognize beginning investigators of significant potential and provide them with experience in research that will broaden perspectives, facilitate interdisciplinary interactions and help broadening participation within MPS fields. The program funds postdoctoral Fellows in postdoctoral research environments that will have maximal impact on their future scientific development and facilitates their transition into a faculty appointment. Awards will support research in any scientific area within the purview of the five MPS Divisions: the Divisions of Astronomical Sciences (AST), Chemistry (CHE), Materials Research (DMR), Mathematical Sciences (DMS), and Physics (PHY). Fellowships are awards to individuals, not institutions, and are administered by the Fellows.

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.

- Harshal Gupta, AST, telephone: (703) 292-5039, email: hgupta@nsf.gov
- Rebecca Peebles, CHE, telephone: (703) 292-8809, email: rpeebles@nsf.gov
- Guebre X. Tessema, DMR, telephone: (703) 292-4935, email: gtessema@nsf.gov
- Victor Roytburd, DMS, telephone: (703) 292-8584, email: vroytbur@nsf.gov
- Edmundo J. Garcia-Solis, PHY, telephone: (703) 292-4493, email: ejgarcia@nsf.gov
- Kathleen V. McCloud, OMA, telephone: (703) 292-8236, email: kmcccloud@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: 40 to 50

Forty to fifty fellowships per year contingent upon availability of funds.

Anticipated Funding Amount: \$9,000,000 to \$10,000,000

Subject to the availability of funds.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Proposals may only be submitted by the following:

MPS-Ascend Postdoctoral Research Fellowships are awards to individuals; proposals are submitted directly by the fellowship candidate to NSF. Each candidate must identify one or more sponsoring scientist(s) and host institution(s) in the proposal. Activities supported by the MPS-Ascend Fellowship program may be conducted at any appropriate U.S. host institution as defined in Section II, "Program Description."

Who May Serve as PI:

Applicants must self-certify that they are eligible to receive the Fellowship. An individual (also referred to as a Fellow) is eligible to submit a proposal to the MPS-Ascend Postdoctoral Research Fellowship program if all the following criteria are met:

- Must be U.S. citizens (or nationals) or legally admitted permanent residents of the United States (i.e., have a "green card") at the time the proposal is submitted;
- Present research, professional development, and broadening participation plans that fall within the purview of one of the Divisions (Astronomical Sciences, Chemistry, Materials Research, Mathematical Sciences, or Physics) within the Directorate for Mathematical and Physical Sciences;
- Must have a doctoral degree conferred before the postdoctoral appointment start date;
- Must not have submitted a fellowship proposal concurrently to another NSF program or to a similar program in another Federal agency (e.g., DOE, NASA);
- It is anticipated that the research will be conducted at an institution other than the Fellowship candidate's doctoral-granting or current postdoctoral fellowship institution. However, if the Fellowship candidate chooses to remain at their current institution, the Project Description should include a strong justification of how this choice benefits their research and career development.

Applicants uncertain about the eligibility requirements are strongly encouraged to contact a cognizant NSF program officer listed in this solicitation before preparing the proposal. Awardees must begin the fellowship within 6 months of notification of an award.

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.

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

Individuals may submit only one fellowship proposal per annual competition to this program. (Note: These proposals do not allow for co-PIs).

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
 - Full Proposals submitted via FastLane: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
 - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

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

Not Applicable

- **Other Budgetary Limitations:**

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

C. Due Dates

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

June 15, 2021

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:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

The future of the Nation's scientific enterprise depends on including the best and most highly trained minds in the pursuit of cutting edge scientific problems. This solicitation aims to support outstanding future scientists with a focus on achieving excellence through diversity and supporting postdoctoral Fellows that will broaden the participation of underrepresented minorities in academia as well as across the Nation's scientific enterprise. The intent is to support and prepare postdoctoral Fellows to transition from a postdoctoral position into the first few years of an academic faculty position. The proposed research must be in an area within the purview of one of the Divisions within the Directorate for Mathematical and Physical Sciences (MPS).

Fellows must affiliate with appropriate research institutions and are expected to devote themselves full time to the Fellowship activities during its term.

II. PROGRAM DESCRIPTION

The twofold purpose of the MPS-Ascend program is to support future scientific leaders in MPS fields by facilitating their participation in postdoctoral research environments that will have maximal impact on their future scientific development, and to broaden the participation of underrepresented minorities in MPS science. Fellows supported through this program will affiliate with a host institution during the postdoctoral appointment component of the fellowship and select a sponsoring scientist who will provide mentoring and guidance for the research proposed by the applicant. Appropriate host institutions include U.S. institutions of higher education, private nonprofit institutes and museums, government installations and laboratories, and scientific facilities such as observatories. The applicant is responsible for making prior arrangements with the sponsoring scientist. The postdoctoral support can be requested for between one to three years, depending on the research plan and the nature of the science. As these awards will cross multiple scientific disciplines, NSF anticipates additional cohort building and professional development support for the Fellows through an external institution (herein referred to as the External Mentoring Institution) supported through a future solicitation.

Postdocs supported through this program will be prepared for success in their choice of career paths. MPS also recognizes a gap in the participation of underrepresented minorities in academia in MPS [1], and for those Fellows interested in academia, NSF anticipates a future solicitation allowing Postdoctoral Fellows who choose an academic career to apply for further support upon acceptance of a tenure track or tenured position at a U.S. institution of higher education. Said funds could be used to help establish the Fellow in their academic career and should be considered a supplement to start-up funds offered by the academic institution (if start-up funds are offered) rather than a substitute for such funds.

The Fellow must affiliate with a host institution(s) at all times during the entire tenure of the Fellowship and select a sponsoring scientist(s) who will provide mentoring and guidance with the research and education activities. In addition, the sponsoring scientist must design a mentoring plan for the Fellow. Fellowships can be requested for a duration of one to three years. The requested duration should be decided in consultation with the sponsoring scientist.

The applicant is responsible for making prior arrangements with the host institution and sponsoring scientist(s). If more than one sponsor is proposed, one must be named lead sponsor and the roles of the other sponsors must be clearly stated in the project description. An important basis for judging the suitability of the host institution is the degree to which the sponsoring scientist statement describes and offers a research, education, and mentoring plan that could not be provided without Fellowship support. (See Section V. Proposal Preparation Instructions for additional information about the sponsoring scientist statement.)

National Center for Science and Engineering Statistics, Women, Minorities, and Persons with Disabilities in Science and Engineering: 2019. Alexandria, VA : Special Report NSF 19-304, 2019. Available at <https://www.nsf.gov/statistics/>

III. AWARD INFORMATION

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

DURATION/TENURE AND STIPEND/ALLOWANCES

A. Duration and Tenure

The duration of a Fellowship award is up to 36 months, during which stipend support is provided for between 12 to 36 months. Extensions beyond 36 months are rare and must be agreed upon by the Program Officer managing the award. The postdoctoral appointment must start within 6 months of the award. The doctoral degree must be conferred before the start date of the appointment. Within the up to 36-month Fellowship period, up to two months may be used for paid leave, including parental or family leave, calculated as one day of paid leave earned per month. The up to 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. Fellowships may end before the anticipated end date at the request of the Fellow (for example, if the Fellow accepts a different job offer during the expected duration of the postdoctoral appointment). Under these circumstances no further funds will be dispensed for postdoctoral support after the end date and funds remaining in the award will revert to NSF.

Those applicants selected to receive Fellowships will be contacted by NSF and asked to provide additional information, such as completing acceptance forms and starting certificates, before starting their Fellowships. Successful applicants who have not completed the PhD at the time of application must provide certification of the receipt of the PhD before receiving their Fellowship award. Normally Fellowships will be held at institutions specified in the proposal, but under certain circumstances and with suitable justification, Fellows may transfer during the tenure of the Fellowship to a new institution upon approval by NSF. If a Fellow chooses to accept employment (i.e. a tenure-track position or other full time employment) during a Fellowship year, the Fellow stipend will be terminated upon the start of the new position and a prorated portion of the fellowship allowance must be returned to NSF.

B. Stipend and Allowances

The Fellowship amount of \$100,000 per year for up to three years consists of two separate payments:

1. A monthly stipend of \$5,833 (up to \$70,000 annually) for full-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 \$30,000 annually is paid to the Fellow in the same manner for:
 - a. expenses directly related to the conduct of the research, such as some materials and supplies (the majority of materials and supplies should be provided by the host institution, especially anything that is restricted or larger equipment), subscription fees and recovery costs for databases, travel, and publication expenses and/or
 - b. 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.

In both cases the Fellow should keep records to document the expenditures.

NSF anticipates allowing Postdoctoral Fellows who choose an academic career to apply for further support through this program upon acceptance of a tenure track position at a U.S. college or university. This intended support is envisioned to be administered separately from the MPS-Ascend award and would be available for the Fellow for items such as travel, postdoctoral, graduate or undergraduate student support, materials and supplies, services, equipment and summer salary for the Fellow (academic year salary for the Fellow is not intended to be allowed), along with the associated indirect costs. NSF intends to provide more details through a future solicitation.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Proposals may only be submitted by the following:

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Limit on Number of Proposals per Organization:

Only individuals may submit proposals.

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

Individuals may submit only one fellowship proposal per annual competition to this program. (Note: These proposals do not allow for co-PIs).

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF 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. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The

complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

See PAPPG Chapter II.C.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.

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.

Before starting proposal preparation, the proposer must be registered as an individual. Proposers must register as a [new individual in Research.gov](#) and/or as a [new individual in Grants.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 FastLane or Grants.gov. Submission through NSF FastLane is strongly recommended because these are Fellowships with unique requirements. If the proposer elects to submit through Grants.gov, notification that ALL required documents have been successfully uploaded into FastLane by the deadline date must be affirmed.

Proposal Contents

The following instructions supplement the guidelines in the NSF Proposal & Award Policies & Procedures Guide (PAPPG) and NSF Grants.gov Application Guide for the specified sections. In cases where requirements given in this document differ from those given in the PAPPG or NSF Grants.gov Application Guide, this solicitation takes precedence.

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

NSF Cover Sheet: Select the MPS-Ascend program solicitation number shown at the beginning of this solicitation from the drop-down menu in FastLane. (Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page.) When designating the Unit of Consideration, proposals should be submitted to the Office of Multidisciplinary Activities within the Directorate for Mathematical and Physical Sciences.

The applicant should be designated as PI.

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, and including a justification of how the applicant and project will serve to broaden the participation of underrepresented minorities in MPS fields;

Project Description (10 page limit), which addresses what the postdoctoral Fellow proposes to accomplish during the fellowship period and how it relates to the Fellow's career goals, as well as a more detailed description of how the applicant and project will serve to broaden the participation of underrepresented minorities in MPS fields. 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 the applicant's past accomplishments, including those aimed at broadening participation; 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 institution; and a separate section entitled "Broader Impacts" that discusses the broader impacts of the proposed activities and includes the justification describing how the applicant and project will serve to broaden the participation of underrepresented minorities in MPS fields and the applicant's past experience in such broadening participation efforts (this justification should be at least one page).

References Cited: Follow the instructions in the PAPPG.

Biographical Sketch: Follow the instructions in the PAPPG for senior personnel.

NSF Budget: See instructions in Section V.B, Budgetary Information.

Current and Pending Support: Follow the instructions in the PAPPG for senior personnel.

Facilities, Equipment and Other Resources: Please note that this section is a required part of the proposal. The applicant should enter "See Letters of Collaboration" in the Facilities, Equipment, and Other Resources section of the proposal.

Supplementary Documentation consisting of:

1. 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. The sponsoring scientist will send the statement to the applicant who will then upload the statement into the application. The statement should be signed by both the sponsoring scientist and the Department Chair (or equivalent) at the sponsoring institution.
2. Plan for long-term absence (if applicable; 1 page limit). If the Fellow plans a scientifically based 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. Other long term absences (such as family leave) should be made known to the cognizant Program Officer when the need for such an absence is clear.
3. Two or three letters of reference. One reference letter should be from the doctoral adviser and the other letter(s) should be from scientists who know the applicant and/or the applicant's research well. 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. All reference letters must be submitted as Supplementary Documents.
4. Any needed letters of collaboration (such as those required for access to equipment at national labs or facilities, or access to a collaborator, etc) must follow the NSF format:

"If the proposal submitted by Dr. [insert the full name of the Principal Investigator] entitled [insert the proposal title] is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal."

5. Data Management Plan. All proposals must include a document of no more than two pages uploaded under "Data Management Plan" in the supplementary documentation section.

Sponsoring Scientist Statement: 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. The statement is limited to 3 pages. The statement should address the following: the mentoring plan for the Fellow, the sponsoring scientist's past experiences and track record in mentoring postdocs, especially the track record (if any) in mentoring underrepresented minorities and broadening participation of underrepresented minorities; the expected availability of the sponsoring scientist for consultation during the requested award period; the role that the sponsoring scientist will play in the professional development of the Fellow; the opportunities for training and research at the sponsoring institution that will be of particular benefit to the Fellow; the appropriateness of the match between the sponsoring scientist and the Fellow; an agreement that the sponsoring scientist will support the applicant's involvement in cohort building and professional development activities at the anticipated External Mentoring Institution, once operational, as well as planned activities aimed at broadening participation of underrepresented minorities; and a description of 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, as well as those provided by the External Mentoring Institution. The statement should describe the Fellow's research achievements and future research goals and how they align with those of the sponsoring scientist. 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. The sponsoring scientist should sign the statement before sending it to the Fellow. In addition, the Department Chair (or equivalent) should add the following statement and sign below:

"As Department Chair (or equivalent), I have reviewed the sponsoring scientist statement for (name of MPS-Ascend Fellow) and hereby state my overall support and commitment to provide the necessary Departmental resources described in the statement."

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Other budgetary limitations apply.

Budget Preparation Instructions:

The stipend and fellowship allowance should be entered in Participant Support Costs (Section F on the FastLane budget and Field E on the Grants.gov budget). Enter the \$70,000 stipend in F.1 (FastLane) or E.2 (Grants.gov) and the \$30,000 fellowship allowance in F.4 (FastLane) or E.5 (Grants.gov). Enter (1) as the Total Number of Participants. An annual budget page must be submitted for each of up to three years of fellowship support. A budget Justification is not required and should not be submitted. Applicants should disregard the warning generated by FastLane.

FastLane users: Since no person months and no salary are being requested for senior personnel, the PI (fellow) should be removed from section A of the budget. This can be done by clicking "Add/Delete Senior Personnel", then "Check to remove" by the name, on the budget. Additional information is available on the FastLane website.

The average total Fellowship amount is between \$100,000 and \$300,000 (depending on the length of support requested) and is limited to three main categories:

1. A monthly salary of \$5,833 (up to \$70,000 annually) for full-time support of the postdoctoral Fellow.
2. A total allowance of \$30,000 annually for:
 - a. expenses directly related to the conduct of the research, such as some materials and supplies (the majority of materials and supplies should be provided by the hosts institution, especially anything that is restricted or larger equipment), subscription fees and recovery costs for databases, travel, and publication expenses and/or
 - b. support of fringe benefits.

Fellows will be expected to devote full time to appropriate scientific research, broadening participation activities, and professional development activities either sponsored by the host institution or intended external mentoring institution during the appointment period of the fellowship, and to pursue the program for which the fellowship was awarded. One exception is opportunities for teaching, which are important for the professional development of the Fellow. Limited engagement in teaching responsibilities is encouraged. Such engagement can include no more than one one-semester course per year, with a limit of two such courses over the entirety of the postdoc fellowship. Since teaching opportunities are not covered by the Fellowship, the institution may hire the Fellow to teach such courses, but the Fellowship support must be reduced by the same amount. Discussion with the cognizant Program Director is strongly encouraged in advance of such arrangements.

C. Due Dates

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

June 15, 2021

D. FastLane/Research.gov/Grants.gov Requirements

For Proposals Submitted Via FastLane:

Before starting proposal preparation, the proposer must register as a new individual in Research.gov: <https://www.research.gov/accountmgmt/assets/welcomeunaffiliated.html>. Detailed instructions regarding the technical aspects of 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. 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.

Submitting the Proposal: Fellowship proposals must be submitted by the individual, not by the individual's current or proposed organizational Sponsored

Projects Office (SPO). The individual serves as his/her own SPO and Authorized Organizational Representative (AOR) for the purposes of any research administration functions in FastLane. As such, the proposer, serving as the SPO/AOR must electronically sign and submit the proposal using the Sign and Submit button in FastLane. The individual is signing on his/her own behalf and by signing the proposal NSF is in no way inferring that the individual has assumed organizational status. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

For Proposals Submitted Via Grants.gov:

Before starting proposal preparation, the proposer must register as a new individual in Research.gov and Grants.gov. To register as a new individual in Research.gov go to: <https://www.research.gov/accountmgmt/assets/welcomeunaffiliated.html> and to register in Grants.gov go to: <https://www.grants.gov/web/grants/applicants/registration.html>. Once registered, the proposer can then apply for grant opportunities which indicate "Individual" eligibility on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <https://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Fellowship proposals must be submitted by the individual, not by the individual's current or proposed organizational Sponsored Projects Office (SPO). Once all documents have been completed, the individual must submit the proposal to Grants.gov and verify the desired funding opportunity and agency to which the proposal is submitted. The individual must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

Proposers that submitted via FastLane may use Research.gov to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the applicant may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

A comprehensive description of the Foundation's merit review process is available on the NSF website at: 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

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 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

Within the standard NSF review criteria, the evaluation of proposals will place special emphasis on:

- The scientific ability and potential of the proposed Fellow;
- the potential of the proposed Fellow and project to lead to increased representation of underrepresented minorities in MPS fields;
- the suitability and availability of the sponsoring scientist and other colleagues, as described in the sponsoring scientist statement;
- the likely impact of the Fellowship on the future career of the Fellow,
- the likely impact of the sponsoring scientist and the institution on the professional and scientific development of the Fellow; and,
- the scientific quality of the research likely to emerge from the fellowship experience.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

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

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

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and

issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.

Special Award Conditions:

The main purpose of this award is to support the identified postdoctoral Fellow. If the Fellow transfers at any time prior to or during the award period to another postdoctoral position that is eligible for a MPS ASEND award, the award may support the new postdoctoral experience with the agreement of the cognizant Program Officer. The Fellow must supply documentation, including a new sponsoring scientist statement, in advance of the change in institution and project.

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 Diversity and Inclusion (ODI) 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.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

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

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

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF*

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:

- Harshal Gupta, AST, telephone: (703) 292-5039, email: hgupta@nsf.gov
- Rebecca Peebles, CHE, telephone: (703) 292-8809, email: rpeebles@nsf.gov
- Guebre X. Tessema, DMR, telephone: (703) 292-4935, email: gtessema@nsf.gov
- Victor Roytburd, DMS, telephone: (703) 292-8584, email: vroytbur@nsf.gov
- Edmundo J. Garcia-Solis, PHY, telephone: (703) 292-4493, email: ejgarcia@nsf.gov
- Kathleen V. McCloud, OMA, telephone: (703) 292-8236, email: kmcccloud@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.
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF [Grants Conferences](#). Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

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