

Faculty Development in geoSpace Science (FDSS)

PROGRAM SOLICITATION

NSF 23-577

REPLACES DOCUMENT(S):

NSF 19-558



National Science Foundation

Directorate for Geosciences
Division of Atmospheric and Geospace Sciences

Full Proposal Target Date(s):

September 18, 2023

Target Date

March 03, 2025

March 1, Every Other Year Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

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:

Faculty Development in geoSpace Science (FDSS)

Synopsis of Program:

The Geospace Section of the NSF Division of Atmospheric and Geospace Sciences (AGS) offers funding for the creation of new tenure-track faculty positions within the disciplines that comprise the AGS Geospace programs to ensure their vitality at U.S. universities and colleges. The aim of the Faculty Development in geoSpace Science (FDSS) is to integrate topics in geospace science including solar and space physics and space weather research into natural sciences or engineering or related departments at U.S. institutions of higher education (IHE). FDSS also stimulates the development of undergraduate or graduate programs or curricula capable of training the next generation of leaders in geospace science. Geospace science is interdisciplinary in nature and FDSS awardees will be expected to establish partnerships within multiple parts of the IHE. NSF funding will support the salary, benefits and training of the newly recruited tenure-track FDSS faculty member for a duration of up to five years with a total award amount not to exceed \$1,500,000.

Growing diversity in the geospace science workforce and institutions is a community priority, yet relatively few geospace science research and training opportunities are available at minority-serving institutions (MSIs) and emerging research institutions (ERIs). One of NSF's priorities is to improve representation in the scientific enterprise. FDSS aims to bolster long-term investments in geospace science at a broad range of U.S. IHEs, including MSIs and ERIs. This solicitation offers a track for all qualified U.S. IHEs and additionally, a separate track for proposal submissions from MSIs and ERIs.

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.

- Mangala Sharma, Program Director, telephone: (703) 292-4773, email: IntegrativeGeospace@nsf.gov

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 2 to 4

1-3 awards in each track every other year

Anticipated Funding Amount: \$6,000,000

Approximately \$3,000,000 for Track 1 and approximately \$3,000,000 for Track 2, over five years.

This annual amount is approximate and includes new and continuing increments.

The FDSS award, including indirect costs, must be up to a maximum of \$300,000 per year for five years for a total maximum award amount of \$1,500,000.

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

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the United States, acting on behalf of their faculty members. Proposing institutions are those that offer or plan to offer bachelor, masters or doctoral degrees in natural sciences or engineering or related sciences. The institution must be able to grant tenure status to faculty.
 - Track 1 - Any eligible IHE (as described above)
 - Track 2 - Only minority-serving institutions (MSIs) and emerging research institutions (ERIs) among IHEs as described above.

This solicitation adopts the U.S. Department of Education definition of MSIs to be U.S. IHEs enrolling populations with significant percentages of undergraduate minority students, or that serve certain populations of minority students under various programs created by Congress. These include Historically Black Colleges or Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Tribal Colleges or Universities (TCUs), and Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs).

For the purposes of this solicitation, ERIs are IHEs that have less than \$50,000,000 in annual Federal research expenditures averaged over the previous 5 fiscal years at the time of proposal submission.

Institutions that have previously received an NSF FDSS award are ineligible to submit proposals to this solicitation.

Who May Serve as PI:

Principal Investigators should be someone at the IHE with the authority to implement the proposed FDSS program and select and hire the new faculty member. These may be, but are not limited to, a dean, provost, director of a university associated research institute, department chairperson, or a senior tenured faculty member.

Limit on Number of Proposals per Organization: 1

An institution may submit only one proposal in response to this solicitation per target date.

Collaborative proposals are not allowed.

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

An individual may be the principal investigator (PI) or co-PI for only one proposal for the FDSS solicitation per target date.

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.
 - 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 Target Date(s):**

September 18, 2023

Target Date

March 03, 2025

March 1, Every Other Year Thereafter

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

Within the current administrative structure of most U.S. institutions of higher education (IHEs), research and education in geospace science (aeronomy,

magnetospheric physics, solar-terrestrial physics, space physics, and space weather) do not fall under the purview of a specific department such as physics, astronomy, space science, Earth science, planetary science, atmospheric science, meteorology, electrical engineering, computer science and engineering, applied mathematics, etc. There are few faculty positions devoted principally to the education and training of future geospace scientists. At the same time, geospace science is making important discoveries about the connected Sun-Earth system, and the work of geospace scientists has become more valuable to our society as we rely more heavily upon technologies (electric grids, aviation, and satellite systems) sensitive to conditions in the near-Earth space environment. This solicitation provides funding support and incentive for U.S. IHEs to create new tenure-track faculty positions in the intellectual disciplines that comprise the AGS Geospace programs (to include aeronomy, magnetospheric physics, solar-terrestrial research, space weather research, and geospace facilities).

Growing diversity in the geospace science workforce and institutions is a community priority, yet relatively few geospace science research and training opportunities are available at minority-serving institutions (MSIs) and emerging research institutions (ERIs). One of NSF's priorities is to improve representation in the scientific enterprise. FDSS aims to bolster long-term investments in geospace science at a broad range of U.S. IHEs, including MSIs and ERIs. Recognizing the unique needs and challenges of the latter institutions, this solicitation offers a separate track for proposal submissions from MSIs and ERIs.

- Track 1 - Any eligible IHE as described in the eligibility information section
- Track 2 - Only MSIs and ERIs as described in the eligibility information section

II. PROGRAM DESCRIPTION

Proposals submitted in response to this solicitation will have as their principal objective the creation and support of one tenure-track faculty position bearing research, teaching, service, and educational outreach responsibilities in geospace science at the submitting IHE. The FDSS faculty position may reside within one department or be shared among several departments at the IHE.

The proposal must clearly identify which NSF AGS Geospace program(s) the hire is relevant to and what research priorities of the program(s) will be addressed. NSF AGS Geospace programs/priorities include, but are not limited to, the following:

- Aeronomy: research on the mesosphere, thermosphere and ionosphere of the Earth, and the phenomena of ionization, recombination, chemical reaction, photo emission, and the transport of energy and momentum within and between these regions;
- Geospace Facilities: research areas that rely upon existing facilities or develop new instrumentation for geospace observations;
- Magnetospheric Physics: research on the magnetosphere, coupling of the magnetosphere with the solar wind, ionosphere, and atmosphere; development of ground-based observations and lab-based plasma physics;
- Solar-Terrestrial: development of U.S. ground-based solar observation, lab-based solar plasma physics, and instrumentation capabilities, including polarimetry techniques, and new modeling and theoretical research that connects to current or future NSF solar observatories;
- Space Weather Research: system-of-systems research on the physical processes in the integrated Sun-Earth system that underlie space weather and space climate, and characterizing space weather impacts on critical infrastructure and technological systems.

The proposal must not designate any candidate for the new FDSS faculty position, but should include a description of the desired skills, background, and training of the desired candidate. Candidates already in tenured or tenure track positions or those whose research interests are not or only marginally related to geospace science are not eligible for FDSS support.

The proposal must contain details of how an open and inclusive job search would be carried out. Consonant with the stated policies of the National Science Foundation, members of underrepresented and under-served communities should be strongly encouraged to apply.

The proposal must state how topics in geospace science will be integrated into the undergraduate and/or graduate courses offered by the department(s) supporting the FDSS hire.

The proposal must clearly state how the position will be integrated into the institution's overall strategic plan and the measures taken to ensure the successful integration of the faculty position into the institution.

It must include specific objectives and milestones for the hiring, and for the research, curriculum development, and educational outreach activities. It must also include specific evaluation plans to gauge the overall efficacy of the hiring process and the development of geospace science at the institution.

Important aspects to emphasize in the project description are the following:

- Clear articulation of how the FDSS faculty position will be integrated into the IHE's program of education, research, service, and outreach;
- Relevant NSF Geospace program research area(s) that will be addressed by the new faculty member;
- Plan for geospace science curriculum development;
- Potential for the faculty position to attract diverse students and train future scientists in geospace science;
- Plan for developing partnerships both within the university and with the broader geospace science community;
- Plan to support the success of the FDSS hire (including but not limited to reasonable teaching and service expectations, professional development in pedagogy, mentoring, assistance with proposal preparation, etc.);
- Metrics to ascertain the success of the FDSS hiring and related activities of the hire;
- Activities to foster participation by underrepresented and under-served groups in FDSS projects.

Principal Investigators should be someone at the IHE with the authority to implement the proposed FDSS program and select and hire the new faculty member. These may be, but are not limited to, a dean, provost, director of a university associated research institute, department chairperson, or a senior tenured faculty member.

NSF funding will support the academic year (9-month) salary, benefits, and training of the newly recruited tenure-track faculty for the duration of the award. For Track 2 (MSIs and ERIs), the FDSS grant may also support up to 2 months of summer salary for the first three years after hire.

To allow sufficient time for the FDSS hire to stand for tenure review or at least complete a pre-tenure review at or before the end of the award period, it is expected that the award duration will be 5 years. The maximum total award size will be \$1,500,000 over this duration.

Collaborative proposals or subawards are not allowed.

Continuation of the FDSS award beyond the first year is contingent on the successful hiring of a new tenure-track faculty member who meets the intent of this solicitation. As soon as a specific candidate accepts the FDSS tenure-track offer from the IHE, NSF must be notified, including the qualifications of the candidate and their proposed research and teaching plans that address the stated objectives of this solicitation. The cognizant NSF Program Officer may request information about the candidate to confirm that the intent of this solicitation is being met. Such information may include but is not limited to:

1. A description of the search including details of efforts undertaken to broaden participation;
2. A curriculum vitae, including a publication list, for the FDSS hire;
3. A statement of research interests and proposed educational outreach and teaching plans of the successful FDSS candidate.

When the FDSS hire formally joins the IHE, the institution must submit a formal request for the hire to be added to the grant award as a Co-Principal Investigator. It is expected that the majority of the first year's budget costs, e.g., faculty salary and benefits, lab equipment (if needed), etc., will be associated with the new hire and will not be spent until that individual is in place. The FDSS award must be acknowledged by the FDSS hire in all their publications and presentations. See the special award conditions for more information.

III. AWARD INFORMATION

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

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the United States, acting on behalf of their faculty members. Proposing institutions are those that offer or plan to offer bachelor, masters or doctoral degrees in natural sciences or engineering or related sciences. The institution must be able to grant tenure status to faculty.
 - Track 1 - Any eligible IHE (as described above)
 - Track 2 - Only minority-serving institutions (MSIs) and emerging research institutions (ERIs) among IHEs as described above.

This solicitation adopts the U.S. Department of Education definition of MSIs to be U.S. IHEs enrolling populations with significant percentages of undergraduate minority students, or that serve certain populations of minority students under various programs created by Congress. These include Historically Black Colleges or Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Tribal Colleges or Universities (TCUs), and Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs).

For the purposes of this solicitation, ERIs are IHEs that have less than \$50,000,000 in annual Federal research expenditures averaged over the previous 5 fiscal years at the time of proposal submission.

Institutions that have previously received an NSF FDSS award are ineligible to submit proposals to this solicitation.

Who May Serve as PI:

Principal Investigators should be someone at the IHE with the authority to implement the proposed FDSS program and select and hire the new faculty member. These may be, but are not limited to, a dean, provost, director of a university associated research institute, department chairperson, or a senior tenured faculty member.

Limit on Number of Proposals per Organization: 1

An institution may submit only one proposal in response to this solicitation per target date.

Collaborative proposals are not allowed.

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

An individual may be the principal investigator (PI) or co-PI for only one proposal for the FDSS solicitation per target date.

Additional Eligibility Info:

Institutions that have previously received an NSF FDSS award are ineligible to submit proposals to this solicitation.

Collaborative proposals are not allowed.

A current Certification of MSI Eligibility or Certification of ERI Eligibility, following the relevant format in Section V.A below, on organizational letterhead and executed by an Authorized Organizational Representative is required for all proposals to Track 2.

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 Research.gov or Grants.gov.

- Full Proposals submitted 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 and Award Policies and 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. The Prepare New Proposal setup will prompt you for the program solicitation number.
- 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.

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

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.

Note: Collaborative proposals or subawards are not allowed.

Proposal Title: Proposal titles should begin with "FDSS: Track x: ", where x is 1 or 2 as appropriate, and then the title.

Co-PIs: The successful FDSS hire will be added as a Co-PI on the award, subject to NSF's approval and in accordance with standard agency policies and procedures. As NSF proposals allow only 4 Co-PIs, the submitted proposal may include a maximum of 3 Co-PIs to allow for the FDSS hire to be added as a Co-PI on the award subsequently.

Supplementary Document: Certification of MSI or ERI Eligibility for Track 2

A current Certification of MSI Eligibility or Certification of ERI Eligibility, following the relevant format below on organizational letterhead and executed by an Authorized Organizational Representative is required for all proposals to Track 2. The signed Certification must be uploaded as a searchable PDF file into the Supplementary Documents section.

If a Track 2 proposal does not include the Certification of MSI Eligibility or Certification of ERI Eligibility for the submitting institution, then that proposal will be considered within Track 1 instead.

Certification of MSI Eligibility

By submission of this proposal to Track 2 of the NSF Faculty Development in geoSpace Science (FDSS) solicitation, the organization hereby certifies that the originating and managing organization is an institution enrolling populations with significant percentages of undergraduate minority students or that serves certain populations of minority students under various programs created by Congress, and is, in fact, **[a/an HBCU, HSI, TCU, AANAPISI, etc. – choose relevant]** as described by the U.S. Department of Education.

Authorized Organizational Representative

Typed Name and Title

Signature

Date

Certification of ERI Eligibility

By submission of this proposal to Track 2 of the NSF Faculty Development in geoSpace Science (FDSS) solicitation, the organization hereby certifies that the originating and managing organization is an Emerging Research Institution, having received less than \$50,000,000 in annual Federal research expenditures averaged over the previous 5 fiscal years at the time of proposal submission.

Authorized Organizational Representative

Typed Name and Title

Signature

Date

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Subawards are not allowed.

Budget Preparation Instructions:

NSF funding will support the academic year (9-month) salary, benefits, and training of the newly recruited tenure-track faculty for the duration of the award. For Track 2 (MSIs and ERIs), the FDSS grant may also support up to 2 months of summer salary for the first three years after hire.

Required Meeting Travel: All proposals should budget for one to two senior personnel (including the FDSS hire) to attend an annual two-day PI meeting at NSF every year of the project. The main purpose of the PI meeting is to facilitate networking among the awardees and to present their progress on the FDSS project.

C. Due Dates

- **Full Proposal Target Date(s):**

September 18, 2023

Target Date

March 03, 2025

March 1, Every Other Year Thereafter

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

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/ProposalPreparationandSubmission.html. 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.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <https://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

Proposers that submitted via Research.gov 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 Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

Emphasis will be placed upon evaluating the following aspects of the proposal:

- Clear articulation of how the FDSS faculty position will catalyze development of a geospace program that will be integrated into the IHE's education, research, service, and outreach activities;
- Relevant NSF Geospace program research area(s) that will be addressed by the new faculty member;
- Plan for geospace science curriculum development;
- Potential for the faculty position to attract diverse students and train future scientists in geospace science;
- Plan for developing partnerships both within the university and with the broader geospace science community;
- Plan to support the success of the FDSS hire (including but not limited to reasonable teaching and service expectations, professional development in pedagogy, assistance with proposal writing, mentoring, etc.);
- Metrics to ascertain the success of the FDSS hiring and related activities of the hire;
- Activities to foster participation by underrepresented and under-served groups in FDSS projects.

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 or the Division of Acquisition and Cooperative Support 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 an NSF Grants and Agreements Officer. 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.

Administrative and National Policy Requirements

Build America, Buy America

As expressed in Executive Order 14005, [Ensuring the Future is Made in All of America by All of America's Workers](#) (86 FR 7475), it is the policy of the executive branch to use terms and conditions of Federal financial assistance awards to maximize, consistent with law, the use of goods, products, and materials produced in, and services offered in, the United States.

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for an award unless all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's [Build America](#), [Buy America](#) webpage.

Special Award Conditions:

- This award is made based on the ability of the grantee (1) to successfully hire a candidate within one year of the award, in accordance with established organizational policies and procedures and consistent with the process described in the NSF approved proposal; and (2) to put forward this candidate for consideration for tenure at or before the conclusion of the award. In the event that the institution's internal regulations do not allow for tenure within 5 years, a pre-tenure review prior to the end of the award is acceptable.
- As soon as a specific candidate accepts the FDSS tenure-track offer from the IHE, NSF should be notified. The cognizant NSF Program Officer may request information about the candidate to confirm that the intent of this solicitation is being met. Such information may include, and is not limited to:
 1. A description of the search including details of efforts undertaken to broaden participation;
 2. A curriculum vitae, including a publication list, for the FDSS hire;
 3. A statement of research interests and proposed educational outreach and teaching plans of the successful FDSS candidate.
- After the award has been made and the candidate has been hired, the grantee organization shall request (via NSF's electronic systems) that the candidate be added as a co-PI to the award.
- The FDSS award must be acknowledged by the FDSS hire in all publications and presentations of their work produced during the award period.
- The grantee organization must immediately notify the cognizant NSF Program Officer if, at any time during the award, the candidate hired into the new FDSS faculty line should terminate their association with the award. In such cases, NSF will have the discretion to terminate the award or permit the organization to either support another tenure-track faculty member working in a closely related field or open a new search process to fill the vacant position.

C. Reporting Requirements

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

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

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

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

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:

- Mangala Sharma, Program Director, telephone: (703) 292-4773, email: IntegrativeGeospace@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-673-6188
- [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.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 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
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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National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (703) 292-5090 or (800) 281-8749

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