

Antarctic Research Not Requiring U.S. Antarctic Program (USAP) Field Support

PROGRAM SOLICITATION

NSF 23-508

REPLACES DOCUMENT(S):

NSF 21-567



National Science Foundation
Directorate for Geosciences
Office of Polar Programs

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

Proposals Accepted Anytime

IMPORTANT INFORMATION AND REVISION NOTES

This solicitation is one of two solicitations that replace the current Antarctic Research solicitation. This solicitation specifically covers proposals that do **NOT** require U.S. Antarctic Program (USAP) logistical support for fieldwork. Proposers that require logistical support should consult [NSF 23-509](#).

Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in [Important Notice No. 147](#). In support of these efforts, proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov or via Grants.gov and may not be prepared or submitted via FastLane.

Any proposal submitted in response to this solicitation should be submitted in accordance with the [NSF Proposal & Award Policies & Procedures Guide](#) (PAPPG).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Antarctic Research Not Requiring U.S. Antarctic Program (USAP) Field Support

Synopsis of Program:

The Antarctic Sciences Section (ANT) of the Office of Polar Programs (OPP) supports cutting-edge research that:

- Improves understanding of interactions among the Antarctic region and global systems;
- Expands fundamental knowledge of Antarctic systems, biota, and processes;
- Utilizes previously collected samples or focuses on non-field-supported themes;
- Utilizes the unique characteristics of the Antarctic region as a science observing platform; and
- Builds capacity and enhances diversity in the US workforce for polar-related science.

ANT encourages and supports non-fieldwork research that crosses and combines disciplinary perspectives and approaches from other fields. ANT encourages and supports research that uses existing data and samples and other research not requiring a presence in Antarctica. Proposals that require USAP support for field work must use solicitation [NSF 23-509](#), Antarctic Research Requiring U.S. Antarctic Program (USAP) Support for Fieldwork.

Diversifying and broadening participation is a priority for the Antarctic Sciences Section. ANT encourages the leadership, partnership, and contributions of individuals who are members of groups underrepresented and/or underserved in all opportunities in STEM education programs and careers. ANT promotes and expects that all individuals, including those from groups that are underrepresented and/or underserved in STEM are treated equitably and inclusively throughout the Foundation's proposal and award process.

The Antarctic Sciences Section coordinates with programs across NSF and with other federal and international

partners to co-review and co-fund Antarctic-related proposals as appropriate.

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.

- William G. Ambrose, Program Director, Antarctic Organisms and Ecosystems, W7254B, telephone: (703) 292-8048, email: wambrose@nsf.gov
- Kelly M. Brunt, Program Director, Antarctic Glaciology & Oceans and Atmospheric Sciences, W7100, telephone: (703) 292-8457, email: kbrunt@nsf.gov
- Paul M. Cutler, Program Director, Glaciology, Ice Core Science & Geomorphology, W7217, telephone: (703) 292-4961, email: pcutler@nsf.gov
- Rebecca Gast, Program Director, Antarctic Organisms and Ecosystems, W7100, telephone: (703) 292-2356, email: rgast@nsf.gov
- Michael E. Jackson, Program Director, Earth Science, Geodesy & Geophysics, W7239, telephone: (703) 292-8033, email: mejacks@nsf.gov
- Vladimir O. Papitashvili, Program Director, Astrophysics and Geospace Sciences & Antarctic Instrumentation, W7118, telephone: (703) 292-7425, email: vpapita@nsf.gov
- David F. Porter, Program Director, Antarctic Oceans and Atmosphere, telephone: (703) 292-2930, email: dporter@nsf.gov
- Elizabeth L. Rom, Program Director, Polar Education, W8164, telephone: (703) 292-7709, email: elrom@nsf.gov
- Jessie L. Crain, Antarctic Research Logistics Support Manager, W7126, telephone: (703) 292-7457, email: jlcrain@nsf.gov
- Timothy M. McGovern, Oceans Project Manager, W7124, telephone: (703) 292-4248, email: tmcgover@nsf.gov

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

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 50

Anticipated Funding Amount: \$60,000,000

The Antarctic Sciences Section anticipates committing annually up to approximately \$60 million across the full Antarctic Program (to include both field and non-field-based projects and activities) for an estimated 50 awards, as either standard or continuing awards, contingent on the availability of funds.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

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:**
Not Applicable

C. Due Dates

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

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:

Standard NSF award conditions apply.

Reporting Requirements:

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

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I. INTRODUCTION

The Antarctic Sciences Section, as part of the U.S. Antarctic Program (USAP), supports scientific research related to Antarctica and the Southern Ocean. This solicitation supports non-field-based proposals or programs that do not require US Antarctic Program (USAP) logistical support.

This solicitation encourages research using existing samples, data, and models, that do not require fieldwork as described in NSF 21-041, Dear Colleague Letter: Supporting Data and Sample Reuse in Polar Research (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21041.) Proposals for workshops, conferences, and Research Coordination Networks to advance, coordinate, or synthesize research in these areas are also encouraged. Prior to submission of a conference or RCN proposal, PIs should contact the cognizant program officer for guidance.

Diversifying and broadening participation is a priority for the Antarctic Sciences Section. ANT encourages the leadership, partnership, and contributions of individuals who are members of groups underrepresented and/or underserved in all opportunities in STEM education programs and careers. ANT promotes and expects that all individuals, including those from groups that are underrepresented and/or underserved in STEM are treated equitably and inclusively throughout the Foundation's proposal and award process.

The Antarctic Sciences Section also supports proposals that leverage international and interagency collaborations. The Section coordinates with programs across NSF and with other federal and international partners to co-review and co-fund Antarctic-related proposals as appropriate.

Proposals that require USAP support for fieldwork must be submitted under Program Solicitation [NSF 23-509](#), Antarctic Research Requiring U.S. Antarctic Program (USAP) Support for Fieldwork. For projects that have field work but deploy solely with another Antarctic program or other non-USAP entity, the PI must reach out to contact the cognizant Program Officer during the concept formation stage to discuss deployment details. The Program Officer will provide guidance on the most appropriate ANT solicitation to use.

II. PROGRAM DESCRIPTION

The Antarctic continent remains a frontier for exploration and discovery. As such, NSF investments in Antarctic Science support a broad portfolio of cutting-edge or transformative research across a spectrum of interlinked disciplinary areas. This solicitation supports research that does not require USAP support for field work but that advances understanding of biota and physical systems operating in the Antarctic region and adjacent seas through laboratory, modeling, and theoretical work encompassing terrestrial, marine, cryospheric, atmospheric, and space settings. The Antarctic Section supports a broad base of research programs across all major areas of Antarctic and Southern Ocean science to understand the wide range of environments, organisms, and processes that currently shape, and have shaped in the past, this unique continent, its surrounding continental shelves, and adjacent ocean basins. A key component of Antarctic Sciences-supported research is the identification and characterization of processes, feedbacks, and responses of the Antarctic system to physical, geochemical, and biological drivers. This solicitation also supports non-USAP field supported transformative science for emerging astrophysical and geospace research themes that use Antarctica as an observing platform.

Core Program

The core Antarctic Science program supports research that:

- Improves understanding of interactions among the Antarctic region and global systems.
- Improves understanding of the dynamic linkages among processes operating in the Antarctic and Southern Ocean and linkages to global Earth systems, which helps inform decision making regarding environmental change.
- Advances fundamental understanding of Earth systems and the biological, geochemical, and physical processes in the Antarctic and Southern Ocean as drivers and responders to changes on a global scale.
- Expands fundamental knowledge of Antarctic systems, biota, and processes.
- Utilizes the unique characteristics of the Antarctic region as a science observing platform

Program Priority Areas

Research investments are guided, in part, by the National Academies of Sciences August 2015 report entitled "A Strategic Vision for NSF Investments in Antarctic and Southern Ocean Research" (<https://www.nap.edu/catalog/21741/a-strategic-vision-for-nsf-investments-in-antarctic-and-southern-ocean-research>). This report affirmed the need to maintain strong core research programs and identified the following three major themes as drivers for Antarctic Research Priority Areas:

- *The Changing Antarctic Ice Sheets Initiative* - How fast, and by how much, will sea level rise
- *Decoding the genomic and transcriptomic bases of biological adaptation and response across Antarctic organisms and ecosystems* - How have Antarctic biota evolved and adapted to the polar environment, and how might changing systems impact their populations?
- *A next-generation cosmic microwave background program* - How did the Universe begin and what are the underlying physical laws that govern its evolution and ultimate fate?

Antarctic Sciences also supports non-field work proposals that promote effective collaboration between Polar and cyberinfrastructure researchers. Such proposals should provide significant benefit to the Antarctic research community including (i) cost-effective transfer of data from remote field locations; (ii) long-term sustainable curatorship, standardization, management and discovery of data and metadata; (iii) visualization, manipulation, and analysis, particularly for understanding complexity; (iv) access and interoperability across scientific disciplines; (v) promotion of effective use of High Performance Computing (HPC) for direct and sustainable advances in current Antarctic research; and (vi) e-learning and educational tools based on cyberinfrastructure components. Proposals that establish or enhance Virtual Organizational resources for Antarctic research, and its broader impacts, are also encouraged. The Program works collaboratively with NSF's [Office of Advanced Cyberinfrastructure](#) and NSF's [EarthCube](#) program for reviewing and funding purposes.

Existing Sample/Data Use and Modeling

To help promote derivation of full benefits from prior efforts, Antarctic Sciences encourages proposals that seek to address pressing Antarctic science questions through use or re-processing of existing data and samples as described in NSF 21-041, Dear Colleague Letter: Supporting Data and Sample Reuse in Polar Research (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21041.) Proposers should investigate the utility of samples available from individual researchers and sample/data repositories such as the Polar Rock Repository (<http://research.bpcrc.osu.edu/rr/>), Marine Geology Repository (<http://osu-mgr.org>), National Ice Core Laboratory (<https://icecores.org/>), Polar Geospatial Center (<https://www.pgc.umn.edu/>), USAP-Data Center (<http://www.usap-dc.org/>), Antarctic Meteorological Research and Data Center (<https://amrc.ssec.wisc.edu/>), Antarctic Glaciology Data Center (<https://nsidc.org/data/data-programs/nsidc-daac>), Biological and Chemical Oceanography Data Management Office (<https://www.bco-dmo.org/>), IRIS (<https://www.iris.edu/hq/>), and UNAVCO (<https://www.unavco.org/>).

Instrumentation and Research Facilities

Antarctic Sciences encourages and supports development of scientific instrumentation for use in polar regions to: (1) enable multi-disciplinary research; (2) reduce the on-ice footprint of research and/or operations in Antarctica; and (3) to enhance capabilities for in situ observing on the continent and in the surrounding ice-covered waters.

There are specific proposal preparation requirements for instrument development (see Section V, Proposal Preparation and Submission Instructions) and additional merit review criteria apply (see Additional Solicitation Specific Review Criteria in Section VI). It is recommended that investigators contact a relevant Antarctic Sciences Program Director prior to submission. It is also recommended that investigators review opportunities as part of NSF's Major Research Instrumentation Program (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5260) to determine whether work to be proposed is suitable for submission to that program.

Education and Outreach

The integration of research and education is essential to NSF's mission, and NSF strives to broaden participation in science and to make the results of research projects widely accessible to students and the public. ANT seeks to meet these objectives by supporting the engagement of diverse students, educators, and the public in Antarctic research projects.

In an effort to increase the diversity of the polar workforce, ANT encourages the inclusion of support for diverse students and early-career researchers. ANT encourages the leadership, partnership, and contributions of individuals who are members of groups underrepresented and/or underserved in all opportunities in STEM education programs and careers. ANT promotes and expects that all individuals, including those from groups that are underrepresented and/or underserved in STEM are treated equitably and inclusively throughout the Foundation's proposal and award process. Proposals can take advantage of existing sample/data collections to offer opportunities for graduate or undergraduate thesis work and/or Postdoctoral researchers to provide a means to expose under-represented groups to Antarctic research. Teams may also consider submitting proposals under this general theme to NSF's [Research Experiences for Undergraduates](#) (REU) program solicitation.

Investigators who wish to propose projects that are primarily education and outreach efforts are encouraged to contact the Polar Education Program Director for the Office of Polar Programs and to submit proposals via other relevant solicitations in the Directorate of Geosciences and the Directorate of Education and Human Resources. ANT encourages scientists to partner with education researchers when submitting proposals focused primarily on education, and to consider efforts that make use of innovative technologies and pedagogies to provide large groups of students, educators, and the public remote access to research in the Antarctic. Proposals that engage audiences with long-term investments in Antarctic research and logistics, with databases that have extended lifespans, or with public participation in scientific research, such as crowdsourcing or citizen science related to the Antarctic, are also encouraged.

III. AWARD INFORMATION

The Antarctic Sciences Section anticipates committing annually up to approximately \$60 million across the full Antarctic Program (to include both field and non-field-based projects and activities) for an estimated 50 awards, as either standard or continuing awards, contingent on the availability of funds.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There are no restrictions or limits.

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:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via Research.gov. PAPPG Chapter II.D.3 provides additional information on collaborative proposals.

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.

Proposals must adhere strictly to the specified page limitations. Proposals that are not compliant with the guidelines will be returned without review. The submitting organization is responsible to ensure compliance with the guidelines.

Additional Instructions for Full Proposal Submission:

1. The statement "This proposal does not require USAP-supported fieldwork in the Antarctic." Must be included as the last line of the Project Summary.
2. **Data Management Plan:** The Data Management Plan (DMP) must be compliant with NSF's policy on dissemination and sharing of samples and research results (<https://www.nsf.gov/bfa/dias/policy/dmp.jsp>) and the additional [Dear Colleague Letter: Office of Polar Programs Data, Code, and Sample Management Policy \(NSF 22-106\)](#). Investigators are strongly encouraged to use a DMP creation program such as the California Digital Library DMP Tool (<https://www.cdlib.org/services/uc3/dmpt.html>) or ezDMP (<https://ezdmp.org/index>).
3. **Revised Proposals:** Programs will not accept proposal resubmissions that have not been substantially revised in accordance with policy outlined in the current PAPPG. Investigators are encouraged to contact a Program Director in Antarctic Sciences for guidance on their revised proposal prior to resubmission.
4. **Project Management:** Proposals must articulate how activities will be managed toward a successful conclusion of the project. Proposers should carefully consider the project management needs of research activities and should include an appropriate management plan in the proposal with appropriate resources in the budget to support this plan. Complex projects may require dedicated project management expertise as part of the proposing team.
5. **Instrument Development Proposals:** Proposals for instrument development or Research Facilities must demonstrate that project management best practices will be used to manage the activity. This includes defining milestones for development and testing, establishing criteria for evaluating whether milestones are met, and conducting readiness reviews prior to deployment. Proposals must also demonstrate that the design is optimized to

reduce operations and maintenance costs, and maximize logistical efficiencies, during deployment, servicing, and recovery.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

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

Proposals Accepted Anytime

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 the NSF FastLane system 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.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

Instrumentation and technology development: The quality of development and testing plans, including milestones and criteria for acceptance, will be considered as an important criterion in the evaluation of proposals involving instrument development, or modification of instruments for polar work.

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.

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.

Principal investigators are required to comply with the NSF 22-106, Dear Colleague Letter: Office of Polar Programs Data, Code, and Sample Management Policy (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf22106) and evidence of compliance is required in annual and final project reports. Within the first year of the award, investigators must register their projects with the USAP-Data Center (USAP-DC) at <https://www.usap-dc.org/> and include the project USAP-DC website in the first annual report under the "Other Products" or "website" sections. In all project reports submitted to NSF, principal investigators must address the status of storing metadata files, physical/biological samples, full data sets, and derived data products into long-lived and publicly accessible archive(s). Collaborative proposals can have a single website entry, but it must be referenced in each collaborative final report. USAP-DC personnel can assist with this step (info@usap-dc.org)

Investigators are also expected to specifically address progress on activities related to proposed Broader Impacts in annual and final reports.

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:

- William G. Ambrose, Program Director, Antarctic Organisms and Ecosystems, W7254B, telephone: (703) 292-8048, email: wambrose@nsf.gov
- Kelly M. Brunt, Program Director, Antarctic Glaciology & Oceans and Atmospheric Sciences, W7100, telephone: (703) 292-8457, email: kbrunt@nsf.gov
- Paul M. Cutler, Program Director, Glaciology, Ice Core Science & Geomorphology, W7217, telephone: (703) 292-4961, email: pcutler@nsf.gov
- Rebecca Gast, Program Director, Antarctic Organisms and Ecosystems, W7100, telephone: (703) 292-2356, email: rgast@nsf.gov
- Michael E. Jackson, Program Director, Earth Science, Geodesy & Geophysics, W7239, telephone: (703) 292-8033, email: mejacks@nsf.gov
- Vladimir O. Papitashvili, Program Director, Astrophysics and Geospace Sciences & Antarctic Instrumentation, W7118, telephone: (703) 292-7425, email: vpapita@nsf.gov
- David F. Porter, Program Director, Antarctic Oceans and Atmosphere, telephone: (703) 292-2930, email: dporter@nsf.gov
- Elizabeth L. Rom, Program Director, Polar Education, W8164, telephone: (703) 292-7709, email: elrom@nsf.gov
- Jessie L. Crain, Antarctic Research Logistics Support Manager, W7126, telephone: (703) 292-7457, email: jlcrain@nsf.gov
- Timothy M. McGovern, Oceans Project Manager, W7124, telephone: (703) 292-4248, email: tmcgover@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.

For general questions or more information, contact opp-prf@nsf.gov.

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately

11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <https://www.nsf.gov>

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (703) 292-5111
(NSF Information Center):
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
Send an e-mail to: nsfpubs@nsf.gov
or telephone: (703) 292-8143
- **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
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