

# NSF 23-572: Arctic Research Opportunities

Arctic Natural Sciences; Arctic Social Sciences; Arctic System Science; Arctic Observing Network; Polar Cyberinfrastructure; Arctic Research Coordination and Policy Support

## Program Solicitation

### Document Information

#### Document History

- **Posted:** March 28, 2023
- **Replaces:** [NSF 21-526](#)

[View the program page](#)



#### National Science Foundation

Directorate for Geosciences  
Office of Polar Programs

### Full Proposal Target Date(s):

July 17, 2023

July 15, Annually Thereafter

Target Dates for Arctic Natural Sciences and Arctic Social Sciences

January 16, 2024

January 15, Annually Thereafter

Target Dates for Arctic Natural Sciences and Arctic Social Sciences



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## Important Information And Revision Notes

- Proposals will be submitted to "Arctic Sciences" in response to this solicitation. Proposers should indicate the intended Program or Programs in the last line of the Project Summary.
- [Target dates](#) have been added to the Arctic Natural Sciences and Arctic Social Sciences Programs. Proposals for all other Programs have no deadlines nor target dates.
- Minor edits and clarifications have been made to directions regarding the use of logistics support.
- Solicitation points to the updated OPP Data Management Policy.
- Solicitation provides guidance on including Letters of Collaboration from community-based organizations.
- The Arctic Sciences Section requires that proposers who include off-campus or off-site research as part of their project submit, as supplementary documentation, a Plan for Safe and Inclusive Working Environments. For this solicitation, this document replaces the required plan associated with the certification in Chapter II.E.9 of the Proposal and Award Policies and Procedures Guide (PAPPG, [NSF 23-1](#)). Instructions for inclusion of the Plan for Safe and Inclusive Working Environments can be found in the additional proposal preparation instructions in this solicitation.
- Results of Prior NSF Support information is now required in a supplementary document and not the project description.
- A supplementary document is now required on ethical considerations and approaches to the proposed work.

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:

Arctic Research Opportunities  
Arctic Natural Sciences; Arctic Social Sciences; Arctic System Science; Arctic Observing Network; Polar Cyberinfrastructure; Arctic Research Coordination and Policy Support

### Synopsis of Program:

The National Science Foundation (NSF) invites investigators at U.S. organizations to submit proposals to the Arctic Sciences Section in the Office of Polar Programs (OPP) within the Geosciences Directorate, to conduct research about the Arctic region.

The goal of this solicitation is to attract research proposals that advance a fundamental, process, and/or systems-level understanding of the Arctic's rapidly changing natural environment, social and cultural systems, and, where appropriate, to improve our capacity to project future change. The Arctic Sciences Section supports research focused on the Arctic region and its connectivity with lower latitudes. The scientific scope is aligned with, but not limited to, research priorities outlined in the [Interagency Arctic Research Policy Committee \(IARPC\)](#) five-year plan.

The Arctic Sciences Section coordinates with programs across NSF and with other federal and international partners to co-review and co-fund Arctic-related proposals as appropriate. The Arctic Sciences Section also maintains Arctic logistical infrastructure and field support capabilities that are available to enable research.

### 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.*

- Rainer Amon, Program Director, Arctic Natural Sciences, telephone: (703) 292-7979, email: [ramon@nsf.gov](mailto:ramon@nsf.gov)
- Lesley Anderson, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [leanders@associates.nsf.gov](mailto:leanders@associates.nsf.gov)
- Kelly M. Brunt, Program Director, Arctic Natural Sciences, telephone: (703) 292-8457, email: [kbrunt@nsf.gov](mailto:kbrunt@nsf.gov)
- Renee D. Crain, Arctic Research Support and Logistics Manager, telephone: (703) 292-4482, email: [rcrain@nsf.gov](mailto:rcrain@nsf.gov)
- Lauren Culler, Program Director, Arctic Observing Network, telephone: (703) 292-8057, email: [lculler@nsf.gov](mailto:lculler@nsf.gov)
- Roberto Delgado, Program Director, Arctic Observing Network, telephone: (703) 292-2397, email: [robdelga@nsf.gov](mailto:robdelga@nsf.gov)
- Gary Eells, Arctic Research Support and Logistics Project Controls Manager (Contractor), telephone: (703) 292-8029, email: [geells@associates.nsf.gov](mailto:geells@associates.nsf.gov)
- Liam Frink, Program Director, Arctic Social Sciences, telephone: (703) 292-7584, email: [lfrink@nsf.gov](mailto:lfrink@nsf.gov)
- Monte Ingram, Arctic Research Support and Logistics Project Controls Manager (Contractor), (703) 292-8029, email: [mingram@associates.nsf.gov](mailto:mingram@associates.nsf.gov)
- Linda M. Izzard, Arctic Research Support and Logistics Program Analyst, telephone: (703) 292-7430, email: [lizzard@nsf.gov](mailto:lizzard@nsf.gov)
- Emma Menio, Science Analyst, telephone: (703) 292-7781, email: [emenio@nsf.gov](mailto:emenio@nsf.gov)
- Randy Olsen, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [rolsen@associates.nsf.gov](mailto:rolsen@associates.nsf.gov)
- Frank R. Rack, Arctic Research Support and Logistics Manager, telephone: (703) 292-2684, email: [frack@nsf.gov](mailto:frack@nsf.gov)

- Alfredo J. Riera, Arctic Research Support and Logistics Manager, telephone: (703) 292-2130, email: [ariera@nsf.gov](mailto:ariera@nsf.gov)
- Elizabeth L. Rom, Polar Education Liaison, telephone: (703) 292-7709, email: [elrom@nsf.gov](mailto:elrom@nsf.gov)
- Kate E. Ruck, Arctic Research Support and Logistics Manager, telephone: (703) 292-8051, email: [kruck@nsf.gov](mailto:kruck@nsf.gov)
- Katy Smith, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [catsmith@associates.nsf.gov](mailto:catsmith@associates.nsf.gov)
- Rasheda S. Spratley, telephone: (703) 292-8580, email: [rspratle@nsf.gov](mailto:rspratle@nsf.gov)
- Marc Stieglitz, Program Director, Arctic Natural Sciences, telephone: (703) 292-4354, email: [mstiegli@nsf.gov](mailto:mstiegli@nsf.gov)
- Colleen Strawhacker, Program Director, Arctic System Sciences and Arctic Research Coordination and Policy Support, telephone: (703) 292-7432, email: [colstraw@nsf.gov](mailto:colstraw@nsf.gov)

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

- 47.050 --- Geosciences

**Award Information**

**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** 75 to 80 per year, pending availability of funds.

**Anticipated Funding Amount:** \$50,000,000 per year approximately, pending 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 US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.
- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- For-profit organizations: U.S.-based commercial organizations, including small businesses, with strong capabilities in scientific or engineering research or education and a passion for innovation.
- Tribal Governments: The governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a, et seq.)
- Foreign organizations: For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

**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](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](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 Target Date(s):**
  - July 17, 2023
  - July 15, Annually Thereafter
  - Target Dates for Arctic Natural Sciences and Arctic Social Sciences
  - January 16, 2024
  - January 15, Annually Thereafter
  - Target Dates for Arctic Natural Sciences and Arctic Social Sciences

**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:**

Standard NSF reporting requirements apply.

## **I. Introduction**

The Arctic Sciences Section (ARC) in the Office of Polar Programs (OPP), within the Geosciences Directorate, funds scientific research about the Arctic region and provides operational support for Arctic research activities. Science programs provide support for disciplinary, multidisciplinary, and convergence investigations directed at understanding the Arctic region and its connectivity with lower latitudes.

A geographic definition of the Arctic region is provided by the [United States Arctic Research and Policy Act \(ARPA\) of 1984 Section 112](#). Because this solicitation includes research on phenomena that link the Arctic to lower latitudes, the ARPA definition should not be viewed as strictly constraining the location of the work proposed. Proposals conducting research outside the Arctic geographic region should contain a clear statement of how the proposed research will increase knowledge of the Arctic.

## **II. Program Description**

The Arctic Sciences Section solicits proposals for research to enhance understanding of the Arctic, from advancing fundamental disciplinary understanding of important Arctic processes to complex interdisciplinary studies of couplings among social, biological, physical, and geochemical components of the Arctic system to the changing connections between the Arctic and lower latitudes. Of special interest is research focused on understanding processes relevant to social and environmental change. All proposals should discuss explicitly how their results would contribute to increasing our understanding of the Arctic region or its interaction with global systems. Proposals must fit the aims of one of the following programs and may be co-reviewed as appropriate:

### **Arctic Social Sciences**

The Arctic Social Sciences Program (ASSP) supports research on Arctic social and cultural systems, present and past, and research relevant to understanding these systems. ASSP welcomes research proposals in all social science disciplines that are funded by the [NSF Directorate for Social, Behavioral and Economic Sciences](#). Topics of particular interest are outlined in the final report for the [Arctic Horizons](#) [🔗](#) process and the federal [Arctic Research Plan 2022-2026](#) [🔗](#). Research priorities include:

- Past and present drivers of socio-economic change in the Arctic convergent research on socio-ecological systems
- Migration and demography
- Community health and well-being
- Food, water, and energy security
- Youth and gender studies
- Sustainable development
- Globalization
- International relations

- Innovations in data curation, management, sharing, discoverability, and access, including those contributing to synthesis science

The Arctic Social Sciences Program especially encourages projects that are circumpolar and/or comparative; involve collaborations between researchers and those living in the Arctic; or form partnerships among disciplines, regions, researchers, communities, and/or students (K-12, undergraduate, or graduate). The program is interested in Indigenous scholarship and Indigenous knowledge, community-based participatory research, and knowledge co-production.

### **Arctic Natural Sciences**

The Arctic Natural Sciences (ANS) program supports novel and creative research focused on disciplinary and/or interdisciplinary investigations to advance understanding of Arctic processes, including how those processes are shifting in a rapidly changing Arctic. The program encourages proposals that test hypotheses leading to new understanding of the Arctic, including those that synthesize and analyze existing data. Areas of interest include Arctic marine and terrestrial ecosystems, terrestrial hydrology, atmospheric and oceanic dynamics and climatology, and glaciological processes. Proposals may be co-reviewed with other programs at NSF, as appropriate. Where ANS participates in cross-Agency competitions, such as the [Paleo Perspectives on Present and Projected Climate](#) program, proposals should generally be submitted directly to these competitions rather than to ANS. If there is doubt as to the appropriate destination for a proposal, prospective PIs are encouraged to contact the ANS program officers prior to submission. If PIs would like to include an REU student in a project, the program requests that it be included in the original proposal. Supplements for REU students will be granted on a more limited basis.

### **Arctic System Science**

The Arctic System Science (ARCSS) program supports projects that study systems of the Arctic operating at multiple temporal and spatial scales, systems that can inform our understanding of Arctic processes, and the relationship of Arctic systems to other global and regional systems. For ARCSS, the "Arctic system" is defined very broadly to encourage creative proposals. PIs should ask themselves if their work addresses interactions among several components of the Arctic system, explores emergent behavior in linked subsystems, or otherwise provides essential knowledge, and they should apply that knowledge to system-level understanding.

ARCSS projects are often but not always interdisciplinary and can focus on the relationships among physical, chemical, biological, geological, ecological, social, cultural, and/or economic processes. ARCSS welcomes proposals focusing on the cycles of carbon, water, and energy in the functioning of Arctic systems, as well as the relationship of these cycles to human and social processes occurring in the Arctic. ARCSS also accepts proposals that contribute to better understanding of the interactions and feedbacks between humans and the environment. Theoretical and methodological approaches can include (but are not limited to) political ecology, historical ecology, human eco-dynamics, food security, resilience theory, Indigenous and local knowledge, socio-ecological systems, coupled natural human systems, risk and vulnerability studies, ecosystem services, and sustainability studies. ARCSS also encourages projects aimed at creating new knowledge through synthesis of published science, reports, and previously collected data to better understand the Arctic system at multiple scales.

### **Arctic Observing Network**

The Arctic Observing Network (AON) program supports proposals to make field observations to detect and understand Arctic change occurring on time scales longer than the duration of a typical NSF research grant. These projects should address major drivers and/or impacts of change and generate data that are intended for wider use by the scientific research community in understanding the changing Arctic. Proposals to develop new sensors/sensing platforms and/or to design/optimize observing strategies will also be considered. To promote broader use, AON data must promptly be made public (see Office of Polar Programs Data Management policy, [NSF 22-106](#) for specific requirements). Data analysis may be included as part of the proposed work. Proposals may be single investigator or collaborative and include up to 5 years of observations. Continuation of observations beyond 5 years requires a successful new proposal that must demonstrate use of the previously collected data by the scientific research community.

### **Polar Cyberinfrastructure**

The Polar Cyberinfrastructure program considers proposals that promote effective collaboration between Polar and cyberinfrastructure researchers. The Arctic Sciences Section will support proposals that provide significant benefit to the Arctic 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 Arctic research; and (vi) e-learning and educational tools based on cyberinfrastructure components. Proposals that establish or enhance Virtual Organizational resources for Arctic research, and its broader impacts, are also encouraged. The Program works collaboratively with NSF's [Office of Advanced Cyberinfrastructure](#) and NSF's [GEO Cyberinfrastructure](#) group for reviewing and funding purposes.

### **Arctic Research Coordination and Policy Support**

The Arctic Research Coordination and Policy Support (ARCPS) Program supports short- and long-term efforts to enhance communication, coordination, and collaboration across the research enterprise, which includes:

- communication, coordination, and collaboration within the Arctic research community
- communication, coordination, and collaboration between the Arctic research community and interested parties, such as northern residents, policy makers, the general public, and industry

Efforts to coordinate within the Arctic research community tend to be ones that cut across the Arctic Section disciplinary portfolio, focusing on:

- the NSF-funded community
- US federal interagency efforts where NSF plays a leadership role
- partnerships between the US research community and their international counterparts

Successful ARCPS proposals are expected to promote new, diverse, and integrative research communities that are capable of effectively conducting and communicating research on local, regional, and global science and policy topics to enhance our understanding of the Arctic. Projects are expected to build capacity and develop approaches to synthesize results that inform policy development and/or management decisions. These efforts, in turn, will support national goals for Arctic research, including enhancing the wellbeing of Arctic residents; advancing stewardship of the Arctic environment; strengthening national and regional security; and improving our understanding of the Arctic as a component of the Earth system.

Another key goal is to support communication, coordination, and collaboration among interested parties of Arctic research, including the Arctic research community and the public, including fostering partnerships with northern communities, especially Indigenous communities. These efforts may involve (but are not limited to):

- planning efforts designed to develop research questions and projects in partnership with interested parties, allowing for robust co-production of knowledge with local and Indigenous peoples and organizations
- exploration of new collaborations with potentially interested parties
- consulting activities to ensure research is not disruptive to northern residents and their livelihoods, including subsistence activities

Investigators must contact cognizant Program Officers to discuss the suitability of proposals prior to submission to ARCPS.

### **Types of Proposals Accepted**

The Arctic Sciences Section supports research proposals and other activities that can be submitted in line with the Programs above. The Arctic Sciences Section accepts proposal types described in the PAPPG (including but not limited to Conference, Planning, Research Coordination Networks, RAPID, and EAGER proposals) in addition to the specific proposal types listed here:



- **General Arctic Science proposals** The Arctic Sciences Section encourages the submission of research proposals, either single investigator or collaborative, for research that involves field observations, process studies, modeling, synthesis, and other efforts to further our understanding of the Arctic. We anticipate that most proposals submitted in response to this solicitation will fall in this category.
- **Research Networking Activities (RNAs)** RNA awards support collaboration by groups of investigators to aggregate research results across disciplinary, organizational, or international boundaries. Such proposals may support activities such as synthesis of research results, inter-comparison of existing data or models, developing networks of connections among existing research projects, exploration of new theory and efforts to establish best practices for data collection, observations, models, or data management.

RNAs support efforts that are more complicated and larger in scope than are appropriate for a [Research Coordination Network \(RCN\)](#); for example, RNA activities might include modeling and large-scale data analysis that are beyond the budgetary scope of RCNs. RNAs are encouraged to engage, as appropriate, with international partners that have funding from their own sources and with activities, centers and networks supported by other federal agencies, state, local, or tribal governments or the private sector.

Proposals should identify an initial network of likely participants, but there should be mechanisms identified to maintain openness and promote participation in the proposed network by interested parties outside of the initial group. The inclusion of new researchers, post-docs, graduate students, and undergraduates is strongly encouraged. Proposals should present a clear management plan that includes a description of the roles and responsibilities of the PIs and a steering committee. Mechanisms for assessing progress and the effectiveness of the networking activities should be part of the management plan. RNA projects may be up to 5 years in duration. Proposers are strongly encouraged to discuss plans with the cognizant program officer prior to submission.

- **Large Project Support (LPS):** ARC supports the development of large, complex projects that may require significant planning and coordination among large groups of investigators and/or the development of agreements between interagency or international partners. NSF recognizes that such projects often succeed through sustained efforts of a community coalescing behind a core leadership group that may require support through development, design, and eventual implementation. The Large Project Support (LPS) mechanism is intended to provide support for such projects. Generally, projects proposed through the LPS mechanism would involve three stages: (a) conceptual development, (b) project planning, and (c) project implementation, as described below:
  - **Conceptual Development:** ARC will support conceptual development, often through a community workshop or workshops. First, the interested group should send to a cognizant ARC program officer a brief document summarizing the approach to conceptual development. ARC program officers will contact the interested group to discuss the idea and provide guidance for the next steps. Workshop proposals should follow the guidance for Conference Proposals in Chapter II.F.9 the [PAPPG](#), including the need for workshops to be broadly advertised, inclusive, include meaningful participation from young investigators and local communities, address dependent care options as appropriate, and develop and require attendees to adhere to a code of conduct. The "Conference" type of proposal should be selected.
  - **Project Planning:** If the project requires further detailed planning before research projects can be proposed, ARC may support a planning grant. The grant may support workshops, the development of white papers, and other activities to:
    - Foster the development of a science plan describing the science goals and an implementation plan outlining a project management structure, a project schedule, and necessary resources;
    - Provide time to develop, align, or schedule resources;
    - Enable the provision of planning information need to coordinate actions by national and/or international funding entities; and
    - Support an individual or group to lead the Project Planning phase.

NSF will review the science and implementation plan documents and decide whether to encourage proposal submissions for the Implementation Stage.

- **Implementation Stage:** The **Implementation Stage** of a large project is typically best supported by a coordinated set of proposals. This would usually comprise a *coordinating proposal* plus a number of *contributing research proposals*. The coordinating proposal would include (a) science goals and objectives, (b) a detailed concept of operations plan (logistics, project coordination, etc.), and (c) support for a project coordination office; this proposal would provide support for the project lead and their team. Each of the research proposals would describe the plan to implement one or more major components of the overall project, including logistics and other support needed to carry out that component.

ARC would review these proposals in a single panel and may conduct site visits if appropriate. ARC may work with the project leadership to coordinate with interagency and/or international partners as needed. The decision on whether to advance the entire project would be made following review of the coordinated set of proposals and would depend on ARC's assessment of the potential to meet the overall goals of the project.

## **ADDITIONAL OPPORTUNITIES**

### **Other NSF Funding Opportunities**

Consult the NSF online program guide to browse for funding opportunities ([https://www.nsf.gov/funding/browse\\_all\\_funding.jsp](https://www.nsf.gov/funding/browse_all_funding.jsp)).

Education and Outreach Activities: Investigators who wish to propose projects that are primarily education and outreach efforts are encouraged to contact the Polar Education Liaison, and to submit proposals to other solicitations in the Directorate for Geosciences, such as Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences (GEOPaths) and [Cultural Transformation in the Geoscience Community \(CTGC\)](#), and to the Directorate for STEM Education Resources as detailed in the [NSF 19-086, Dear Colleague Letter: Support for Engaging Students and the Public in Polar Research](#).

The Arctic Sciences Section encourages investigators from Alaska [Tribal Colleges and Universities Program](#)-eligible (TCUP-eligible) institutions to submit proposals or collaborative proposals from consortia of TCUP-eligible institutions and/or partnering universities with educational or research ties to Alaska TCUP-eligible institutions' faculty or students. Such collaborations may include, for example, attracting, retraining, and supporting TCU students in independent research endeavors and non-TCU institutions providing research training to enable the successful transition of TCU students to major research universities. The Section also encourages submissions from or in collaboration with investigators at other Minority-Serving Institutions, including Historically Black Colleges and Universities (HBCUs) and Hispanic-Serving Institutions (HSIs), and urges prospective PIs to contact a Program Officer to discuss the opportunities within the Section and at NSF.

## **III. Award Information**

Pending availability of funds, \$50,000,000 may be available for proposals to this solicitation per fiscal year. This does not include logistics support that may be provided through the Arctic Research Support and Logistics program. NSF estimates 75 awards per year as standard or continuing grants, or cooperative agreements. The number of awards and average award size and 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 US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain

the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

- Non-profit, non-academic organizations: Independent museums, observatories, research laboratories, professional societies and similar organizations located in the U.S. that are directly associated with educational or research activities.
- For-profit organizations: U.S.-based commercial organizations, including small businesses, with strong capabilities in scientific or engineering research or education and a passion for innovation.
- Tribal Governments: The governing body of any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994 (25 U.S.C. 479a, et seq.)
- Foreign organizations: For cooperative projects involving U.S. and foreign organizations, support will only be provided for the U.S. portion.
- Other Federal Agencies and Federally Funded Research and Development Centers (FFRDCs): Contact the appropriate program before preparing a proposal for submission.

#### **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.

#### **Additional Eligibility Info:**

Only U.S. organizations are eligible to submit proposals under this solicitation.

## **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](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg). Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov). 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](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](mailto: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.E.3 provides additional information on collaborative proposals.

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.

### **Project Summary**

*Proposals Should Indicate Which Program(s) Are Targeted for Submission*

The statement "This proposal is intended for submission to [insert Program or Programs listed in this solicitation here]." should be included as the last line of the Project Summary.

### **Project Description**

*Maximum Length for Project Description*

For initial stage Large Project Support (LPS) proposals only, the Project Description is limited to 20 pages in length.

The Project Description for all other proposals submitted pursuant to this solicitation is limited to 15 pages in length, except as otherwise specified in the PAPPG.

### **Supplementary Documents**

Supplementary documents are limited to the specific types of documents listed in the PAPPG, with the following exceptions:

**Letters of Collaboration:** The Project Description must fully detail any substantial collaborations and engagements (included or not included in the budget) with partner organizations. Letters of Collaboration should be provided in the Supplementary Documents section of the proposal and follow the format instructions specified in the NSF PAPPG. *If requesting a letter of collaboration, please allow for sufficient time for potential collaborators to respond to your request. Given that many tribal councils and local organizations meet once a month or less, sufficient time in some cases may be two or more months.*

NSF recognizes that community-based organizations may need to explain in more detail how the proposed collaboration will meet their needs and goals, particularly with relation to the cultural and social aspects of the communities they represent. Therefore, letters of collaboration from community-based organizations may deviate from the PAPPG-specified format as needed to document the unique nature of the collaboration. "Community-based organizations" include those that primarily represent, research, and/or lead Indigenous and non-Indigenous residents of the Arctic. These can include, but are not limited to, tribal colleges and councils, local and international Indigenous organizations, and non-profit organizations. These do not include universities or major research facilities.

**Data Management Plan:** All proposals submitted in response to this solicitation must include a Data Management Plan that describes how the project will provide open and rapid access to quality-controlled and fully documented data and information during and after the project. This plan must be consistent with [NSF's policy on dissemination and sharing of research results](#) and NSF's PAPPG. The Data Management Plan must specifically discuss how the investigators will comply with the [Office of Polar Programs Data Management Policy \(NSF 22-106\)](#). This policy establishes requirements for the archiving of metadata and data in long-lived and publicly accessible, unrestricted archives. Proposals that include collection of physical samples and/or archaeological excavation must discuss plans for long-term curation of samples, and/or artifacts, as appropriate, in the Data Management Plan. A letter of collaboration from a museum or repository may be included to document such plans. Repository or curation fees may be included in the project budget. Further

information to help PIs develop their Data Management plans is available on the [OPP Repository & Resource webpage](#). Questions concerning this policy should be directed to the cognizant Program Officer(s) in the Arctic Sciences Section.

**Results from Prior NSF Support:** Results from prior NSF support for both PI's and co-PI's should appear in a separate document, not to exceed 3 pages, uploaded to the Supplementary Documents Section. Follow PAPPG guidance on what information must be reported in results from prior NSF support. PIs must also indicate where metadata and data from the award discussed are archived.

**Safe and Inclusive Working Environments Plan:** All proposals submitted to this solicitation after 15 July 2023 that include research that will be conducted off-campus or off-site must submit a plan for safe and inclusive working environments as a supplemental document that will be considered under the broader impacts review criterion. This supplemental document is in lieu of the required plan associated with the certification called for in Chapter II.E.9 of the PAPPG ([NSF 23-1](#)). More information regarding review of the plan is provided under Solicitation Specific Review Criteria.

It is NSF policy to foster safe and harassment-free environments wherever science is conducted. Work conducted off-campus or off-site should be an enriching experience for everyone and help draw researchers to Arctic research. By requiring advanced planning and attention to maintaining an inclusive environment, NSF is working to ensure that off-campus or off-site research is safe and inclusive for all participants.

Off-campus or off-site research is defined as data/information/samples being collected off-campus or off-site, such as fieldwork and research activities on vessels and aircraft. The plan must be no longer than two pages.

The plan for safe and inclusive working environments must include:

- a brief description of the field setting and unique challenges for the team
- the steps the proposing organization will take to nurture an inclusive off-campus or off-site working environment, including processes to establish shared team definitions of roles, responsibilities, and culture, e.g., codes of conduct, trainings, mentor/mentee mechanisms and field support that might include regular check-ins, and/or developmental events;
- communication processes within the off-site team and to the organization(s) that minimize singular points within the communication pathway (e.g., there should not be a single person overseeing access to a single satellite phone);and
- the organizational mechanisms that will be used for reporting, responding to, and resolving issues of harassment if they arise.

**Ethical Considerations and Approaches of the Proposed Work:** All proposals submitted in response to this solicitation must include a supplementary document where the project team can summarize the most salient ethical issues raised by the research and how the research team is approaching them. This document provides space to discuss issues not addressed at length elsewhere in the proposal, as well as to refer to issues that are addressed in other parts of the proposal. Ethical considerations and approaches will vary by project and could relate to community-engaged research or co-production of knowledge with living populations (e.g., research participants, descendant communities), many of whom have been historically excluded from the STEM research enterprise; environmental impacts of research; working in and around local Arctic communities; use of vertebrate animals; collection and analysis of biological, genetic, and/or Indigenous data; researcher safety; data archiving and sharing; and other issues. This supplementary document is limited to one page in length.

**Documents Describing Scope and Costs from 3<sup>rd</sup>-Party Research Support Providers:** Proposals requesting support from the Arctic Research Support and Logistics Services contractor, other research service providers, ship time requests, or other support should include a 1–2-page document describing the scope and costs and clarify whether the costs are included in the proposal budget or are being requested to be paid for by the Arctic Research Support and Logistics (RSL) program.




### **Proposals involving investigators employed by other Federal agencies or FFRDCs**

As stated in PAPPG Chapter I.E.2.d, NSF does not normally support research or education activities by investigators employed by Federal agencies or FFRDCs. Other Federal agencies and FFRDCs may submit proposals directly to NSF only when the proposed project meets one of the exceptions described in that section of the PAPPG. Proposers who think their project may meet at least one of those exceptions must contact a cognizant NSF Program Officer in writing before preparing a proposal for submission, must receive written concurrence from the cognizant NSF Program Officer, and must include the request and concurrence as a Single Copy Document in the proposal submission.

### **Revising Previously Declined Proposals**

A declined proposal may be resubmitted, but only after it has undergone substantial revision. Revised proposals may include a brief description of how the resubmitted proposal has been revised in response to reviewer and panel comments as part of the body of the Project Description section of the proposal. Please note that a revised proposal may be returned without review if the cognizant NSF Program Officer determines the revised submission has not clearly considered the major comments or concerns resulting from the prior NSF review.


### **Principles for Conducting Research in the Arctic**

Principal Investigators are expected to incorporate the [Principles for Conducting Research in the Arctic](#) into the design, planning, execution, and completion of their research. The 2018 Principles, revised from the 1990 version by the Social Science Task Force of the U.S. Interagency Arctic Research Policy Committee (IARPC), reflect the values of the IARPC member agencies. Investigators may find these resources useful: [Conducting Research with Northern Communities site](#)  by the Arctic Research Consortium of the U.S., the [Inuit Circumpolar Council's Protocols for Ethical and Equitable Engagement](#)  and [Fostering a Respectful Work Environment](#)  by the University-National Oceanographic Laboratory System (UNOLS).

### **Proposals Involving Human Subjects**

The NSF PAPPG provides procedural information for projects with human subjects in the section Proposals Involving Human Subjects. Investigators must ensure that human subjects are protected from research risks in conformance with the relevant federal policy known as the Common Rule (*Federal Policy for the Protection of Human Subjects*, 45 CFR 690). Additional information is available at <https://www.nsf.gov/bfa/dias/policy/human.jsp>.

### **Proposals Involving Fieldwork or Ship Time**

Projects may request funds directly to the grant budget to perform fieldwork or they may utilize third-party support providers arranged through the [Arctic Research Support and Logistics](#) (RSL) program. RSL supports fieldwork for projects awarded by the Arctic Sciences Section and may support other projects on a cost reimbursable basis. The RSL program operates through a prime logistics contract, the Arctic Research Support and Logistics Services contract, currently awarded to Battelle Arctic Research Operators (Battelle ARO) and awards to other support providers and ship operators. More information is available on the [RSL website](#) and the Battelle ARO [Arctic Gateway](#)  website. Investigators may decide how best to arrange for the logistics costs and may reach out to the RSL program managers or the cognizant science program officer to discuss these arrangements.

Proposals involving fieldwork in the Arctic must 1) describe the field activities in the body of the proposal, including a schedule of proposed work, 2) describe the costs of the fieldwork either requesting funds in the grant budget or providing Supplementary Documents that outline the scope of work and estimate the cost for support estimated through third-party providers, and 3) comply with the Principles for Conducting Research in the Arctic. The total cost of a project, including fieldwork, is considered at the time of review. Please allow third-party service providers 4-6 weeks to prepare Supplementary Documents to include in proposals. For any instrument or infrastructure deployed to the field, investigators should include the scope and cost for the demobilization or other disposal of the property.

Proposals requesting contractor support for fieldwork should expect to go to the field no sooner than 12 months after award, and generally no sooner than 18 months for proposals with ship time requests or especially complex logistics, to allow time to plan, budget, and complete environmental compliance documentation. Per the NSF PAPPG, awardees are responsible for acquiring and complying with all permits necessary for their work and are responsible for all activities

conducted under the award. For projects working in crevassed or potentially crevassed areas, researchers must notify Battelle ARO at the proposal stage to initiate satellite imagery collection of potential study sites to ensure adequate data for analysis in the event of award. To mitigate the risks of working in crevassed areas or potentially crevassed areas, the RSL program has a process for imagery analysis involving the Polar Geospatial Center and the US Army Cold Regions Research and Engineering Laboratory. Several years of imagery collected during the warmest time of the year improves the quality of the analysis. NSF is not responsible for costs associated with search and rescue, medical evacuations, or other interruptions to scheduled fieldwork and reserves the right to seek reimbursement for costs incurred for search, rescue, or medical evacuation. Proposers should ensure all members of the field team are covered by institutional medical evacuation insurance or request funds to purchase medical evacuation insurance, which is an allowable grant cost. All Investigators should have a risk management plan for their fieldwork including a plan for emergencies and are encouraged to coordinate with their institution's risk management office. The ARSLS contractor can help Investigators develop these plans and offers training relevant to fieldwork.

For research in some locations, NSF requires personnel deploying to pass a physical qualification (PQ) exam. This requirement applies primarily to remote deployments in Greenland. Researchers may request to use the PQ process for their projects (e.g., deployments to remote regions) with the subcontractor providing medical support in the program, University of Colorado Anschutz Medical Center (CU Anschutz), Section of Wilderness and Environmental Medicine, Department of Emergency Medicine. The Arctic program operates its own PQ process through CU Anschutz, consistent with the U.S. Antarctic Program [Medical Screening Guidelines](#). NSF encourages all field teams to initiate medical records with CU Anschutz to enhance their ability to be of service as part of the 24/7 telemedicine services available to all NSF projects in the Arctic. In some locations, NSF may require participants to be vaccinated or meet other requirements to protect the health of program participants and others and to preserve continuity of operations, as during the COVID-19 pandemic. For current information, check the Battelle ARO website for [Health, Safety and Environment](#) [🔗](#) guidance.

The [Battelle ARO](#) [🔗](#) website provides more information on services available to researchers. To initiate contact, please email [arctic.planning@battelle.org](mailto:arctic.planning@battelle.org).

Other frequently used field support and service organizations are listed below. Investigators should reach out to these providers directly when preparing their proposals and request a scope and cost document for the Supplementary Documents if the support has an incremental cost.

Geodetic Facility for the Advancement of Geoscience ( [GAGE](#) [🔗](#) ) operated by UNAVCO

Seismological Facility for the Advancement of Geoscience ( [SAGE](#) [🔗](#) ) operated by Incorporated Research Institutions for Seismology

Ice Drilling Program ( [IDP](#) [🔗](#) ) for ice core drilling and drill development

Ice Core Facility ( [ICF](#) [🔗](#) ) for ice core archival and sample requests

Polar Geospatial Center ( [PGC](#) [🔗](#) ) for satellite imagery

Toolik Field Station ( [TFS](#) [🔗](#) ) for access to this field station


Proposals requesting ship time on the U.S. Coast Guard (USCG) cutter HEALY should visit the [HEALY planning site](#) [🔗](#), contact the planner for HEALY ([bcmendenhall@ucsd.edu](mailto:bcmendenhall@ucsd.edu)), and submit a ship time request. Vessels operated by the University-National Oceanographic Laboratory System (UNOLS) and HEALY can be requested using the same Marine Facilities Planning ( [MFP](#) [🔗](#) ) system. Ship time requests should be included as a Supplementary Document. Please contact the ship operator for more information during proposal development. Other international and regional class vessels are available for use and can be arranged through the Battelle ARO contract, international agreements, or other mechanisms. Vessels not in the Marine Facilities Planning system can still be requested by entering comments to clarify the request. Please include a Supplementary Document that describes the scope and cost of the work and a point of contact for the vessel. Please contact Frank Rack at [frack@nsf.gov](mailto:frack@nsf.gov) to discuss vessel needs prior to proposal submission.


For work in Greenland, follow the process for [expedition permits](#) [🔗](#) laid out by the Government of Greenland. In response to the requirement that researchers in remote parts of Greenland carry DKK 1,000,000 in Search and Rescue


(SAR) insurance payable to the Danish State, NSF made an agreement with the Government of Greenland for Search and Rescue costs as a self-insured government agency. NSF provides the names of each traveler under the auspices of NSF to the Government of Greenland. NSF would coordinate SAR activities with the Government of Greenland and reserves the right to seek reimbursement for costs incurred. For work based out of Thule Air Base, please coordinate with Battelle ARO and reach out to Kate Ruck at [kruck@nsf.gov](mailto:kruck@nsf.gov) to coordinate with NSF. For work at Summit Station, please coordinate with Battelle ARO and reach out to Renee Crain at [rcrain@nsf.gov](mailto:rcrain@nsf.gov).

### **Coordination and Collaborations with Arctic Communities**

Given the deep knowledge held by local and Indigenous residents in the Arctic, NSF encourages scientists and Arctic residents to collaborate on Arctic research projects where appropriate. NSF recognizes that these collaborations will take a variety of forms based on the nature of the scientific projects, needs of community members and organizations, and the intensity of planned collaboration. The following outlines and defines some (but not all) forms of engagement:

*Research Sites Near Arctic Residents.* Proposers preparing projects working near, or impacting, Arctic communities are strongly encouraged to discuss the proposed work with those communities while developing the project concept. In accordance with the Interagency Arctic Research Policy Committee (IARPC) [Principles for Conducting Research in the Arctic](#) and the [Inuit Circumpolar Council's Protocols for Ethical and Equitable Engagement](#) , researchers should coordinate their field activities with nearby communities and are expected to share results with the community following each field season and/or at the end of the project. Investigators should include travel funds for this in their proposal budget. Some projects may require consultation with Tribal and/or subsistence co-management organizations. Time for consultation should be included in the project schedule and travel and salary funds for these consultations should be included in the proposal budget. The Arctic Research Support and Logistics (RSL) program may also support requests to visit communities and support communication with local communities. Please contact the RSL Program Officers for information about these opportunities.

*Community engagement and outreach* are important components of both integrative research and research capacity-building. Here, community engagement refers to substantive interaction with community partner organizations and anchor institutions such as governments, federal and state agencies, schools, libraries, health and social service providers, Tribal and Indigenous-serving organizations, non-profits, cultural organizations, and businesses. In accordance with the IARPC [Principles for Conducting Research in the Arctic](#) and the [Inuit Circumpolar Council's Protocols for Ethical and Equitable Engagement](#) , investigators and community partners are encouraged to work closely to develop and evaluate creative approaches to achieving meaningful engagement for mutual benefit. Co-production of knowledge does not fall under this category for the purposes of this solicitation.

*Co-production of Knowledge.* Knowledge co-production with Arctic Indigenous communities is encouraged only when appropriate and must be strongly justified and supported in the proposal text and project budget. NSF identifies co-production of knowledge as the integration of different knowledge systems and methodologies to systematically understand the phenomena, systems, and processes being studied in a research project. In the Arctic, this often takes the form of Indigenous Knowledge holders and scientists working closely together to address shared research questions, pursue shared methodologies, and agree upon appropriate outreach and data sharing activities. In Greenland, it may also mean working closely with the local Greenland science research community. A co-produced approach includes research in which local and Indigenous peoples and organizations fully engage in the complete research process from the development of research questions to the collection, use and stewardship of data, and interpretation and application of results. Given the diversity of peoples, worldviews, ideas, approaches, and methodologies in the Arctic, the co-production of knowledge in Arctic projects will take various forms. If intending to pursue knowledge co-production, community engagement must begin well in advance of proposal submission, and PIs are recommended to put into practice the [Principles for Conducting Research in the Arctic](#) and the [Inuit Circumpolar Council's Protocols for Ethical and Equitable Engagement](#) .

Proposals that include research in communities, or with Greenland's research institutes, must attach a letter or email that confirms community collaboration, or at a minimum community awareness, from the relevant community organizations (e.g., Alaska Native corporations or non-profits, tribal councils, municipal governments, and/or school authorities, or Greenland's research institutes) as a Supplementary Document. Investigators should request sufficient funding to



support the time and travel of Arctic community members and treat their collaborators as members of their research team, including acknowledging collaborators in publications and including them as co-authors and in research presentations, as appropriate.

### **Environmental Policy Considerations of Fieldwork**

Federal agencies must comply with the National Environmental Policy Act (NEPA) and other applicable laws and policies such as the Endangered Species Act, the Marine Mammal Protection Act, and the National Historic Preservation Act. Projects will be [assessed for environmental impacts](#) prior to award and additional consultations or mitigation efforts may be required. PIs should expect to be involved in the assessment and environmental compliance process for their projects. Investigators may need to travel to communities or meetings as part of the environmental compliance for projects and should request these funds in their award. The RSL program may also provide travel funds if needed to ensure that appropriate consultation takes place. Researchers proposing work that may affect cultural or historic properties, or whose work involves tribal lands, must cooperate with NSF in complying with the consultation requirements of section 106 of the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act (NAGPRA). For additional information on cultural or historic preservation issues, see the Advisory Council on Historic Preservation's website at <http://www.achp.gov/work106.html>; for information concerning NAGPRA see <http://www.nps.gov/nagpra/>. Contact the Environmental Compliance Officer Holly Smith ([hsmith@nsf.gov](mailto:hsmith@nsf.gov)) for guidance on environmental consultations, permitting, and NSF's obligations under existing environmental laws.

### **B. Budgetary Information**

#### **Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

#### **C. Due Dates**

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

July 17, 2023

July 15, Annually Thereafter

Target Dates for Arctic Natural Sciences and Arctic Social Sciences

January 16, 2024

January 15, Annually Thereafter

Target Dates for Arctic Natural Sciences and Arctic Social Sciences

Proposals accepted anytime for Arctic System Science, Arctic Observing Network, Arctic Research Collaboration and Policy Support, and Polar Cyberinfrastructure.

### **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/ProposalPreparation](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparation)

For Research.gov user support, call the Research.gov Help Desk at 1-800-673-6188 or e-mail [rgov@nsf.gov](mailto: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](mailto: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/](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**

- Proposals will be evaluated for their potential to advance understanding of the Arctic region or its impact on global systems
- Proposals to the AON program must demonstrate that the data collected will be of value to the scientific community.
- ARCSS proposals must identify explicitly how the results of the research will contribute to improvements in system-level understanding.
- Proposals conducting research outside the Arctic geographic region must contain a clear statement of how the proposed research will increase our knowledge of the Arctic.
- Reviewers will be instructed to evaluate the Plan for Safe and Inclusive Working Environments within the Broader Impacts review criterion, specifically:
  - Is there a compelling plan (including the procedures, trainings, and communication processes) to establish, nurture, and maintain inclusive off-campus or off-site working environment(s)?

- Does the proposed plan identify and adequately address the unique challenges for the team and the specific off-campus or off-site setting(s)?
- Are the organizational mechanisms to be used for reporting, responding to, and resolving issues of harassment, should they occur, clearly outlined?

## **B. Review and Selection Process**

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

Ad hoc, panel, and site visit.

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](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](mailto: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](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](https://www.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](https://www.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](https://www.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](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:

- Rainer Amon, Program Director, Arctic Natural Sciences, telephone: (703) 292-7979, email: [ramon@nsf.gov](mailto:ramon@nsf.gov)
- Lesley Anderson, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [leanders@associates.nsf.gov](mailto:leanders@associates.nsf.gov)
- Kelly M. Brunt, Program Director, Arctic Natural Sciences, telephone: (703) 292-8457, email: [kbrunt@nsf.gov](mailto:kbrunt@nsf.gov)
- Renee D. Crain, Arctic Research Support and Logistics Manager, telephone: (703) 292-4482, email: [rcrain@nsf.gov](mailto:rcrain@nsf.gov)
- Lauren Culler, Program Director, Arctic Observing Network, telephone: (703) 292-8057, email: [lculler@nsf.gov](mailto:lculler@nsf.gov)
- Roberto Delgado, Program Director, Arctic Observing Network, telephone: (703) 292-2397, email: [robdelga@nsf.gov](mailto:robdelga@nsf.gov)
- Gary Eells, Arctic Research Support and Logistics Project Controls Manager (Contractor), telephone: (703) 292-8029, email: [geells@associates.nsf.gov](mailto:geells@associates.nsf.gov)
- Liam Frink, Program Director, Arctic Social Sciences, telephone: (703) 292-7584, email: [lfrink@nsf.gov](mailto:lfrink@nsf.gov)
- Monte Ingram, Arctic Research Support and Logistics Project Controls Manager (Contractor), (703) 292-8029, email: [mingram@associates.nsf.gov](mailto:mingram@associates.nsf.gov)
- Linda M. Izzard, Arctic Research Support and Logistics Program Analyst, telephone: (703) 292-7430, email: [lizzard@nsf.gov](mailto:lizzard@nsf.gov)
- Emma Menio, Science Analyst, telephone: (703) 292-7781, email: [emenio@nsf.gov](mailto:emenio@nsf.gov)
- Randy Olsen, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [rolsen@associates.nsf.gov](mailto:rolsen@associates.nsf.gov)
- Frank R. Rack, Arctic Research Support and Logistics Manager, telephone: (703) 292-2684, email: [frack@nsf.gov](mailto:frack@nsf.gov)
- Alfredo J. Riera, Arctic Research Support and Logistics Manager, telephone: (703) 292-2130, email: [ariera@nsf.gov](mailto:ariera@nsf.gov)
- Elizabeth L. Rom, Polar Education Liaison, telephone: (703) 292-7709, email: [elrom@nsf.gov](mailto:elrom@nsf.gov)
- Kate E. Ruck, Arctic Research Support and Logistics Manager, telephone: (703) 292-8051, email: [kruck@nsf.gov](mailto:kruck@nsf.gov)
- Katy Smith, Arctic Research Support and Logistics Project Manager (Contractor), telephone: (703) 292-8029, email: [catsmith@associates.nsf.gov](mailto:catsmith@associates.nsf.gov)
- Rasheda S. Spratley, telephone: (703) 292-8580, email: [rspratle@nsf.gov](mailto:rspratle@nsf.gov)
- Marc Stieglitz, Program Director, Arctic Natural Sciences, telephone: (703) 292-4354, email: [mstiegli@nsf.gov](mailto:mstiegli@nsf.gov)
- Colleen Strawhacker, Program Director, Arctic System Sciences and Arctic Research Coordination and Policy Support, telephone: (703) 292-7432, email: [colstraw@nsf.gov](mailto:colstraw@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](mailto: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](mailto: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 (FASED)* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.F.7 for instructions regarding preparation of these types of proposals.

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
  - Send an e-mail to: [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov)
  - or telephone: (703) 292-8134



- **To Locate NSF Employees:**

(703) 292-5111

## Privacy Act And Public Burden Statements

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See [System of Record Notices, NSF-50](#), "Principal Investigator/Proposal File and Associated Records," and [NSF-51](#), "Reviewer/Proposal File and Associated Records." Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. 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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