

Biological Anthropology Program - Doctoral Dissertation Research Improvement Grants (BA-DDRIG)

PROGRAM SOLICITATION NSF 18-504

REPLACES DOCUMENT(S): NSF 17-506



National Science Foundation

Directorate for Social, Behavioral & Economic Sciences
Division of Behavioral and Cognitive Sciences

Full Proposal Target Date(s):

January 24, 2018

July 20, 2018

July 20, Annually Thereafter

January 22, 2019

January 20, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

The below statement was added in the Proposal Preparation Instructions section of this solicitation under the information for the Project Description.

If the proposal is a resubmission, the first paragraph of the Project Description must summarize how the proposal has responded to previous reviewer concerns.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) ([NSF 19-1](#)), which is effective for proposals submitted, or due, on or after February 25, 2019.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Biological Anthropology Program - Doctoral Dissertation Research Improvement Grants (BA-DDRIG)

Synopsis of Program:

The Biological Anthropology Program supports multifaceted research to advance scientific knowledge of human biology and ecology, including understanding of our evolutionary history and mechanisms that have shaped human and nonhuman primate biological diversity. Supported research focuses on living and fossil forms of both human and nonhuman primates, addressing time scales ranging from the short-term to evolutionary, encompassing multiple levels of analysis (e.g., molecular, organismal, population, ecosystem), conducted in field, laboratory, captive, and computational research environments, and often incorporating interactions between human biology and culture.

Areas of inquiry that promote understanding of the evolution, biology, and adaptability of our diverse species include, but are not limited to: genetic/epigenetic/genomic variation and relationship to phenotype; ecology and socioecology; functional anatomy and skeletal biology; and paleoanthropology and primate paleontology. Multidisciplinary research that integrates biological anthropology with related anthropological fields, such as archaeology, cultural anthropology, and forensic anthropology, also may receive support through the Program.

The Program contributes to the integration of education and basic research through support of dissertation projects conducted by doctoral students enrolled in U.S. universities. **This solicitation specifically addresses the preparation and evaluation of proposals for such Doctoral Dissertation Research Improvement (DDRI) Grants.** Dissertation research projects in all of the subareas of biological anthropology are eligible for support through these grants. These awards are intended to enhance and improve the conduct of dissertation research by doctoral students who are pursuing research in biological anthropology that enhances basic scientific knowledge.

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.

- Rebecca Ferrell - Program Director, telephone: (703) 292-7850, email: rferrell@nsf.gov
- Robin Bernstein - Program Director, telephone: (703) 292-7758, email: rbernste@nsf.gov
- Angelica T. Brewer - Program Specialist, telephone: (703) 292-4636, email: abrewer@nsf.gov

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

- 47.075 --- Social Behavioral and Economic Sciences

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 25 to 40

It is anticipated that 25 to 40 DDRIG awards will be made per fiscal year.

Anticipated Funding Amount: \$600,000 to \$800,000

The anticipated funding amount is \$600,000 to \$800,000 per fiscal year (1 October through 30 September), pending availability of funds.

Project budgets should be developed at scales appropriate for the work to be conducted. Proposal budgets cannot exceed \$20,000 in direct costs for the entire duration of the award; indirect costs are in addition to this maximum direct cost limitation and are subject to the awardee's current Federally negotiated indirect cost rate. The maximum project duration is 24 months.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Universities and Colleges - Ph.D. granting universities and colleges accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

Who May Serve as PI:

DDRIG proposals must be submitted with a principal investigator (PI; the faculty member serving as the doctoral student's dissertation advisor) and a co-principal investigator (Co-PI; the doctoral student) from the same U.S. university. The proposal should be submitted through regular, required organizational channels by the PI/dissertation advisor on behalf of the graduate student Co-PI. If appropriate, an additional faculty member may serve as another Co-PI. The doctoral student must be enrolled at a U.S. institution, but need not be a U.S. citizen. At the time of the submission deadline, doctoral students are expected to be at the appropriate stage of their academic career to enable submission of a finalized dissertation proposal, most typically very near, or having advanced to candidacy for the Ph.D. degree.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There is no limitation on the number of DDRIG proposals submitted to the BA Program by an advisor or other faculty member functioning as the PI, either during a particular competition or over the course of her/his career. A particular doctoral student may submit to the BA Program DDRIG competition twice (original and one resubmission); in rare circumstances, this restriction may be waived at the discretion of the Biological Anthropology Program Officer. A student may receive only one DDRIG award.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

via *Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the *Grants.gov* website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

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

Not Applicable

- **Other Budgetary Limitations:**

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

C. Due Dates

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

January 24, 2018

July 20, 2018

July 20, Annually Thereafter

January 22, 2019

January 20, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria apply.

Award Administration Information

Award Conditions:

Standard NSF award conditions apply.

Reporting Requirements:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Biological Anthropology Program supports multifaceted basic research that advances scientific knowledge of humans as biological organisms, within an evolutionary framework and with adaptation as a central theoretical theme. The Program contributes to the integration of such basic research with education through support of dissertation projects conducted by doctoral students enrolled in U.S. universities. **This solicitation specifically addresses the preparation and evaluation of proposals for such Doctoral Dissertation Research Improvement (DDRIG) Grants submitted to the Biological Anthropology Program.**

Dissertation projects in all of the subareas of basic scientific research in biological anthropology, whether conducted in specialized facilities or field settings, are eligible for support through these grants. These awards are intended to provide support that will enhance and improve the conduct of dissertation research by doctoral students enrolled in U.S. universities.

II. PROGRAM DESCRIPTION

Proposals eligible for support through the Biological Anthropology Program fall within the scope of basic research that advances scientific knowledge of human biology and ecology, including understanding of our evolutionary history and mechanisms that have shaped human and nonhuman primate biological diversity. Supported research focuses on living and fossil forms of both human and nonhuman primates, addressing time scales ranging from the short-term to evolutionary, encompassing multiple levels of analysis (e.g., molecular, organismal, population, ecosystem), and conducted in field, laboratory, captive, and computational research environments.

Areas of inquiry that promote understanding of the evolution, biology, and adaptability of our diverse species include, but are not limited to: genetic/epigenetic/genomic variation and relationship to phenotype; ecology and socioecology; functional anatomy and skeletal biology; and paleoanthropology and primate paleontology. Multidisciplinary research that integrates biological anthropology with related fields, including but not limited to archaeology, cultural anthropology, and forensic anthropology, also may receive support through the Program and may be co-reviewed by relevant programs.

NSF does not support research on the etiology, diagnosis, or treatment of disease; research focused on basic ecological, biological and behavioral processes that underlie health and disease in humans and non-human primates, however, may be eligible for support. Projects funded through the Program exemplify contributions to theoretical and conceptual insights within biological anthropology that might inform understanding of societal concerns, such as adaptability to environmental stresses and global change.

DDRIG proposals are accepted in all of the research areas encompassed by the Program and utilizing any of the diversity of research approaches to investigations within the discipline. It is expected that the research, whether hypothesis- or discovery-driven, will have a strong conceptual foundation and contribute to the advancement of theory and knowledge in biological anthropology beyond that of the highly-focused research topic. This expectation extends to the **broader impacts** of the research; meritorious proposals clearly, creatively, and strongly demonstrate the implications of the research for advancing education and informing issues of broader societal importance, as appropriate to the topic and scale of the research.

Proposals for dissertation research are not expected to support the full costs of the student's research. These awards are intended to provide supplemental funds for items not normally available from the student's university or other funding sources. Allowable items include travel to research facilities/field sites distant from the student's institution, costs for data-collection activities integral to the project, purchase of research supplies and services not otherwise available through the institution, the hiring of field or laboratory assistants if warranted by the scope of the research, fees for use of specialized research equipment or research facilities, and research fees imposed for international fieldwork. **Funds may not be used** for stipends or salary for the doctoral student or their advisor(s), tuition, textbooks or journals, dissertation preparation or publication costs, travel by the faculty advisor to the research site or to professional meetings, or travel by the student to professional meetings.

DDRIG awards may be for one or two years in duration, with all costs to be covered by received funds reimbursed during this award period. **Proposals may request up to \$20,000 in Direct Costs.** There are no Indirect Cost limitations; proposals submitted in response to this solicitation are subject to the awardee's current Federally-negotiated indirect cost rate. **Please note that indirect costs are in addition to the maximum direct cost request of up to \$20,000.** PIs are requested to ensure that utilization of the on-campus/off-campus rates for calculation of indirect costs is appropriate to the conduct of the proposed research and in conjunction with negotiated and institutional policies and procedures for calculation of these indirect costs.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 25 to 40

It is anticipated that 25 to 40 DDRIG awards will be made per fiscal year.

Anticipated Funding Amount: \$600,000 to \$800,000

The anticipated funding amount is \$600,000 to \$800,000 per fiscal year (1 October through 30 September), pending availability of funds.

Project budgets should be developed at scales appropriate for the work to be conducted. Proposal budgets cannot exceed \$20,000 in direct costs for the entire duration of the award; indirect costs are in addition to this maximum direct cost limitation and are subject to the awardee's current Federally negotiated indirect cost rate. The maximum project duration is 24 months.

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

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Universities and Colleges - Ph.D. granting universities and colleges accredited in, and having a campus located in, the US acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

Who May Serve as PI:

DDRIG proposals must be submitted with a principal investigator (PI; the faculty member serving as the doctoral student's dissertation advisor) and a co-principal investigator (Co-PI; the doctoral student) from the same U.S. university. The proposal should be submitted through regular, required organizational channels by the PI/dissertation advisor on behalf of the graduate student Co-PI. If appropriate, an additional faculty member may serve as another Co-PI. The doctoral student must be enrolled at a U.S. institution, but need not be a U.S. citizen. At the time of the submission deadline, doctoral students are expected to be at the appropriate stage of their academic career to enable submission of a finalized dissertation proposal, most typically very near, or having advanced to candidacy for the Ph.D. degree.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

There is no limitation on the number of DDRIG proposals submitted to the BA Program by an advisor or other faculty member functioning as the PI, either during a particular competition or over the course of her/his career. A particular doctoral student may submit to the BA Program DDRIG competition twice (original and one resubmission); in rare circumstances, this restriction may be waived at the discretion of the Biological Anthropology Program Officer. A student may receive only one DDRIG award.

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 Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

See PAPPG Chapter II.C.2 for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the PAPPG instructions.

For the following listed sections of the proposal, elaborations, emphases, and **instructions specific to DDRI proposals under this solicitation** are presented:

1. Cover Sheet

- Begin the Project Title on the Cover Sheet with "**Doctoral Dissertation Research:**" followed by a brief title of the dissertation research project. This title should correspond to the title for any required applications for IRB and/or IACUC approval of the specific dissertation project. Use concise, straight-forward language that conveys the core research objective of the project such that a scientifically or technically literate reader could understand that core scientific contribution.
- Select the specific number of this BA-DDRIG solicitation in the section labeled Program Announcement/Solicitation/Program Description.
- Verify that the NSF Unit of Consideration is "BCS-DDRI Bio Anthro".
- List the primary dissertation advisor as the PI and list the doctoral student (and other advisors, only if highly appropriate to the conduct of the research) as Co-PI(s) in the "Remainder of the Cover Sheet" section.

2. Project Description

- The text of the Project Description is limited to **10 single-spaced pages**. Up to **5 additional pages** at the end of the Project Description can be used for presentation of graphics (non-textual material), including maps, figures, and photographs essential to presentation of the project. Tables may be included in these additional pages, but should be highly concise, quantitative, and absent lengthy captions and explanatory statements. Captions for all graphics must be short and without textual elaborations. Each of these must be referenced within the text of the

10-page Project Description.

- o If the proposal is a resubmission, the first paragraph of the Project Description must summarize how the proposal has responded to previous reviewer concerns.
- o The 'Results from Prior Support' section is not required.
- o Uniform Resource Locators (URLs) should not be included within the Project Description, for reasons provided in the NSF PAPPG related to the requirement that this section be self-contained.
- o The Project Description should incorporate discussion of the scientific significance of the project and the relevant theoretical framework(s) and literature (including significance of the research to biological anthropology beyond informing the focused area of inquiry, as well as any distinct transformative potential), detailed presentation of the research question(s) to be addressed, and details of the research design, analyses and interpretation.
- o In preparation of the required, separate section on Broader Impacts, discussion of the improvement of graduate student training (that of the Co-PI) can be included, but investigators should go beyond this in delineating impacts generated by the research itself, through activities related to the research, or activities that are supported by, but are complementary to the project. These should be appropriate to the size and scope of the research, but are expected to illustrate that significant thought has been applied to consideration of the impact of the research as it may inform or advance societally-relevant outcomes.

3. Budget

- o Permitted budget items include: travel to research facilities/field sites distant from the student's institution, costs for data-collection activities integral to the project, purchase of research supplies and services not otherwise available through the institution, the hiring of field or laboratory assistants if warranted by the scope of the research, fees for use of specialized research equipment or research facilities, and research fees imposed for international fieldwork.
- o **Funds may not be used** for stipends or salary for the doctoral student or their advisor(s), tuition, textbooks or journals, dissertation preparation or publication costs, travel by the faculty advisor to the research site or to professional meetings, or travel by the student to professional meetings.
- o Since salaries or stipends for the doctoral student or their advisor(s) are not eligible for support, after the PI and Co-PI(s) are entered on the Cover Sheet, their names must be manually removed from the Senior Personnel listing on the budget pages. This is to avoid construal as voluntary committed cost sharing, which is not permitted.

4. Other Supplementary Documents

The BA-DDRIG solicitation includes a **required statement from the Principal Investigator** that must be uploaded to this section. This **signed** statement from the doctoral student's major advisor or other faculty member serving as the PI affirms that 1) s/he has actively mentored the student throughout the production of the proposal, 2) s/he has read the final, submitted version of that proposal, and 3) the proposal represents a strong case for support of the dissertation research project.

The following **template must be used** to prepare the statement; the only changes permitted are provision of information where there are blank lines in the template. Additional text is **not** permitted. The statement should be prepared and then **signed** by the PI; the scanned document can then be uploaded into the Other Supplementary Documents section. Electronic signature or its equivalent will be permitted only in highly unusual, fully supported circumstances; prior written approval of the Program Director for the Biological Anthropology Program is required before such substitution of the PI's real signature.

Required template for the PI's signed statement:

TO: NSF Biological Anthropology Program

FROM: _____ (insert typed/printed name of the PI)

By signing below, I acknowledge that I am the listed Principal Investigator on this proposal, entitled " _____ " (insert title of the *DDRIG proposal from the Cover Sheet*), with my doctoral student advisee _____ (insert typed/printed name of the Co-PI) as the Co-Principal Investigator.

I affirm that the student Co-PI has advanced to a stage in her/his doctoral program where submission of a finalized dissertation proposal is appropriate, and that the student will be able to undertake the dissertation research project described in this proposal promptly after any award of funding (as indicated by the proposed starting date on the Cover Sheet).

I affirm that 1) I have actively mentored the student throughout the production of the proposal, 2) I have read the final, submitted version of this proposal, and 3) in my estimation, the proposal represents a strong case for support of the dissertation research project through NSF funding.

Signed: _____ (must be signed by the PI)

University Affiliation: _____ (insert university name)

Date: _____ (insert date that the statement is signed by the PI)

Letters of Collaboration

If the dissertation project involves collaboration on the part of individuals and/or organizations in order to carry-out the activities and achieve the research goals, **brief** statements (in the form of letters or free-standing email messages) may be included in this section (Other Supplementary Documents). These must be statements of intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment or Other Resources section of the proposal; statements submitted for inclusion in the proposal cannot be altered in any way without the author's explicit prior approval. Such statements must **not** be letters of recommendation in support of the project, nor should they include elaboration of the collaborative activities beyond what has been presented in the Project Description. These are solely to attest to willingness to collaborate or commit resources such as access to research facilities.

5. Institutional Review Board (IRB) and/or Institutional Animal Care and Use Committee (IACUC) Approvals

If the project requires approval by one or both of these entities (the research involves human subjects and/or vertebrate animals), proper certification is required. If approval of the research has not been obtained prior to submission, the proposer should indicate 'Pending' in the space provided on the Cover Sheet for the approval date. If a decision is made to recommend the proposal for funding, an official copy of the IRB and/or IACUC approval

letter must be submitted to the Program Director. If the research has been deemed exempt from IRB/IACUC review, this must be affirmed by the IRB/IACUC or appropriate knowledgeable authority designated by the submitting organization, not the PI. The approval document must identify the DDRI project specifically, and the stated expiration date of the approval should extend a minimum of 6 months beyond the start date of the project. Additional information about IRB and IACUC policies and procedures is available in the PAPPG.

6. Appendices

No appendices are permitted.

Pre-Submission Proposal Checklist:

- o Submitted before or on the target date; in rare circumstances that require a submission past the target date, the submission should be cleared with the Biological Anthropology Program Director
- o Research proposed matches the areas encompassed by the Biological Anthropology Program
- o Proposal title begins with "Doctoral Dissertation Research:"
- o Project Summary is one page and contains separate sections for Overview, Intellectual Merit, and Broader Impacts; as a whole, the summary should provide sufficient detail so that the reader knows the proposed topic/question/problem, specific hypotheses/aims, sample or data to be used/collected, and proposed methods of analysis.
- o Project Description does not exceed 10 pages, followed by up to 5 additional pages containing only graphics and tables
- o References Cited present as a separate section
- o Biographical Sketches for the PI and Co-PI(s) are present, do not exceed two pages each, and are prepared in the required NSF format (see PAPPG)
- o Collaborators & Other Affiliations (COA) Information is included for the PI and Co-PI(s). COA information specified in the PAPPG should be submitted using the instructions and spreadsheet template found on the [Collaborators and Other Affiliations Information](#) website.
- o Budget does not list personnel names
- o Budget does not exceed \$20,000 in **direct costs** (indirect costs are computed according to negotiated rates and appropriate to institutional policy regarding aspects such as application of on-campus versus off-campus rates)
- o Budget does not include items prohibited for BA-DDRI proposals, as delineated above
- o Budget Justification is present and fully delineates and explains the need for the items in the context of the proposed research
- o Current and Pending Support forms for both PI and Co-PI(s) are present and **include the current DDRI proposal (the proposal being submitted) under pending support**
- o Facilities, Equipment and Other Resources section is included (and if not applicable, text is inserted or a document uploaded in this section that states "Not Applicable")
- o Required Data Management Plan is present and thorough with respect to NSF guidelines
- o Signed Statement by the PI is included under Other Supplementary Documents and utilizes the required template with no alterations or added text

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

Up to \$20,000 in Direct Costs for up to 24 months. There are no Indirect Costs limitations; proposals submitted in response to this solicitation are subject to the awardee's current Federally negotiated indirect cost estimate. Please note that indirect costs are in addition to the maximum direct cost request of up to \$20,000. Restrictions on allowable categories of funding, as described in this solicitation, must be followed.

C. Due Dates

• Full Proposal Target Date(s):

January 24, 2018

July 20, 2018

July 20, Annually Thereafter

January 22, 2019

January 20, Annually Thereafter

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

For Proposals Submitted Via FastLane or Research.gov:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html. For FastLane or Research.gov user support, call the FastLane and Research.gov Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov or rgov@nsf.gov. The FastLane and Research.gov Help Desk answers general technical questions related to the use of the FastLane and Research.gov systems. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in

Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

A comprehensive description of the Foundation's merit review process is available on the NSF website at: https://www.nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 – 2022*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be

accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (PAPPG Chapter II.C.2.d(i). contains additional information for use by proposers in development of the Project Description section of the proposal). Reviewers are strongly encouraged to review the criteria, including PAPPG Chapter II.C.2.d(i), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities 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.

B. Review and Selection Process

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

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

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

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

C. Reporting Requirements

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

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

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

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

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:

- Rebecca Ferrell - Program Director, telephone: (703) 292-7850, email: rferrell@nsf.gov
- Robin Bernstein - Program Director, telephone: (703) 292-7758, email: rbernste@nsf.gov
- Angelica T. Brewer - Program Specialist, telephone: (703) 292-8740, email: abrewer@nsf.gov

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188
FastLane Help Desk e-mail: fastlane@nsf.gov.
Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

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

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

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

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

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

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
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 - 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
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National Science Foundation
Alexandria, VA 22314

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