# Dynamic Language Infrastructure-Doctoral Dissertation Research Improvement Grants (DLI-DDRI)

## PROGRAM SOLICITATION
### NSF 19-607

**National Science Foundation**

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

Directorate for Geosciences
    Office of Polar Programs

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

Proposals Accepted Anytime

   Submission for Doctoral Dissertation Research Improvement Grants only.

## IMPORTANT INFORMATION AND REVISION NOTES

This solicitation provides instructions for the preparation of proposals to be submitted to the Linguistics Program for Dynamic Language Infrastructure Doctoral Dissertation Research Improvement Grants (DLI-DDRI).

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

## SUMMARY OF PROGRAM REQUIREMENTS

## General Information

**Program Title:**

   Dynamic Language Infrastructure-Doctoral Dissertation Research Improvement Grants (DLI-DDRI)

**Synopsis of Program:**

   This program supports doctoral research focusing on building dynamic language infrastructure (DLI). Developing language infrastructure includes the documentation and preservations of languages in ways that articulate or advance linguistic theory, as well as the use of digitization techniques and novel computational methods that support and advance the study of language. Special emphasis is given to human languages that are endangered, i.e., understudied and at risk of falling out of use. The program supports the development of the next generation of researchers that contribute to language data management and archiving, and to the analysis of these archives to advance language infrastructure. Funding can support fieldwork and other activities relevant to the digital recording, documenting, and archiving of endangered languages, including the preparation of lexicons, grammars, text samples, and databases. Funding in this solicitation is in the form of doctoral dissertation research improvement grants (DDRIs) for up to 24 months and this solicitation addresses the preparation and evaluation of proposals for DDRI proposals.

**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.*

- Mary Paster - Program Director, telephone: (703) 292-2762, email: mpaster@nsf.gov

- Tyler S. Kendall - Program Director, telephone: (703) 292-2434, email: tkendall@nsf.gov

- Kenyatta Johnson - Program Specialist, 13256A, telephone: (703) 292-4850, email: kenjohns@nsf.gov

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

- 47.050 --- Geosciences
- 47.075 --- Social Behavioral and Economic Sciences

## Award Information

**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** 10 to 15

Approximately 10-15 awards with a duration up to 24 months.

**Anticipated Funding Amount:** $150,000 to $250,000

The maximum individual award size is $15,000 in direct costs. Indirect costs are in addition to the maximum direct cost limitation and are subject to the awardee's current federally negotiated indirect cost rate. The total funding amount for the DLI-DDRI program is between $150,000 and $250,000, pending availability of annual appropriations.

## Eligibility Information

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Ph.D granting IHEs accredited in, and having a campus located in the U.S. acting on behalf of their faculty members.

**Who May Serve as PI:**

DLI-DDRI proposals must be submitted with a principal investigator (PI) and a co-principal investigator (co-PI). The PI must be the advisor of the doctoral student or another faculty member at the U.S. IHE where the doctoral student is enrolled. The doctoral student must be the co-PI.

**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 times that a graduate advisor may be the principal investigator on a DDRI proposal submitted to the DLI-DDRI program either during a specific competition or over the course of her/his career.

However, doctoral students are limited to two DDRI submissions to the Linguistics Program in the course of their graduate careers.

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

    Proposals Accepted Anytime

Submission for Doctoral Dissertation Research Improvement Grants only.

## Proposal Review Information Criteria

**Merit Review Criteria:**

National Science Board approved criteria. Additional merit review considerations 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.

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## I. INTRODUCTION

This program supports doctoral research focusing on building dynamic language infrastructure (DLI). Developing language infrastructure includes the documentation and preservations of languages in ways that articulate or advance linguistic theory, as well as the use of digitization techniques and novel computational methods that support and advance the study of language. Special emphasis is given to human languages that are endangered, i.e., understudied and at risk of falling out of use.

Roughly half of the world's seven thousand languages are endangered and risk extinction. These endangered languages constitute an irreplaceable resource, not only for the communities who speak them, but also for scientists and scholars.

- The great variety of these languages represents a vast, largely untapped resource for which linguists, anthropologists, and cognitive scientists can chart the full capabilities and limits of the human mind.
- Each endangered language embodies unique local knowledge of the cultures and natural systems in the region in which it is spoken and thus includes knowledge not otherwise documented.
- These languages are among the few sources of evidence for filling in the record of the human past.

Recent advances in information technology can facilitate prompt and coordinated fieldwork. These advances make it possible not only to document endangered languages but also to integrate and analyze that body of knowledge in unprecedented ways. Computerization of speech and universal Internet access is transforming the practice of linguistics in the area of endangered languages.

- Linguists will be able to work from shared, common sets of data, rather than from isolated personal data collections.
- The data will be searchable in a large variety of ways. For example, finding all occurrences of a particular phoneme or syntactic feature in a database will become feasible.
- The recorded sounds of a language will be available. Linguists will be able to check written transcriptions; they will be able to focus more attention on such matters as intonation in syntax.
- Interoperable digital repositories will be created.

- Interoperability will drive the development of a unified ontology for linguistics, eventually replacing inconsistent descriptive terminologies.

The endangered languages belong to highly divergent language families, which often present the most extreme cases of language differentiation.

- This wider range of data will enable linguists to achieve much greater time depth, for example, in using the comparative method to reconstruct proto-languages.
- It will enable linguists to test more precisely claims about linguistic universals and about what humans can learn.

## II. PROGRAM DESCRIPTION

As part of its effort to encourage and support projects that explicitly integrate education and basic research, the DLI-DDRI grants provide support to enhance and improve the dissertation projects conducted by doctoral students enrolled in U.S. universities in Linguistics, Language Documentation, and associated fields. The Linguistics Program provides support to enhance and improve the dissertation projects conducted by doctoral students enrolled in U.S. universities in Language Documentation and associated fields.

All DDRI proposals recommended for funding must clearly demonstrate how the proposed research will contribute to the advancement of the basic science of linguistics and the field of language documentation and infrastructure. Principal Investigators (PIs) may propose projects involving one or more of the following three emphasis areas:

1. **Language Description**

   to conduct fieldwork to record in digital audio and video format one or more endangered languages; to carry out the early stages of language documentation including transcription and annotation; to carry out later stages of documentation including the preparation of lexicons, grammars, text samples, and databases; to conduct initial analysis of findings in the light of current linguistic theory.

2. **Infrastructure**

   to digitize and otherwise preserve and provide wider access to such documentary materials, including previously collected materials and those concerned with languages which have recently lost all fluent speakers and are related to currently endangered languages; to create other infrastructures to make the problem of endangered languages more widely understood and more effectively addressed.

3. **Computational Methods**

   to further develop standards and databases to make this documentation of a certain language or languages widely available in consistent, archivable, interoperable, and web-based formats; to develop computational tools for endangered languages, which present an additional challenge for statistical tools (taggers, grammar induction tools, parsers, etc.) since they do not have the large corpora for training and testing the models used to develop those tools; to develop new approaches to building computational tools for endangered languages, based on deeper knowledge of linguistics, language typology and families, which require collaboration between theoretical and field linguists and computational linguists (computer scientists).

   Documentation is a key complement to language revitalization efforts, but DLI-DDRI does not support projects to revive or expand the actual use of endangered languages. Tribal groups interested in the full range of language revitalization activities should contact the Native Language Program of the Administration for Native Americans in the Administration for Children & Families of the U.S. Department of Health and Human Services https://www.acf.hhs.gov/ana/programs/native-language-preservation-maintenance .

## III. AWARD INFORMATION

**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** Approximately 10-15 awards with a duration up to 24 months.

**Anticipated Funding Amount:** $150,000 to $250,000

The maximum individual award size is $15,000 in direct costs. Indirect costs are in addition to the maximum direct cost limitation and are subject to the awardee's current federally negotiated indirect cost rate. The total funding amount for the DLI-DDRI program is between $150,000 and $250,000, pending availability of annual appropriations.

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

## IV. ELIGIBILITY INFORMATION

**Who May Submit Proposals:**

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Ph.D granting IHEs accredited in, and having a campus located in the U.S. acting on behalf of their faculty members.

**Who May Serve as PI:**

> DLI-DDRI proposals must be submitted with a principal investigator (PI) and a co-principal investigator (co-PI). The PI must be the advisor of the doctoral student or another faculty member at the U.S. IHE where the doctoral student is enrolled. The doctoral student must be the co-PI.

**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 times that a graduate advisor may be the principal investigator on a DDRI proposal submitted to the DLI-DDRI program either during a specific competition or over the course of her/his career.

> However, doctoral students are limited to two DDRI submissions to the Linguistics Program in the course of their graduate careers.

# V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

## A. Proposal Preparation Instructions

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

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

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

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

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

**Note:** The following information supplements the standard proposal preparation guidelines in the NSF PAPPG and NSF Grants.gov Application Guide.

An outstanding dissertation proposal will clearly specify the research questions and hypotheses, the data relevant to answering those research questions, the theoretical framework being used and the methods of analysis. It will provide a brief literature review and a clear work plan. It will also address the NSF review criterion of broader impacts.

**Title:** The DDRI proposal title should begin with "Doctoral Dissertation Research: " followed by a substantive subtitle, which should describe the project in a concise, informative way so that a scientifically or technically literate reader could understand what the project is about.

**Cover Sheet:** DDRI grants focus on providing support for the dissertation research of a doctoral student. The student's advisor or another faculty member at the university where the student is enrolled must serve as the principal investigator (PI) of the proposal, however. The student must be listed as a co-principal investigator (co-PI). In cases when a student is working closely with multiple faculty members, an additional faculty member may be added as another co-PI. (Note that identification of an individual as a PI or co-PI means that they will have administrative responsibility for an award based on the proposal.)

**Project Summary and Project Description:** DLI-DDRI proposals may have up to 10 single-spaced pages for the Project Description; otherwise follow the NSF PAPPG for other general proposal preparation guidelines. As with any proposal, the one-page Project Summary must provide an Overview and address in separate, labeled paragraphs the "Intellectual Merit" and the "Broader Impacts" as per the PAPPG.

As specified in Chapter II of the NSF PAPPG and in the comparable section of the NSF Grants.gov Application Guide, the project description should be a clear statement of the work to be undertaken.

To be competitive for DLI-DDRI funding, the project description should provide clear descriptions of relevant literature and theoretical frameworks within which

the project is set, a complete description of the research methods that will be used, and discussion of the expected intellectual merit and broader impacts that may result from the project.

Although a discussion of the results from prior NSF support are required for most proposals, if the PI and/or any co-PIs have had NSF funding within the last five years, results from prior support do not need to be provided for the PI or any other senior personnel for a DLI-DDRI proposal.

**Biographical Sketches:** For DDRI proposals, biographical sketches should be submitted for both the student and the dissertation advisor(s) and should conform to the PAPPG specifications. In addition, the biographical sketch for the student should also include a statement about the student's current academic status and degree progress; a separate letter concerning the student's academic status may be uploaded under "Other Supplementary Documents" but is not required. Do not submit transcripts or letters of reference.

**Special Information and Supplementary Documents**

*Data Management Plan:* All proposals must include as a supplementary document a plan for data management and sharing the products of research. The data management plan (DMP) to be submitted with a proposal must be no longer than two (2) pages in length and must be included as a supplementary document.

In preparing their data management plans, proposers should address all five of the points specified in Chapter II of the NSF PAPPG and the comparable section of the NSF Grants.gov Application Guide.

The solicitation-specific DMP requirements are (1) the archiving location should appear in the Project Summary; (2) plans and methodology for the sustainable, long-term archiving of all data and a discussion of interoperability with related materials should appear in the Project Description; (3) budgeted costs for archiving, including the ingestion into the archive, should appear in the Budget and Budget Justification under Other Direct Costs line G6; (4) a letter from the archive selected by the project should appear in Supplementary Documents; and (5) the Data Management Plan should appear in Supplementary Documents. The SBE Data Management Plan for SBE Directorate Proposals and Awards includes information relevant to reporting and is located at https://www.nsf.gov/news/news_summ.jsp?cntn_id=118038&org=SBE.

The DMP should provide evidence that the proposer has contacted a trusted repository to arrange for long-term archiving of documentation materials generated by the DLI-DDRI project. While the Linguistics Program does not sponsor or have an official arrangement with any language archive, these services are provided by DELAMAN member archives (delaman.org) and by institutions holding the Data Seal of Approval (datasealofapproval.org). Regular data backup should be an integral part of the DMP; however, this is not to be equated with archiving in a trusted repository. Backing up data on hard drives, servers, optical media, and cloud based services does not constitute archiving. Crucially, the language archive selected by a DLI-DDRI project must have a long-term institutional commitment to data preservation and access.

The DMP should include a time-line for completion of archiving activities. It is expected that archiving should be completed prior to the submission of the final project report.

Proposers should include a letter of support from the archive indicating their willingness to archive project materials and outlining any specific arrangements which have been made. This letter must be uploaded under "Other Supplementary Documents".

Language documentation is of little value if it cannot be accessed. To that extent the Linguistics Program expects that the vast majority of data generated by the DLI-DDRI project will be publically accessible with minimal restrictions for non-commercial, educational purposes. (Restrictions on commercial use are acceptable.) The DMP should indicate how archived materials will be accessible to the public. Any restrictions to be placed on access should be clearly indicated. If the proposer expects access to some materials to be restricted to certain user groups, the DMP should indicate the criteria delineating such user groups and provide an estimate of the percentage of materials which will be so restricted. If time limits are to be placed on access to materials, the DMP should indicate the period of time after which access restrictions will be removed.

*Statement of Consultation:* Include an explicit statement that care has been taken to consult with the relevant parties in the speech communities about the nature and results of the research to be conducted. The PI should ensure that the process of seeking appropriate permissions has been initiated. This statement must be uploaded under "Other Supplementary Documents".

*Letters of Collaboration*: Brief statements (whether written as letters or as free-standing e-mail messages) from individuals and/or organizations that will work with the doctoral student and/or provide in-kind support for the proposed project may be included under "Other Supplementary Documents." Such letters are not needed from the student's university administration or from other individuals at that university. If the research project includes a significant component requiring the involvement of another institution (either within the US or abroad), it is recommended that the proposal include a letter (or letters) testifying to local institutional sponsorship from the student's extramural sponsor.

Letters of recommendation are not allowed. Letters of collaboration should focus on the willingness of the letter's author to collaborate or provide in-kind support for the project in ways that have been outlined in the project description. The content of the letter(s) should be limited to a description of the committed facilities or resources (which may include advising by the extramural sponsor). Collaboration letters should not argue for support of the project by articulating in greater detail what activities the collaborator will undertake and/or by elaborating reasons for endorsing the project. The inclusion of such prohibited content may result in the proposal being returned without review.

*Signed Statement from the Principal Investigator:* The advisor or other faculty member serving as the principal investigator (PI) of the proposal is required to submit a signed statement affirming that the student will be able to undertake the proposed research soon after a DLI-DDRI award is made. In addition, the PI must affirm that she/he has read the proposal and believes that it makes a strong case for support of the dissertation research project.

The following template must be used to prepare this statement, with changes permitted only to provide information where there are blank lines in the template. Additional text is not permitted. The statement must be signed by the PI. (In very unusual cases, an electronic signature or equivalent may be permitted, but replacement of a real signature with a PI's real equivalent is permitted only with prior written approval from a Linguistics Program officer.)

**Required template for a statement signed by the PI**

To: NSF DLI-DDRI Program Officers

From: _____
[Insert name of the PI]

By signing below, I affirm that the doctoral student is at a stage in her/his graduate program that makes it very likely that the student will be able to undertake the dissertation research described in this proposal soon after a DLI-DDRI award is made.

I affirm that I have read this proposal, and I believe that this proposal makes a strong case for NSF support for this project.

Signed: _____
[Insert PI's signature]

University: _____
[Insert university name]

Date: _____
[Insert date that the statement is signed by the PI]

**NOTE:** In addition to the above documents, a file with up to two pages of examples of interlinear glossing, dictionary format, questionnaires, task protocols, etc. may also be included under "Other Supplementary Documents".

## B. Budgetary Information

**A. Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

**Other Budgetary Limitations:**

**B. Budgetary Information**

**Cost Sharing:**

Inclusion of voluntary committed cost sharing is prohibited.

**Other Budgetary Limitations:**

DLI-DDRI proposals are not intended to provide the full costs of a student's doctoral dissertation research. DLI-DDRI proposals recommended by the Linguistics Program will not exceed $15,000 in allowable direct costs over the 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. Project budgets should be developed at scales appropriate for the work to be conducted and may only include costs directly associated with the conduct of dissertation research.

DLI-DDRI proposals provide funding for research costs not normally covered by the student's university. Examples of the kinds of expenses that may be included in a DLI-DDRI proposal budget are the following:

- Costs associated with travel and related expenses to conduct research at field sites, archives, specialized collections, and/or facilities away from the student's campus.
- Costs for data-collection activities, including the conduct of experiments, surveys and/or questionnaires.
- Costs for securing data and for archiving data.
- Costs for equipment necessary for the conduct of the project that will be devoted to the project over the duration of the award. (Note that any equipment purchased with NSF funds becomes property of the awardee organization.)
- Costs for payments to research subjects and/or language informants
- Costs for materials and supplies required for the conduct of the project.
- Costs for travel to one domestic professional meeting to present preliminary research results and obtain feedback to further improve the project. (Note budgetary limitations specified below. Note also that the Linguistics Program will not recommend a DLI-DDRI proposal for an award solely to provide support to share research results at conferences.)

Costs that cannot be reimbursed by DLI-DDRI proposals include the following:

- A stipend or salary for the doctoral student or advisor. (Note that salaries or payments for work by other individuals whose assistance may be essential to the conduct of the project may be permitted when there is sound justification for such expenses.)
- Costs for tuition, textbooks, or other items not directly related to the conduct of dissertation research.
- Publication costs for articles based on the dissertation, except when the university's degree requirements permit the substitution of published research results for a free-standing dissertation.
- Costs for travel of the dissertation advisor(s) to the field site and/or professional meetings.

DLI-DDRI proposals may be for one or two years in duration. The dissertation does not have to be completed during that time period, but costs associated with research activities to be reimbursed with DLI-DDRI funds must be incurred while the award is active.

**Budget Preparation Instructions:**

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 FastLane Cover Sheet, their names should 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.

## C. Due Dates

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

   Proposals Accepted Anytime

      Submission for Doctoral Dissertation Research Improvement Grants only.

## D. FastLane 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.

**Additional Solicitation Specific Review Criteria**

In addition to the standard NSF review criteria, DLI-DDRI proposals will be evaluated with respect to the degree to which they meet the goals and objectives of the DLI-DEL program.

## B. Review and Selection Process

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

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

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

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

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

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

# VII. AWARD ADMINISTRATION INFORMATION

## A. Notification of the Award

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

## B. Award Conditions

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

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

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

## C. Reporting Requirements

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

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

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

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

# VIII. AGENCY CONTACTS

*Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.*

General inquiries regarding this program should be made to:

- Mary Paster - Program Director, telephone: (703) 292-2762, email: mpaster@nsf.gov

- Tyler S. Kendall - Program Director, telephone: (703) 292-2434, email: tkendall@nsf.gov

- Kenyatta Johnson - Program Specialist, 13256A, telephone: (703) 292-4850, email: kenjohns@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* (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.
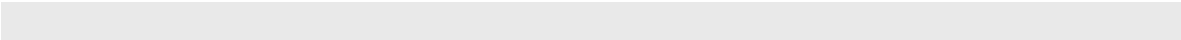
The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

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

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

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

- **Location:**                                                    2415 Eisenhower Avenue, Alexandria, VA 22314

- **For General Information**                           (703) 292-5111
  (NSF Information Center)**:**

- **TDD (for the hearing-impaired):**            (703) 292-5090

- **To Order Publications or Forms:**

    Send an e-mail to:                                        nsfpubs@nsf.gov

    or telephone:                                               (703) 292-8134

- **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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