

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)

PROGRAM SOLICITATION

NSF 16-544



National Science Foundation

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources
Division of Human Resource Development

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social, Behavioral & Economic Sciences

Office of Integrative Activities

Preliminary Proposal Due Date(s) (*required*) (due by 5 p.m. submitter's local time):

April 15, 2016

Design and Development Launch Pilots

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

June 24, 2016

Design and Development Launch Pilots

IMPORTANT INFORMATION AND REVISION NOTES

Preliminary proposals and full proposals. Submission of a preliminary proposal is required for Design and Development Launch Pilots. Full Design and Development Launch Pilot proposals may be submitted by invitation only after the review of the preliminary proposal is completed.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) ([NSF 16-1](#)), which is effective for proposals submitted, or due, on or after January 25, 2016.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)

Synopsis of Program:

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) is a comprehensive national initiative designed to enhance U.S. leadership in science, technology, engineering and mathematics (STEM) discoveries and innovations focused on NSF's commitment to diversity, inclusion, and broadening participation in these fields. NSF INCLUDES supports efforts to develop talent from all sectors of society to build the STEM workforce. The initiative aims to improve the preparation, increase the participation, and ensure the contributions of individuals from groups that have traditionally been underrepresented and underserved in the STEM enterprise, including women, members of racial and ethnic groups, persons with disabilities, and persons with low socio-economic status. Significant advancement of these groups will result in a new generation of promising STEM talent and leadership to secure our nation's future in science and technology.

The grand challenge of broadening participation in STEM is to transform the STEM enterprise at all levels in order to fully engage the nation's talent for the ultimate improvement of the STEM enterprise. As a comprehensive

national initiative, NSF INCLUDES aims to address the various complex equity and inclusion-related challenges and opportunities that characterize the nation's cultural and linguistic diversity, with a specific emphasis on the aforementioned groups. The goal is to achieve national level impact and progress toward STEM inclusion. Viewing this challenge as a social innovation problem, NSF is particularly interested in using approaches to scaling and growth such as collective impact, networked communities and strategic partnerships. The objective is to develop networks that involve representative organizations and consortia from different sectors that are committed to a common agenda to solve a specific STEM inclusion problem at scale. The long-term goal of NSF INCLUDES is to support, over the next ten years, innovative models, networks, partnerships, and research that enable the U.S. science and engineering workforce to thrive by ensuring that women, blacks, Hispanics, and people with disabilities are represented in percentages comparable to their representation in the U.S. population.

In FY 2016, NSF seeks proposals for Design and Development Launch Pilots to catalyze the formation of NSF INCLUDES Alliances.

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.

- Bernice T. Anderson, telephone: (703) 292-5151, email: banderso@nsf.gov
- Tasha R. Inniss, telephone: (703) 292-4684, email: tinniss@nsf.gov
- Mark H. Leddy, telephone: (703) 292-4655, email: mleddy@nsf.gov
- Julio E. Lopez-Ferrao, telephone: (703) 292- 5183, email: jlopezfe@nsf.gov
- James L. Moore, telephone: (703) 292-7082, email: jamoore@nsf.gov
- Kamau Bobb, telephone: (703) 292-4291, email: kbobb@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 30 to 40

In FY 2016, 30 - 40 NSF INCLUDES two-year Design and Development Launch Pilot Projects awards will be made.

Anticipated Funding Amount: \$12,500,000

In FY 2016, approximately \$12.5 million is available to fund 30 - 40 NSF INCLUDES two-year Design and Development Launch Pilot Projects at levels up to \$300,000 each.

Eligibility Information

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

The PI must hold a permanent position at the lead institution. The PI must have experience in leading distributed teams and organizations. Collaboration for impact in STEM relevant activities is desirable but not required.

Limit on Number of Proposals per Organization:

An organization may serve as the lead institution on only one Design and Development Launch Pilot proposal.

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

An individual may serve as a PI on only one (1) Design and Development Launch Pilot proposal. An individual may serve as the Co-PI on up to three (3) Design and Development Launch Pilot proposals.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- **Full Proposals:**

- Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
- 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: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.

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

Not Applicable

- **Other Budgetary Limitations:**

Not Applicable

C. Due Dates

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. submitter's local time):

April 15, 2016

Design and Development Launch Pilots

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

June 24, 2016

Design and Development Launch Pilots

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.

TABLE OF CONTENTS

[Summary of Program Requirements](#)

[I. Introduction](#)

[II. Program Description](#)

[III. Award Information](#)

[IV. Eligibility Information](#)

[V. Proposal Preparation and Submission Instructions](#)

- [A. Proposal Preparation Instructions](#)
- [B. Budgetary Information](#)
- [C. Due Dates](#)
- [D. FastLane/Grants.gov Requirements](#)

[VI. NSF Proposal Processing and Review Procedures](#)

- [A. Merit Review Principles and Criteria](#)
- [B. Review and Selection Process](#)

[VII. Award Administration Information](#)

- [A. Notification of the Award](#)
- [B. Award Conditions](#)
- [C. Reporting Requirements](#)

VIII. Agency Contacts

IX. Other Information

I. INTRODUCTION

Diversity – of thought, perspective, and experience – is essential for excellence in research and innovation in science and engineering.^[1] Full participation of all of America's STEM talent is critical to the advancement of science and engineering for national security, health, and prosperity. America's STEM talent pool has a competitive advantage when it is enriched by diversity of perspectives and approaches, which in turn enriches knowledge across STEM. African Americans, Hispanics, Native Americans, women, persons with disabilities, and persons with low socio-economic status are underrepresented in various fields of science and engineering across all levels – from K-12 to long-term workforce participation.^[2] Inclusion of talent from all these sectors of American society is necessary for the health and vitality of the science and engineering community and its societal relevance.

NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) is a comprehensive initiative to enhance U.S. leadership in science and engineering discovery and innovation by proactively seeking and effectively developing STEM talent from all sectors and groups in our society.

The overarching goal of NSF INCLUDES is to create a sustainable collaborative process for the inclusion in STEM of women, members of racial and ethnic groups that have been underrepresented in STEM, persons with low socio-economic status and people with disabilities. NSF INCLUDES will improve the preparation, increase the participation, and ensure the contributions of individuals from groups that traditionally have been underrepresented in the STEM enterprise.

NSF INCLUDES aims to mobilize communities concerned with STEM opportunities to bring renewed focus and effective collaboration to solving broadening participation challenges at scale. Collective commitment to specific objectives for inclusion is necessary for impact at scale in STEM. This initiative will leverage investments from NSF programs and projects focused on broadening participation, building on lessons learned, best practices, and proven mechanisms for achieving success.^{[3],[4]}

Collaborative alliances spanning both education levels and public and private sectors, and including new partners, will need to be developed, expanded, organized and built by leveraging state-of-the-art knowledge on scaling of social innovations. For example, the collective impact approaches that incorporate key success determinants of common agenda, shared measurements, mutually reinforcing activities, continuous communications, and backbone support organizations have the potential to yield large-scale progress towards NSF INCLUDES' goals. While the latest knowledge from the science of broadening participation provides a strong foundation, novel systems approaches and designs for achieving scale are critical for advancing diversity and inclusion in STEM.^{[5],[6],[7]}

NSF INCLUDES will fund new research, models, networks, and partnerships that lead to measurable progress in diversity and inclusion in STEM, and have the ability to scale to the national level. The multi-year goals of NSF INCLUDES are to:

1. Synthesize and build the research base for broadening participation and foster the spread and adaptation of proven effective practices.
2. Support the identification, development and attainment of a set of shared goals and objectives developed by stakeholders, including those from specific STEM disciplines, which are essential for achieving inclusion in the nation's scientific workforce and in high quality STEM learning opportunities.
3. Support local/regional and discipline-specific or crosscutting multi-stakeholder partnerships and networks (NSF INCLUDES Alliances) and support an NSF INCLUDES National Network.

[1] S. E. Page, *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies* (Princeton University Press, 2007).

[2] National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads* (Washington, DC: The National Academies Press, 2011).

[3] Committee on Equal Opportunities in Science and Engineering (CEOSE) (2015), *Broadening Participation in America's STEM Workforce*, Table 3.1, p.28.

[4] NSF Broadening Participation Portfolio: http://www.nsf.gov/od/broadeningparticipation/bp_portfolio_dynamic.jsp

[5] John Kania & Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* (Winter 2011), http://ssir.org/articles/entry/collective_impact.

[6] Anthony S. Bryk, Louis Gomez, & Alicia Grunow, "Getting Ideas into Action: Building Networked Improvement Communities in Education," *Carnegie Foundation for the Advancement of Teaching* (July 2011). http://cdn.carnegiefoundation.org/wp-content/uploads/2014/09/bryk-gomez_building-nics-education.pdf.

[7] Jon McPhedran Waitzer and Roshan Paul, "Scaling Social Impact, When Everybody Contributes, Everybody Wins," *Innovations*" (2011). http://www.ashokaglobalizer.org/sites/www.ashokaglobalizer.org/files/INNOVATIONS_McPhedran-Waitzer-Paul.pdf.

II. PROGRAM DESCRIPTION

The NSF INCLUDES is a multi-year program with three essential components:

1. INCLUDES Design and Development Launch Pilots
2. INCLUDES Alliances

3. INCLUDES Backbone Organization

NSF INCLUDES Design & Development Launch Pilots

In FY 2016, the NSF INCLUDES initiative invites proposals for Design and Development Launch Pilots, which are pilot projects that represent bold, innovative ways for solving a broadening participation (BP) challenge in STEM. The Launch Pilots will be funded for up to two years, for a maximum of \$300,000. Successful pilots will deliver models or prototypes for collective efforts aimed at increasing the active participation of those who have been traditionally underserved and underrepresented in all fields of STEM. Teams of organizations might come together locally, regionally, nationally, or by disciplinary focus. Key to a successful proposal will be the identification of a specific goal and measurable objectives, and an argument that the set of partners being assembled includes all who are needed to successfully address the objective. The plan must articulate its potential for scaling. These planning and start-up activities are aimed at engaging appropriate communities in testing the feasibility of developing a full-scale plan and process for change, including identifying other support mechanisms for sustaining the efforts. Early in the first year, the partners are expected to refine their collective commitment to a common set of objectives and plans to achieve them. No later than the second year, successful teams are expected to carry out and report on the results of projects to demonstrate their ability to implement a collective impact-style approach to address the selected BP challenge. Early in FY 2017, the successful Design & Development Launch Pilots will share their goals and plans in a live event and/or webinar with one another, the broader community, and NSF, enabling all to learn from their pilot project experiences. This effort will facilitate the formation of NSF INCLUDES Alliances.

NSF INCLUDES Alliances

In FY 2017, NSF will begin to invite proposals to form NSF INCLUDES Alliances. The formation of these alliances will build on the activities started in FY 2016. It is expected that up to five alliances will be funded for 5 years, at up to \$2,500,000 per year each. There will be an expectation that each Alliance proposal will build from a Design and Development Launch Pilot that develops and adds new partners, collaborators, or networks. NSF INCLUDES Alliances will leverage existing Design and Development Launch Pilots, programs, people, organizations, and institutions to form NSF's "next generation" BP investments,^[8] with each Alliance committed to jointly solving a specific set of objectives. The NSF INCLUDES Design and Development Launch Pilot projects are expected to demonstrate how extant teams and organizations can be reconfigured and joined together to form new alliances with common goals and purposes and collective impact-style approaches, with a strategy for how the effective practices of the Alliance are likely to be deployed at scale. The focus on collective impact-style approaches, partnership diversity, and scaling practices distinguishes the NSF INCLUDES Alliances from existing programs in the NSF broadening participation portfolio that support alliances of homogenous organizations that may not have scaling as a primary goal. NSF INCLUDES Alliances will be funded late in FY 2017, enabling them to learn from and involve the most promising Launch Pilot activities. Some alliances might focus on emerging fields of science and engineering, such as data science, as key domains for advancing BP. Other alliances might focus on more established fields such as clean energy technologies that are known or perceived as "magnets for inclusion." The alliances will propose, implement, and assess solutions to address the barriers that result in seepage of talent from diverse communities and develop the talent among those who have been traditionally underrepresented in the STEM enterprise.

NSF INCLUDES Backbone Organization

A critical component of the collective impact approach is the Backbone Organization. The work of the Backbone Organization is multifaceted and complex. More specifically, the Backbone Organization drives the following activities over the lifecycle of the initiative: (a) guiding vision and strategy; (b) alignment of activities; (c) establishing shared measurement practices; (d) building public will; (e) advancing policy; and (f) mobilizing funding.^[9] Building on proven mechanisms of success with technical assistance support structures, resource networks and centers, and other related efforts to create communities of practice, NSF is seeking new ideas for leveraging research, effective practices, and emerging technologies to manage the multi-site complexities associated with vision development, alignment, shared measurement practices, implementation research, evaluation, public support and engagement, policy change and implementation, leveraging of funding, and communication between and across the set of Design and Development Launch Pilots and Alliances. In FY 2016, NSF will be calling for conference and workshop proposals to inform the design of the Backbone Organization infrastructure for NSF INCLUDES. This will be done in an upcoming Dear Colleague Letter associated with this solicitation, which will provide further guidance for developing proposals for the Backbone Organization.

[8]CEOSE, 2011 - 2012 Biennial Report to Congress. (See https://www.nsf.gov/od/oia/activities/ceose/reports/Full_2011-2012_CEOSE_Report_to_Congress_Final_03-04-2014.pdf)

[9] Shiloh Turner, Kathy Merchant, John Kania, & Ellen Martin, "Understanding the Value of Backbone Organizations in Collective Impact, Part 1," The Greater Cincinnati Foundation and FSG (July 2012), http://www.leveragingourstrengths.ca/reading/Health_BackboneOrgsCollectiveImpact.pdf

III. AWARD INFORMATION

NSF INCLUDES proposals (pending availability of funds):

Design and Development Launch Pilot projects

- Number of awards: 30 - 40
- Project duration: Two years
- Award size: Up to \$300,000
- Grant Administration: Design and Development Launch Pilot projects will be managed by NSF as standard grants

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

Who May Serve as PI:

The PI must hold a permanent position at the lead institution. The PI must have experience in leading distributed teams and organizations. Collaboration for impact in STEM relevant activities is desirable but not required.

Limit on Number of Proposals per Organization:

An organization may serve as the lead institution on only one Design and Development Launch Pilot proposal.

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

An individual may serve as a PI on only one (1) Design and Development Launch Pilot proposal. An individual may serve as the Co-PI on up to three (3) Design and Development Launch Pilot proposals.

Additional Eligibility Info:

Submission of a preliminary proposal is required for Design and Development Launch Pilots. Full Design and Development Launch Pilot proposals may be submitted by invitation only after the review of the preliminary proposal is completed.

Proposals should include diverse teams of stakeholders justifying the role of each partner including academic institutions, professional organizations, business, industry, government, non-profit, community-based, science and industry-focused organizations.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals (required): Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

A preliminary proposal is required for NSF INCLUDES Design and Development Launch Pilots. All proposers must submit a preliminary proposal that outlines the major goals of the project including the components described below. Preliminary proposals typically will be reviewed by a panel of outside experts. The Program Directors will communicate the decision to Invite/Do Not Invite full proposals via FastLane and those decisions will be based on the panel recommendations and additional portfolio considerations. Invite/Do not Invite decisions are binding. Preliminary proposals must be submitted via the NSF FastLane system.

The following exceptions and additions to the GPG guidelines apply to preliminary proposals submitted to this solicitation:

Submission of a preliminary proposal is required to be eligible for invitation for a full proposal. Preliminary proposals that are not compliant with the guidelines may be returned without review. It is the submitting organization's responsibility to ensure that the proposal is compliant with all applicable guidelines.

For collaborative proposals, a single preliminary proposal should be submitted by **ONLY** the lead institution. The collaborative partners should be indicated on the list of personnel in the project description (see below).

Preliminary proposals must contain the items listed below and strictly adhere to the specified page limitations. No additional information may be provided as an appendix or by links to Web pages. Figures and tables must be included within the applicable page limit. All elements of the proposal, including legends and tables, must meet the formatting requirements for font size, characters per inch, margins, etc. as specified in the GPG.

Results from prior support are neither required in, nor excluded from preliminary proposals. It is up to the individual submitters to determine if either represents an efficient use of the limited Project Description space in support of their request.

Preliminary proposals should contain an overview of the proposed Design and Development Launch Pilot plan with sufficient detail to allow assessment of the major ideas and approaches to be used. Preliminary proposals must include the following components.

- **Cover Sheet:** Check the box indicated for the preliminary proposal. Entries on the Cover Sheet are limited to the Principal Investigator and a maximum of four co-Principal Investigators. Beginning Investigators (individuals who have not been a Principal Investigator [PI] or co-Principal Investigator [co-PI] on a Federally-funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants) listed as Lead PI must check the box for "Beginning Investigator" on the proposal Cover Sheet. Leave blank the fields for Requested Amount, Requested Duration and Start Date for the grant. For more FastLane instructions, see section V.D. below.
- **Title of Proposed Project:** Title should begin with the prefix: "Preliminary Proposal NSF INCLUDES"
- **Project Summary (1 page):** Provide an overview of the proposed Design and Development Launch Project, addressing separately the intellectual merit and broader impacts. The summary should be written in the third person, informative to those working in the same or related field(s), and understandable to a scientifically or technically literate reader. **Preliminary proposals that do not contain the Project Summary, including an overview and separate statements on intellectual merit and broader impacts will be returned without review. Note: Project Summaries entered in the FastLane form are displayed with standardized formatting and subject to a cumulative character limit for the three sections.**
- **Project Description.** Maximum 5 pages total, containing the two following sections:

I. Personnel (This section is limited to one page. Any remaining space should be left blank.) Provide a list of project personnel plus each person's institutional affiliation, and a minimal description of that person's role(s) in the project. The description of role(s) may not exceed two lines per person and cannot include external links. Divide the list into two sections. The first section of the list must contain all PI(s), co-PI(s), and sub-award lead senior investigators, including those from all parts of a collaborative proposal. This constitutes the list of key personnel subject to the submission cap for PIs and Co-PIs. The second section of the list should contain other senior personnel. Any individual for whom a biographical sketch is included in the preliminary proposal must be on one of these lists. You should not list undergraduate or graduate students, technicians, or other participants.

II. Project (This section is limited to four pages and must address separately both the intellectual merit and broader impacts.

The preliminary proposal project narrative must address the following questions:

1. What BP challenge(s) will be addressed and, if successfully addressed, what will be the contribution to BP in the Nation's scientific workforce?
2. What is the preliminary strategic plan to address the BP challenge(s), including goals and measurable objectives?
3. Which objectives will be addressed by the pilot, and why will successfully addressing these objectives position the PIs to launch a successful NSF INCLUDES Alliance that will continue to address the BP challenge(s) and lead to information for improved BP at a national scale?
4. Who are the initial and proposed partners and what is the evidence that the partnership will be able to use social innovation frameworks such as collective impact to achieve the goals of the project?
5. How will the pilot project's activities contribute to next steps for a research agenda and/or development plan to improve inclusion in STEM through an NSF INCLUDES Alliance?

Examples of national BP objectives that have potential for scaling nationally and require regional implementation include, but are not limited to: all high schools in a state offer advanced placement courses in calculus, computer science, and engineering; a disciplinary organization launches a major initiative designed to significantly improve the diversity of PhD graduates in that discipline; creating preK-20+ pathways in major urban centers involving universities, community colleges, local schools, surrounding communities, not-for-profits, museums and science centers, local businesses and industries, and science-rich institutions designed to enable success for students from underrepresented and low socio-economic groups.

- **References Cited** are limited to 3 pages, see GPG for format.
- **Biographical Sketches** (2-page limit for each) should be included for each person listed on the Personnel page. It should **follow the format described in the GPG** with the exception that because they commonly present difficulties in adhering to the page limit "(e) Collaborators & Other Affiliations" may be left out of the biographical sketch.
- **No budget should be submitted;** No budget justification should be submitted; please leave blank the Requested Amount box on the FastLane Cover Sheet.

Applicants must include the above documents (prepared in accordance with standard NSF formatting guidelines).

No other items, appendices or supplementary documents are permitted for preliminary proposals.

Preliminary Proposal Checklist For Compliance

Prior to submission, please review your preliminary proposal against this checklist to ensure that it is fully compliant with the guidelines provided in this solicitation:

- On the Cover Page, nothing is entered into the Requested Amount or start date boxes; the Beginning Investigator box is checked if applicable.
- The Title begins with the prefix "Preliminary Proposal: NSF INCLUDES"
- The Project Summary is limited to 1 page, includes as separate sections an Overview, the Intellectual Merit, and the Broader Impacts of the proposed activity.
- The Project Description is limited to 5 pages, addresses both the Intellectual Merit and Broader Impacts of the proposed research as separate sections, and the first page of which contains only a list of project personnel, including institution, planned status (e.g., PI, co-PI, subaward lead, other senior personnel), and no more than a 2 line description of role(s) in the project.
- The References Cited is limited to 3 pages and conforms to the GPG format.
- The Biographical Sketches need not include information about advisors, advisees, and collaborators.
- Ensure that your final submitted PDF conforms to the typeface size limits (10-11 pt depending on font), line spacing maximum (no more than six lines of text per vertical space of one inch) and margins (at least one inch on all sides of page) specified in the GPG.

Items that should NOT be included in a Preliminary Proposal:

Budget, Budget Justification, Facilities, Equipment and Other Resources, Current and Pending Support, Letters of Collaboration, Data Management Plan, Postdoctoral Mentoring Plan, or any other Supplementary Documents.

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 Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 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: (http://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) 292-7827 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. Chapter II, Section D.5 of the Grant Proposal Guide provides additional information on collaborative proposals.

See Chapter II.C.2 of the [GPG](#) 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 GPG instructions.

Full proposals for Design and Development Launch Pilots may be submitted by invitation only after the review of the preliminary proposal is completed.

As noted above, for organizations that prefer to submit Collaborative Proposals which allow multiple organizations to submit separate proposals and provide an alternative to subawards, more information may be found in Chapter II, Section D.5 of the Grant Proposal Guide. All Collaborative Proposals must be submitted via the NSF FastLane system.

Proposals for the Design and Development Launch Pilots are expected to:

- Determine the challenge to be addressed.
- Organize the set of partners that will participate in the project; teams might come together locally, regionally, nationally, or by disciplinary focus.
- Identify the lead partner who has the demonstrated capacity and vision to develop, manage, and lead a collective effort.
- Identify a common agenda in which participants share a vision for change that reflects a collective understanding of the BP challenge.
- Delineate an approach to solving the challenge problem through agreed upon goals, objectives, strategies, and activities.
- Describe agreed-upon ways to measure and report success, including the selection of an external evaluator with demonstrated qualifications to develop a comprehensive evaluation plan.
- Develop an integrated and coordinated strategic plan that facilitates the accomplishment and implementation of a set of specified action items, including progress indicators.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

C. Due Dates

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. submitter's local time):

April 15, 2016

Design and Development Launch Pilots

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

June 24, 2016

Design and Development Launch Pilots

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

To prepare and submit a proposal via FastLane, see detailed technical instructions available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <http://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 are strongly encouraged to use FastLane 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 the [GPG](#) as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://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 [Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018](#). 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. ([GPG](#) 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 [GPG](#) 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, or Internal NSF Review.

Preliminary and full proposals submitted in response to the NSF INCLUDES program solicitation will be reviewed by merit review panels and ad hoc reviewers. Other unsolicited proposals will be reviewed on panels or by ad hoc reviewers. Preliminary proposals are required for Design and Development Launch Pilot proposals. Full proposals for Design and Development Launch Pilots may be submitted **by invitation** only after the review of the preliminary proposal is completed.

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 http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 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 Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

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 Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

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:

- Bernice T. Anderson, telephone: (703) 292-5151, email: banderso@nsf.gov
- Tasha R. Inniss, telephone: (703) 292-4684, email: tinniss@nsf.gov
- Mark H. Leddy, telephone: (703) 292-4655, email: mleddy@nsf.gov
- Julio E. Lopez-Ferrao, telephone: (703) 292- 5183, email: jlopezfe@nsf.gov
- James L. Moore, telephone: (703) 292-7082, email: jamoore@nsf.gov
- Kamau Bobb, telephone: (703) 292-4291, email: kbobb@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@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 <http://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 provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 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 <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: nsfpubs@nsf.gov
 - or telephone: (703) 292-7827
- **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 Systems of Records, [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and [NSF-51](#), "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). 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
Office of the General Counsel
National Science Foundation



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

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