Accelerating Research Translation (ART)

PROGRAM SOLICITATION
NSF 23-558

National Science Foundation

Directorate for Technology, Innovation and Partnerships
    Innovation and Technology Ecosystems
        Translational Impacts

Directorate for Biological Sciences

Directorate for Computer and Information Science and Engineering

Directorate for Engineering

Directorate for Geosciences

Office of Integrative Activities

Directorate for Mathematical and Physical Sciences

Directorate for Social, Behavioral and Economic Sciences

Directorate for STEM Education

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

    May 23, 2023

    September 18, 2024

    Third Wednesday in September, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

The Accelerating Research Translation (ART) program is an NSF-wide endeavor that welcomes proposals from all scientific, technological, and engineering fields. In the remainder of this solicitation, the program will be referred to as ART.

The initial program deadline has been changed to May 23, 2023.

There are no limits on IHEs serving as subawardees on multiple proposals. The budget preparation instructions associated with such subawards have been simplified accordingly.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) that is in effect for the relevant due date to which the proposal is being submitted. The NSF PAPPG is regularly revised and it is the responsibility of the proposer to ensure that the proposal meets the requirements specified in this solicitation and the applicable version of the PAPPG. Submitting a proposal prior to a specified deadline does not negate this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

    Accelerating Research Translation (ART)

Synopsis of Program:

    The National Science Foundation (NSF) seeks to increase the scale and pace of advancing discoveries made while conducting academic research into tangible solutions that benefit the public. This is the primary aim of the "Accelerating Research Translation" (ART) program. Specifically, the primary goals of this program are to build capacity and infrastructure for translational research at U.S. Institutions of Higher Education (IHEs) and to enhance their role in regional innovation ecosystems. In addition, this program seeks to effectively train graduate students and postdoctoral researchers in translational research, benefiting them across a range of career options.

A particular intent of ART is to support IHEs that want to build the necessary infrastructure to boost the overall institutional capacity to accelerate the pace and scale of translation of fundamental research outcomes into practice by supporting the development of a range of activities essential for this activity. The ART program is *not* intended to support IHEs that already have high levels of translational research activity as part of their R&D enterprise (as noted by their number of invention disclosures, patents issued, start-ups, licenses/options, revenue from royalties, the overall volume of industry-funded research, broad adoption of research outputs by communities or constituents, etc.). Such institutions are encouraged to become part of the ART network as valuable collaborators, providing expertise in building the necessary infrastructure for translational research at other IHEs responding to this solicitation. The ART program is also *not* intended as a resource for conducting additional fundamental research. See sections II and VI of this solicitation for additional information.

This solicitation seeks proposals that enable IHE-based teams to propose a blend of: (1) activities that will help build and/or strengthen the institutional infrastructure to sustainably grow the institutional capacity for research translation in the short and long terms; (2) educational/training opportunities, especially for graduate students and postdoctoral researchers, to become entrepreneurs and/or seek use-inspired and/or translational research-oriented careers in the public and/or private sectors; and (3) specific, translational research activities that offer immediate opportunities for transition to practice to create economic and/or societal impact. The funded teams will form a nationwide network of 'ART Ambassadors' who will champion the cause of translational research.

Cognizant Program Officer(s):

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

- Pradeep Fulay, telephone: (703) 292-2445, email: art@nsf.gov
- Nina Maung-Gaona, telephone: (703) 292-4697, email: art@nsf.gov
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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 --- STEM Education
- 47.079 --- Office of International Science and Engineering
- 47.083 --- Office of Integrative Activities (OIA)
- 47.084 --- NSF Technology, Innovation and Partnerships

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 10

Up to 10 awards per round of this solicitation, with up to $6,000,000 per award and a duration of 4 years, are anticipated.

Anticipated Funding Amount: $60,000,000

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

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Institutions of Higher Education (IHEs) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

A proposal can involve multiple organizations, but the proposal must be submitted by a lead organization with subawards to other participating organizations. Separately submitted collaborative proposals are **not** permitted.

An eligible IHE can submit a maximum of one proposal as a lead organization per submission deadline identified in this solicitation.

Any IHE that receives an ART award is not allowed to submit a proposal to this program as the lead organization in any future competitions of this solicitation.

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

An individual can serve as a PI on only one proposal. An individual can serve as a co-PI on multiple proposals.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**

    - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
    - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

B. Budgetary Information

- **Cost Sharing Requirements:**

    Inclusion of voluntary committed cost sharing is prohibited.

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

    Not Applicable

- **Other Budgetary Limitations:**

    Not Applicable

C. Due Dates

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

    May 23, 2023

    September 18, 2024

    Third Wednesday in September, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria:

National Science Board approved criteria. Additional merit review criteria apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions:

Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements:

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

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I. INTRODUCTION

Scientific, technological, and engineering research projects result in innovative ideas, concepts, findings, observations, data, discoveries, and/or inventions. Many of these hold considerable promise in terms of their translational potential. Some are worthy of further exploration and development. Translational research typically refers to converting discoveries, often made in a laboratory or other setting, into practical applications that can be deployed at scale. Opportunities for translation are often spotted first by those with intimate knowledge of a research project. The translation is successful when these opportunities lead to knowledge/technology transfer, commercialization, or transition to practice, resulting in tangible economic and/or societal benefits.

The U.S. innovation economy is primarily driven by research outcomes that are successfully translated into practice across various economic, technology, and public policy sectors. Over the last several decades, a large proportion of such transformational research outcomes has emerged from federally funded research at U.S. IHEs. Despite this, at many IHEs, there is still significant room to create and actively support a vibrant translational research ecosystem.

Some IHEs have centers or laboratories that focus more explicitly on use-inspired and/or translational research activities, sometimes in partnership with the private sector, aimed explicitly at leveraging fundamental research advances. These IHEs often have well-established infrastructure to support researchers interested in translational research activities and an institutional culture that values and encourages such activities. IHEs with a vibrant translational research ecosystem tend to feature a high volume of fundamental research, access to capital, and dedicated talent with experience in generating, protecting, licensing, and marketing any generated intellectual property (IP).

Many IHEs, however, continue to have low levels of *translational* research activity even though federal R&D investments, including those from NSF, have led to high levels of fundamental research activity. Such lower levels of translational research activities, despite an overall high volume of fundamental research, could be due to many factors. For example, resources that support additional steps related to translational research activities may be relatively scarce. This could include limited financial resources (e.g., to support additional steps/phases for conducting translational research or its marketing), limited access to social capital, absence of a vibrant local innovation ecosystem, or absence of a robust regional economy. Some IHEs may primarily focus on fundamental research and/or might not sufficiently support ways to recognize the scholarship and/or reward those engaged in translational research. The geographical location of an IHE can be a limiting factor in terms of its ability to accelerate and scale translational research activities. Thus, although translational research is seen as beneficial in terms of economic and/or societal impact, incentivizing and scaling up research translation activities at many IHEs can be challenging. It is recognized that the pathways needed for accelerating and scaling translational research activities will vary significantly. Such approaches must be nuanced and customized for different IHEs and their surrounding innovation ecosystems.

Advancing U.S. scientific and economic leadership requires an increase in the number of robust translational research ecosystems in IHEs everywhere in our nation. The ART program seeks to achieve this ambitious goal by serving as a model that will help build the institutional capacity needed to enhance the scale and pace of translation of innovative ideas and knowledge, especially stemming from federal investments, into tangible products, services, tools, and methods that will ultimately create lasting economic and/or societal impacts.

II. PROGRAM DESCRIPTION

The ART program is intended for IHEs that clearly see the benefits of building capacity and actively seek the infrastructure necessary for scaling translational research activities. The program aims to increase such institutions' capacity to conduct and accelerate translational research activities with a clear emphasis on capturing the resultant societal and economic benefits to their surrounding communities and regions.

The ART program provides funding to build institutional capacity and the infrastructure needed to conduct translational research activities. The programmatic intent of ART is to support IHEs where the fundamental research activity is high, but the level of *translational research* activity is relatively low. NSF data on research expenditures can be used by the IHEs considering proposal submission for this program to determine whether their respective institutions are operating at high fundamental research levels. There are different research translation and entrepreneurship metrics (e.g., number of invention disclosures, patents issued, start-ups, licenses/options, revenue from royalties, the overall volume of industry-funded research, broad adoption of research outputs by communities or constituents, etc.) that can reflect the current capacity and the status of an infrastructure for translational research activities at an IHE. However, these metrics do not necessarily provide a complete picture. As a result, for this solicitation, each submitting IHE must provide data to justify their current capacity and infrastructure for *translational* research activities, using multiple evidence-based methods and metrics to determine such capacity. Most importantly, IHEs submitting a proposal to this program should clearly articulate *why* there is significant potential and an opportunity to build institutional capacity for translational research activities and its transition to practice.

A. Expected Outcomes

This solicitation seeks proposals in which an IHE describes its plans to achieve **all of the following outcomes**:

(1) Develop institutional capacity and infrastructure for translational research activities in the short (during the four-year duration of the award) and long terms (beyond the duration of the award).

(2) Create and continually train new cohorts of graduate students and postdoctoral researchers versed in translational research to successfully create economic and/or societal impact through various career pathways, e.g., as entrepreneurs, in industry or public sectors.

(3) Support a nationwide network of 'ART Ambassadors' who will be the agents of change within their institutions and region to support equal importance for translational research and its ensuing impact.

The first important expected outcome of the ART program is growing the capacity for research translation and creating and strengthening the institutional innovation ecosystem to be more robust and sustainable. A range of metrics can be used to measure the scale of translational research activities or evaluate their economic or societal impact. It is up to the proposing institution to use any of the metrics to determine a baseline and then set goals for accelerating the pace and scale for making discoveries, supporting industry needs, and contributing to the innovation-driven economy for the region. The expectation is that research translation at ART awardee institutions will be seen and valued as an organic and vital next step to leverage the knowledge and discoveries stemming from fundamental research. *Translational research activities at ART awardee institutions should be treated on par with fundamental research activities in faculty recruitment, tenure, and promotion decisions*.

The second expected outcome is that ART will serve as a *model* for IHEs to create a new genre of postdoctoral researchers and graduate students who will successfully pursue translation-focused career pathways and enable societal and economic impacts through their work. Recently published NSF data show that the fraction of new doctorates gaining employment in tenured and tenure-track positions is much smaller than that gaining employment in non-academic professions. These data also show that the trend towards more significant numbers of doctorate holders employed in non-academic professions has accelerated over the last three decades. Despite this, most of the training for doctoral students still focuses on academic career pathways, which leaves most doctoral degree holders unprepared for other pathways, such as those in start-ups, established mid- and large-scale industries, federal, state, and local governments, and other non-academic sectors. The ART program encourages participating IHEs to create mechanisms to train a different genre of graduate students who will learn first-hand about translational research opportunities. These students could receive opportunities to engage in translational research projects and experientially learn:

- the benefits associated with the societal and economic impacts of use-inspired and translational research, transition to practice, and
- the skills needed to work in interdisciplinary teams focused on specific deliverables while receiving opportunities to network with peers and mentors.

The third outcome expected from this program is creating a network of 'ART Ambassadors' from different institutions throughout the United States. The ambassador cohorts, coming together from many different geographical regions, will include senior research administrators, faculty members, technology transfer officials, entrepreneurs, postdoctoral researchers, and graduate students. The ambassadors will be practitioners of translational research at their institutions and open to learning and sharing each other's experiences. These ambassadors will serve as advocates and mentors for research translation, guiding other faculty, postdoctoral researchers, and students. The ART program expects that the best practices emerging from awardee institutions will spread to a broader range of institutions across the United States and accelerate R&D innovation and impact across the country.

B. Translation Projects

ART awardees will be required to identify and fund at least 2 (two) active Seed Translational Research Projects (STRPs) selected from across the full spectrum of research activities supported within the lead institution. *None* of the STRPs should be based in institutions that have high levels of translational research activity. The total funding for all the seed projects throughout the award cannot be more than 50% of the total budget for the entire project.

In general, an STRP candidate would be an innovation that has emerged from prior fundamental research with a clear underlying analytical and/or experimental proof of concept that has been completed. The STRP should have a justifiable path of achieving a prototype in an accelerated manner (< 2 years) that can be demonstrated in an environment relevant to the intended usage of the innovation.

Thus, an STRP is deemed to be highly focused, with a clearly defined path for tangible deliverables, a timeline, and an exit strategy. The STRP description should provide details on how customer identification, user-centered design, development, validation, and testing of prototypes for specific potential customers will be performed and outline anticipated societal and/or economic impact.

Each STRP is expected to be supported for up to two years. The progress of each STRP should be monitored, and decisions will need to be made on whether the project should receive additional funding beyond an initial period based on progress made. IHEs should also have a process and plans for identifying subsequent STRPs to support throughout the award period.

For the duration of the award and beyond, an ART awardee is expected to be able to identify and pursue multiple translational research projects that can be supported not just by the award but also by additional public and private sources. For example, programs from NSF, such as the Partnerships for Innovation (PFI) program or the Convergence Accelerator (CA) program, could be sources of support for such projects. The ART program expects awardees to take active steps to both identify such projects continually and also pursue funding support for these projects from public and private sources.

C. ART Ambassadors

In the context of this solicitation, in addition to the PI and co-PIs, NSF considers senior administrators, tech transfer office staff at an eligible institution, and entrepreneurs to be a vital part of an "ART Ambassadors" cohort. An institution can also designate anyone in a senior leadership position actively engaged in boosting the efforts related to translational research as an ambassador for this program. The leader of each STRP and its core team members, including the graduate students and/or postdoctoral researchers, are considered "ART Ambassadors." As the STRPs "graduate," a new group of STRP team members will form the new cohort of ambassadors that join with the previous ambassadors.

Led by the PI and co-PIs, ART Ambassadors will work together as a team to design and implement educational and mentoring programs that will provide training to graduate students and postdoctoral researchers in translational research as it relates to the framework and intent of this solicitation. These ambassadors will use their experience, expertise, and position in the organization to continue working with the institution's leadership to help build capacity, accelerate and scale translational and use-inspired research activities, and institutionalize a culture that recognizes and promotes such activities within the institution. The collective goal for the institutional ART Ambassadors network will be to help grow the institution's overall ecosystem and translation infrastructure. Under the PI and co-PIs leadership, this group of ambassadors will also build bridges with ambassadors from other institutions supported by the ART program and explore and develop connections with other research programs and organizations focused on boosting translational research activities and innovation capacity.

D. Diversity, equity, inclusion, and accessibility

With the emphasis on promoting a range of translation pathways, all awardees need to ensure that the cohorts of faculty, postdoctoral trainees, and students trained under this program are broad, diverse, and inclusive, reflective of the Nation's demography and geography. The program recognizes that in the specific areas of entrepreneurship and technology transfer, several groups are underrepresented and/or under-served, including but not limited to, Blacks/African Americans, Latino/Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and other Pacific Islanders, women, and persons with disabilities (PWD). The challenges and barriers for these communities may include limited network access to critical decision-makers, lack of funding, academic incentives, conscious and unconscious bias, and limited availability of mentors. Therefore, one component of building a diverse and inclusive cohort is ensuring the robust participation of individuals from groups who have remained underrepresented and/or under-served in their involvement in such endeavors across the leadership and management of the ART project, as well as in the STRPs selected by the institution. Proposals must clearly articulate specific steps, both in the short and long term, that will be undertaken to demonstrate the principles of diversity and equity along with commitments to inclusiveness and accessibility.

E. Partnerships with other IHEs

Many IHEs have high levels of translational research activity with established infrastructure/ecosystem for technology transfer and strong experience/expertise in translational activities. The ART program strongly encourages, but does not require, the lead institution (with a high volume of fundamental research but low translational activity) to partner with another institution with an established infrastructure and expertise in transitioning fundamental research into practice to create economic and/or societal impact. This partner institution will be expected to offer the expertise/resources to translational capacity-building activities at the institution leading the ART project. While not required, the partner institution is encouraged to be located in the same region or state as the lead institution. There should be a clear understanding of how this arrangement will work, the specific tasks the partner institution will aid in, and the short- and long-term benefits for the proposing/lead institution. *The primary beneficiary of this partnership should be the lead institution and any other partnering institutions with high volumes of fundamental research but low levels of translational research activity and the associated innovation ecosystems.*

F. Sustainability and engagement with external stakeholders

The long-term vision is for the lead institution to build capacity for translation from the momentum gained from the ART funding, leverage partnerships, and create plans for sustainability beyond the ART award period. It is expected that the lead and participating IHEs are committed to long-term sustainability. As such, the IHE(s) will need to build relationships with *external* partners, including investors, industry, non-profit foundations, incubators, accelerators, state and local governments such as economic development agencies, and small business development centers. These activities should be pursued during the project to build a robust path for sustaining and growing the pace of research translation beyond the award duration.

G. Proposal Core Components

All ART proposals are **required** to address the following core components:

1. **Capacity building activities for longer-term impact:** Discuss: (i) the challenges and opportunities that exist at the proposing IHE for significantly boosting capacity for research translation, well above the existing level; (ii) the evidence-based and outcome-oriented mechanisms that will be deployed for capacity-building activities aimed at accelerating translational research activities **across multiple scientific disciplines at the entire institution** in the long term, including the creation and expansion of translational infrastructure, as well as changes to promotion and tenure criteria to support parity between fundamental and translational research activities; (iii) creation of external partnerships along with a plan to sustain and grow them; (iv) a plan for tracking and measuring the impact of the ART program; and (v) a plan to develop the *internal* network of ambassadors at the institution, including how such a network will be formed, who will be on the leadership team, what activities will be undertaken by this network, how the institution will leverage network effects of this cohort to increase translation activities across the institution.
2. **Education and training:** Provide a plan for evidence-based training of postdoctoral researchers and graduate students via translational research activities that can successfully support diverse career pathways, focusing on non-academic ones.
3. **Specific project-level activities in the short term:** Describe the overall rationale, criteria, and process used for selecting and supporting STRP. For *each* inaugural STRP selected, provide a very brief description of the prior fundamental research conducted, any barriers/challenges encountered in transitioning to practice, tangible outcomes that will be achieved through translation, the timeline for translation, the "exit strategy" (i.e., how, and when will the project "graduate"), and the anticipated next steps in terms of technology/knowledge transfer and transition to practice for economic and/or societal impact.
4. **Diversity, equity, inclusion, and accessibility:** Elaborate on specific steps, both in the short and long term, that will be undertaken to demonstrate the principles of diversity and equity along with commitments to inclusiveness and accessibility.

Given the translational research emphasis of this program and a more comprehensive range of activities spanning different disciplines, partners, and stakeholders, the recruitment of a full-time, experienced project coordinator/facilitator is strongly encouraged. This individual is expected to have some experience related to research translation, tech transfer, and commercialization. The project coordinator/facilitator does *not* need to have a Ph.D. or be a faculty member. The individual must be able to work with faculty, graduate students, and external stakeholders in a fast-paced environment.

H. Roles of PI and co-PIs

The PI and co-PIs will all be the ambassadors for accelerating and scaling translational research activities at the awardee institution. The PI will serve as the lead ambassador and must be capable of providing intellectual leadership. The PI must have the knowledge, vision, and drive to build the capacity and infrastructure needed to accelerate the institution's translational research activities. It is expected that the PI will have strong leadership and communication skills. The PI will be expected to directly and fully engage in the activities needed to help initiate, facilitate, monitor, coordinate and sustain ART activities. The PI will help establish an independent, fair, and transparent process in selecting STRPs over the award duration and champion the program internally and externally. As the lead ambassador, the PI will set up the ART Ambassadors network and provide a clear vision to establish its activities and work with others to ensure they are coordinated. The proposal should clearly describe how the PI will be engaged in the specific project activities.

In addition to the PI, up to four (4) other individuals can serve as co-PIs. The ART team members (including co-PIs and Senior Personnel) and other ambassadors will be expected to be primarily in one of the two areas of responsibility: (1) those primarily involved in a broader range of capacity-building activities aimed at strengthening the overall research translation ecosystem at the institution in the short and long terms, including the development of translation infrastructure in the institution, training of graduate students and mentoring of postdoctoral researchers; and (2) those primarily involved in conducting translational research activities in the STRPs.

I. Ethical use of data, privacy, and protection of human subjects

Ethical use of data, including the privacy and protection of human subjects, is of paramount importance. The ART program will not support clinical trials. If the proposed project involves the use of human data or data related to human activities, then the PIs should consult with their local Institutional Review Board (IRB) to obtain either IRB approval or official letters of exemption. Proposals will not be recommended for an award until and unless appropriate IRB approval or

exemption documents have been submitted to NSF. See *PAPPG* Chapter II.E.5 for NSF policies on proposals involving human subjects. For proposals involving vertebrate animals, sufficient information must be provided in the project description to enable reviewers to evaluate the choice of species, the number of animals to be used, and any necessary exposure of animals to discomfort, pain, or injury. NSF requires that proposed projects involving the use of any vertebrate animal for research or education be approved by the submitting organization's Institutional Animal Care and Use Committee (IACUC) before an award can be made. See *PAPPG* Chapter II.E.4 for NSF policies on proposals involving vertebrate animals.

J. Training for ART

Up to five (5) ambassadors of each team are required to attend ART training expected to be held virtually and organized by NSF within the first year of the award. raining will enable each awarded team to boost its potential for building a sustainable ecosystem for translational research activities and identifying economic and societal impacts expected from the translational research activities. The training will include experiential learning activities in translational research, and workshop sessions focused on community building, governance, negotiations, and sustainability of translational research ecosystems. For planning purposes, NSF anticipates this training will require a time commitment on the order of three (3) hours per week for about 16 weeks spread across the first year of the award period. NSF will provide further details (e.g., logistics, timing) about this training and ART Ambassadors network-building activities to all awardees.

III. AWARD INFORMATION

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) - Two- and four-year IHEs (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Special Instructions for International Branch Campuses of US IHEs: If the proposal includes funding to be provided to an international branch campus of a US institution of higher education (including through use of subawards and consultant arrangements), the proposer must explain the benefit(s) to the project of performance at the international branch campus, and justify why the project activities cannot be performed at the US campus.

Who May Serve as PI:

There are no restrictions or limits.

Limit on Number of Proposals per Organization: 1

A proposal can involve multiple organizations, but the proposal must be submitted by a lead organization with subawards to other participating organizations. Separately submitted collaborative proposals are **not** permitted.

An eligible IHE can submit a maximum of one proposal as a lead organization per submission deadline identified in this solicitation.

Any IHE that receives an ART award is not allowed to submit a proposal to this program as the lead organization in any future competitions of this solicitation.

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

An individual can serve as a PI on only one proposal. An individual can serve as a co-PI on multiple proposals.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

- Full Proposals submitted via Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov. The Prepare New Proposal setup will prompt you for the program solicitation number.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: (https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package,

click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from nsfpubs@nsf.gov.

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

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

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

Collaborative Proposals: Collaborative proposals arranged as separate submissions from multiple organizations will **not** be accepted in response to this solicitation. PAPPG Chapter II.D.3 provides additional information on collaborative proposals. If multiple organizations are involved in a proposal, the submission must take the form of a single proposal from a lead institution with subawards to participating institutions.

The following information supplements the standard PAPPG or NSF Grants.gov Application Guide proposal preparation guidelines:

1. **Title:** The proposal title **must** begin with "ART", followed by a colon (":"), and then the title of the project.
2. **Project Summary and Keywords:** A one-page Project Summary must be provided, which consists of three parts: (1) a project overview, (2) a statement on the intellectual merit of the proposed activity, and (3) a statement on the broader impacts of the proposed activity. The last line of the Project Summary **must** have a list of six keywords. The first two keywords must denote the NSF Directorates that are the most relevant to the initial cohort of STRPs described in the proposal from this list: BIO, CISE, EDU, ENG, GEO, MPS, SBE. Please do **not** include TIP as one of these directorates.
3. **Project Description:** This section is limited to a maximum of 15 pages. A proposal must respond fully to the ART Program Description in this solicitation. The Project Description **must** include the following sections and **address all the core components described in Section II-G** of this solicitation:

   a. **Context for ART:** This should describe the context and vision of the proposed ART activities. This section should include a description of the need, guiding principles, and a long-term vision for accelerating translational research activities at the proposing institution(s), the specific societal, local, regional, or national need(s) that the ART project will address, and the anticipated economic and societal impacts.

   b. **Capacity-Building and Training Activities:** This should describe the institution-wide activities that will be implemented as part of the project to accelerate and promote research translation at the IHE(s) in the short- and long-term. For example, what resources will be available to incentivize use-inspired and translational research activities? These could include, for example: making available dedicated incubator-like workspaces or providing access to laboratory/pilot scale/prototype building facilities suitable for translational research activities. Similarly, steps to provide resources to faculty to navigate through technology transfer and/or commercialization issues, policies and procedures that will reduce the barriers in working with industry, evidence-based training and education opportunities to graduate students, postdoctoral fellows, and faculty to pursue translational research, and/or partnerships with other institutions that can provide guidance on accelerating translational research activities can be described. Note that the list of activities noted here is exemplary and is not designed to be the entire (or only) list of capacity-building activities. *ART funding is not to be used to build, construct, acquire, or renovate physical office or laboratory space.* Activities described in this section should demonstrate the principles of diversity and equity along with commitments to inclusiveness and accessibility.

   c. **Seed Translational Research Projects (STRPs):** It is expected that initially, two such projects will be undertaken at the lead IHE. &Each STRP is a project ready for translation (see Section II-B for details). As described before, it is expected that these seed projects will have analytical and/or experimental proof of concept that has already been demonstrated and that the project team sees a clear path of achieving a prototype in an accelerated manner (< 2 years) within an environment relevant to the intended usage scenario of the innovation. The total amount of funding for all the seed projects over the duration of the award cannot be more than 50% of the total budget for the entire project. This section should provide (as explained in Section II): titles, a brief description, specific tangible outcomes/deliverables expected, timelines, and exit strategy for each project. It is understood that it may not be possible to include a detailed technical description of each STRP because of the 15-page limit. This section should also include the "big-picture" consideration of how and why these projects have been selected, how they will be evaluated, etc. ART funding is *not* to be used for the purchase or acquisition of major pieces of equipment or instrumentation but can be used to buy equipment up to $50K and/or gain access to such equipment or instrumentation that can be shown as necessary for the activities of an STRP.

   d. **Partnerships:** This should describe what external partnerships will be leveraged and how. This may include a partnership with an IHE with a well-established research translation ecosystem (see Section II-E). The role of all other partners and the unique value they provide should be described. Some of this information could be included in the Letters of Collaboration (see Section 5).

   e. **Sustainability and Scalability:** This should describe how the proposing IHEs will sustain the momentum gained from the ART project investment, how future STRPs will be identified across the full range of scientific disciplines supported by the IHEs, and how the translational research capacity and the associated infrastructure will be further increased. This should also include a plan to develop a holistic strategy/approach for building a community of contributors to building and strengthening the overall translational research ecosystem for the IHEs.

   f. **Evaluation:** This section should describe a clearly thought-out evaluation plan for the ART project activities and the outcomes/deliverables expected. Using an independent external evaluator is recommended, though not required.

   g. **Broader Impacts:** The Project Description must contain a separate section labeled 'Broader Impacts'.

   h. **Results from Prior NSF Support:** In cases where the PI or any co-PI has received more than one NSF award (excluding amendments to existing awards), please report only the award most closely related to the proposal. Please refer to the PAPPG, Chapter II.D.2.

4. **Supplementary Documents:**

   Supplementary Documentation: The items permitted in the Supplementary Documents section are (1) A statement from the IHE attesting to their current research capacity; (2) Letters of Collaboration, (3) a Consolidated List of Personnel (CLP), and (4) a Postdoctoral Researcher Mentoring Plan if

the proposal includes funding to support postdoctoral researchers.

Statement from the IHE attesting to their current research capacity (no more than 3 pages): This document should describe the institution's current levels of fundamental and translational research activities, and their respective capacity and infrastructure for translational activities using multiple evidence-based methods and metrics. It should be certified by the Vice President of Research or someone in an equivalent role at the institution. The programmatic intent of ART is to support IHEs where the fundamental research activity is high, but the level of *translational research* activity remains relatively low.

Letters of Collaboration (LOC): Up to three (3) Letters of Collaboration (LOC) can be included and uploaded as Supplementary Documents. These letters should be from external contributors or stakeholders to the ART project activities. Each letter should be limited to one page in length. It should clearly describe how the organization providing the letter plans to make specific contributions to the ART project activities (including short- and long-term) and their unique value proposition for the project. The LOC must contain the letter writer's name, affiliation, and organization. Care should be taken so that these letters are **not** seen as a letter of recommendation or an endorsement.

Letters of support or other forms of endorsement are **not** permitted.

Consolidated List of Personnel (required): The Consolidated List of Personnel (CLP) is a spreadsheet listing all key personnel, subaward and collaborators, consultants, etc., involved in the project. The spreadsheet template can be downloaded by clicking here. Please read the instructions carefully. Using the Excel file template, compile information for all persons identified in the proposal as: "PI or co-PI" (i.e., those listed on the cover page); "Other Senior Personnel,"; "Subawardee Personnel,"; or "Other Personnel" who have a biographical sketch included in the proposal; or "Collaborators" (Letters of Collaboration). Only one spreadsheet should be submitted per proposal and be converted into a PDF document. The file name should be "CLP_PI First Name_PI Last Name" (e.g., CLP_Jennifer_Smith). Once completed, the file should be uploaded as a supplementary document. If you are unsure of whether to include someone in the Personnel List Spreadsheet, err on the side of including the person. The purpose of this document is to assist the program in managing reviewer selection.

After the proposal is submitted and a proposal number is obtained, please email a copy of the CLP spreadsheet (as a spreadsheet and **not** a PDF) to art@nsf.gov. Please send this in within two business days of your proposal submission. This file should be labeled as "CLP_PI Last Name_PI First Name_Proposal Number" (e.g., CLP_Jennifer_Smith_2345678). In this file-name, include only the numeric part of your NSF proposal number.

Postdoctoral Researcher Mentoring plan: This should describe how postdoctoral fellows supported on the project will be mentored in the context of the ART program. The ART program differs in duration and goals from traditional academic research efforts. The Postdoctoral Researcher Mentoring Plan should reflect how mentoring will be appropriate for the specific roles of postdoctoral researchers in this project. The Mentoring Plan must not exceed one page.

5. **Data Management Plan (required):**

In accordance with the guidance in the PAPPG, proposals must include a Data Management Plan of no more than two pages (in the Data Management Plan section in Research.gov or as a Supplementary Document in Grants.gov).The Data Management Plan must be substantive and specific to the project and should address all project-relevant aspects of security and data privacy. In addition to addressing how the project will conform to NSF's policy on the dissemination and sharing of research results, the Data Management Plan should address the following topics if they are relevant to the project:

- Intellectual Property (IP): The plan must discuss how IP related matters will be managed and how IP will be protected.
- Security: The project must describe a security plan if the ART project will develop and/or release any artifacts, including (without limitation) (a) source code in any form; (b) languages or formats; (c) hardware instruction sets; (d) hardware designs or specifications; (e) scientific methodologies, models, or processes; (f) manufacturing processes or process specifications; (g) material formulations; and/or (h) data. The plan should discuss the access control mechanisms that are planned for both users and content contributors, and the specific mechanisms that will be in place to ensure (i) quality; (ii) secure modification, integration, and release of content (e.g., secure software development methodologies, policies for patching known security vulnerabilities); and (iii) chain of custody.
- Handling of sensitive data: If the project involves sensitive data, the plan must discuss the method of data collection and identification of harms that could arise from its collection or inadvertent dissemination, techniques that will be used to protect the privacy of individuals and organizations associated with the data and plans to request IRB and/or IACUC approval for data collection, aggregation, and analysis if applicable. Methods for providing other users with controlled access to datasets and the time period during which data will be available, and policies for authorizing access to the data and techniques (including security protections) that will be used to prevent the unauthorized dissemination of the data should also be discussed.

For additional information on the Dissemination and Sharing of Research Results, see: https://www.nsf.gov/bfa/dias/policy/dmp.jsp.

6. **Submission Checklist:**

To assist proposal preparation, the following checklist is provided as a reminder of some important items that should be checked before submitting a proposal to this solicitation. For the items marked with "(RWR)," the proposal will be returned without review if the required item is non-compliant at the submission deadline. Note that these are requirements unique to this solicitation; for other return-without-review requirements, see the PAPPG.

- (RWR) The maximum budget shown on the Cover Sheet and on the budget sheets **must** not exceed $6,000,000.
- (RWR) A set of up to two keywords identifying the NSF Directorates closely aligned with the themes of the STRPs should be included in the Project Summary page.
- (RWR) A statement from the IHE attesting to their current research capacity be included with content as described in this section.
- (RWR) A Consolidated List of Personnel (CLP) list submitted as a Supplementary Document **must** be included.
- (RWR) Collaborative proposals submitted as separate submissions from multiple organizations will **not** be accepted in response to this solicitation. They will be returned without review.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Budget Preparation Instructions:

The budget can, but is not required to, include support for:

- **Salary:** Any staff who will assist in the scoping and/or development of ART related activities, including the principal investigator (PI) and co-PIs, postdoctoral fellows, graduate and undergraduate students, developers, and marketing, administrative, and/or legal professionals. Time needed for training activities of personnel involved should be budgeted.

- **Project Coordinator:** Given the multi-faceted nature of the range of activities expected, a full-time, experienced project manager/coordinator/facilitator can be budgeted.

- **Patenting Costs:** Direct costs of up to $100,000 over the entire duration of the project (up to four years) to: a) defray internal costs incurred by awardee's technology transfer office during the evaluation and protection of STRP intellectual property, and/or b) secure the services of one or more third-party service providers to assist in the evaluation and protection of the STRP intellectual property. Filing fees for provisional, non-provisional and PCT applications are allowable only if paid to the United States Patent and Trademark Office (USPTO). No foreign patenting costs are allowed.

- **Setup costs:** Costs incurred for the organization-wide coordination and governance approach, any necessary infrastructure, market analysis, and customer-discovery activities.

- **Subawards:** Up to one subaward of up to 10% percent of the total proposal requested budget for the entire project (inclusive of direct and indirect costs) per year to one institution of higher education with a well-established record for translational research related activities and a well-resourced tech transfer operation is allowed. As mentioned before (Section II-E), the participation of such an institution with considerable tech transfer experience/resources is strongly encouraged. This subaward will be to support activities that will be useful to the proposing institution to build and grow its capacity for research translation. Additional subawards can be made to other organization types, except for-profit institutions. The total budgeted amount for all subawards must not exceed 20% of the total budget requested.

- **Equipment purchase:** Funding can be used for acquisition of smaller pieces of equipment up to a total of $50,000 per year that may help accelerate testing, add a unique capability to an equipment that's already in place or equipment that can enable rapid development of a prototype. As mentioned before in Section V, ART funding is not to be used to build, construct, acquire, or renovate physical office or laboratory space. Similarly, ART funding is not to be used for purchase or acquisition of major pieces of equipment or instrumentation.

Annual ART cohort meeting: The budget should include set aside funds of $10,000 per year to cover the cost of attending an annual ART meeting. NSF plans to hold this meeting, however, given the uncertainties associated with the spread of infectious diseases, it is possible that this meeting may be held virtually or in-person but at a smaller scale, or not held. The PI and at least two more co-PIs should plan on attending this meeting. Attendance by graduate and undergraduate students and postdoctoral fellows is also encouraged. The purpose of this annual meeting will be to provide a platform for exchanging ideas on challenges and opportunities, most effective approaches for building institutional capacity in a holistic way, and network with other ART participants as well other organizations/firms/investors. The annual meeting will also be an opportunity for students as well as postdoctoral fellows to learn about different ways to recognize the societal and economic benefits of translational research, and ways get actively involved in translational research activities during the very early stages of their careers.

C. Due Dates

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

    May 23, 2023

    September 18, 2024

    Third Wednesday in September, Annually Thereafter

D. Research.gov/Grants.gov Requirements

For Proposals Submitted Via Research.gov:

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

For Proposals Submitted Via Grants.gov:

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

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

Proposers that submitted via Research.gov may use Research.gov to verify the status of their submission to NSF. For proposers that submitted via Grants.gov,

until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Leading the World in Discovery and Innovation, STEM Talent Development and the Delivery of Benefits from Research - NSF Strategic Plan for Fiscal Years (FY) 2022 - 2026*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

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

2. Merit Review Criteria

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

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

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in

which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

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

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

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

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and other underrepresented groups in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

ART proposals will be evaluated based on the following solicitation-specific review criteria:

1. **Capacity-building activities for longer-term impact:** Does the proposal and supporting statement from the IHE attesting to their current research capacity make a convincing case that current level of fundamental research efforts are high, but the level of translational research activities and the associated translational research capacity is low at the proposing organization? Does the proposal describe a compelling long-term vision at the institution for nurturing and growing translational research capacity and processes, building on the momentum gained from the ART funding, including potential partnerships?

   Does the proposal clearly describe the rationale, motivation, and commitment at the institutional level and a feasible plan to significantly boost research translation capacity and infrastructure well above the current level? Is there evidence in the proposal that suggests that the PI and the proposing institution, as a whole, will be intensely engaged in driving ART project activities as well as accelerating translational research activities at the organization? Does the proposal describe a feasible evaluation plan for the ART project impact?

2. **Education and training:** Does the proposal describe a clear plan for evidence-based training and education of postdoctoral researchers and graduate students in translational research activities to help them be successful in pursuing non-academic career pathways?

3. **Specific project-level activities in the short term:** Is there strong evidence that suggests that the STRPs selected will be successful in translation? Does the proposal satisfactorily articulate how the initial and future cohorts of ambassadors have been/will be selected for the STRPs and continue to be supported in the future?

4. **Diversity, equity, inclusion, and accessibility:** Does the proposal clearly demonstrate institutional commitments to diversity, equity, inclusion, and accessibility in the short- and long-term activities and in a holistic fashion?

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 Reverse Site Review.

Program Officers may request a Reverse Site Visit with a select subset of proposers after the completion of the panel-based merit review process.

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

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

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

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal

Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Administrative and National Policy Requirements

Build America, Buy America

As expressed in Executive Order 14005, Ensuring the Future is Made in All of America by All of America's Workers (86 FR 7475), it is the policy of the executive branch to use terms and conditions of Federal financial assistance awards to maximize, consistent with law, the use of goods, products, and materials produced in, and services offered in, the United States.

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for an award unless all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's Build America, Buy America webpage.

Special Award Conditions:

NSF ART awards will be made as cooperative agreements. The cooperative agreement will include Special Conditions relating to the period of performance, statement of work, awardee responsibilities, NSF responsibilities, joint NSF-awardee responsibilities, funding and funding schedule, reporting requirements, Senior Personnel, and other conditions.

Towards the end of the first year and every year after that, the PI and co-PIs will be required to participate in a project evaluation meeting held online or at NSF. The purpose of this meeting is for an external panel and NSF to assess the progress the awardees have made toward advancing project goals via a well-functioning team. Each awardee team will prepare briefing material (expected to be ten pages or less) describing its accomplishments and make a short presentation followed by questions and answers. The reviewers from a panel will evaluate the team's progress toward its stated goals and, in particular, progress toward creating deliverables. Considering reviewers' input and the team's history in successfully addressing program feedback, NSF will decide whether the IHE will receive funding for the following year. A determination by NSF that the ART project has failed to perform to the satisfaction of NSF during any review may result in the termination of the award.

Ensuring Adequate COVID-19 Safety Protocols

a. This clause implements Section 3(b) of Executive Order 14042, Ensuring Adequate COVID Safety Protocols for Federal Contractors, dated September 9, 2021 (published in the Federal Register on September 14, 2021, 86 FR 50985). Note that the Department of Labor has included "cooperative agreements" within the definition of "contract-like instrument" in its rule referenced at Section 2(e) of this Executive Order, which provides:

   For purposes of this order, the term "contract or contract-like instrument" shall have the meaning set forth in the Department of Labor's proposed rule,

   "Increasing the Minimum Wage for Federal Contractors, " 86 Fed. Reg. 38816, 38887 (July 22, 2021). If the Department of Labor issues a final rule

   relating to that proposed rule, that term shall have the meaning set forth in that final rule.

b. The awardee must comply with all guidance, including guidance conveyed through Frequently Asked Questions, as amended during the performance of this award, for awardee workplace locations published by the Safer Federal Workforce Task Force (Task Force Guidance) at https://www.saferfederalworkforce.gov/contractors/.

c. *Subawards.* The awardee must include the substance of this clause, including this paragraph (c), in subawards at any tier that exceed the simplified acquisition threshold, as defined in Federal Acquisition Regulation 2.101 on the date of subaward, and are for services, including construction, performed in whole or in part within the United States or its outlying areas. That threshold is presently $250,000.

d. *Definition*. As used in this clause, United States or its outlying areas means:

1. The fifty States.
2. The District of Columbia.
3. The commonwealths of Puerto Rico and the Northern Mariana Islands.
4. The territories of American Samoa, Guam, and the United States Virgin Islands; and
5. The minor outlying islands of Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Midway Islands, Navassa Island, Palmyra Atoll, and Wake Atoll.

e. The Foundation will take no action to enforce this article, where the place of performance identified in the award is in a U.S. state or outlying area subject to a court order prohibiting the application of requirements pursuant to the Executive Order (hereinafter, "Excluded State or Outlying Area". A current list of such Excluded States and Outlying Areas is maintained at https://www.saferfederalworkforce.gov/contractors.

Awardees will be required to include appropriate acknowledgment of NSF support in any publication (including World Wide Web pages) of any material based on or developed under the project, in the following terms: "This material is based upon work supported by the National Science Foundation ART program under Award No. (Grantee enters NSF award number.)"

Awardees also will be required to orally acknowledge NSF support using the language specified above during all news media interviews, including popular media such as radio, television, and news magazines.

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.

NSF may require additional reporting requirements for the ART program, including metrics for success, which will be provided later. Additional reporting conditions may also apply pursuant to approval by the Office of Management and Budget (OMB).

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:

- Pradeep Fulay, telephone: (703) 292-2445, email: art@nsf.gov
- Nina Maung-Gaona, telephone: (703) 292-4697, email: art@nsf.gov
- Daniel S. Goetzel, telephone: (703) 292-5304, email: art@nsf.gov
- Jesus V. Soriano Molla, telephone: (703) 292-7795, email: art@nsf.gov
- Andy DeSoto, telephone: (703) 292-8700, email: art@nsf.gov
- Mohan Kumar, telephone: (703) 292-7408, email: art@nsf.gov
- Crystal Leach, telephone: (703) 292-2667, email: art@nsf.gov
- Jonathan D. Madison, telephone: (703) 292-2937, email: art@nsf.gov
- Jeanne R. Small, telephone: (703) 292-8623, email: art@nsf.gov
- Rita A. Teutonico, telephone: (703) 292-4284, email: art@nsf.gov
- Huihui H. Wang, telephone: (703) 292-4894, email: art@nsf.gov
- Jennifer W. Weller, telephone: (703) 292-2224, email: art@nsf.gov

For questions related to the use of NSF systems contact:

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

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.

Please address any program-related inquiries to art@nsf.gov.

IX. OTHER INFORMATION

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

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

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

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

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.F.7 for instructions regarding preparation of these types of proposals.

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

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

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>   (NSF Information Center)**:**
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>   or telephone: (703) 292-8134
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> - **To Locate NSF Employees:**   (703) 292-5111

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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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