Innovation Corps - National Innovation Network Teams Program (I-Corps^{TM} Teams)

PROGRAM SOLICITATION
NSF 21-552

REPLACES DOCUMENT(S):
NSF 18-515

National Science Foundation

Directorate for Technology, Innovation and Partnerships

Directorate for Engineering

Directorate for Biological Sciences

Directorate for Computer and Information Science and Engineering

Directorate for Education and Human Resources

Directorate for Geosciences

Directorate for Mathematical and Physical Sciences

Directorate for Social, Behavioral and Economic Sciences

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

Proposals Accepted Anytime

No submission deadline. Proposal accepted anytime with a cognizant NSF Program Officer's invitation. See II. PROGRAM DESCRIPTION - Requirements.

IMPORTANT INFORMATION AND REVISION NOTES

Starting February 1, 2021, for I-Corps Teams Active Grantees and Proposers: Temporary Guidance Regarding Budgeted Travel and Customer Discovery Activities as well as Extensions for Period of Performance.

The COVID-19 pandemic has created a great deal of uncertainty in the US economy and across nearly all industry sectors as well as the national university research enterprise. Due to current meeting and travel restrictions, national I-Corps training cohorts are now held virtually rather than in-person, and customer discovery is conducted by phone or video conference rather than face-to-face. With this in mind, NSF is providing temporary guidance for I-Corp Teams proposers regarding the preparation of proposal budgets and the allowable period of performance.

During this time, proposal budgets may include stipends and/or compensation of up to $10,000 for the Technical Lead and up to $15,000 for the Entrepreneurial Lead. Please refer to this solicitation (NSF 21-552) and the related FAQs (NSF 18-057) for additional guidance about the preparation and requirements of I-Corps Teams proposal budgets.

NSF is also extending the allowed period of performance from 6 to 12 months to enable customer discovery in person when travel resumes. Therefore, during this time proposers to this solicitation may request a project duration of up to 12 months.

Grantees with active awards may request comparable changes to both the budget and the period of performance and should contact the Cognizant Program Director to discuss. NSF will continue to monitor closely the COVID-19 situation and will provide any appropriate updates to this solicitation as required in the future.

Other Important Information

Due to the unique nature of the I-Corps Teams proposal submission process, a waiver to the external review requirement was granted by the NSF Office of the Director on February 3, 2018.

Any proposal submitted in response to this solicitation should be submitted in accordance with the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Innovation Corps Teams (I-Corps^{TM} Teams) Program
* Note: Trademark hereafter asserted and referred to as I-Corps

Synopsis of Program:

The National Science Foundation (NSF) seeks to further develop and nurture a national innovation ecosystem that guides the output of scientific discoveries closer to the development of technologies, products, and services that benefit society. The goals of the NSF Innovation Corps (I-Corps) Program, created in 2011 by NSF, are to spur translation of fundamental research to the marketplace, to encourage collaboration between academia and industry, and to train NSF-funded faculty, students and other researchers in innovation and entrepreneurship skills.

The I-Corps Program utilizes experiential learning of customer and industry discovery, coupled with first-hand investigation of industrial processes, to quickly assess the translational potential of inventions. The I-Corps Program is designed to support the commercialization of "deep technologies," those revolving around fundamental discoveries in science and engineering. The I-Corps Program addresses the skill and knowledge gaps associated with the transformation of basic research into deep technology ventures (DTVs).

The purpose of the I-Corps Teams program is to identify NSF-funded researchers to receive additional support in the form of entrepreneurial education, mentoring, and funding to accelerate the translation of knowledge derived from fundamental research into emerging products and services that may attract subsequent third-party funding. The outcomes of I-Corps Teams' projects are threefold: 1) a decision on a clear path forward based on an assessment of the business model, 2) substantial first-hand evidence for or against product-market fit, with the identification of customer segments and corresponding value propositions, and 3) a narrative of a technology demonstration for potential partners.

WEBINAR:

A webinar will be held monthly to answer questions about this program. Details will be posted on the I-Corps Teams website (see https://www.nsf.gov/news/special_reports/i-corps/program.jsp) as they become available.

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.

- Ruth M. Shuman, Program Director, ENG/IIP, telephone: (703) 292-2160, email: rshuman@nsf.gov
- Rebecca Shearman, Program Director, CISE/CNS, telephone: (703) 292-7403, email: rshearma@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
- 47.079 --- 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: Standard Grant

Estimated Number of Awards: 200 to 255

Estimated program budget and number of awards are subject to the availability of funds.

Anticipated Funding Amount: $10,000,000 to $12,750,000M/

The anticipated funding amount is $10 to $12.75 million per year, pending availability of funds.

Eligibility Information - See Section IV for additional 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.

Principal Investigator (PI) Limit:

Multiple awards based on the same core technology generally will not be supported.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Multiple I-Corps awards to a PI participating on a currently active I-Corps team generally will not be supported. Collaborative proposals are not eligible for the I-Corps Teams Program.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

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

B. Budgetary Information

- **Cost Sharing Requirements:**

    Inclusion of voluntary committed cost sharing is prohibited.

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

    Recovery of indirect costs (F&A) shall be limited to $5,000. Each budget must include the correct indirect cost rate (i.e. $5,000 / $45,000 = 11.11%). As such, this program does require mandatory cost sharing, and, therefore, is an exception to NSF's cost sharing policy.

- **Other Budgetary Limitations:**

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

C. Due Dates

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

    Proposals Accepted Anytime

    No submission deadline. Proposal accepted anytime with a cognizant NSF Program Officer's invitation. See II. PROGRAM DESCRIPTION - Requirements.

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

America's prosperity has originated in part from the ability to capitalize economically on ground-breaking discoveries from science and engineering research. Simultaneously, a knowledgeable, creative workforce has maintained the country's global leadership in critical areas of technology. These important discoveries and capable workforce result from substantial, sustained investment in science and engineering. A strong capacity for leveraging fundamental scientific discoveries into powerful engines of innovation is essential to maintain our competitive edge in the future.

The National Science Foundation (NSF) supports fundamental research and education in science and engineering. NSF's dual role, unique among government agencies, results in new knowledge and tools as well as a capable, innovative workforce. These complementary building blocks of innovation have led to revolutionary technological advances and wholly new industries.

Through this initiative, NSF seeks to accelerate the development of new technologies, products, and processes that arise from fundamental research. NSF investments will strategically strengthen the innovation ecosystem by addressing the challenges inherent in the early stages of the innovation process. This solicitation will support collaborations between academia and industry that are designed to overcome many of the obstacles in the path of innovation.

II. PROGRAM DESCRIPTION

The goals of this program are to spur translation of fundamental research to the marketplace, to encourage collaboration between academia and industry, and to train NSF-funded faculty, students and other researchers in innovation and entrepreneurship skills.

The I-Corps Teams program provides NSF-funded faculty, students and other researchers with entrepreneurial education, mentoring, and funding to accelerate the translation of knowledge derived from fundamental research into emerging products and services that may attract subsequent third-party funding.

The selected I-Corps teams participate in the I-Corps Teams Program Curriculum. This curriculum, now delivered exclusively in an online format, typically includes a Kick-off meeting with Entrepreneurial Immersion Training, a weekly training meeting and a Lessons Learned Closing Presentation. An I-Corps team includes the Entrepreneurial Lead, Technical Lead, and the Industrial Mentor. During the training program, the team will be expected to spend significant time conducting active customer discovery, including interviewing potential customers and potential partners. More details on the I-Corps Teams Program may be found in the I-Corps Teams FAQs.

The outcomes of I-Corps Teams projects will be threefold: 1) a decision on a clear path forward based on an assessment of the business model, 2) substantial first-hand evidence for or against product-market fit, with the identification of customer segments and corresponding value propositions, and 3) a narrative of a compelling technology demonstration for potential partners.

The path forward plan will be made by each I-Corps team in consultation with instructors of the I-Corps Teams Program.

Requirements:

To be eligible to pursue funding under an I-Corps Teams award, proposers must have received a prior award from NSF in a scientific or engineering field relevant to the proposed innovation that is currently active or that has been active within five years from the date of the I-Corps Teams proposal submission. The lineage of the prior award extends to the PI, co-PIs, Senior Personnel, Postdoctoral Researchers, Professional Staff or others who were supported under the award. The prior award may range from a single-investigator award to a large, distributed center.

In addition, proposing I-Corps Teams are also eligible to apply based on participation in a Regional NSF-supported I-Corps Training Program hosted by an I-Corps Site, Node, or Hub. A senior member of the Regional I-Corps Program staff must provide a letter of recommendation for the Team to be considered for the National I-Corps Teams Program. This letter is to be included in the Supplementary Documents. In addition, the technology underlying the effort must: 1) have an explicit connection to an IHE (beyond personnel); 2) be consistent with NSF requirements for intellectual merit; and 3) represent a deep technical innovation based on discovery in fundamental science and/or engineering.

Before an I-Corps Teams proposal may be submitted, PIs must complete a series of steps that may lead to an invitation to submit a proposal. The steps are as follows:

1. Team Formation:

Identify at least three I-Corps Team members. The I-Corps team will consist of three roles:

- Entrepreneurial Lead (EL)
- Technical Lead (TL)
- Industrial Mentor (IM)

The **Entrepreneurial Lead (EL)** may be a postdoctoral scholar, graduate, or other student, staff member, researcher, or other personnel with relevant knowledge of the technology and a deep commitment to investigating the commercial potential and landscape surrounding the innovation. The Entrepreneurial Lead will typically guide translation of the technology, should the I-Corps Teams project demonstrate the potential for commercial viability.

The **Technical Lead (TL)** will typically be a faculty member, senior research scientist, or postdoctoral scholar with deep and direct technical expertise in the relevant core technology about which the I-Corps team is exploring commercial potential. Typically, the Technical Lead will also serve as the Principal Investigator (PI) of the award.

The **Industry Mentor (IM)** will typically be an experienced entrepreneur or business leader with expertise in transitioning technology out of academic labs. The Industry Mentor should be a third-party resource and may be recommended by the proposing institution. The Industry Mentor will be responsible for advising the team on its progress throughout the I-Corps Program and will usually have contacts in the industry area(s) being explored. For more details on the role of the IM, please see the I-Corps FAQs. Other than their direct expenses for program participation, IMs are not compensated through I-Corps Team awards. Mentors are part of a volunteer cadre of leaders in the entrepreneurial ecosystem.

Teams may have an additional member in the role of co-EL, co-TL, or co-IM. Teams with more than four members will not typically be supported.

2. Executive Summary Preparation:

Prepare a two-page (maximum) Executive Summary that describes the following:

- Team Members. Composition and roles (EL, TL, and IM, plus any additional co-EL, co-TL or co-IM) of the team members proposing to participate in the National I-Corps Program and a brief description of each member's professional expertise.
- Principal Investigator. Principal Investigator (PI) and a brief description of their connection to the team. In most cases the PI will also be the TL.
- Lineage. Relevant current/prior NSF awards establishing team eligibility, including that of a Regional I-Corps Training Program if appropriate.
- Technology. Brief description of the core technology.
- Application/Market. Brief description of the potential commercial application.
- Current Plan. Brief description of the current commercialization plan.

If the proposed I-Corps Team is applying based on participation in a Regional NSF-supported I-Corps training program hosted by a current I-Corps Site, Node, or Hub, a senior member of that I-Corps Program staff must provide a letter of recommendation for the Team to be considered in the I-Corps Teams Program. This letter should be uploaded in the Supplementary Documents. The technology underlying the effort must: 1) have an explicit connection to an IHE (beyond personnel); 2) be consistent with NSF requirements for intellectual merit; and 3) represent a deep technical innovation based on discovery in fundamental science and/or engineering.

3. NSF Contact:

Submit the initial application, called an Executive Summary, through the I-Corps Teams Web Form for review. This will require creating a log in account.

4. Virtual Interviews:

Teams that submit Executive Summaries that meet the eligibility requirements and describe innovations based on deep technologies with commercialization potential will be scheduled to engage in a telephone or video conference interview with NSF's I-Corps staff. The purpose of the interview is to verify the proposing Team's information and commitment to the commercialization of the innovation and the I-Corps program requirements. At the conclusion of the interview, teams may be invited for a second virtual interview or they may be invited to submit an I-Corps Teams proposal.

5. Proposal Submission:

The I-Corps Teams Program will not accept proposals that have not been authorized for submission by a cognizant NSF Program Officer. Uninvited proposals will be returned without review.

Each team member will be asked to agree to all program requirements by meeting the target number of interviews (typically a minimum of 100 interviews) with potential customers and potential partners from their proposed target market(s) ecosystem during the program, allocating the time required to meet the Program requirements, agreeing to attend all I-Corps meetings, and committing fully to the I-Corps Teams Program before receiving approval to submit a proposal to NSF.

See Section V on Proposal Preparation for instructions about preparing an I-Corps Teams proposal.

6. I-Corps Teams Program Participation

All I-Corps team members are required to participate in the I-Corps Teams Program. This curriculum, now delivered exclusively in an online format, typically includes a Kick-off meeting with Entrepreneurial Immersion Training, a weekly training meeting and a Lessons Learned Closing Presentation. An I-Corps team includes the Entrepreneurial Lead, Technical Lead, and Industrial Mentor. More details on the I-Corps Teams Program can be found in the I-Corps Teams FAQs. Dates for upcoming cohorts will be posted on the NSF I-Corps Teams Program website.

The I-Corps Teams Program provides a real-world, hands-on, immersive learning experience to evaluate the commercial opportunity around the innovation. The main activity is customer discovery where the team "leaves the lab" to evaluate potential product-market fit and the wider business model. The team's progress in customer discovery will be shared with the entire cohort to facilitate group learning. At the end of the curriculum, teams are expected to have performed at least one hundred (100) interviews with potential customers and potential partners from their proposed target market(s) ecosystem.

NSF I-Corps teams are encouraged to travel to reach their customer discovery goals when feasible. Travel to customer discovery interviews typically does not need approval by NSF, however, teams must obtain written prior approval from their NSF I-Corps program officer for either international travel or travel to an academic conference. Additionally, teams must receive prior approval for any technical research and development (R&D) work done under the award.

Expectations from the I-Corps Teams Grant:

Successful completion of the I-Corps Teams Program is expected to contribute to one or more of the following:

- Informed decision about commercial potential of proposed technology
- Formation of a for-profit, start-up business
- Selection of a licensing commercialization strategy
- Submission of a SBIR/STTR proposal
- Development of a business model suitable for review by third-party investors
- Students prepared to be competitive entrepreneurially
- Enhanced entrepreneurial mindset among NSF-funded researchers

NSF will seek to collect outcomes from the grantees along the lines listed above during the postaward period.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 200-255

Estimated program budget and number of awards are subject to the availability of funds.

Anticipated Funding Amount: Funding for the Innovation-Corps Teams Program is $50,000 per award. The anticipated funding amount is $10-$12.75 million per year, pending availability of funds. Award Duration: This is a six-month award.

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.

Principal Investigator (PI) Limit:

Multiple awards based on the same core technology generally will not be supported.

Limit on Number of Proposals per Organization:

There are no restrictions or limits.

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

Multiple I-Corps awards to a PI participating on a currently active I-Corps team generally will not be supported. Collaborative proposals are not eligible for the I-Corps Teams Program.

Additional Eligibility Info:

Proposers must have an active NSF award or a prior award that has been active within the past five years from the date of submission of the I-Corps Teams proposal in a science or engineering field relevant to the proposed innovation.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

Mandatory Communication with cognizant NSF I-Corps Program Officer: PI(s) *must* contact one of the cognizant NSF I-Corps Program Officers and receive prior written authorization to submit a proposal. To start this process, the I-Corps Team should submit an application, called an Executive Summary, (as outlined in Section II-PROGRAM DESCRIPTION) through the NSF I-Corps Teams Execution Summary Form, which may be found at https://nsfiip.force.com/icorps for review. This will require creating a log in account.

Guide to Submission of an I-Corps Teams Proposal

Note: The I-Corps Teams proposal preparation and submission requirements specified below modify, or supplement, the requirements specified in the NSF Proposal and Award Policies and Procedures Guide (PAPPG) or NSF Grants.gov Application Guide.

An I-Corps Teams proposal must contain the following required sections:

Project Summary

The Project Summary consists of an overview, a statement on the intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity.

The summary MUST have the following components:

1. The overview section must include a listing of "key" words. The key words/phrases should identify the areas of technical expertise in science, engineering, or education that are to be considered in reviewing the proposal, and the areas of application that are the initial target of the technology.
2. A summary limited to 200 words addressing the Intellectual Merits of the proposed activity. No proprietary information should be included in the summary.
3. A summary limited to 200 words addressing the Broader Impacts of the proposed activity. Include information on how the innovation will enhance scientific and technological understanding. Describe the potential societal and commercial impact of the project.

Project Description

The project description is **limited to 5 pages**. The following information should be provided in the project description:

1. I-Corps Team (two-page limit)

Describe the composition of the team and roles (EL, TL, IM, plus any additional co-EL, co-TL or co-IM team members) and provide a one-paragraph description of each member's professional experience. Include each member's entrepreneurial experience and their experience in collaborating with the other team members.

2. Lineage of the Proposed Innovation (one-page limit)

a. Provide a table of previous awards with the cognizant NSF Program Officer (if applicable) identified.
b. Indicate the eligibility pathway by providing the relevant NSF award number(s) or by identifying the Regional I-Corps Training Program (include the letter of recommendation in the Supplementary Documents module as well as the NSF award number for the Regional I-Corps Program). Teams qualifying through a Regional I-Corps Training Program must use the following language in both the letter of recommendation and the lineage statement of the proposal: "The Regional I-Corps Training Program award conferring lineage is:".
c. Briefly describe the core technology that is being considered for commercialization potential.
d. Briefly describe how this research has led the team to believe that a commercial opportunity exists for the effort moving forward.

3. Description of the Potential Commercial Impact (one-page limit)

a. Provide a brief profile of a typical customer of the proposed innovation.
b. Describe the customer need that you believe will be met by the proposed innovation. How much do you think a customer would pay for your solution? How did you arrive at that estimate?
c. Describe how the customer currently meets those needs.

4. Brief description of the project plan (one-page limit)

a. Describe your approach. What is the proposed innovation? How does it relate to the fundamental research already conducted under previous

award(s)?

b. Describe the current status of the technology. In what stage is the development: proof-of-principle, proof-of-concept, prototype (alpha, beta), other?
c. Provide a brief description of the proof-of-concept or technology demonstration you envision will be the next step following the I-Corps program.

Please note that per guidance in the PAPPG, the Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities. You may decide where to include this section within the Project Description but it must be a separate section labeled "Broader Impacts."

References Cited

Provide a comprehensive listing of relevant reference sources, including patent citations.

Biographical Sketches

A biographical sketch for each team member (two pages maximum per team member), prepared in accordance with the requirements specified in the PAPPG, must be provided, highlighting technical expertise and track records in successful technology and business development. Exhaustive academic resumes are not appropriate.

*Proposal Budget ***Please refer to the February 2021 notice posted at the beginning of this solicitation for temporary travel and customer discovery activities budgetary guidance.****

Funding for the Innovation-Corps Teams Program is $50,000 per award. Recovery of indirect costs (F&A) is limited to $5,000 (11.11%).

To complete the I-Corps Teams budget in Fastlane or Research.gov:

- Include $45,000 on line G6 (Other Direct Costs)
- Include $5,000 on line I.1 (Indirect Costs)

To complete the I-Corps Teams budget in Grants.gov:

- Include $45,000 in Field F.8 (Other Direct Costs)
- Include $5,000 in Field H (Indirect Costs)

The Budget should include $5,000 per team to cover participation fees in the required course.

The total amount of the request must not exceed $50,000.

Funds should be set aside for customer discovery activities and tools to facilitate program participation and requirements. It is expected that customer discovery will be the largest portion of the I-Corps budget.

- Virtual tools to facilitate customer interviews such as Zoom Meeting subscriptions, LinkedIn Premium membership, inexpensive headsets, Dropbox (used for Program participation), and recommended books.
- Conference fees for attending virtual conferences.
- Travel expenses associated with travel for customer discovery including in-person interviews and conferences when meeting and travel restrictions are lifted.

No technical R&D work, which includes facility fees or materials and supplies, should be budgeted. With written approval from the cognizant NSF I-Corps Program Officer it may be possible to accommodate some limited, well-motivated R&D work after the end of the I-Corps Program; however, this should not be budgeted in the proposal.

The following statement must be included in the budget justification: "The team will require explicit written approval from the cognizant NSF I-Corps Program Officer prior to attending an academic conference or any international travel under the I-Corps award."

Current and Pending Support

- The proposal should provide information regarding all research to which the PI, Technical Lead, I-Corps Teams Mentor, and Entrepreneurial Lead either have committed time or have planned to commit time outside of this submitted I-Corps Team proposal.

Current and Pending Support must be prepared in accordance with the requirements specified in the PAPPG and uploaded for each of the team members. Note that this proposal is considered "pending" and, therefore, MUST appear on each Current and Pending Support submission.

Facilities, Equipment, and Other Resources

Discuss requirements for and the availability of equipment, instrumentation, and facilities required for the proposed project. If none, state NONE.

Data Management Plan

Proposals MUST contain a supplementary document labeled "Data Management Plan (DMP)".

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Indirect Cost (F&A) Limitations:

Recovery of indirect costs (F&A) shall be limited to $5,000. Each budget must include the correct indirect cost rate (i.e. $5,000 / $45,000 = 11.11%). As such, this program does require mandatory cost sharing, and, therefore, is an exception to NSF's cost sharing policy.

Other Budgetary Limitations:

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

C. Due Dates

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

Proposals Accepted Anytime

> No submission deadline. Proposal accepted anytime with a cognizant NSF Program Officer's invitation. See II. PROGRAM DESCRIPTION - Requirements.

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

For Proposals Submitted Via FastLane or Research.gov:

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

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

A. Merit Review Criteria

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

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

All proposals are evaluated against two criteria:

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

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

1. What is the potential for the proposed activity to
   a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?

4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

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

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

Additional Solicitation Specific Review Criteria

- Team composition
- Commitment to commercialization
- Focus on a Deep Technology based on fundamental discoveries in science and engineering
- Potential commercial impact on market
- Time horizon to impact

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Internal NSF Review.

Internal review by NSF I-Corps Program Officers.

Full proposals may only be submitted upon invitation of a cognizant I-Corps program officer. Proposals submitted in response to this program solicitation will be reviewed by internal NSF merit review. The proposal may be declined if there are deviations in the proposal from what has been disclosed or discussed during the initial and final screening interviews.

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 is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, 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 and 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.

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 letter, 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 letter; (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 letter.

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

Special Award Conditions:

Online content establishing the process and progress tracking throughout the I-Corps cohort will be available. Team progress will be tracked using an online technology platform that supports the I-Corps curriculum. This I-Corps platform is a shared resource provided by a logistics partner and is accessible by NSF, the entrepreneurial course instructors, and the peer teams that participate in the I-Corps Cohort.

C. Reporting Requirements

The Principal Investigator must submit a final project report and a Project Outcomes Report for the General Public to the cognizant Program Officer within 90 days following the expiration of the grant.

Failure to provide the final project report 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.

The PI is required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of the final project report. 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.

The final report must include commercialization disposition along lines similar to the following:

- Patent applications
- Patents granted and derived or both
- Licensing agreements
- Company formation
- Royalties realized
- SBIR proposal submission (with agency name and date submitted)
- Third party financing
- Enhanced entrepreneurial mindset of NSF-funded researchers
- Enhanced career trajectories of team members

The final report needs to detail the work conducted under the I-Corps award, the progress and learning made by the team in the reporting period, the outcomes of the work, and the project's vision post-award. It should articulate the customer segments explored, what pivots were made and how the team sees their value proposition and the rest of the business model.

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:

- Ruth M. Shuman, Program Director, ENG/IIP, telephone: (703) 292-2160, email: rshuman@nsf.gov
- Rebecca Shearman, Program Director, CISE/CNS, telephone: (703) 292-7403, email: rshearma@nsf.gov

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

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

For questions relating to Grants.gov contact:

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

IX. OTHER INFORMATION

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

> The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.
>
> To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at https://www.nsf.gov
>
> - **Location:**   2415 Eisenhower Avenue, Alexandria, VA 22314
>
> - **For General Information**   (703) 292-5111
>   (NSF Information Center)**:**
>
> - **TDD (for the hearing-impaired):**   (703) 292-5090
>
> - **To Order Publications or Forms:**
>
>   Send an e-mail to: nsfpubs@nsf.gov
>
>   or telephone: (703) 292-8134
>
> - **To Locate NSF Employees:**   (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Policy Office, Division of Institution and Award Support
Office of Budget, Finance, and Award Management
National Science Foundation
Alexandria, VA 22314

National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (703) 292-5090 or (800) 281-8749

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