NSF Convergence Accelerator Pilot Phase II

PROGRAM SOLICITATION
NSF 20-555

National Science Foundation

Convergence Accelerator Office

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

May 13, 2020

Full Proposal Deadline

IMPORTANT INFORMATION AND REVISION NOTES

The NSF Convergence Accelerator is a new NSF-wide program, launched with a request for Pilot Phase I proposals in Dear Colleague Letter (DCL) NSF 19-050. Phase II projects will enable the delivery of the tangible research products identified and planned in Phase I. All Pilot Phase II proposals must be built upon a foundation developed by one or more Pilot Phase I awards. Additionally:

- At least one Principal Investigator or Co-Principal Investigator from a Pilot Phase I award must be included as a PI or Co-PI on a Pilot Phase II proposal.
- Only one Phase II proposal is permitted from each Phase I team.
- The Pilot Phase I grantee organization does not have to be the proposing organization for the Pilot Phase II proposal, nor does the same individual have to be the lead PI. Any change of proposing institution or PI should be fully explained in the proposal.
- Proposers should describe the way(s) in which they plan to collaborate with other Phase I team(s). These collaborations may be supported via sub-awards or other mechanisms. However, simultaneous submission of proposals from different organizations, with each organization requesting a separate award, are NOT permitted. If teams choose to create a fully integrated, single effort, only one proposal may be submitted.

Proposals submitted in response to this program solicitation will be reviewed by Ad Hoc Review and/or Panel Review, and in addition will be invited to participate in an in-person presentation (pitch) to a panel of experts.

Promoting partnerships is one of NSF's core strategies and can enhance research productivity and impacts. The Convergence Accelerator seeks to engage with a range of potential stakeholders. External stakeholders including industry, foundations, other federal government agencies, state or local governments, and members of potential investment communities will be invited to attend the pitch competition described in section VI. Any organization or individual that seeks to attend the pitch competition should contact the Cognizant Program Officers listed below.

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

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NSF Convergence Accelerator Pilot Phase II

Synopsis of Program:

The goals of NSF's convergence accelerator effort are to support and accelerate use-inspired convergence research in areas of national importance within particular topics (tracks).

Dear Colleague Letter (DCL) NSF 19-050 invited proposals for the NSF Convergence Accelerator Pilot (NSF C-Accel). Track A1 of this pilot, Open Knowledge Network, relates to the Harnessing the Data Revolution (HDR) Big Idea. Track B1, AI and Future Jobs, and track B2, National Talent Ecosystem, relate to the Future of Work at the Human-Technology Frontier (FW-HTF) Big Idea.

This solicitation is limited to grantees who received a Phase I Award under Dear Colleague Letter (DCL) NSF 19-050 and wish to advance to Phase II.

The NSF Convergence Accelerator supports fundamental research that leads to rapid advances that can deliver useful results to society. Teams are expected to include personnel with the appropriate mix of disciplinary expertise needed to execute their proposed Phase II research and development plan. The team should also include appropriate stakeholders (e.g., industry, Institutions of Higher

Education (IHEs), non-profits, government entities, and others), each with a specific role(s) in facilitating the transition of research outputs into practical uses.

The proposers should outline a two-year research and development plan in which research transitions to practice. Successful proposals will be funded initially for one year. Each team's progress will be assessed during the year through approximately six virtual and in-person meetings with NSF program staff. The overall progress will be evaluated at the end of one year, based on a report and presentation that the team will make to a panel of reviewers. Teams that show significant progress during the first year, in accordance with the agreed timetable of milestones and deliverables, will receive funding for a second year. Interested teams may request up to $3,000,000 for the first year and up to $5,000,000 in total for the two-year project. Teams should plan on completing the effort within two years; no-cost extensions will be authorized only in extraordinary circumstances.

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.

- Lara A. Campbell, telephone: (703) 292-7049, email: lcampbel@nsf.gov

- Michael Pozmantier, telephone: (703) 292-4475, email: mpozmant@nsf.gov

- Linda Molnar, telephone: (703) 292-8316, email: lmolnar@nsf.gov

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

- 47.083 --- Office of Integrative Activities (OIA)

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 10

Anticipated Funding Amount: $30,000,000

Anticipated funding is $30,000,000, pending availability of funds, to support the first year of proposals selected for an award. The total amount awarded in future years will depend on the availability of funds and the number of awards advancing to year 2. Proposers may request up to $3,000,000 for year 1 and up to $5,000,000 in total for the two-year project.

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- This solicitation is limited to proposers who received a Phase I Award under Dear Colleague Letter (DCL) NSF 19-050 and wish to advance to Phase II. The organization that received the Pilot Phase I award does not have to be the proposing (lead) organization for the Pilot Phase II proposal, but must have been part of the Phase I team. Any change of proposing organization from Phase I should be explained in the proposal. Only one proposal may be submitted per Phase I award.

  Full proposals MUST include multiple types of organizations, including IHEs, non-profit, for-profit, state or local government, and/or federal government entities as partners or they will be returned without review. From among the Phase I grantee teams, the categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E.

Who May Serve as PI:

The PI and any Co-PIs must hold an appointment at an organization that is eligible to submit as described under "Who May Submit Proposals." At least one PI or Co-PI from a Pilot Phase I award must be included as a PI or Co-PI on a Pilot Phase II proposal. The same individual who served as PI for the Pilot Phase I award does not have to be PI for the Pilot Phase II proposal. Any change of PI and Co-PI should be fully explained in the proposal.

Limit on Number of Proposals per Organization:

This solicitation is limited to proposers who received a Phase I Award under Dear Colleague Letter (DCL) NSF 19-050 and wish to advance to Phase II. The organization that received the Pilot Phase I award does not have to be the proposing (lead) organization for the Pilot Phase II proposal. Any change of proposing organization should be explained in the proposal. Only one proposal may be submitted per Phase I award.

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

An individual may serve as PI or a Co-PI for only one proposal in response to this solicitation. This limitation includes PIs and Co-PIs listed for the proposing organization or any subaward submitted as part of the proposal. There are no restrictions or limits on serving as Senior Personnel.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required

- **Preliminary Proposal Submission:** Not required

- **Full Proposals:**

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

B. Budgetary Information

- **Cost Sharing Requirements:**

    Inclusion of voluntary committed cost sharing is prohibited.

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

    Not Applicable

- **Other Budgetary Limitations:**

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

C. Due Dates

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

    May 13, 2020

        Full Proposal Deadline

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:

Standard NSF reporting requirements apply.

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I. INTRODUCTION

The NSF Convergence Accelerator promotes use-inspired, convergence research in areas of national importance via partnerships between academic and non-academic stakeholders. In this Phase II solicitation of the NSF Convergence Accelerator Pilot, NSF seeks to support and facilitate research that advances ideas from concept to deliverables in three convergence topics (tracks). All Phase II proposals must be built upon a foundation developed by one or more Pilot Phase I awards.

The NSF Convergence Accelerator Pilot consists of three tracks, with each track aligned with one of NSF's 10 Big Ideas, namely Harnessing the Data Revolution (HDR) (track A1) and the Future of Work at the Human-Technology Frontier (FW-HTF) (tracks B1 and B2). These tracks also align with Administration R&D Priorities including leadership in artificial intelligence (see July 2018 memo M-18-22), the President's Management Agenda (see Cross Agency Priority Goals), and the U.S. 5-Year STEM Education Strategic Plan.

Convergence research is a critical mechanism for solving many vexing research problems, especially those stemming from complex societal and/or scientific challenges. The NSF Convergence Accelerator seeks to proactively enable the accelerated research efforts of convergence teams that developed during Phase I. In the Phase II proposals solicited here the teams will describe the research and development efforts they will undertake to produce deliverables that transition effectively to use.

The NSF Convergence Accelerator program is committed to research and development that derives expertise from and provides broad benefits to a diverse public. The program encourages proposals from, and partnerships with, minority-serving institutions (e.g., Historically Black Colleges and Universities (HBCUs), Tribal Colleges, Hispanic Serving Institutions, Alaska Native-Serving Institutions, and Native Hawaiian-Serving Institutions), and other organizations that reflect, support, and include a diverse public (e.g., in terms of demographics and regions).

II. PROGRAM DESCRIPTION

This NSF Convergence Accelerator Pilot Phase II solicitation seeks to build upon the Pilot Phase I research supported by the Convergence Accelerator, leading to rapid research advances that can deliver useful results to society.

The guiding rationale of the NSF Convergence Accelerator is that a high level of interdisciplinarity and engagement with multiple kinds of stakeholders, including researchers and the ultimate users of research products, is essential to deliver progress on scientific challenges of societal relevance — such as those embodied by the three tracks in this solicitation. Successful NSF Convergence Accelerator Pilot Phase II proposals are expected to have four important characteristics: 1) convergence research approach; 2) a strong, multi-organization partnership involving researchers, users, and other stakeholders; 3) high probability of successful deliverables within a two-year period that will ultimately benefit society, and 4) strong alignment with the track goals as described in this solicitation.

Partnerships

The Convergence Accelerator program seeks to encourage partnerships with many types of organizations to ensure that research efforts are use-inspired and have a clear path to transition to practice. Partners may join Convergence Accelerator teams in multiple ways.

- In a proposal. Partners may contribute effort and/or resources that are described in a proposal submitted under this solicitation. The NSF review process will consider the qualifications and resources of the full effort described in the proposal.
- After a proposal is submitted, but before awards are made. Additional partners, collaborators, or other interested parties may provide an "Expression of Interest" (see section VI for additional information on Expressions of Interest), especially following the Pitch Presentations. Expressions of interest will be one element of NSF's decision-making process but are in no way a requirement for an award. An Expression of Interest could lead to an agreement with NSF to contribute resources to a project OR could lead to an agreement directly with the proposing organization or a sub-awardee. Any agreements developed through NSF would be negotiated and implemented separately from awards made under this solicitation. NSF welcomes Unrestricted Gifts as well as more specific agreements.
- After awards are made. Partners, collaborators or contributors may join projects through agreements developed directly with grantee organizations or NSF after an award is made. These may be subject to terms and conditions of the NSF award.

Partnerships supported under this solicitation are not intended as a mechanism to conduct corporate sponsored research but can take advantage of synergistic activities. NSF encourages engagement with for-profit entities (including sharing of data, tools, expertise, or other resources); however, fee or profit may not be requested in NSF proposals submitted under this solicitation.

An Expression of Interest does not guarantee an opportunity for partnership with one or more teams. Potential partnerships suggested by Expressions of Interest will be developed in collaboration with grantee teams. NSF's award-making process will not be tied to negotiation of agreements based on Expressions of Interest, and an Expression of Interest is not a requirement for a Phase II award.

Intellectual Property

The disposition of rights to inventions made by small business firms, large business firms, and non-profit organizations, including universities, during NSF-assisted research is governed by Chapter 18 of Title 35 of the USC, commonly called the Bayh-Dole Act and EO12591, as amended by EO 12618. Additional information can be found in the Chapter XI.D the NSF PAPPG. Potential awardees and their partners should familiarize themselves with the information in these documents. Intellectual property (IP) developed with funds from this award is subject to the Bayh-Dole Act and should be differentiated from IP developed separately and contributed by partners. An Intellectual Property Management Plan is a required element of every

proposal (see supplementary documents below), and appropriate IP agreements will be required to be in place prior to an award being made. The Intellectual Property Management Plan should clearly describe the management of (1) any pre-existing IP that is relevant to the project and (2) IP that may be developed during the award. The Intellectual Property Management Plan should also indicate the path through which any partners who may join later could access IP.

Broadening Participation in the NSF Convergence Accelerator

NSF is committed to Broadening Participation in all science and engineering fields and research endeavors. The underrepresentation of many groups—including women, African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders, and persons with disabilities—deprives large segments of the population the opportunity to be creators of research and technology and deprives the scientific enterprise of their potential contributions.

As a pilot effort within the overall Convergence Accelerator Pilot, this solicitation requests that each project prepare a Broadening Participation Plan that describes activities that will be undertaken to increase the participation of underrepresented groups in the project's research and development efforts. The Broadening Participation Plan should be included as a supplementary document not to exceed 2 pages. Examples of ways to engage groups and/or individuals that are typically underrepresented could include: through the expertise of personnel, via partnerships, through work with users and user groups, via engagement with stakeholders, through use of datasets that represent information about underrepresented groups, etc. The Broadening Participation Plans should include: (1) the context of the proposed broadening participation activity(ies), (2) the intended target population(s) for the activity, (3) the plan of activities over the project duration, (4) prior experience (if any) with broadening participation, and/or intended plan for preparation/training of project members in broadening participation, and (5) plans for the measurement and dissemination of outcomes in broadening participation. More information, including potential metrics for activities and examples, can be found at the following links: https://www.nsf.gov/od/broadeningparticipation/bp.jsp, https://www.nsf.gov/od/broadeningparticipation/BIO_BroadeningParticipation_v4mt_508.pdf; https://www.nsf.gov/mps/broadening_participation/index.jsp, https://www.nsf.gov/cise/bpc/

TRACKS

TRACK A1: **OPEN KNOWLEDGE NETWORKS**

To help advance the progression from data to information to knowledge - to fully harness the data revolution – Track A1 of the Convergence Accelerator seeks to create an Open Knowledge Network (OKN) to enable new modes of data-driven discovery. Recent workshops (see, for example, https://www.nitrd.gov/news/Open-Knowledge-Network-Workshop-Report-2018.aspx) have articulated the research and development challenges and tremendous possible benefits of developing an Open Knowledge Network with the potential to drive innovation across all areas of science and engineering, and unleash the power of data and artificial intelligence to achieve scientific discovery and economic growth.

The overall goal of Track A1 is to enable the creation of a nonproprietary shared knowledge infrastructure. A knowledge network allows stored data (both structured and unstructured data) to be located and its attributes and relationship to other data and to real-world objects and concepts to be understood at a semantic level. Today, technology companies develop largely proprietary knowledge networks, often specialized for customer needs (e.g., web search, advertising placement, and question answering). Instead, the *Open Knowledge Network* will engage convergence teams from all areas of data science and science and engineering domains, and leverage public-private cooperation, to create a shared, open infrastructure.

Building upon Phase I efforts, *Phase II of the Open Knowledge Network track* will support the creation of tangible deliverables by multidisciplinary and multi-institutional teams. These teams may address "horizontal" challenges that apply to all domains, addressing challenges such as developing the underlying representation of facts, querying services that perform reasoning tasks with the data, or developing secured access capabilities. Teams may also choose to address "vertical" challenges specific to different topical domains such as geosciences, education, smart health, finance, and manufacturing, with a particular focus on exploiting publicly available U.S. Government data and other public datasets (see, e.g., https://www.data.gov). A participatory design approach that considers the needs and perspectives of the many user communities will be essential.

TRACKS B1 AND B2: AI AND FUTURE JOBS; NATIONAL TALENT ECOSYSTEM

The NSF Future of Work at the Human-Technology Frontier (FW-HTF) Big Idea seeks to respond to the challenges and opportunities for the future of jobs and work. FW-HTF supports convergence research to understand and influence the impact of artificial intelligence on workers and work, understand and develop the human-technology partnership, design new technologies to augment human performance, illuminate the emerging socio-technological landscape, understand the risks and benefits of new technologies, and foster lifelong and pervasive learning.

Several reports and studies have highlighted the challenges and opportunities, including the 2017 report from the National Academies of Sciences, Engineering and Medicine, *Information Technology and the U.S. Workforce: Where Are We and Where Do We Go from Here* and the 2018 report from the White House Council of Economic Advisors, *Addressing America's Reskilling Challenge.* Many American organizations suffer from a talent gap. Not only do their current workers lack the requisite skills to perform 21st century work, but graduates moving into the marketplace also lack those skills. According to a 2017 report from The Business-Higher Education Forum, IBM and Burning Glass Technologies, The Quant Crunch: How the Demand for Data Science Skills is Disrupting the Job Market, an integrated set of skills, related to AI/machine learning, data science, and predictive analytics will be increasingly expected from current staff as well as new job applicants.

A National Academies report, Building America's Skilled Technical Workforce (2017), makes the argument that workers will need to be trained and re-trained across the spectrum of education levels as more types of industry digitize their operations, from manufacturing to agriculture to the service industries and beyond. Another National Academies report, Data Science for Undergraduates: Opportunities and Options (2018)*,* focuses on the implications for middle and high schools as well as community colleges and encourages partnerships across these institutions. However, there remains, in general, a lack of alignment between educational opportunities at all levels and business demands. A holistic, more strategic, approach to this challenge is still needed.

TRACK B1: **AI AND FUTURE JOBS**

Building upon these fundamentals, the goal of the NSF Convergence Accelerator Track B1—AI and Future Jobs—is to support research and development leading to technological tools that will connect individual workers with jobs, keeping in mind that periodic retraining and reskilling outside of traditional educational settings will increasingly become integral to successful lifetime careers.

Phase II of Track B1 (*AI and Future Jobs*) will support the creation of tangible deliverables, based on Phase I efforts. Ensuring fair and ethical treatment of workers will be a key guiding principle in the development of tools, resources and activities associated with this effort. Track B1 projects will consider the broad range of factors that may impact employment and training, such as disabilities and family responsibilities. Projects in this track may focus on particular industries or regions, specific populations such as veterans, or particular workplace types such as small businesses, decentralized

manufacturing, medical facilities, or K-12 schools.

TRACK B2: **NATIONAL TALENT ECOSYSTEM**

The goal of NSF Convergence Accelerator Track B2 is to support research and development leading to innovative approaches for employers to support workers seeking the skills required for 21st century work related to AI, data science, predictive analytics, and other technologies of the future.

Phase II of Track B2 *(National Talent Ecosystem)* will support the creation of tangible deliverables, based on Phase I efforts to devise research and development plans addressing multiple approaches toward re-envisioning the concepts, structures, and technologies needed for employers to support continuous learning for dynamic, digitally-intensive work, and provide access to skilled talent pathways, mentors and authentic workplace experiences. Successful projects will be informed by research on STEM (science, technology, engineering, and mathematics) learning, engagement, and its social context, as well as research on organizations and collaboration. Successful projects will focus on prototyping innovative approaches such as learning environments, platforms, interfaces, or simulations, tools for analysis, assessment, or prediction, and vehicles for recruitment and engagement, with the potential for wider implementation by industry, educational institutions, and other stakeholders engaging in the co-creation of a national talent ecosystem.

III. AWARD INFORMATION

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

Up to $30,000,000 will support the first year of approximately ten Phase II awards. Awards will be made as cooperative agreements.

Proposers may request up to $3,000,000 for the first year and up to $5,000,000 in total for the two-year project. The Year 1 budget will be committed upon award. Provision of the Year 2 budget is subject to satisfactory review of efforts and accomplishments through approximately six in-person and/or virtual meetings with NSF program staff, a panel review at the end of year 1, and availability of funds. Teams should plan on completing the effort within two years; no-cost extensions will be authorized only in extraordinary circumstances.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

> Proposals may only be submitted by the following:
>
> - This solicitation is limited to proposers who received a Phase I Award under Dear Colleague Letter (DCL) NSF 19-050 and wish to advance to Phase II. The organization that received the Pilot Phase I award does not have to be the proposing (lead) organization for the Pilot Phase II proposal, but must have been part of the Phase I team. Any change of proposing organization from Phase I should be explained in the proposal. Only one proposal may be submitted per Phase I award.
>
>   Full proposals MUST include multiple types of organizations, including IHEs, non-profit, for-profit, state or local government, and/or federal government entities as partners or they will be returned without review. From among the Phase I grantee teams, the categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E.

Who May Serve as PI:

> The PI and any Co-PIs must hold an appointment at an organization that is eligible to submit as described under "Who May Submit Proposals." At least one PI or Co-PI from a Pilot Phase I award must be included as a PI or Co-PI on a Pilot Phase II proposal. The same individual who served as PI for the Pilot Phase I award does not have to be PI for the Pilot Phase II proposal. Any change of PI and Co-PI should be fully explained in the proposal.

Limit on Number of Proposals per Organization:

> This solicitation is limited to proposers who received a Phase I Award under Dear Colleague Letter (DCL) NSF 19-050 and wish to advance to Phase II. The organization that received the Pilot Phase I award does not have to be the proposing (lead) organization for the Pilot Phase II proposal. Any change of proposing organization should be explained in the proposal. Only one proposal may be submitted per Phase I award.

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

> An individual may serve as PI or a Co-PI for only one proposal in response to this solicitation. This limitation includes PIs and Co-PIs listed for the proposing organization or any subaward submitted as part of the proposal. There are no restrictions or limits on serving as Senior Personnel.

Additional Eligibility Info:

> All Pilot Phase II proposals must be built upon a foundation developed by one or more Pilot Phase I awards supported under Dear Colleague Letter (DCL) NSF 19-050. Additionally:
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> - At least one Principal Investigator or Co-Principal Investigator from a Pilot Phase I award must be included as a PI/Co-PI on a Pilot Phase II proposal.
> - Any change of proposing institution or PI from the Pilot Phase I award should be fully explained and justified in the proposal.
>
> Proposers should describe the way(s) in which they plan to collaborate with other teams, which can include work via sub-awards.

Simultaneous proposal submissions for a single joint project from different organizations, with each organization requesting a separate award, will be NOT be accepted. If teams choose to create a fully integrated, single effort, only one proposal may be submitted.

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.

Proposal Title: The title of the proposal must begin with the track identifier (A1, B1, or B2) followed by a colon. The rest of the title of the proposal should describe the project in concise, informative language, without use of acronyms, so that a technically literate reader can understand what the project is about. The title should emphasize the science and engineering work to be undertaken and be suitable for use in the public press. The title does not need to be the same as the Phase I proposal title.

Personnel Listed on the Cover Sheet: Provide complete information requested on the cover sheet for the PI and up to four Co-PIs.

Project Summary: Prepare as described in the PAPPG.

Project Description: The project description should provide a clear statement of the work to be undertaken and must include the objectives for the period of the proposed work and expected significance. Proposals should discuss 1) objectives and significance of the proposed activity; 2) the suitability of the methods to be used; 3) the qualifications of the investigators and the participating organizations; 4) the ability of the effort to produce deliverables aligned with one of the tracks in this solicitation; and 5) how activities in the project plan will contribute towards "track success", i.e., the success of the full cohort of projects, in addition to the success of each individual project.

Proposals should clearly describe the specific role and contribution of each team member. Proposals should describe how the proposer will organize collaboration among project members to promote team effectiveness, taking into account the lessons learned from Phase I activities, such as human-centered design, user interviews, team science techniques, as well as domain-specific activities.

Proposing teams MUST be comprised of researchers and stakeholders from different disciplines that can help catalyze the proposed scientific discovery and accelerate the transition of that innovation into practical use. Phase II teams can involve different partners than were part of the Phase I proposal. However, at least one of the PI or Co-PIs in the Phase II proposal must have served as a PI or Co-PI for that project in Phase I. Any exception to this must be discussed with NSF in advance of proposal submission.

Project descriptions are a maximum of 15 pages and must contain separate sections within the narrative labeled "Intellectual Merit" and "Broader Impacts." Results of prior NSF support must be discussed, including work conducted during Phase I (see PAPPG for guidelines). This solicitation also has additional review criteria outlined in Section VI below. In addition to the requirements of the PAPPG, the project description must include sections that address the following:

- Convergence research *:* Explain how the work conducted in Phase I and the work proposed in Phase II represent research at the highest level of interdisciplinarity.
- Partnership : Describe how stakeholders from multiple kinds of organizations, including academic and non-academic partners, form deep and diverse partnerships in support of the proposed use-inspired research.
- Track *:* Explain the close match to one of the tracks in this solicitation (A1, B1, or B2) and how the proposed work in Phase II will assist in the success of the entire track.
- Deliverables : State clearly what are the planned, tangible deliverables, along with milestones, during the two-year award period as well as after two years of funding. Explain why there is a high probability that this plan will be achieved.

Supplementary Documents:

The proposal should include applicable supplementary documents as instructed in the *Proposal and Award Policies and Procedures Guide* (PAPPG). The following items are to be provided as additional supplementary documents and do not count against the 15-page limit for the project description.

- **List of Project Personnel**: *NSF staff will use this information in the merit review process to manage reviewer selection.* Each proposal must include a table that lists the PI, Co-PIs, and all Senior Personnel. This table should list the following information for each individual in separate columns: Last Name; First Name, Middle Initial; Organizational Affiliation. There is no limit on the number of Senior Personnel.
- **Phase I Portfolio:** *(up to three pages)* Each proposal should provide discussion of the participation of the project team in the in-person meetings and webinars, discussion of how Phase I efforts modified the project path, and documentation of any creative products or preliminary results developed during Phase I.
- **Timeline of Milestones and Deliverables**: *(one page)* Along with the Convergence Management Plan, each proposal must provide a visual representation (e.g., Gantt chart or alternative) of key milestones during the two-year award period, including creation of specific deliverables.
- **Convergence Management Plan**: *(up to two pages)* Each proposal must contain a Management Plan that describes how the project will be managed across disciplines, institutions, and stakeholder entities over time. This plan should identify specific convergence activities that will enable cross-disciplinary and cross-sectoral integration of teams, such as mentoring and/or professional development/training to support convergent outcomes, and the plan should provide a timeline showing principal tasks and associated interactions. The plan must address the specific roles and responsibilities of the collaborating PI, Co-PIs, other Senior Personnel, paid consultants, partners, any other stakeholder participants, and describe the timing and how tasks will be integrated over the course of the project.
- **Intellectual Property Management Plan:** *(up to three pages) Partnerships that facilitate the research effort and transition to practice of research results are a key element of the Convergence Accelerator program and a clear Intellectual Property Management Plan is essential for current and future partnerships.* Both ownership and management of IP should be addressed in the Intellectual Property Management Plan. The plan should include (1) IP contributed by partners included in this proposal, (2) IP that may be developed during the project, and (3) a plan for access to IP from (1) and (2) by potential future partners. Current and future partners may include, but are not limited to, institutions of higher education, non-profit organizations such as foundations or community organizations, for-profit organizations such as companies or investment groups, local/state/federal government, and others. The Intellectual Property Management Plan must articulate how potential future partners will access intellectual property within the project. Appropriate agreements must be in place before an award is made to successful proposals. Similarly, commitments from partner organizations for sharing of resources (such as data, research instrumentation, or any other required elements for carrying out the proposed work) should be described and formal agreements must be in place before an award is made. The Intellectual Property Management Plan is protected by the Privacy Act (as is the full proposal) and is the type of non-public information that NSF typically will not release beyond the closed, confidential review process, even under FOIA or other request. The Intellectual Property Management Plan will NOT be shared with organizations attending the pitch competition, but appropriate information that can be shared should be included in the Public Executive Summary document.
- **Broadening Participation Plan:** *(up to two pages)* As a pilot effort within the overall Convergence Accelerator Pilot, this solicitation requests that each project prepare a Broadening Participation Plan that describes activities that will be undertaken to increase the participation of underrepresented groups in the project's research and development efforts. The Broadening Participation Plan should be included as a supplementary document not to exceed 2 pages. Examples of ways to engage groups and/or individuals that are typically underrepresented could include: through the expertise of personnel, via partnerships, through work with users and user groups, via engagement with stakeholders, through use of datasets that represent information about underrepresented groups, etc. The Broadening Participation Plans should include: (1) the context of the proposed broadening participation activity(s), (2) the intended target population(s) for the activity(s), (3) the plan of activities over the project duration, (4) prior experience (if any) with broadening participation, and/or intended plan for preparation/training of project members in broadening participation, and (5) plans for the measurement and dissemination of outcomes in broadening participation.
- **Data Management Plan:** (*up to two pages*) In addition to the general elements of the data management plan described in the PAPPG, proposals should address within the Data Management Plan their plans for data-sharing across their team, across the track with other teams, and with the general public, during the project and after its completion as well.
- **Contribution to Track Success:** *(up to two pages)* Each proposal should include a description of how the proposed project will contribute to an integrated overall effort that will deliver useful outputs. This document should describe the types of activities that are proposed to be undertaken to promote track integration. After the awards are made, Phase II projects in each track will have the opportunity to interact and refine their plan for these integrating activities, with approval from NSF.
- **Public Executive Summary:** *(up to two pages)* Because the NSF is interested in partnering with industry, foundations, investment community, and others in Phase II, the proposal MUST include a Public Executive Summary that will be posted publicly and shared with potential NSF partners prior to the pitch competition. This supplementary document is the only element of the Phase II proposal that will be shared with attendees at the pitch competition and may also be posted publicly on the NSF Convergence Accelerator website. At a minimum, the Public Executive Summary should include the following: (1) Summary of the project's objectives and deliverables; (2) Current status of the intellectual property associated with the project; (3) Summary of the Intellectual Property Management Plan (produced as one of the supplementary documents mentioned previously); (4) A description of the current industry partners and how they are participating in the current Phase I activities and their expected participation in Phase II; (5) A clear and concise description of how the proposed project is different from other research and a comparison of other similar work the team is aware of; and (6) A description of the timeline for proposed milestones and deliverables of the project. The Executive Summary may include other information to help potential NSF partners decide about possible co-funding or provision of resources to the project. Potential partners will not receive any additional documentation from NSF other than the Public Executive Summary, but additional information may be requested from the proposer.
- **Letters of Collaboration:** If the project involves collaborative arrangements of significance, these arrangements should be documented through letters of collaboration. Letters of collaboration should state the intent to collaborate and describe the nature of collaboration, which ideally will include listing the tasks the collaborator will undertake. The letters should *not* contain endorsements or evaluation of the proposed project or sections of the proposal. Letters should be succinct and in general should not exceed two pages each. Refer to the PAPPG section II.C.2.j for instructions, although proposers are asked to provide more information than the PAPPG format for these letters. There is no limit on the number of letters of collaboration. *Please note that letters of recommendation for the PI or other letters of support for the project are not permitted.*
- **Postdoctoral Researcher Mentoring Plan:** *(up to one page)* As described in the PAPPG section II.C.2.j, each proposal that requests funding to support postdoctoral researchers must upload under "Mentoring Plan" in the supplementary documentation section, a description of the mentoring activities that will be provided for such individuals.

B. Budgetary Information

Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

Other Budgetary Limitations:

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

Budget Preparation Instructions:

Proposals should include a two-year budget. The budget for year 1 should not exceed $3,000,000 for the first year and the total budget for the two-year project should not exceed $5,000,000. Teams that show significant progress during the first year, in accordance with the agreed timetable of milestones and deliverables, may receive funding for a second year. Teams should plan on completing the effort within two years; no cost extensions will be authorized only in extraordinary circumstances.

Budgets for all projects must include funding for Senior Personnel to attend at least three meetings per year in the Washington, DC area.

Because a **significant level of personnel effort** is **expected** in order to achieve deliverables that benefit the American people in two years, PIs, Co-PIs and other Senior Personnel **may request more than two months of salary support**. The *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter II.C.2.g.(i)(a) contains NSF's policy on Senior Personnel salaries and wages. Any compensation for Senior Personnel in excess of two months must be disclosed in the proposal budget, justified in the budget justification, and must be specifically approved by NSF in the award notice budget.

Approximately 10% of the overall budget amount, and no less than 5%, should be set aside for collaboration among Phase II projects for *track integration* and potential cross-track activities. The **Contribution to Track Success Supplementary Document** should describe the types of activities that are proposed to be undertaken to promote track integration, and/or other cross-track activities. After the awards are made, Phase II projects in each track will have the opportunity to interact and refine their plans for these activities, with approval from NSF.

Although many proposals to this solicitation will include the participation of for-profit entities, note that NSF award budgets may not include profit or fee as line items.

Contributions from Partners should be described in the Facilities, Equipment and Other Resources section of the proposal which is described in *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter II.C.2.i. It is not appropriate in this section to list funding amounts that may be contributed by partners. Instead proposers should describe what facilities, equipment and other resources will be possible based on contributions (financial and otherwise) from any partners. Voluntary committed cost sharing is prohibited in the proposal as described in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter II.C.2.g.xii.

C. Due Dates

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

    May 13, 2020

        Full Proposal Deadline

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

For Proposals Submitted Via FastLane or Research.gov:

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

For Proposals Submitted Via Grants.gov:

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

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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

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

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

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

A. Merit Review Principles and Criteria

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

1. Merit Review Principles

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

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

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

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

2. Merit Review Criteria

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

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

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

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

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

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

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

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

Additional Solicitation Specific Review Criteria

In addition to above criteria, reviewers will be asked to address the following questions:

- Convergence Research
  - Do the Project Description, Phase I Portfolio, and Convergence Management Plan represent research at the highest level of interdisciplinarity, justifying this investment in supporting a convergence research team?
- Partnership
  - Does the proposal - including letters of collaboration and the Facilities, Equipment and Other Resources section - make a strong case that stakeholders from multiple kinds of organizations, including academic and non-academic partners, form a deep and diverse partnership that supports the use-inspired research proposed?
- Track
  - Is the proposed research appropriate, i.e., is there a close match to one of the tracks in this solicitation (A1, B1, or B2)?
  - Do the proposed ideas differ markedly from research supported by other NSF programs, initiatives, Big Ideas or other NSF funding mechanisms?
  - Is there a convincing explanation of how the effort proposed in Phase II will assist in the success of the entire track?
- Deliverables
  - Do the Project Description, Convergence Management Plan, and Timeline of Milestones and Deliverables indicate a high probability of deliverables within a two-year period that will ultimately benefit society?

Pitch Competition

Following the proposal review panels, the Convergence Accelerator Office will execute an in-person oral *pitch competition* consisting of two "pitch days." Pitch Day 1 will consist of two sessions – one for Track A1 and one for Tracks B1 and B2. The Track A and B events will run in parallel. Each Day 1 pitch session will have a separate review panel with members from academia, industry, and other sectors. The Pitch Day 1 event will include NSF reviewers and competing teams only.

The review criteria for the pitch session are the same as those applied to the written proposal and described above. Intellectual Merit and Broader Impacts continue to be the key review criteria. From the solicitation specific review criteria, Partnerships and Deliverables may be easier to assess in the pitch format than Track and Convergence, but reviewers will be asked to comment on all four areas.

Expressions of Interest

The Pitch Day 2 event will be presented to an invited audience of other potential funders from industry, foundations, other government agencies, and other members of the investment community, as well as the broader public (press, etc.). These Pitch Day 2 attendees will have the opportunity to provide "Expressions of Interest" in projects. Any organization or individual that seeks to attend the pitch competition should contact the Cognizant Program Officers listed at the beginning of this solicitation and C-Accel@nsf.gov. Invitations to attend the pitch competition will focus on organizations interested in potentially contributing resources to the specific research and development areas identified in the Phase II projects, but other interested groups and individuals may also attend. Accordingly, only information that is intended for a public audience should be included in the Pitch Day 2 Presentation. Expressions of Interest may be submitted at any time by email to C-Accel@nsf.gov, but are primarily expected within approximately one week of the pitch competition. A format for potential Expressions of Interest will be provided at the pitch competition and will be available online. Additional information will be provided when the Public Executive Summaries are posted on the NSF Convergence Accelerator website.

Schedule and Location for Pitch Presentations

The National Science Foundation will notify all proposers of the schedule for the oral Pitch Presentations and provide further details as they become available. Pitch Presentations will likely be held in or near Washington, DC, at a location near the National Science Foundation. Pitch Presentations should comply with these instructions and any additional instructions that the NSF may provide prior to the presentation. The date of the pitch competition will be approximately 2-4 weeks after the full proposal due date.

Participation and Attendance in the Pitch

A proposers oral Pitch Presentation team may include the presenter and up to four others. The proposer may send a maximum of 5 representatives to the Pitch Presentation. Representatives may be from any of the Convergence Accelerator team members. The presenter should be a person engaged with

the project, such as the PI, a Co-PI, or a Senior Personnel member from the team. Any one (or more) of these individuals can make the presentation. It is not required that the PI be the presenter, but the presenter should not be a person engaged just to make the pitch.

Format of the Pitch

The Pitch Presentations will occur as follows:

- The proposer will have about 8 minutes (maximum 10 minutes) to present their proposed Convergence Accelerator Phase II approach to the review panel on Pitch Day 1.
- Time may be allocated for the NSF pitch review panels to ask questions of the proposer following their pitch on Day 1. The question-and-answer period does not count against the oral Pitch Presentation time limit.
- Proposers will have approximately 5-8 minutes to present their proposed Convergence Accelerator Phase II approach on Pitch Day 2. The exact time allotted will be defined for proposing teams at least one month prior to the pitch events. Because the NSF is interested in partnering with industry, foundations, investment community, and others in Phase II, the NSF intends to open the Day 2 Pitch Presentations to participation from these communities and potentially also the broader public by invitation. Organizations wishing to attend the Pitch Presentation should contact the Cognizant Program Officers at the beginning of this solicitation and C-Accel@nsf.gov.
- The NSF reserves the right to hold question-and-answer session(s) during or immediately after Pitch Day 2. The question-and-answer session(s) does not count against the oral Pitch Presentation time limit.

Expected Pitch Content

The oral Pitch Presentation should address the following:

1. Introduce the team number and name, names and titles of presenting personnel and their role in this project, and provide a brief (one sentence) description of the Phase II project.
2. Provide a brief summary of the Convergence Accelerator Phase I project that includes:
   - The initial objectives of the project when it was funded.
   - Key learnings during the Phase I project and how they resulted in revision to project plans and deliverables and informed the Phase II application.
   - Any outcomes or outputs from the Phase I project.
3. Provide a summary of the proposed Convergence Accelerator Phase II project that includes:
   - A clear description of the innovation and why it is needed.
   - The broader social impact of the project, including potential applications if the Phase II effort is successful.
   - The objectives for the project.
   - The key deliverables and expected outcomes (concrete and measurable).
   - The capacity and capabilities of the team to execute the project including management, staffing and necessary technical and other skills.
   - The current and expected partners making firm commitments that will help the team achieve the project goals. This may include collaborations with other teams.
   - Describe project elements and activities that will contribute to integrating efforts among or across projects to achieve track success.
4. Any additional topics provided by the NSF prior to the oral Pitch Presentation.

The above topics should successfully address the Merit Review Criteria of Intellectual Merit and Broader Impacts, as well as the solicitation specific criteria, set forth previously in this solicitation.

Teams may prepare different presentations for the Pitch Day 1 and Pitch Day 2 events.

Presentation Media

Proposers shall prepare all presentations using electronic presentation tools when making the oral pitch presentation. The proposer shall provide electronic copies of the oral pitch presentation one week in advance of the presentation.

Overall Evaluation

NSF will assemble a list of recommended Phase II awards based on all review information available, including the written proposal reviews and the Day 1 pitch reviews. This is the core material the program will use in making award recommendations. Expressions of Interest will be considered separately from the proposal and pitch panel reviews based on complementarity with NSF's mission and the specific goals of the Convergence Accelerator. Proposing teams can choose if and how to engage with any organization that seeks to interact with them directly or via an Expression of Interest. An Expression of Interest is not required for a Phase II award recommendation, and the presence of Expressions of Interest does not guarantee Phase II success. NSF will consider the extent to which Expressions of Interest complement NSF goals, seem likely to assist project success, are desired by the project team, and seem likely to increase the success of the overall track. These considerations may influence final award recommendations.

If Expressions of Interest lead to agreements to support projects between organizations and NSF, proposers potentially receiving support via those agreements would work directly with the organization providing the Expression of Interest to determine what proprietary information the proposer is willing to share (e.g. proposal, Intellectual Property Management Plan). NSF may agree to share unattributed reviews of the proposal and/or pitch materials with the partner organizations as well as potentially allowing partner organizations to serve as observers at post-award site visits and/or sharing unattributed site visit reviews.

B. Review and Selection Process

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

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

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals

have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Special Award Conditions:

NSF Convergence Accelerator Pilot Phase II awards are made in the form of cooperative agreements. The cooperative agreements will have a section of 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. Within the first approximately 30 days of the Award, all Senior Personnel will be required to participate in an approximately two-day meeting at NSF. In addition, Senior Personnel will be required to attend an evaluation meeting at NSF near the end of year one. The purpose of the evaluation meeting is to assess progress the awardees have made towards advancing project goals via a well-functioning interdisciplinary and multi-organization team. Each awardee team will prepare briefing material (expected to be 10 pages or less) describing its accomplishments and make a short presentation which will be followed by questions and answers. The reviewers will evaluate the team's progress towards its stated goals and, in particular, progress towards creating deliverables. Taking into account reviewers' input, NSF will make a decision if the team will receive funding for the second year. As noted in "Budget Preparation Instructions," budgets for all projects must include funding for Senior Personnel to attend three meetings per year at NSF. At least one of these meetings each year is likely to focus on track integration.

The NSF Convergence Accelerator Pilot Phase II projects will be required to submit annual reports on progress and plans which will be used as a basis for performance review and determining the obligation of continuing grant increments. Annual reviews of progress will also take the form of site visit(s) or reverse site visit(s). In addition, PIs will be required to participate in other meetings and interactions with NSF staff and provide documentation for these meetings. The data will capture the information required to demonstrate progress towards achieving the project goals and the goals of the relevant track (A1, B1, or B2) of the NSF Convergence Accelerator Pilot.

Grantees will be required to include appropriate acknowledgment of NSF support under the NSF Convergence Accelerator 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 Convergence Accelerator under Award No. (Grantee enters NSF award number.)"

Grantees 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.

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:

- Lara A. Campbell, telephone: (703) 292-7049, email: lcampbel@nsf.gov

- Michael Pozmantier, telephone: (703) 292-4475, email: mpozmant@nsf.gov

- Linda Molnar, telephone: (703) 292-8316, email: lmolnar@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.

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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.E.6 for instructions regarding preparation of these types of proposals.

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

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

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

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