NATIONAL SCIENCE FOUNDATION
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NSF 22-021

Dear Colleague Letter: Request for Information on Future Topics for the NSF Convergence Accelerator

December 13, 2021

Dear Colleagues:

OVERVIEW

This Dear Colleague Letter (DCL) replaces NSF 21-012, which was the previous Request for Information (RFI) on Future Topics for the NSF Convergence Accelerator.

The Convergence Accelerator builds upon NSF investments in fundamental research and discovery to accelerate solutions toward societal impact using a three-tiered approach: topic ideation, followed by convergence research phases 1 and 2. Topics aligned to a specific research focus are called "tracks" and funded teams constitute a cohort. The teams include multiple disciplines, expertise and cross-sector partnerships to stimulate innovative ideas and to develop long-lasting, sustainable solutions to support a variety of societal challenges.

The purpose of this RFI is to seek input from industry, institutions of higher education (IHEs), non-profits, state and local governments, and other interested parties on potential NSF Convergence Accelerator tracks for the next round of funding, anticipated in fiscal year (FY) 2023.

This RFI does *not* invite research proposals. However, collective input from different ideas submitted may result in the identification of potential topics for future research funding opportunities. Through this DCL, the Convergence Accelerator is providing a direct opportunity to offer input on potential topic ideas for FY 2023.

BACKGROUND

The objectives of the NSF Convergence Accelerator are to accelerate *use-inspired convergence* research in areas of national importance and societal challenges, and to initiate convergence team-building capacity around exploratory, potentially high-risk proposals addressing selected convergent research topics.

The NSF Convergence Accelerator funds and synergizes teams together in a cohort to work interactively toward solving national-scale societal challenges that require ideas, approaches, and techniques from a wide range of diverse disciplines, experts and sectors. Teams are composed of representatives from academia, industry, government, non-profits, and other communities of practice. Disciplines include all science and engineering fields, and also other areas like law, healthcare, communications, and business management needed to accelerate the solutions forward.

Teams selected for funding by the Convergence Accelerator will leverage the program's fundamental activities to include the integration of multidisciplinary research and innovation processes such as human-centered design; customer/user discovery; team science; early-stage prototyping; communications and storytelling and pitching. The overarching focus is on use-inspired research, which engages the end user early in the design process to ensure that solutions address issues of significant national and societal impact. Furthermore, the teams include a wide variety of knowledge needed to stimulate discovery and innovation, and to ensure that ideas transition to impactful benefits. In addition to expertise, partners may provide resources, services, infrastructure, and pathways for transitioning research to practice.

The Convergence Accelerator program model includes three phases—topic ideation, followed by convergence research phases 1 and 2. Teams that complete the convergence research phases are expected to deliver high-impact solutions that address societal needs and continue impact beyond NSF support.

Ideation Process – Topic Identification:

Convergence Accelerator research topics originate in the ideation process. Ideas from the community are gathered through a DCL/RFI such as this one. For ideas that meet the program's criteria, the Convergence Accelerator then supports community workshops to further develop and frame the ideas to incorporate convergence research as well as collaboration among stakeholders from various disciplines. The workshop findings assist NSF in developing the final convergence research tracks to be funded for the next year.

Convergence Research Phases 1 & 2:

The Convergence Accelerator speeds use-inspired research into practice through a two-phase process. Yearly, the program releases a funding opportunity featuring at least two research tracks. Topics aligned to a specific research focus are called "tracks" and funded teams constitute a cohort. All teams within the cohort begin in Convergence Research Phase 1.

At the end of phase 1, the teams participate in a formal NSF pitch and proposal process,

which is used in selecting teams for phase 2. Teams selected for Convergence Research Phase 2 will continue accelerating their solutions toward impact. By the end of the convergence research phases, the funded solutions are expected to be sustainable and impactful in addressing societal needs.

Funded Cohorts and Track Topics:

The Convergence Accelerator's portfolio spans three cohorts launched in FY 2019, 2020, and 2021. Information about these previous cohorts is included below.

2019 Cohort:

The NSF Convergence Accelerator Pilot, also referred to as the 2019 cohort, featured tracks on *Open Knowledge Networks* (Track A), related to the NSF Harnessing the Data Revolution (HDR) Big Idea; and *AI and Future Jobs* (Track B1) and National Talent Ecosystem (Track B2), related to the Future of Work at the Human-Technology Frontier (FW-HTF) Big Idea.

Phase 1 resulted in 43 awards (21 teams in Track A and 22 teams in Tracks B1 and B2). Nine teams from the 2019 cohort were awarded phase 2 awards.

For more details, see:

- Ideation Process and Convergence Research Phase 1: DCL: NSF 19-050; and
- Convergence Research Phase 2: NSF 20-555.

2020 Cohort:

The Convergence Accelerator 2020 cohort is focusing on tracks of Quantum Technology (Track C) and AI-Driven Innovation via Data and Model Sharing (Track D). Track C complements NSF's Quantum Leap (QL) Big Idea and aligns with the National Strategy for Quantum Information Science aiming to improve the U.S. industrial base, create jobs and provide significant progress toward economic and societal needs. Track D complements NSF's Harnessing the Data Revolution (HDR) Big Idea and the National AI Research and Development (R&D) Strategic Plan to advance R&D investments in priority areas of AI. Phase 1 resulted in 29 awards (11 teams in Track C and 18 teams in Track D). Ten teams from the 2020 cohort have been selected to advance to phase 2.

For more details, see:

- Ideation Process: DCL NSF 19-065; and
- Convergence Research Phase 1 and 2: NSF 20-565.

2021 Cohort:

The Convergence Accelerator 2021 cohort is focusing on the Networked Blue Economy

(Track E) and *Trust and Authenticity in Communications Systems* (Track F). Track E aims to create a smart, integrated, connected, and open ecosystem for ocean innovation, exploration, and sustainable utilization. This track complements the efforts outlined in the 2019 Powering the Blue Economy workshop sponsored by NSF. Track F complements efforts across the Federal Government to combat misinformation by funding R&D that will result in new approaches to prevention and intervention. The 2021 cohort phase 1 resulted in 28 awards (16 teams in Track E and 12 teams in Track F).

To encourage the participation of both academic and non-academic submitters, the Convergence Accelerator released the 2021 funding opportunity through two funding opportunity pathways. The first pathway was through a traditional NSF program solicitation. The second opportunity was through a Broad Agency Announcement (BAA) to specifically encourage industry, non-profits, and other organizations to submit proposals.

For more details, see:

- Ideation Process: DCL NSF 20-061;
- Convergence Research Phase 1 and 2:
    - Traditional NSF grant solicitation: NSF 21-572; and
    - BAA solicitation: NSFBAA-CA21-01.

2022 Cohort:

NSF anticipates announcing the Convergence Accelerator 2022 tracks shortly. The tracks will be the result of the ideation process pursuant to the previous version of this DCL:

- Ideation Process: DCL NSF 21-012.

OBJECTIVE

The objective of this DCL is to seek ideas for NSF Convergence Accelerator FY 2023 tracks that build upon use-inspired fundamental research aligned to the National Science Board's Vision 2030 and/or NSF's Big Ideas. Of particular interest to NSF are approaches to advance Critical and Emerging Technologies as described in the Multi-Agency Research and Development Priorities for FY 2023. Topics must emphasize *convergence research*, requiring deep multidisciplinary collaboration, including cross-sector partnerships. Topics that have been selected for prior or ongoing Convergence Accelerator tracks are likely to be of low priority. It is recommended that ideas for new topics, which have significant societal impacts, be submitted.

WHAT NSF IS LOOKING FOR?

Initial ideas submitted must provide the following information (see survey link for permissible

length of responses):

1. Name [Point of Contact]:
2. E-mail:
3. Institutional Affiliation:
4. Concept Title:
5. What is the high impact societal need that is being targeted?
6. What disciplines will engage using a convergent approach in addressing this need?
7. Who are the major stakeholders (e.g., academic, private industry, government, non-profit) that need to be engaged to address the societal need? Describe what major stakeholders you have already contacted to address this need and why they would want to be involved.
8. Provide examples of potential deliverables that would impact society and are achievable in a three-year effort.

After receiving the RFI input, NSF plans to invite up to 12 submitters to engage with NSF for further discussions of their proposed topics. The NSF Convergence Accelerator team, in consultation with the NSF-wide Convergence Accelerator Working Group, will then develop topics for the FY 2023 funding opportunity.

TIMELINE

Responses to this RFI must be submitted by **February 28, 2022**.

HOW TO RESPOND TO THIS RFI?

Submit your ideas at https://www.surveymonkey.com/r/NSF_CA_2021_RFI and complete the online questionnaire no later than February 28, 2022. While completing the questionnaire, select the "email contact" field to enable a courtesy copy of your response to be sent to your Authorized Organizational Representative or institutional leadership, to ensure organizational awareness of your RFI submission.

WHAT WILL NSF DO WITH THIS INFORMATION?

NSF will invite and fund workshop proposals based on the concept information submitted for future NSF Convergence Accelerator track topics. Please do not include confidential or proprietary information in your submission. The information submitted will support NSF's internal planning of future NSF Convergence Accelerator activities.

Sincerely,

Douglas Maughan
Head, Convergence Accelerator
NSF