NSF CONVERGENCE ACCELERATOR (CA)

CA Funding		
(Dollars in Millions)		
FY 2019 Actual	FY 2020 (TBD)	FY 2021 Request
$41.39	**-**	**$70.00**

Overview

CA seeks to transform how NSF supports innovative science, reflecting its commitment to foundational research, while also encouraging rapid advances through partnerships between academic and non-academic stakeholders. CA makes timely investments that (1) initiate new capabilities to accelerate convergence research in areas of national importance, and (2) build capacity in multi-stakeholder convergence teams to address these critical challenges. Focusing on use-inspired, convergence research, with directed deliverables and using an approach that rewards innovation, risk-taking, and transition to use, CA has customized various models and techniques of acceleration and innovation activities that have proven successful outside the federal government. For more information on convergence research, see the Growing Convergence Research narrative in this chapter.

NSF is well positioned to implement an acceleration of convergence research. CA complements NSF's existing programs and enhances NSF's capacity to move ideas from discovery into practice. NSF has a unique role with colleges and universities, which are critical participants in this activity, as well as with other stakeholders, such as other federal agencies, industry, non-profits, foundations, and funding agencies around the world. The CA is aligned with, builds upon, and stimulates new directions for NSF directorates' foundational research investments. Therefore, the CA will complement NSF's portfolio of funding mechanisms to accelerate research.

To surface grand challenge research ideas/themes that are of mutual interest to academia, government, and industry, CA uses a variety of methods, such as multi-stakeholder roundtables and workshops. These themes are referred to as "tracks" with anticipated time horizons for each track of up to three years. Each track will comprise a number of multi-stakeholder teams that will work collaboratively to accelerate science and engineering for that particular research theme.

The initial CA pilot in FY 2019 focused on two of NSF's research Big Ideas: HDR and FW-HTF. Tracks that come from these particular research areas have been identified by the cross-agency CA Working Group and aligned with Administration R&D Priorities,[1] the President's Management Agenda,[2] and the U.S. Five-Year STEM Education Strategic Plan.[3] The HDR track focuses on advancing data-driven discovery using artificial intelligence (AI) and machine learning, through research on the components necessary to create early prototypes of an open knowledge network. The FW-HTF tracks focuses on: (1) team building and creating R&D plans addressing multiple components of AI for connecting workers with jobs of the future, such as predictive AI tools, economic and labor market analyses of needed skills for future workplaces, and AI-assisted educational technologies needed for adult learning; and (2) innovative approaches toward re-envisioning the concepts, structures, and technologies needed for employers to support continuous learning for dynamic, digitally-intensive work, and to provide access to skilled talent pathways, mentors, and

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[1] www.whitehouse.gov/wp-content/uploads/2019/08/FY-21-RD-Budget-Priorities.pdf
[2] www.whitehouse.gov/wp-content/uploads/2018/03/The-President%E2%80%99s-Management-Agenda.pdf
[3] Charting a Course for Success: America's Strategy for STEM Education" National Science and Technology Council (2018), www.whitehouse.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf.

authentic workplace experiences.

The CA track investments are distinguished from the corresponding Big Ideas by the nature of the research, the time scale of the activities supported, and the more hands-on, agile approach to project management and support that is envisioned.

Goals

1. *Accelerate the progress of use-inspired convergence research*: Accelerate scientific discovery and innovation by applying more agile team identification, funding, and project management mechanisms to use-inspired, convergence research that requires the integration of knowledge, skills, and methodologies from multiple disciplines and stakeholders.
2. *Harness partnerships to design and enable convergence research*: Assist academic researchers to engage with non-NSF partners—such as commercial entities, non-profits, foundations, philanthropies, other state or federal agencies, and international funders—to create partnerships that identify high-impact research directions and collaborate to achieve specific research goals.
3. *Focus cohorts of teams around broad national goals*: Support activities that bring together the range of expertise needed to tackle pressing, transdisciplinary research challenges and enable the formation of advanced research teams. Use competition mechanisms to enable cohorts of teams to progress towards research goals more rapidly than single teams alone.

FY 2021 Investments

NSF's FY 2021 Request for CA funding is $70.0 million, which will support the following activities:
- continuing support of the HDR and FW-HTF related CA tracks and see these projects to completion;
- continuation of the FY 2020 CA tracks that will transition from Phase I to Phase II;
- initiation of new FY 2021 CA track projects; and
- community workshops, roundtables, and analysis.

The new research tracks for FY 2020 and FY 2021 will be stimulated by research in NSF's Big Ideas and other research areas based on mutual interest of the partners and readiness of the research community to respond. New tracks will be developed through community workshops, roundtables (e.g., with industry, non-profits, and foundations), and analysis of emerging foundational advances in NSF's Big Ideas. Each track will address all three CA goals.

NSF anticipates that external partners will begin contributing financially to the effort in FY 2021. For the partners, this is a new avenue for R&D, allowing access to academic researchers working at the forefront of knowledge. For the academic researchers, this allows access to partners who are interested in contributing to research projects and the broader themes/tracks. Potential partners will be identified in two different ways: (1) by principal investigators, who understand the key stakeholders for their particular research projects; and (2) by NSF, as it develops new tracks through convenings with industry, foundations, and government agencies and workshops with the relevant research communities. For more information about CA, see the IA narrative in the R&RA chapter.