NATIONAL SCIENCE FOUNDATION
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NSF 22-036

Dear Colleague Letter: Announcement of Upcoming Topics for the 2022 NSF Convergence Accelerator Solicitation

January 4, 2022

Dear Colleague:

OVERVIEW

Building upon the National Science Foundation's (NSF) investments in fundamental research and discovery, the NSF Convergence Accelerator aims to accelerate solutions toward societal impact. The NSF Convergence Accelerator comprises three phases: topic ideation, followed by convergence-research phases 1 and 2. Teams funded by the NSF Convergence Accelerator include multiple disciplines, expertise, and cross-sector partnerships to stimulate innovative ideas and develop long-lasting, sustainable solutions to societal challenges that are organized around the program's research track topics.

The purpose of this Dear Colleague Letter (DCL) is to make the research and innovation community aware of the convergent research topics selected from the program's recent ideation process (based upon Dear Colleague Letter/Request for Information NSF 21-012) for fiscal year (FY) 2022. These topics will be included as tracks for the FY 2022 cohort in an upcoming funding opportunity requesting submissions to the NSF Convergence Accelerator. This DCL is intended to provide additional time prior to the release of the new funding opportunity for researchers, innovators, and educators to form teams addressing these topics.

TRACK TOPICS SELECTED FOR THE UPCOMING 2022 SOLICITATIONS

The goals 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 following topics have been selected to be included in the 2022 solicitation that is expected to be published in the coming months:

Track H: Enhancing Opportunities for Persons with Disabilities

There are almost 50 million people with disabilities (PWD or PWDs) in the United States today. PWDs, especially women and those from traditionally underserved racial and ethnic groups, experience major physical and professional barriers that can impact their health, careers, and overall quality of life. The NSF Convergence Accelerator's Track H: Enhancing Opportunities for Persons with Disabilities will serve as a platform to bring together researchers, practitioners, and stakeholders from a wide range of disciplines and sectors to work on use-inspired solutions to enhance quality of life and employment access and opportunities for PWDs. The convergent research track topic was chosen based on the results of NSF-funded community workshops, such as the Accelerating Disability Inclusion in Workplaces Through Technology Workshop and Liberate 2021: Living Better through Rehabilitative and Assistive Technology. Broad topics within this track may include – but are not limited to – the ones listed below.

- Development of innovative assistive or rehabilitative technologies to help improve equity, inclusion, and accessibility for PWDs of all ages. These could be based on advances in social and rehabilitation robotics; non-invasive stimulation technologies; advanced materials; additive manufacturing/3D printing; battery technologies; sensors; flexible printed electronics; soft robotics; neuromorphic engineering; extended reality; autonomous vehicles; and information and communication technologies.
- Design of and enhancements to assistive technologies and access to digital and in-person spaces; hiring and workforce accommodations; training; workforce development; integrated services; work-based learning and K-16 education; and scalable and adaptive retraining tools.
- Creation of tools, methods, software, and other resources that are based on translational approaches rooted in social sciences, behavioral sciences, ethics, and economics, and that ultimately advance innovative policies and procedures to aid PWDs and the communities they interact with. Projects could also focus on the provision and coordination of services; design of accessible transportation and housing; workforce programs; and other key focuses.

Track I: Sustainable Materials for Global Challenges

The objective of the NSF Convergence Accelerator's Track I: Sustainable Materials for Global Challenges will be to converge advances in fundamental materials science with materials design and manufacturing methods in an effort to couple their end-use and full life-cycle considerations for environmentally- and economically-sustainable materials and products. This convergent research track topic was based on the results of NSF-funded community workshops, such as Accelerating Translational Materials R&D for Global Challenges and Socioresilient Infrastructure: Precision Materials, Assemblages, and Systems. Broad topics within this track may include – but are not limited to – the ones listed below.

- Materials research data-sharing principles and infrastructure (Materials Informatics); making materials knowledge usable in design and manufacturing, and for all key stakeholders; and software and tools to enable decision making across the supply chain to support improvements in systems-level analysis packages.
- Critical materials and manufacturing processes, such as microelectronics and their components; solutions for sustainable polymers in areas of high unmet need such as healthcare and packaging; and commercially-viable materials for sustainable clean energy (e.g., batteries, photovoltaics, wind turbines, hydrogen) and transport.
- Full life cycle and sustainability "Systems Thinking" in materials design including the construction of inclusive, large-scale partner ecosystems and education/workforce development for sustainable design that is connected to opportunities in industry. Education (for and as) infrastructure, including scaling of innovative curricula and training for inclusive sustainable infrastructure design and job creation. This could include community/citizen science projects for socio-resilient infrastructure such as housing for displaced persons that is resilient to changing weather patterns.

Track J: Food & Nutrition Security

The overarching goal of the NSF Convergence Accelerator's Track J: Food & Nutrition Security will be to accelerate convergence across food and nutrition sectors to address intertwined challenges in supporting population health, combating climate change, and addressing the nutritional needs of the most vulnerable by empowering youth, women, and disadvantaged communities. The convergent research track topic was chosen based on the results of NSF-funded community workshops, such as Digital and Precision Agriculture and Sustainable Systems Enabling Food Security in Extreme Environments and Food Deserts Employing a Convergence of Food, Energy, Water and Systems for Societal Impact. Broad topics within this track may include – but are not limited to – the following:

- Assessing, modeling, and prediction of food deserts (geographic areas with limited access to affordable and nutritious food); food security in extreme environments; and analyzing food deserts with the focus to create socially, politically, economically, and culturally acceptable solutions. Teams will use existing datasets, coupled with data analytics, machine learning and artificial intelligence, to build upon or create predictive models and forecasting algorithms to anticipate future food deserts and propose sustainable systems that enable food security in susceptible regions, while accounting for the potential effects of climate change.
- Planning, prototyping or modeling for food optimization and minimization of waste, including the utilization of sensors, data, and networks while also addressing policy, food labels and discard behavior.
- Combining concepts and approaches from social sciences, biology, chemistry, and engineering to develop plans and methods to promote sustainable systems and enable

food security and food literacy.

The FY 2021 solicitation published by the Convergence Accelerator (NSF 21-572) provides further details about the program structure and can be used as a resource until the FY 2022 solicitation is published. For example, as outlined in the FY 2021 solicitation, in addition to the standard NSF merit review criteria, proposals should also address Convergence Research, Partnerships, Deliverables, Track Alignment, Intellectual Property, and Broadening Participation, which constitute key components of funded NSF Convergence Accelerator projects.

Should you have questions about this DCL, please contact the Convergence Accelerator at: Convergence-Accelerator@nsf.gov.

Sincerely,

Douglas Maughan
Head, Convergence Accelerator
NSF