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Frequently Asked Questions (FAQ) for the NSF Convergence Accelerator (NSF 19-050)

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DEFINITIONS

1. What is the NSF Convergence Accelerator? What is it accelerating?

The NSF Convergence Accelerator (C-Accel) is a new organizational framework within NSF that stands separately from the NSF research directorates. It has its own budget, staff, and initiatives. Each accelerator track will be time-limited and will focus on specific research topics and themes. The Accelerator will reward high-risk, innovative thinking by multidisciplinary teams of researchers and their partners who want to accelerate

discovery and innovation. The Convergence Accelerator will be a new way of achieving rapid research outcomes. It will accelerate convergence research that is use-inspired and directed at solutions for important national challenges.

NSF identifies [Convergence Research](#) as having two primary characteristics:

- *Research driven by a specific and compelling problem.* Convergence Research is generally inspired by the need to address a specific challenge or opportunity, whether it arises from deep scientific questions or pressing societal needs.
- *Deep integration across disciplines.* As experts from different disciplines pursue common research challenges, their knowledge, theories, methods, data, research communities and languages become increasingly intermingled or integrated. New frameworks, paradigms or even disciplines can form sustained interactions across multiple communities.

Each team responding to [NSF 19-050](#) should include, or have a plan to include, the necessary disciplinary expertise AND partnerships with non-academic organizations that can move the proposed research results into applications that serve the public. The C-Accel pilot focuses on three tracks that align with two of [NSF's Big Ideas](#).

2. **How does this "acceleration" fit into NSF's role of supporting basic research?**

The Convergence Accelerator supports fundamental research that, often through the involvement of non-academic partners, can be expected to produce outputs that can quickly have an impact on practice and produce societal benefits. The research is use-inspired but is still research, not product development. The Convergence Accelerator efforts seeks to support high-risk/high-reward research that is not likely to be supported by the private sector or by NSF's core programs, and that will produce particular value as a shared public asset. For research with potential impacts in the commercial sector, the Convergence Accelerator effort at Phase 1 can be at a similar research stage to phase 1 Small Business Innovation Research (SBIR), but should be much broader in scope and partnerships. Research results from C-Accel could feed into SBIR or other public or private sector efforts to put tools or products into use. Convergence Accelerator research may also be put to good use by non-commercial partners such as non-governmental organizations (NGOs) or state or local governments. Partnerships with state, local, and/or tribal governments, non-governmental organizations, and private sector entities are encouraged to facilitate the transition to practice.

3. **What is convergence research?**

Convergent research is a means of solving vexing research problems, especially complex problems focusing on societal needs. It entails integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to

catalyze scientific discovery and innovation, focused on solving a specific, compelling problem. A deeper explanation of the convergence concept can be found in a 2014 National Academies report, "[Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering and Beyond.](#)"

4. **What is the RAISE Mechanism? Are there any special requirements?**

RAISE stands for [Research Advanced by Interdisciplinary Science and Engineering](#) and is a type of proposal by which bold, interdisciplinary projects can be submitted to NSF. C-Accel is using this proposal type because scientific advances associated with the C-Accel proposals are expected to lie outside the scope of a single program or discipline; the lines of research are expected to generate transformational advances; and because the prospective discoveries reside at the interface of disciplinary boundaries that may not be recognized through NSF's traditional review mechanisms. NSF C-Accel anticipates that Phase 1 proposals will be evaluated first by internal experts, and then, for groups of the most promising proposals, NSF will seek additional advice from external reviewers.

RAISE requires that research efforts include two or more intellectually distinct disciplines. Internal review of research concept outlines and full proposals will ensure that research efforts are interdisciplinary. The RAISE guidelines do not provide a specific definition of intellectually distinct disciplines; however, NSF anticipates that projects in the C-Accel pilot will span areas supported by more than one NSF directorate.

5. **What is a Convergence Accelerator *TEAM*?**

A Convergence Accelerator team is the group of researchers, innovators and other partners working on a Convergence Accelerator project. The team should be composed of personnel from a mix of disciplines and organizations, including non-academic partners, needed to accomplish the project goals of accelerated use-inspired research. The proposal may include subawardees and other types of partners. Not all partners need be identified at the time of Phase 1 proposal submission; however, the proposal should clearly lay out the path to completing recruitment of the full team. There are no upper limits on team size. Teams are expected to evolve and change as a project is refined and executed and are expected to include more than one type of organization.

6. **What is a Convergence Accelerator *COHORT*?**

A cohort is the set of teams that begin their Phase 1 Convergence Accelerator projects at approximately the same time. The first C-Accel cohort is anticipated to receive funding in late summer 2019. Cohorts will collaborate to leverage their respective efforts and will receive training together in Phase 1, and in Phase 2. Cohort training is

discussed more fully in the ACTIVITIES section of the FAQ, below.

7. What is meant by **PARTNERSHIPS** in convergence accelerators?

Partnerships build the team that conducts the project. In addition to researchers, each team should include partners who can help provide the insights and resources needed to ensure that the research effort is leading to research products with practical applications. Each partner in a team may contribute different types of expertise, insights and other resources. Partners may be subawardees or can be connected to the team through other types of agreements, for instance partnership agreements or memoranda of understanding for sharing of information or other resources.

8. What is the role of partnerships?

It is anticipated that strong partnerships between academic and non-academic organizations will be a hallmark of a C-Accel. Successful Phase 1 proposals will identify specific academic and non-academic partners and the proposal must describe how each is expected to contribute to the success of the activity. The project team may enlarge the number of partners involved during the Phase 1 period, and if team expansion is anticipated should include details on how this will be achieved.

9. What are the Convergence Accelerator **TRACKS**?

Tracks are the targeted, use-inspired research topics in areas of national importance that NSF seeks to advance through the Convergence Accelerator. The C-Accel Pilot announced in [NSF 19-050](#) invites proposals in three tracks: A1) Open Knowledge Network, B1) Artificial Intelligence (AI) and Future Jobs, and B2) National Talent Ecosystem.

10. What are the Convergence Accelerator **PHASES**?

Successful C-Accel efforts will involve at least two phases:

Phase 1 lasts 6-9 months and is focused on team building and identifying the research objectives and milestones for further research. Phase 1 proposals are invited under [NSF 19-050](#). Further research would be conducted in Phase 2.

Support for **Phase 2** projects will be based on an evaluation of the team's pitch presentation of their project idea to a "Blue-Ribbon" review panel, as well as review of a written proposal for Phase 2 activities, both of which will be invited under a future solicitation. The goal of Phase 2 will be to develop - in 2 years or less - the high-impact, use-inspired research envisioned in Phase 1 and to generate tangible, demonstrable outputs that can lead to tools and ideas that are useful to the public. Phase 2 will continue to seek high-risk/high-reward efforts, with funding up to \$5M for Phase 2.

Some Phase 1 projects that do not succeed in advancing to Phase 2 may be able to continue in Phase 1 with supplemental funding. Alternatively, they could reapply to Phase 1 if the topic is still an active track the following year, or could attempt to advance to Phase 2 at a later competition if that track is still included in that year's Phase 2 competition.

11. What is a *PITCH*?

A Convergence Accelerator pitch will be a relatively short presentation, probably live and in person, to a Blue-Ribbon panel of experts, that seeks to convince the panel of the value of investing in the ideas presented. Phase 1 projects will receive additional guidance regarding preparing and delivering pitch presentations. Description of the Blue-Ribbon panel is below and the review process is discussed later in the FAQs.

12. When will Pitch Presentations occur?

Pitch presentations are projected to take place in March 2020.

13. What is meant by "*Blue-Ribbon panel*"?

The Blue-Ribbon panel will include experts in the C-Accel track topic, and especially experts in transitioning research to practice or applying the results of basic research, who can help identify the projects with the strongest potential to produce results that are of national value in Phase 2.

14. What is the relationship between C-Accel and NSF's Partnership for Innovation Program?

NSF C-Accel and the NSF Partnerships for Innovation (PFI) program both seek to transition research to societal benefit. PFI permits proposals to be submitted in any research area, is focused on commercialization of recent research efforts and is available only to groups that have received funding from NSF in the past seven years. C-Accel expands upon the PFI "Research Partnerships" track by providing even higher levels of support for complex efforts that can only be accomplished through multi-organizational, interdisciplinary collaboration, and C-Accel requires applicants to work toward specific grand challenges of national importance specified in tracks A1, B1 and B2.

TRACK-SPECIFIC QUESTIONS

15. How are the Tracks connected to the NSF Big Ideas?

The tracks in the Convergence Accelerator pilot are aligned with two of NSF's Big Ideas, [Harnessing the Data Revolution](#) (Track A1) and the [Future of Work at the Human-](#)

Technology Frontier (Tracks B1 and B2), but are a distinct effort intended to encourage rapid advances with the likelihood of providing solutions to important national challenges. Future Convergence Accelerator tracks are likely to align with other NSF Big Ideas or other national priorities. Look for a request for information anticipated in mid-2019 to provide input on potential future C-Accel tracks.

TRACK A1

16. What is an Open Knowledge Network (OKN)?

Knowledge networks are structured representations of semantic knowledge that are stored in a graph. Semantic knowledge graph development has largely been done in industry and is critical to the functions of intelligent virtual assistants such as Siri and Alexa. An Open Knowledge Network will similarly allow stored 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; however, it will be an **open**, shared, public infrastructure that can drive innovation similar to the effects that development of the internet has had.

17. What is meant by "horizontal" challenges in developing an Open Knowledge Network?

Horizontal challenges are the challenges inherent in the architecture and structure of an Open Knowledge Network, regardless of topical domain or the type of data. More information is available at: <https://www.nitrd.gov/news/Open-Knowledge-Network-Workshop-Report-2018.aspx>

18. What is meant by "vertical" challenges in developing an Open Knowledge Network?

Vertical challenges are specific to a topical domain and/or the type of data that will be part of the Open Knowledge Network. More information is available at: <https://www.nitrd.gov/news/Open-Knowledge-Network-Workshop-Report-2018.aspx>

19. What is meant by U.S. Government Data?

Track A1 especially encourages the development of an Open Knowledge Network that can make use of data sets created by U.S. Government (USG) agencies and public data produced by U.S. Government funding. USG Agency data could include data from the Census Bureau, the National Aeronautics and Space Administration (NASA), the Department of Health and Human Services, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey, or many other agencies. Data from USG funding could include public data from reports, published articles, and public data sets from research funded by NSF, the National Institutes of Health, the U.S. Department of Agriculture, NOAA, NASA or many other agencies. For purposes of C-

Accel, U.S. Government Data does not include non-public data from NSF or other agencies, such as proprietary, privacy-restricted, or classified data.

20. Who will use the deliverables from the Open Knowledge Network?

Initially, multi-organizational networks focused on specific types of knowledge are most likely to be able to capitalize on the information and resources developed under the OKN track. For instance, an OKN focused on astrophysics would benefit astrophysics researchers and research networks, large astronomical facilities, US government agencies, and international partners. The tools that are developed will contribute to the development of an Open Knowledge Network that bridges domains as well as sources and types of data.

21. What expertise is needed in teams conducting Open Knowledge Network projects?

OKN projects will bring together team members such as data scientists, artificial intelligence researchers, human centered computing researchers, privacy, cybersecurity, policy and/or data cyberinfrastructure experts, and experts from particular science and engineering domains reflecting the nature of the data sets. Teams are not expected to have specialists from all areas.

22. Who are partners for Track A1 (Open Knowledge Network)

Likely partners for track A1 include large and small companies, industry and professional associations, non-profit organizations, educational networks and organizations, universities and colleges, and federal, state and local government agencies, having the potential to work with, support the use of, or benefit from the application of large data sets.

TRACKS B1 & B2

23. What does 'AI and Future Jobs' mean?

AI and Future Jobs is a general name for multiple activities to help link learners and workers with future jobs, ranging from assessing current capabilities of workers, to supporting learning of new skills, to projecting the nature of jobs in the future, to providing technological solutions to make all of this possible. The intent of AI and Future Jobs is to develop open, shared, public infrastructure for these activities. Note that individual AI and Future Jobs projects may focus on activities for particular workplaces or populations.

24. Who will use the deliverables from AI and Future Jobs?

The intended users of deliverables from C-Accel Track B1 include workers seeking to identify jobs and upskill or reskill for future employment, employers seeking to locate and recruit workers for current and future jobs, and workers interested in mapping out the training needs of a future career trajectory.

25. What expertise is needed in teams conducting AI and Future Jobs projects?

Some examples of relevant expertise include artificial intelligence, data science, education research and educational technology, labor economics, industrial psychology, ethics and policy, management and human resources, and expertise related to particular workplaces and populations.

26. What is the National Talent Ecosystem?

The National Talent Ecosystem is the overall education and work environment of the U.S., including the diverse sources of STEM (science, technology, engineering, and mathematics) education and training across the lifespan and the many work environments that benefit from the talents of highly skilled personnel.

27. Who will use the deliverables from the National Talent Ecosystem track?

A major user of the deliverables from C-Accel Track B2 will be employers seeking to manage, maintain, and promote the ongoing development of their workforce now and for the job skills that will be needed in the future of their organization. Other users of outputs from this track will include educational institutions, such as universities, K-12 and informal learning organizations, and non-traditional providers who are seeking to support employers in reskilling their workforces. This includes innovation in delivering training in the skills and insights needed to ensure the strength of the U.S. workforce for 21st century jobs.

28. What expertise is needed in teams conducting National Talent Ecosystem projects?

Some examples of relevant expertise include artificial intelligence, cognitive science, cyberlearning/educational technology, STEM assessment and engagement, organizational research, human resources, team science, in-service training, and broadening participation in STEM and higher education.

29. Who are partners for Tracks B1 and B2 (AI and Future Jobs; National Talent Ecosystem)?

Potential partners for these tracks include employers, industry and professional associations, non-profit organizations, educational networks and organizations, universities and colleges, technology infrastructure providers, and federal, state and

local government agencies.

30. **What is the relation between tracks B1 and B2?**

Both of these tracks draw upon foundational research in NSF's Future of Work at the Human-Technology Frontier, and both address national concerns about preparing for jobs of the future. The emphasis of Track B1, AI and Future Jobs, is connecting individuals to jobs and training that will help them identify and prepare for future opportunities. The focus of Track B2, National Talent Ecosystem, is helping employers develop their workforce, incorporating new tools and ideas for reskilling and supporting existing workers, as well as innovative paths to identify and nurture future employees.

WHO MAY APPLY

31. **Who may submit to Phase 1?**

There are no specific eligibility requirements for the Convergence Accelerator DCL, beyond those described in the [Proposal & Award Policies & Procedures Guide \(PAPPG\)](#) Chapter I.E. As described in PAPPG Chapter II.E.3, RAISE proposals must be submitted as a single proposal submission from one organization (subawards are permitted.) Simultaneous submission of collaborative proposals from multiple organizations are **not** permitted. See PAPPG Chapter II.D.3 for more information.

32. **May we make changes to the list of participants between submission of the Research Concept Outline and the submission of a Phase 1 RAISE proposal?**

Yes, participants may be added and/or removed. In order for NSF to plan the review process and to avoid conflicts of interest, PIs will need to include a list of team members in their full proposal. If any changes happen while a proposal is in review, PIs are encouraged to inform NSF of any changes in people and/or participating organizations by email as early as possible.

33. **Can Convergence Accelerator projects include international collaborations?**

International collaborations are welcome in any NSF proposal when those efforts enhance the merit of the proposed work by incorporating unique expertise, facilities, or other resources of international partners. Partners based outside the U.S. generally should have support or obtain funding through non-NSF sources, as described in [PAPPG Chapter I.E.6](#). If NSF funding is requested to flow to a foreign organization, in addition the proposal must describe how the international partner's role is **essential** to the success of the proposed activity and justify why that task could not be accomplished by a U.S. person or organization instead.

34. **How can for-profit companies participate?**

For-profit companies are encouraged to participate as part of a university-led project, by providing resources such as personnel, technology, equipment, expertise, or other contributions. For-profit companies also may be subawardees in a Phase 1 or Phase 2 proposals; small for-profit organizations in particular are welcome. For-profit organizations may submit proposals to Phase 1 and/or Phase 2 as described in the NSF [PAPPG Chapter I.E](#); however, note that in accordance with [PAPPG Chapter II.X.E](#), fees (profit) cannot be funded by NSF in Phase 1 RAISE proposals.

35. How can non-profit organizations participate?

Non-profit research or education organizations may apply as described in [PAPPG Chapter I.E](#). Non-profit organizations that do not have a research or education focus but which could be effective in designing or implementing research products are encouraged to participate as partners and may, if appropriate, receive a subaward.

36. How can other federal government organizations participate?

As described in [PAPPG Chapter I.E](#), NSF does not normally support research or education activities by scientists, engineers or educators employed by U.S. Federal agencies or federally funded research and development centers (FFRDCs). However, if an agency or FFRDC is making a **unique** and **essential** contribution to the success of a C-Accel project, it may be able to receive NSF support in some exceptional circumstances. Note that NSF requires all grantees and sub-awardees to fully comply with NSF award terms and conditions.

37. How can state or local government organizations participate?

For the activities of the C-Accel Pilot, we welcome a broad spectrum of state and local government organizations to participate as partners, and depending on the activities proposed, it is possible for state and local government agencies to serve as a subawardee on a C-Accel proposal.

38. Who may submit to Phase 2?

In the pilot, only Phase 1 grantees will be eligible to compete for Phase 2. Submissions to Phase 2 will be described in a forthcoming solicitation. NSF does not anticipate any additional restrictions beyond those listed in [PAPPG Chapter I.E](#).

39. May we change the list of participants between Phase 1 and Phase 2?

Yes, we expect that nearly every team will change their participants (adding and removing), as partnerships are created, and preliminary research identifies areas that need additional expertise.

REVIEW PROCESS

40. **How will decisions be made on funding for Phase 1 proposals?**

As described in [PAPPG Chapter II.E.3](#), NSF may use both internal reviewers and consult external reviewers for advisory input as part of the review of C-Accel proposals. NSF anticipates that Convergence Accelerator full proposals will first be reviewed by internal experts and that for groups of the most promising proposals, NSF will seek additional advice from external reviewers.

41. **Will Research Concept Outline two-pagers be accepted after April 15, 2019?**

Yes, April 15 is only a "target date"; however, full proposals are due June 3, 2019 and proposers may only submit a full proposal if they have received an invitation to submit a full proposal based on their Research Concept Outline. Research Concept Outlines must be received in sufficient time to permit internal reviewers to assess both alignment with the tracks and convergent research goals described in [NSF 19-050](#).

42. **How will decisions be made on funding for Phase 2 proposals?**

Phase 2 selection will be based on a "pitch" and a written proposal. The "pitch" is a relatively short presentation, probably live and in person, to a Blue-Ribbon panel made up of experts from, for example, industry, government, and academia describing the goals and approach of the team. An external review committee will also review written proposals. Decisions will be based on both components.

FUNDING

43. **The PAPPG description of RAISE allows for up to \$1M and 5 years. How does this relate to the timeline described in the Dear Colleague Letter?**

Teams are encouraged to plan for a six to nine month spending window for funds from Phase 1 RAISE awards, so they can make enough progress to apply for larger Phase 2 awards in early 2020. PIs not prepared for the early 2020 Phase 2 deadline may be provided additional time before an additional round of Phase 2 awards, subject to available funds.

44. **What are the typical award sizes anticipated for Phase 1 projects?**

Phase 1 awards made in response to proposals submitted under [NSF 19-050](#) are anticipated to be grants of approximately \$500,000 to \$1,000,000 for six to nine months of effort. Award size will be based on the needs of each project.

45. **Will Phase 2 awards be grants, cooperative agreements, or contracts?**

Phase 2 awards are anticipated to be cooperative agreements with periodic milestones for additional funding. Subject to the availability of funds, it is anticipated that awards may be for up to \$5 million.

46. Can a faculty member request more than 2 months of salary to work on a C-Accel project?

[PAPPG Chapter II.C.2.g.\(i\)\(a\)](#) contains NSF's policy on senior personnel salaries and wages policy. 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.

ACTIVITIES

47. What activities will occur in Phase 1, both within teams and among the teams making up the cohort?

During Phase 1, each track's cohort of C-Accel Principal Investigators (PIs) and several of their team members will be expected to attend a number of face-to-face and virtual meetings. The cohort as a group will receive training in multi-disciplinary team building, "customer" discovery, "pitch" presentation skills, marketing, communication, and other topics intended to enhance the ability of the teams to complete Phase 1 successfully.

To increase the impact of Phase 2 of the C-Accel Pilot, during Phase 1, members of each track's cohort of Phase 1 teams will have the opportunity to coordinate to develop plans that complement each other. For example, by tackling different parts of the development needed to achieve the goal of the track or by collectively testing alternative approaches. NSF's intent for each track is to support a cohort of Phase 2 teams that collaborate and frequently exchange information and ideas so that collectively they make significantly greater progress towards the goal of the track than a similar number of independent teams.

Individual teams are expected to work on preliminary research refining their approaches to addressing the challenges described in the DCL, including identifying partners outside academia who may provide resources and/or be transition partners for technology developed in Phase 2.

48. Will the Convergence Accelerator effort include *TRAINING*?

Phase 1 C-Accel teams will be trained as a cohort and coached as individual projects in interdisciplinary team building, communication, preparing a pitch presentation, and more.

49. Will teams interact with each other besides in training?

Yes, in Phase 2, the teams that comprise a cohort are expected to work together to develop and refine technologies, tools, processes or other practical applications, such that the result of the C-Accel is not only individual innovations from each team, but potentially integrated solutions for broad efforts such as an Open Knowledge Network or National Talent Ecosystem, that bring together pieces from different teams.

50. What activities will occur in Phase 2, both within teams and among the teams making up the cohort?

Teams will be expected to participate in periodic in-person meetings. Teams will work with all other teams in the cohort, and with an "integration" team to ensure that their technology works effectively with technologies being developed by other teams to provide a coherent whole.

51. What are examples of the "deliverables" anticipated by the end of Phase 2?

Deliverables are practical results that are ready for further development into a useful product or tool. Examples could include prototype designs, models, mock-ups, artificial intelligence innovations, or software tools.

52. How is intellectual property dealt with in the Convergence Accelerator effort?

Each team will need to identify by the end of Phase 1 potential intellectual property (IP) that partners are contributing or that may be developed and describe how ownership and management of that IP will be handled by the team, including all the relevant partners. This should include all relevant forms of IP (e.g. trade secrets, copyrights), in addition to patents and patentable information. Additional guidance, possibly including model technology licenses, will be provided to Phase 1 grantees.

TIMELINE

53. What is the overall timeline for the Convergence Accelerator Activity?

Pilot:

Phase 1 Research Concept Outlines have a target date for submission to NSF of April 15, 2019, but arrivals after this date will also be considered if practical. Invited full proposals are due June 3, 2019. Phase 1 awards are anticipated to be made by the end of September 2019. A call for proposals for Phase 2 work is anticipated in summer of 2019. Only Phase 1 grantees will be eligible to submit Phase 2 proposals, which would be due early in 2020. The Phase 1 project Pitch competition is projected to take place in March 2020. Phase 2 awards are intended to be made in late spring 2020.

Future C-Accel Tracks:

A request for information is anticipated in mid-2019 that will invite ideas for future C-Accel tracks under several broad themes. From this input, a future C-Accel solicitation will be developed.