



NATIONAL SCIENCE FOUNDATION
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NSF 18-058

Dear Colleague Letter: Growing Convergence Research

March 23, 2018

Dear Colleagues:

Growing Convergence Research at the National Science Foundation (NSF) was identified in 2016 as one of [10 Big Ideas for Future NSF Investment](#). Research relying on convergence is needed to solve complex scientific and engineering problems that require integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation. NSF identifies [Convergence Research](#) as having two primary characteristics:

- **Research driven by a specific and compelling problem.** Research requiring a convergence paradigm 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 disciplines can form from sustained interactions across multiple communities.

The convergence paradigm builds upon transdisciplinary approaches to research by intentionally bringing together intellectually diverse scientists and/or engineers at a project's inception in new collaborations that can generate multiple solutions to complex problems. Convergence has been discussed in a number of reports. The National Research Council published a series of reports between 2004 and 2014 on topics in interdisciplinary and transdisciplinary research, culminating in the 2014 study, *Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond*, which included several examples of convergence in action. A comprehensive treatment of convergence in the biomedical sciences, entitled *Convergence: The Future of Health*, was published in 2016. More recently – in 2017 – the National Academy of Sciences, Engineering, and Medicine report entitled [A New Vision for Center-Based Engineering Research](#) envisioned convergence becoming the essence of center-based research in the 21st century.

This Dear Colleague Letter (DCL) seeks to identify potential future research areas that go beyond NSF's Big Ideas, require a convergence approach, cross internal and/or external organizational and

disciplinary boundaries, and advance the progress of science as articulated in NSF's mission. NSF encourages the submission of prospectuses to identify these new areas and specific projects within them. NSF may invite the teams submitting the most promising prospectuses to submit proposals to further explore their research strategies. Prospectuses must outline novel approaches and research strategies that are likely to result in a clear demonstration of the potential for transformative advances. The research areas and proposed projects must reflect the characteristics of convergence outlined [here](#).

Interested researchers who would like to compete for FY 2018 and FY 2019 funding must submit a prospectus describing a new area of research and an exploratory research project within it to the converpro@nsf.gov mailbox. A prospectus may be submitted at any time to help NSF identify new areas of research that require convergence, but to be considered for FY 2018 support, the prospectus must be submitted by May 1, 2018, and for FY 2019 funding, by October 15, 2018. All prospectus submissions will be acknowledged via email. The prospectus should not exceed 1,000 words of text and be no more than two pages in length, inclusive of figures and tables. It must include: (i) a description of a potential future research area requiring a convergence approach; (ii) a list of the pertinent disciplines to be integrated; (iii) a brief description of the proposed exploratory research project within the area described in (i); (iv) a brief description of the methods and research strategies that will nurture convergence in the exploratory research project; and (v) a listing of the senior personnel who would be involved in the exploratory project. No references are required in the prospectus.

Researchers describing the most promising research ideas and exploratory projects will be invited to submit a proposal within 60 days after issuance of the invitation. An invited proposal must be prepared in accordance to the guidance for Research Advanced by Interdisciplinary Science and Engineering (RAISE) proposals, as specified in the NSF *Proposal and Award Policies and Procedures Guide* ([PAPPG](#); see Chapter II.E.3). The invited researchers do not need to obtain further approval from NSF program officers to submit the invited proposal. The total proposed budget may not exceed \$1 million, and the proposed project duration should not exceed 3 years.

Prospective principal investigators are advised that, based on the portfolio of ideas received, NSF may choose to use internal review for these RAISE proposals or seek advice from external reviewers as to the merits of the full proposals received. Such external review may include review by ad hoc reviewers and/or a panel.

This DCL remains in effect for twelve months from the date of issue, unless superseded by another DCL or a new solicitation.

POINTS OF CONTACT

Researchers should direct questions about this DCL to converpro@nsf.gov.

Questions about convergence should be directed to Dragana Brzakovic at dbrzakov@nsf.gov.

Sincerely,

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