



NSF Big Idea: Growing Convergence Research

Convergence at NSF

- Convergence is a multifaceted concept
- It is an important component of several parts of NSF's portfolio, including
 - the 6 research-oriented Big Ideas
 - NSF Convergence Accelerators
 - **Growing Convergence Research (GCR)** a process-oriented Big Idea

Big Idea: Growing Convergence Research (GCR)

Stewardship by Foundation-wide Working Group comprised of:

BIO: Donal Manahan

CISE: Wendy Nilsen

EHR: Laura Regassa

ENG: Mike Roco, Nora Savage

GEO: Sarah Ruth

MPS: Leonard Spinu

OIA: Dragana Brzakovic (chair), Leah Nichols

OISE: Jessica Robin

SBE: Steven Breckler, Toby Parcel

Characteristics of convergence research supported by GCR

- *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.

About Growing Convergence Research (GCR)

GCR is a new program which aspires to build **new research capacity** by supporting **small teams**:

- With diverse scientific/technical backgrounds,
- Inspired by a scientific or societal grand challenge,
- Collectively working develop effective ways of communicating across disciplines and sectors
- Developing sustainable relationships
- To develop solutions to the problem that engendered the collaboration and to develop novel ways of framing related research questions and open new research vistas

Solicitation NSF 19-551

- Supports research projects that crosses NSF directorate and division boundaries and that are **not** currently supported by other NSF programs, initiatives or Big Ideas.
- Particular interest is in problems that require the development of a larger research community which will likely extend beyond the project duration.
- It is expected that successful teams may spend protracted time at the beginning of a project to develop effective ways of communicating across disciplines, supporting/training teams, and developing a common scientific vocabulary.

Solicitation NSF 19-551: Award Mechanism and Funding

- Cooperative agreement
- Funding duration 2 + 3 years for successful projects
- Initial funding for two years, up to 600k/year
- Reverse site visit review towards the end of the second year
- Successful teams will receive funding for an additional three years, up to 800k/year

DCL 18-058 Awards

Integrating machine learning and biological neural networks

Xue Han, Boston U

Linking the adaptive dynamics of phytoplankton with emergent global biogeochemistry

Adam Martiny, UC-Irvine

Auto-regulatory scaffolds for directed evolution of non-living functional materials

Teri Odom, Northwestern

Systems approaches for vulnerability evaluation and urban resilience

Aaron Packman, Northwestern

The nearshore water-land interface during extreme storms

Britt Raubenheimer, WHOI

Dynamic touch-based bacteria-device communication

Maria Santore, U Mass-Amherst

Engineering coral reef recovery

Amy Wagoner Johnson, U Illinois