

Integrative Strategies for Understanding Neural and Cognitive Systems

(NSF-NCS; NSF 14-611)

PROGRAM SOLICITATION NSF 14-611



National Science Foundation

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Social, Behavioral & Economic Sciences

Letter of Intent Due Date(s) (*required*) (due by 5 p.m. proposer's local time):

December 10, 2014

INTEGRATIVE FOUNDATIONS

Submit your questions by e-mail to ncs@nsf.gov

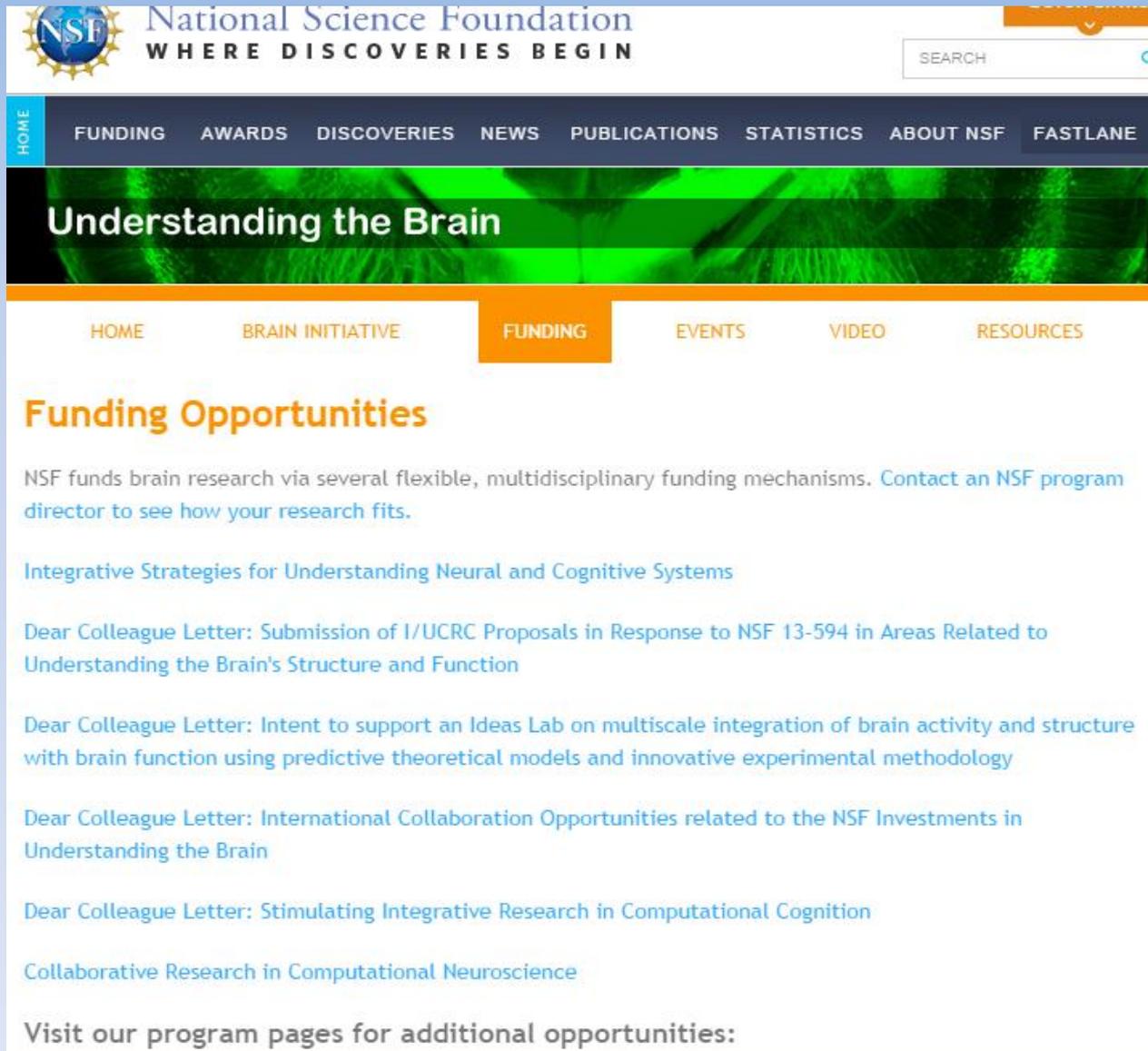
Integrative Strategies for Understanding Neural and Cognitive Systems

(NSF-NCS; NSF 14-611)

- *program scope and context*
- *themes, proposal classes*
- *how to apply*
- *is this the right opportunity for you?*

<http://www.nsf.gov/ncs/>

Submit your questions by e-mail to ncs@nsf.gov



The screenshot shows the NSF Brain Initiative website. At the top is the NSF logo and the text "National Science Foundation WHERE DISCOVERIES BEGIN". A search bar is located in the top right. Below the header is a navigation menu with links for HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT NSF, and FASTLANE. The main content area features a green-tinted image of a brain with the title "Understanding the Brain". Below this is a secondary navigation menu with links for HOME, BRAIN INITIATIVE, FUNDING (which is highlighted), EVENTS, VIDEO, and RESOURCES. The "Funding Opportunities" section is the main focus, with a sub-header "Funding Opportunities" in orange. The text below reads: "NSF funds brain research via several flexible, multidisciplinary funding mechanisms. [Contact an NSF program director to see how your research fits.](#)" followed by a list of specific funding opportunities: "Integrative Strategies for Understanding Neural and Cognitive Systems", "Dear Colleague Letter: Submission of I/UCRC Proposals in Response to NSF 13-594 in Areas Related to Understanding the Brain's Structure and Function", "Dear Colleague Letter: Intent to support an Ideas Lab on multiscale integration of brain activity and structure with brain function using predictive theoretical models and innovative experimental methodology", "Dear Colleague Letter: International Collaboration Opportunities related to the NSF Investments in Understanding the Brain", "Dear Colleague Letter: Stimulating Integrative Research in Computational Cognition", and "Collaborative Research in Computational Neuroscience". At the bottom of the section, it says "Visit our program pages for additional opportunities:".

National Science Foundation
WHERE DISCOVERIES BEGIN

SEARCH

HOME FUNDING AWARDS DISCOVERIES NEWS PUBLICATIONS STATISTICS ABOUT NSF FASTLANE

Understanding the Brain

HOME BRAIN INITIATIVE **FUNDING** EVENTS VIDEO RESOURCES

Funding Opportunities

NSF funds brain research via several flexible, multidisciplinary funding mechanisms. [Contact an NSF program director to see how your research fits.](#)

[Integrative Strategies for Understanding Neural and Cognitive Systems](#)

[Dear Colleague Letter: Submission of I/UCRC Proposals in Response to NSF 13-594 in Areas Related to Understanding the Brain's Structure and Function](#)

[Dear Colleague Letter: Intent to support an Ideas Lab on multiscale integration of brain activity and structure with brain function using predictive theoretical models and innovative experimental methodology](#)

[Dear Colleague Letter: International Collaboration Opportunities related to the NSF Investments in Understanding the Brain](#)

[Dear Colleague Letter: Stimulating Integrative Research in Computational Cognition](#)

[Collaborative Research in Computational Neuroscience](#)

Visit our program pages for additional opportunities:

Submit your questions by e-mail to ncs@nsf.gov

Integrative Strategies for Understanding Neural and Cognitive Systems (NSF-NCS)

<http://www.nsf.gov/ncs/>

- *transformative, integrative, bold, potentially risky; tackle previously intractable challenges*
- bridge temporal/spatial scales, levels of abstraction, levels of analysis, and/or disciplinary and methodological approaches
- first phase of new program
- not business as usual

Submit your questions by e-mail to ncs@nsf.gov

please read the solicitation
[nsf.gov/ncs](https://www.nsf.gov/ncs)

**and the NSF Grant Proposal Guide
(recently revised)**

[nsf.gov/publications/pub_summ.jsp?ods_key=gpg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg)
[nsf.gov/pubs/policydocs/pappguide/nsf15001/sigchanges.jsp](https://www.nsf.gov/pubs/policydocs/pappguide/nsf15001/sigchanges.jsp)

“Broader Impacts of the Proposed Work”

Submit your questions by e-mail to ncs@nsf.gov

“Integrative”

Innovative, **integrative**, boundary-crossing approaches are necessary to push transformative and **integrative** research that will accelerate understanding of novel **integration** of multiple scholarly traditions, experimental methods, and **integrate** across existing disciplines or approaches, spatial or temporal scales, specify how this **integration** occurs within one or more of the research theme **integrative** strategies that will have considerable impact and must transcend **Integrative** strategies are expected to advance scientific frontiers, generate innovative approaches, exploring novel **integration** of expertise and/or tech-**INTEGRATIVE FOUNDATIONS** awards will support projects that develop foun- would connect those projects to significant new **integrative** opportunities in sufficient detail to convey the innovative, **integrative** nature of the project must include a concise description that specifically addresses the **Integrative** that will enable cross-institution and/or cross-discipline scientific **integration** **Integrative** Added Value and Transformative Potential * Does the project articulate a compelling **integrative** vision, build on the state of the art, and develop sound plans for interdisciplinary collaboration and **integrative** research

Submit your questions by e-mail to ncs@nsf.gov

Proposals must articulate significantly new, integrative strategies that will have considerable impact and must transcend the perspectives and approaches typical of individual NSF core programs. All proposals must clearly address how the proposed activity will:

- Extend the boundaries of what is currently possible, with a vision of how important frontiers can be advanced
- Significantly advance existing literature, knowledge, and technologies, or challenge current scientific paradigms
- Bridge temporal/spatial scales, levels of abstraction, levels of analysis, and/or disciplinary and methodological approaches

Potentially groundbreaking approaches that entail significant risk are encouraged. Explicitly address risk and reward.

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS 2015 Research Themes

- *Neuroengineering and Brain-Inspired Concepts and Designs*
- *Individuality and Variation*

and Proposal Classes

- **INTEGRATIVE FOUNDATIONS**
- **CORE+ EXTENSIONS**

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS 2015 Research Themes

Neuroengineering and Brain-Inspired Concepts and Designs

insights from **neuroscience and cognitive science** + insights from **rapidly changing technologies** → **significant innovations** inspired by or directed toward the brain

- technologies for imaging, sensing, recording, or affecting real-time brain activity and behavior
- computing paradigms
- brain-computer interfaces
- augmented and adaptive systems (e.g., for communication, learning, performance)
- other computational and bioengineered systems

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS 2015 Research Themes

Individuality and Variation

characteristic of all neural and cognitive processes:

biological/machine systems *signaling/communication*
representations *learning/adaptation* *development* *resilience*
ability *cultural/social processes* *group differences*

- functionally important individuality and variation
- role of noise
- domain-general statistical and modeling challenges
- explore, describe, and understand the role of naturally occurring variability

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS 2015 Research Themes

Neuroengineering and Brain-Inspired Concepts and Designs

Individuality and Variation

Within each theme, general advances in theory and methods, technological innovations, educational approaches, enabling research infrastructure, and workforce development are all of significant interest.

Subject to availability of funds, anticipated future research themes include:

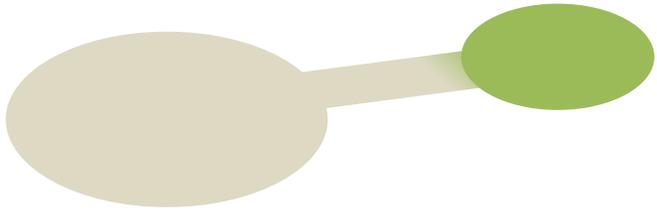
Cognitive and Neural Processes in Realistic, Complex Environments

Data-Intensive Neuroscience and Cognitive Science

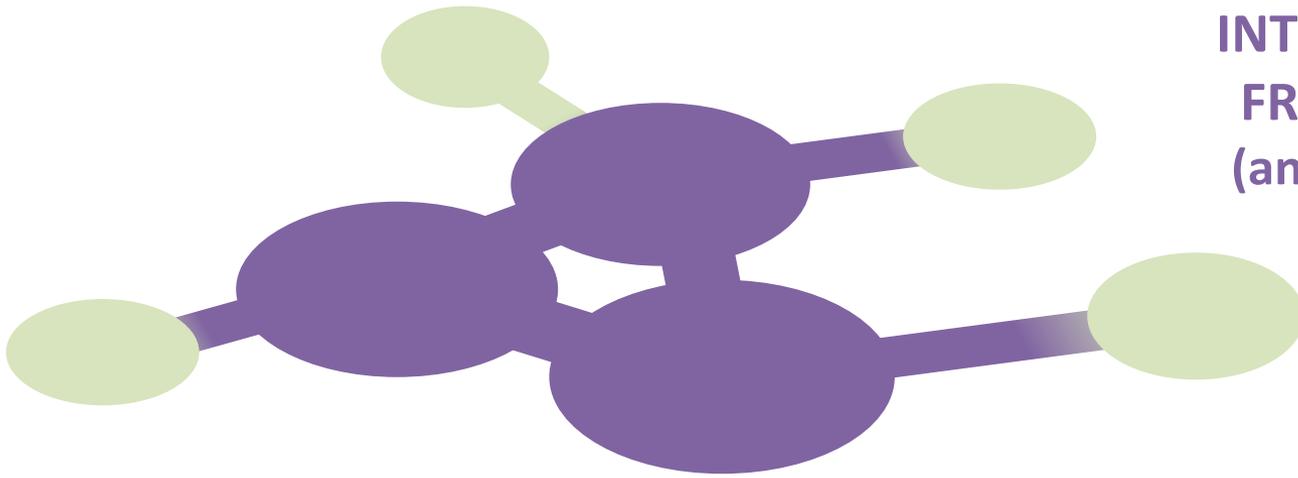
Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS Proposal Classes

CORE+ EXTENSIONS



INTEGRATIVE
FOUNDATIONS



INTEGRATIVE
FRONTIERS
(anticipated)

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS Proposal Classes

Letter of Intent (REQUIRED):

December 10, 2014

Proposal Deadline:

January 26, 2015



- **foundational advances that are deeply connected** to a broad scope of questions in cognitive and neural systems
- **transformative advance** in one or more thematic area
- **two or more investigators** with distinct but complementary expertise
- **\$500,000 to \$1,000,000** over 2 to 4 years

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS Proposal Classes

Letter of Intent (REQUIRED):

December 10, 2014

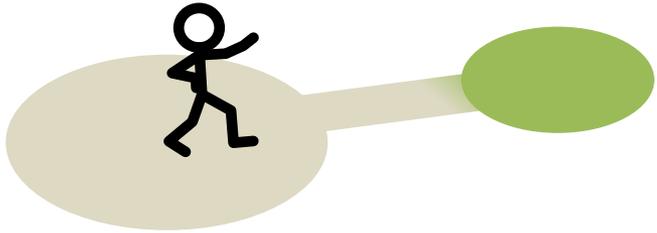
must include on the FastLane form:

- names and institutional affiliations
- synopsis conveying innovative, integrative nature of the project
- research theme or themes
- participating directorate(s) to which the proposal is relevant (CISE, EHR, ENG, SBE)
- why not suitable for an NSF core program?
- distinct areas of expertise, research approaches, or disciplines represented by the investigators

Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS Proposal Classes

CORE+ EXTENSIONS



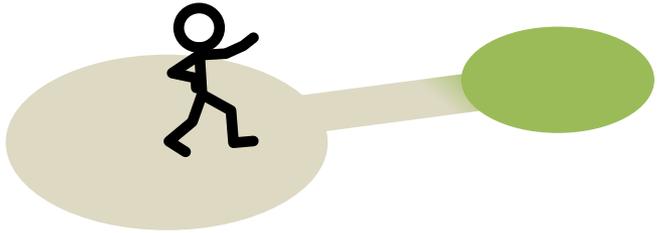
- additional support for projects selected for funding by **other programs in the participating directorates**
- for additional activities that **connect those projects to significant new integrative opportunities** in cognitive and neural systems
- up to **\$100,000** in additional funding

Submit according to dates and requirements of primary program;
No Letter of Intent

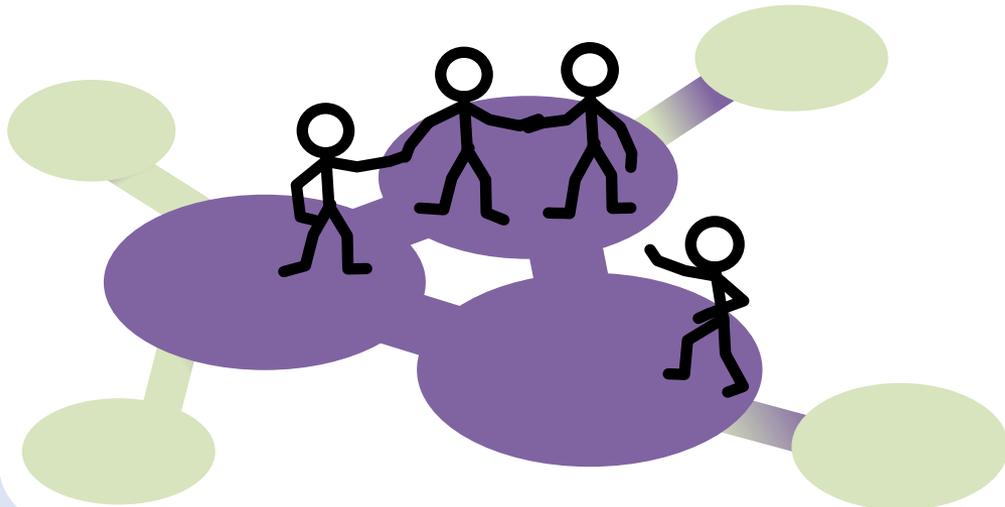
Submit your questions by e-mail to ncs@nsf.gov

NSF-NCS Proposal Classes

CORE+ EXTENSIONS



INTEGRATIVE FOUNDATIONS



INTEGRATIVE FRONTIERS (anticipated)

Subject to availability of funds

- larger ambitious, highly integrative interdisciplinary projects
- three or more investigators
- sustained collaborative effort

Submit your questions by e-mail to ncs@nsf.gov

Merit Review Criteria

Intellectual Merit

Broader Impacts

Integrative Added Value and Transformative Potential

- cross temporal/spatial scales, levels of abstraction, levels of analysis, and/or disciplinary and methodological approaches?
- deep, complementary, synergistic expertise?
- research theme(s) addressed and advanced in significant way?
- bold, potentially risky, well beyond typical disciplinary approach?
- compelling integrative vision, build on the state of the art, sound plans for interdisciplinary collaboration, integrative research?

(continued...)

Submit your questions by e-mail to ncs@nsf.gov

Merit Review Criteria

Integrative Added Value and Transformative Potential...

- general advances in theory or methods, or significant technological innovations?
- broadly accessible, high-quality resources that will be useful to the research community at large?
- unique collaborative research experiences for students and early-career researchers?
- interdisciplinary workforce for cognitive science, neuroscience, and/or neuroengineering?

Applicability and relative weighting of these considerations will vary depending on the nature of the activities being proposed and the proposal class

ask yourself

- innovative/integrative?
- address the research theme(s)?
- why not suitable for an NSF core program?
- distinct expertise/approaches/disciplines of investigators?

also note

- limit one per PI/Co-PI/Senior Personnel
- consistent with the missions of the participating directorates (CISE, EHR, ENG, SBE)
- explicitly address risk and reward

<http://www.nsf.gov/ncs/>

Submit your questions by e-mail to ncs@nsf.gov

Integrative Strategies for Understanding Neural and Cognitive Systems

(NSF-NCS; NSF 14-611)

PROGRAM SOLICITATION NSF 14-611



National Science Foundation

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Social, Behavioral & Economic Sciences

Letter of Intent Due Date(s) (*required*) (due by 5 p.m. proposer's local time):

December 10, 2014

INTEGRATIVE FOUNDATIONS

Submit your questions by e-mail to ncs@nsf.gov