

## Grant Opportunity Alerts: Issue: ORD-GOA-2015-02

### In This Issue:

1. **NJIT 2015 Faculty Research Showcase:** February 23, 2015
2. **Internal Competition** and NSF Grant Opportunity Watch for National Science Foundation Research Traineeship Program (NRT)
3. **NSF Webinar** Event on Cyberlearning: January 29, 2015; 12.30 PM-1.30PM
4. **Grant Opportunities Alerts:**  
Keywords and Areas Included in Funding Opportunities Alerts:  
**NSF:** STEM + Computing Partnerships (STEM+C), Science of Learning: Collaborative Networks (SL-CN), Long Term Ecological Research (LTER), NSF/Intel Partnership on Visual and Experiential Computing (VEC)  
**DARPA:** Materials for Transduction (MATRIX)  
**National Institute of Health:** Basic Cancer Research in Cancer Health Disparities R21 and R01, Shared Instrumentation Grant (SIG) Program (S10), BRAIN Initiative: Development, Optimization, and Validation of Novel Tools and Technologies for Neuroscience Research STTR and SBIR

### NJIT 2015 Faculty Research Showcase

#### **Event: Faculty Research Showcase: Oral Presentations and Electronic Posters**

**When:** February 23, 2015; 11.00 AM – 7.00 PM

**Where:** Ballroom A & B, and Gallery, Campus Center

**Keynote Speaker:** Dr. Tiffani Lash, Program Director, Division of Discovery Science and Technology, National Institutes of Health. Biosketch:

<http://www.nibib.nih.gov/about-nibib/staff/tiffani-lash>

We are pleased to announce the 2015 Faculty Research Showcase to introduce our new faculty members, and highlight the ongoing research projects. With a welcome address, Provost Fadi Deek will introduce new faculty members. The Faculty Research Showcase will feature faculty oral presentations and electronic-poster sessions with a focus on research synergy and recent accomplishments in the thematic areas: Life Sciences and Engineering, Sustainable Systems, and Data Science and Information Technology.

Please save the date on your calendars and join us to network with our new faculty members, Faculty Seed Grant awardees and research center directors to celebrate research accomplishments.

The tentative agenda is as follows.

Tentative Agenda: NJIT 2015 Faculty Research Showcase

11.00 AM-11.15 AM: Welcome Remarks by Provost Fadi Deek and Introduction of New Faculty Members  
11.15 AM-12.15 PM: Faculty Research Presentations: Life Sciences and Health Care  
12.15 PM-1.00 PM: Lunch  
1.00 PM-1.30 PM: Keynote Presentation by Dr. Tiffani Lash  
1.30 PM - 2.30 PM: Faculty Research Presentations: Sustainable Systems  
2.30 PM- 3.30 PM: Faculty Research Presentations: Data Science and Information Technology  
3.30 PM – 4.00 PM: Office of Research Forum: Research Synergy and Opportunities  
4.00 PM- 5.30 PM: Poster and Networking Sessions  
5.30 PM-7.00 PM: Reception

---

### **Internal Competition and Grant Opportunity Watch:**

#### **Grant Program: National Science Foundation Research Traineeship Program (NRT)**

**Agency:** National Science Foundation

**RFP Website:** [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505015](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505015)

**Brief Description:** The NSF Research Traineeship (NRT) program is designed to encourage the development of bold, new, potentially transformative, and scalable models for STEM graduate training that ensure that graduate students develop the skills, knowledge, and competencies needed to pursue a range of STEM careers. Proposals should identify the alignment of project research themes with national research priorities and the need for innovative approaches to train graduate students in those areas. NRT projects should develop evidence-based, sustainable approaches and practices that substantially improve STEM graduate education for NRT trainees and for STEM graduate students broadly at an institution. NRT emphasizes the development of competencies for both research and research-related careers. Strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, museums, and academic partners that enhance research quality and impacts and that facilitate development of technical and transferrable professional skills are encouraged. Creation of sustainable programmatic capacity at institutions is an expected outcome. Proposals accordingly are expected to describe how institutions will support the continuation and institutional-level scaling of effective training elements after award closure.

**Limited Submission:** 1-2 proposals per institution depending on the category submissions

**Expected Announcement:** February 2015

**Expected Full Proposal Submission Deadline:** June, 2015

**Internal Competition:** Pre-proposal for five pages for internal competition must be submitted with the following sections for internal review. Please follow the

instructions for pre-proposals on each section as described in the last year NSF announcement NSF 14-548 available on the website

<http://www.nsf.gov/pubs/2014/nsf14548/nsf14548.htm#prep>

1. Cover sheet (not included in the page limit)
2. Project Summary (1-page limit)
3. Project Description (4-page limit)
  - a. List of Core Participants
  - b. Theme, Vision and Goals
  - c. Education and Training
  - d. Major Research Efforts
  - e. Broader Impact
  - f. Recruitment, Mentoring and Retention
4. Budget and Matching Resources (not included in the page-limit)

**Internal Competition Deadlines:**

Proposals Due to College Deans: February 21

Recommendations on Proposals (1 per college) Forwarded to Vice Provost for Research: February 27

Announcement of Selected Proposal for Institutional Submission: March 3, 2015

---

**Webinars:**

**Webinar Event: Cyberlearning - Learning as a long game: Designing for making in drop-in spaces**

**When: January 29, 2015 12:30 PM to 1:30 PM NSF Room 110**

**Abstract:** As the maker movement becomes a valuable and interesting resource for researchers interested in improving learning in and out of schools, researchers in the Cyberlearning community have turned toward understanding and designing maker-based experiences. Many of these research efforts have focused on spaces that have typically served as drop-in sites for learners – museums, libraries, and afterschool programs. Given that learning is an extended process of becoming and doing, how can we support learners' trajectories as makers? What function can technologies serve for learners, for mentors, and for spaces? In this talk, I will highlight design features and tools that our team is exploring for facilitating learning through making across a range of makerspaces.

**Bio:** Erica Rosenfeld Halverson is an Associate Professor of Digital Media and Literacy in the Department of Curriculum & Instruction at the University of Wisconsin-Madison. Erica studies how people learn in and through the arts; her current focus is the maker movement, studying and designing spaces and tools in museums, libraries, and afterschool spaces. This work is supported through NSF Cyberlearning and the Institute for Museum and Library Services. Erica received her PhD in Learning Sciences from Northwestern University in 2005. Prior to that, she

co-founded Barrel of Monkeys, a Chicago area arts education organization that works with elementary school students on creative writing, drama, and performance.

**To Join the Webinar:** Please register

at: <https://nsf.webex.com/nsf/j.php?RGID=r7da2fe3ddde06f95eceedfb5309def27>  
by 11:59pm EST on Wednesday, January 28, 2015.

---

## **National Science Foundation**

### **Grant Program: STEM + Computing Partnerships (STEM+C)**

**Agency:** NSF 15-537

**RFP Website:** <http://nsf.gov/pubs/2015/nsf15537/nsf15537.htm>

**Brief Description:** The STEM+C Partnerships program seeks to significantly enhance the learning and teaching of science, technology, engineering, mathematics (STEM), and computing by K-12 students and teachers, through research on, and development of, courses, curriculum, course materials, pedagogies, instructional strategies, or models that innovatively integrate computing into one or more STEM disciplines, or integrate STEM content into the teaching and learning of computing. In addition, STEM+C seeks to build capacity in K-12 computing education with foundational research and focused teacher preparation. Projects in the STEM+C Partnerships program should build on research in STEM education and prior research and development efforts that provide theoretical and empirical justification for proposed projects. Pre-service and in-service teachers who participate in STEM+C projects are expected to enhance their understanding and teaching of STEM and computing content, practices, and skills.

STEM+C invites creative and innovative proposals that address emerging challenges in the learning and teaching of STEM and computing. The program offers proposers two tracks: (1) Integration of Computing in STEM Education and (2) Computing Education Knowledge and Capacity Building. The second track is discipline-specific and may be expanded to include additional disciplines in future releases of the solicitation.

**Awards:** Standard Grants

**Anticipated Funding Amount:** \$43,000,000

**Letter of Intent:** Not required

**Deadline: Full Proposal Deadline(s):** Full Proposal Due: April 14, 2015

---

### **Grant Program: Science of Learning: Collaborative Networks (SL-CN)**

**Agency:** NSF 15-532

**RFP Website:**

[http://www.nsf.gov/pubs/2015/nsf15532/nsf15532.htm?WT.mc\\_id=USNSF\\_25&WT.mc\\_ev=click](http://www.nsf.gov/pubs/2015/nsf15532/nsf15532.htm?WT.mc_id=USNSF_25&WT.mc_ev=click)

**Brief Description:** This solicitation launches the National Science Foundation's (NSF's) next phase of research in the Science of Learning (SL). The new SL Program is designed to capitalize on the momentum created by the Science of Learning Centers (SLC) Program to continue developing an integrated, interdisciplinary SL community. The goals of the SL Program are to: advance fundamental knowledge about learning through integrated research; connect the research to specific scientific, technological, educational, and workforce challenges; and enable research communities to capitalize on new opportunities and discoveries. The Program is designed to support projects that – due to the activities supported and their interdisciplinarity and integrative breadth – do not fit into existing NSF programs. This solicitation invites proposals for the creation of new research networks to address important questions in the SL. Networks will focus on:

- Advancing basic research through integrative, interdisciplinary perspectives and methodologies, through integration of theory and experiment, and across scales of analysis; and/or
- Translating findings from basic research on learning to applications to benefit society and further inform fundamental theories of learning.

Each network is expected to engage in both of the following activities:

- Partnership-building activities among the network participants to optimize scientific exchange for the co-design and execution of network goals; and

Collaborative, exploratory research to be conducted by the network participants.  
**Awards:** Standard Awards: Up to \$9.0 million is expected to be available in Fiscal Year (FY) 2015. Contingent on the availability of funds and receipt of competitive proposals, NSF expects to make 12 awards under this solicitation. Awards are expected to be up to three years in duration with a maximum award size of \$750,000 total costs over the full duration of the project.

**Letter of Intent: Required:** February 6, 2015

**Deadline: Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):  
March 18, 2015

---

**Grant Program: Long Term Ecological Research (LTER)**

**Agency: National Science Foundation** PD-15-535

Directorate for Social, Behavioral & Economic Sciences

Directorate for Education & Human Resources

Directorate for Computer & Information Science & Engineering

Directorate for Engineering

**RFP Website:**

[http://www.nsf.gov/publications/pub\\_summ.jsp?WT.z\\_pims\\_id=505176&ods\\_key=nsf15532](http://www.nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=505176&ods_key=nsf15532)

**Brief Description:** Learning is complex, and many investigators from multiple disciplinary perspectives conduct research on this topic. Advances in the integration and accumulation of this knowledge notwithstanding, key knowledge remains fragmented across and within disciplines. A deep and comprehensive understanding of learning requires integration across multiple perspectives and levels of analysis.

NSF is uniquely positioned to lead efforts in this area, as the SL Program builds on and integrates knowledge relevant to learning gained by NSF investments in all of the scientific disciplines, education and engineering. The full ambition of this Program links the science, engineering and education efforts to achieve NSF's strategic goals to: 1) transform the frontiers of science and engineering, and 2) stimulate innovation and address societal needs through research and education.

The NSF Science of Learning Centers (SLC) Program launched in 2003 was designed to catalyze and elevate the scope, scale, and vigor of interdisciplinary research on learning. The cohort of Centers has served as the nucleus that attracted others to form a nascent, international community of established and junior investigators and practitioners poised to translate the knowledge gained from the basic science of learning into applications in education, robotics, national security, health, space exploration and other areas.

This solicitation is jointly issued and managed by four NSF directorates: Social, Behavioral & Economic Sciences (SBE); Education & Human Resources (EHR); Computer & Information Science & Engineering (CISE); and Engineering (ENG). Its goal is to foster the creation of new networks of investigators who will integrate scientific ideas across disciplines and professions to conduct novel, exploratory research that has the potential to provide transformative advances in our understanding of learning. The Program places high value on creativity, inventive uses of technology, integration of theoretical and empirical work, and innovative models of research that capture the multiple dimensions of learning.

This solicitation is designed to support projects that – due to the activities supported and their interdisciplinarity and integrative breadth – do not fit into existing NSF programs. Although the SL program construes learning broadly, including that of humans, other animals and machines, this SL-CN solicitation will support exploratory research in animals only if it is strongly tied to and will specifically inform learning in humans.

**Awards:** Standard Awards

**Letter of Intent:** Required; **February 06, 2015**

**Deadline: Full Proposal Deadline(s): March 18, 2015**

---

**Grant Program: NSF/Intel Partnership on Visual and Experiential Computing (VEC)**

**Agency: NSF 15-518**

Directorate for Computer & Information Science & Engineering

Division of Information & Intelligent Systems

Division of Computing and Communication Foundations

Division of Computer and Network Systems

**RFP Website:** <http://www.nsf.gov/pubs/2015/nsf15518/nsf15518.htm>

**Brief Description:** The advancement of sensing technology such as RGBD (Red Green Blue Depth), multi-camera and light field imaging systems, networks of sensors, advanced visual analytics and cloud computing will challenge the longstanding paradigms of capturing, creating, analyzing and utilizing visual information. Advances in Visual and Experiential Computing (VEC) will enable capability, adaptability, scalability, and usability that will far exceed the simple information systems of today. VEC technology will transform the way people interact with visual information through, for example, the realization of new mobile and wearable devices and the emergence of autonomous machines and semantically aware spaces. VEC research will drive innovation and competition in many industrial sectors as well as enhance the quality of life for ordinary people. Fast growing visual data has become a bottleneck in human decision processes in several emergent situations. New VEC technology is crucial to extracting information from complex visual and related data sets, combining this information with intuitive modes of human perception, and generating actionable information. The goal of this joint solicitation between NSF and Intel is to foster novel, transformative, multidisciplinary approaches that promote research in VEC technologies, taking into consideration the various challenges present in this field. This solicitation aims to foster a research community committed to advancing research and education at the confluence of VEC technologies, and to transitioning its findings into practice. NSF and Intel will support three types of projects, each three years in duration: Small projects with funding from \$500,000 to \$1,000,000 per project; Medium projects with funding from \$1,000,001 to \$2,000,000 per project; and Large projects with funding from \$2,000,001 to \$3,000,000. It is intended that NSF and Intel will cofund each project in equal amounts. This NSF/Intel partnership combines CISE's experience in developing and managing successful large, diverse research portfolios with Intel's long history of building research communities in emerging technology areas through programs such as its Science and Technology Center Program.

**Awards:** Standard Awards; Awards are limited in size to a maximum of \$250,000

**Letter of Intent: Required:** Not Required

**Deadline: Full Proposal Deadline(s)** February 20, 2015

---

## **DARPA**

### **Grant Program: Materials for Transduction (MATRIX)**

**Agency: DARPA: BAA-15-19**

**RFP**

**Website:** [http://www.darpa.mil/Opportunities/Solicitations/DSO\\_Solicitations.aspx#DARPA-BAA-15-19](http://www.darpa.mil/Opportunities/Solicitations/DSO_Solicitations.aspx#DARPA-BAA-15-19)

**Brief Description:** The MATRIX program is soliciting novel ideas in transductional materials and device modeling, design, engineering, and fabrication that address DoD needs, enable new applications, and offer transformative new capability. Achieving these goals within the timescale of the program will require the parallel

development of modeling, fabrication, measurement and other materials and component technologies, as well as the integration and optimization of these components within prototype devices. Devices of interest may cover a broad range of energy transduction modes and capabilities and may be guided by, but are not limited to, the following examples:

- • New high-temperature-differential thermoelectric coolers for cooling of temperature- sensitive sensors; high-heat-flux thermoelectric coolers for stabilizing high-power- density electronics; new power generation and waste heat harvesting technologies;
- • Ultrasensitive room temperature sensors, micromotors and actuators, RF and optical spectral control (e.g., tunable components and antennas), and new switching and logic devices based on multiferroic or phase change materials; and
- • Other devices that leverage thermoelectric, multiferroic, or phase change materials, either singly or in combination. In each case, the proposed materials and device technology should significantly advance the state of the art and enable new applications or capabilities not addressed by present day technologies. It is expected that achieving these goals will, in general, require the application of multiple structural degrees of freedom across scale and across materials and device boundaries. Possible degrees of freedom include, but are not limited to, new crystal compositions and structures; nano-composites; laminates; novel superlattice structures; materials with nanostructures and patterns; nanocrystals; meta-flakes; and quantum surfaces, wires and dots. The design of these devices is envisioned to require multiscale predictive modeling tools leveraging modern computational resources. For example, achieving optimal device performance may require a deeper understanding of carrier transport properties for complex materials and device structures. DARPA expects that it may be necessary to advance the state of the art in many-body and *ab initio* modeling to address strong correlations and complex engineered structures used in transductional materials. Additionally, new modeling and simulation tools that integrate across scale and across modalities may need to be developed in order to engineer the desired properties of dynamic real world devices. Approaches might also involve semi-empirical models that rely upon a tight coupling with experimental measurements in order to achieve computational efficiencies, elucidate parametric dependencies, and accelerate the design- fabrication-validation cycle.

**Awards:** Standard Awards

**Abstract Due Date:** February 19, 2015, 4:00 PM

**Deadline:** Full Proposal Due Date: April 2, 2015, 4:00 PM

---

**National Institutes of Health**



**Grant Program: Exploratory/Developmental Grants Program for Basic Cancer Research in Cancer Health Disparities (R21)**

**Basic Cancer Research in Cancer Health Disparities (R01)**

**Agency: NIH National Cancer Institute (NCI)**

**R21: PA-15-092 R21**

**R03: PA-15-093 R01**

**RFP Website:** <http://grants.nih.gov/grants/guide/pa-files/PA-15-092.html>

<http://grants.nih.gov/grants/guide/pa-files/PA-15-093.html>

**Brief Description:** The goal of this FOA is to stimulate interest in the characterization and functional analysis of biological factors associated with cancer health disparities and to provide funding opportunities in this area. Applications should focus on basic cancer research, consistent with the research interests of the NCI's [DCB](#), [DCP](#), and [CRCHD](#).

The DCB supports research on the discovery and characterization of basic pathways and mechanisms that regulate the development of a pre-malignant state, initiation of cellular transformation and cancer cell progression, formation of tumor microenvironment, metastasis, and host responses to cancer, including immunologic or metabolic responses.

The CRCHD supports cancer health disparity research focused on basic, hypothesis driven studies that explicitly address the unequal burden of cancer amongst racial/ethnic minorities or other underserved populations across the cancer continuum (prevention, early detection, diagnosis, treatment, and survivorship).

The DCP supports research that will generate new information about molecular processes that are susceptible to intervention, developing effective cancer prevention interventions, discovering early detection biomarkers, and pinpointing mechanistically targeted nutrients in cancer prevention.

This FOA encourages basic research projects that will develop and test new methodologies and new research technologies focused on specific topics in cancer health disparities. The availability of annotated clinical samples as well as enabling technologies (genomics/epigenomics, proteomics, metabolomics, single cell analysis, imaging) make it feasible to study biological factors that contribute to cancer disparities among different racial/ethnic populations.

**Research topics of interest include but are not limited to:**

- Influence of obesity on the tumor microenvironment (including immune cells, fibroblasts, ECM, surrounding blood vessels, soluble factors) in basal-like breast cancer;
- Role of the microbiome (bacterial and viral) in tumorigenesis and cancer progression, such as in colorectal cancer in African American men and women;
- Epithelial and mesenchymal markers in circulating tumor cells in breast or prostate cancer patients of distinct racial/ethnic groups;
- Drivers of chromosome instability among racial/ethnic populations;
- Computational analysis and modeling for predicting aggressive prostate tumors in African American men;
- Functional significance of distinct miRNA profiles in specific cancers among racial/ethnic groups;

- Similarities and differences in cancer metabolism (e.g. alterations in metabolic fuel sources, fatty acid synthesis, lipid metabolism, glycolysis, nutrient uptake) among racial/ethnic populations;
- Genetic/epigenetic cancer susceptibility differences among racial/ethnic populations, such as epigenetic differences among African American or Hispanic women in breast cancer;
- Ethnic differences in HPV strain types/infection prevalence among Hispanics and other populations;
- Host response and infectious agent-related biological determinants in liver and gastric cancer in susceptible populations, e.g. Hispanics and Asians;
- Gene expression profiles of triple negative breast tumors in African American women compared to other racial/ethnic populations;
- Biologic determinants of renal cancer in American Indian/Alaska natives and other populations;
- New animal and cell culture models/systems designed to investigate cancer disparities.

**Awards:** Standard awards

**Letter of Intent:** Not Required

**Deadline: Full Proposal Deadline(s)**

June 17, 2015; November 17, 2015; June 17, 2016; November 17, 2016; June 19, 2017; November 17, 2017, by 5:00 PM local time of applicant organization.

All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

**Grant Program: Shared Instrumentation Grant (SIG) Program (S10)**

**Agency: NIH S10 Biomedical Research Support Shared Instrumentation Grants**

**RFP Website:** <http://grants.nih.gov/grants/guide/pa-files/PAR-15-088.html>

**Brief Description:** The purpose of this funding opportunity is to continue the Shared Instrumentation Grant (SIG) Program administered by ORIP. The objective of the Program is to make available to institutions expensive research instruments that can only be justified on a shared-use basis and that are needed for NIH-supported projects in basic, translational or clinical areas of biomedical/behavioral research. The SIG Program provides funds to purchase or upgrade a single item of expensive, specialized, commercially available instrument or an integrated instrumentation system. An integrated instrumentation system is one in which the components, when used in conjunction with one another, perform a function that no single component could provide. The components must be dedicated to the system and not used independently.

Types of supported instruments include, but are not limited to: x-ray diffractometers, electron and confocal microscopes, mass and nuclear magnetic

resonance (NMR) spectrometers, protein and DNA sequencers, biosensors, cell sorters, and biomedical imagers. Applications for "stand alone" computer systems (supercomputers, computer clusters and storage systems) will only be considered if the instrument is solely dedicated to the research needs of a broad community of NIH-supported investigators.

The SIG Program will not support requests for:

- an instrument with a base cost of less than \$50,000;
- multiple instruments bundled together or a series of complementary related instruments;
- software, unless it is integral to the operation of a piece of equipment;
- purely instructional equipment, institutional administrative management systems, clinical management systems;
- instruments used for clinical (billable) care;
- general purpose equipment or an assortment of instruments to furnish a research facility and equipment for routine sustaining infrastructure (such as, standard machine shop equipment, standard computer networks, autoclaves, hoods and equipment to upgrade animal facilities).

Instruments must be for research purposes only. Applications for research on advancing the design or for the development of new instrumentation are not appropriate for this Funding Opportunity Announcement (FOA).

Foreign-made equipment is allowable.

**Awards:** Standard awards

**Letter of Intent:** Not Required

**Deadline:**

May 29, 2015, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on this date .

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

---

**Grant Program: BRAIN Initiative: Development, Optimization, and Validation of Novel Tools and Technologies for Neuroscience Research (STTR)(R41/R42)**  
**BRAIN Initiative: Development, Optimization, and Validation of Novel Tools and Technologies for Neuroscience Research (SBIR)(R43/R44)**

**Agency: National Institutes of Health (NIH)**

PAR-15-090: R41/R42 Small Business Technology Transfer (STTR) Grant - Phase I, Phase II, and Fast-Track

PAR-15-091: [R43/R44](#) Small Business Innovation Research (SBIR) Grant - Phase I, Phase II, Fast Track

**RFP Website:** <http://grants.nih.gov/grants/guide/pa-files/PAR-15-090.html>  
<http://grants.nih.gov/grants/guide/pa-files/PAR-15-091.html>

**Brief Description:** Based on the priority areas identified by the BRAIN 2025, two general technology areas were identified to be appropriate for commercial

development and are outlined below. While some of the markets for these products may be small, NIH is supportive of developing these technologies towards sustainable commercial manufacture. This will enable novel hypothesis-driven experiments to understand the brain that are currently infeasible, or will reduce barriers to these experiments that currently are costly, difficult, or take too long to perform widely. This FOA seeks to highlight two central themes for exploration: 1) Understanding the dynamic activity of neural circuits is central to the NIH BRAIN Initiative and 2) Developing novel tools to facilitate the detailed analysis of complex circuits and provide insights into cellular interactions that underlie brain function. ***Understanding the dynamic activity of neural circuits is central to the NIH BRAIN Initiative.*** This FOA seeks STTR phase I applications for proof-of-concept testing and development of new technologies and novel approaches for large scale recording and manipulation of neural activity, to enable transformative understanding of dynamic signaling in the nervous system. In particular we seek exceptionally creative approaches to address major challenges associated with recording and manipulating neural activity, at or near cellular resolution, at multiple spatial and/or temporal scales, in any region and throughout the entire depth of the brain. It is expected that the proposed research may be high risk, but if successful could profoundly change the course of neuroscience research.

In addition, to achieve their potential these technologies must also be optimized through feedback from end-users in the context of the intended experimental use, and scalable manufacture platforms/processes developed to enable reliable, broad, sustainable dissemination and incorporation into regular neuroscience practice. This FOA would also support STTR phase II applications for the iterative refinement and development of manufacture for emergent technologies and approaches that have already demonstrated their transformative potential through initial proof-of-concept testing in the phase I STTR or SBIR.

Technologies may engage diverse types of signaling beyond neuronal electrical activity for large-scale analysis, and may utilize any modality such as optical, electrical, magnetic, acoustic or genetic recording/manipulation. Applications that seek to integrate multiple approaches are encouraged. Where appropriate, applications are encouraged to integrate multiple domains of expertise, including biological, chemical and physical sciences, engineering, computational modeling and statistical analysis.

Examples of priority topics:

- Probes for Large Scale Sensing and/or Manipulation of Neural Activity in Vivo
- Imaging Instrumentation for Recording and/or Manipulating Neural Activity in Vivo
- Development of Electrodes for Large-Scale Recording and/or Circuit Manipulation in Vivo
- Techniques and Approaches for Recording/Manipulating Neural Activity during Behaviors

***Development of novel tools to facilitate the detailed analysis of complex circuits and provide insights into cellular interactions that underlie brain function.*** The new tools and technologies should confer a high degree of cell-type and/or circuit-

level specificity. Of particular interest for this FOA are first-in-class and/or cross-cutting non-invasive or minimally invasive techniques that permit repeated measurements from cells over time in a non-destructive manner. Tools/technologies relevant for this initiative are expected to be transformative, either through the development of novel tools that may be high-risk or through major advances in current approaches that break through technical barriers and will significantly improve current capabilities. In addition, tools developed through this initiative that can be used in a number of species/model organisms rather than those restricted to a single species are also highly desired as are tools that can be used in any point in the lifespan.

To achieve their potential the utility of these tools/technologies must also be validated. This FOA would also support STTR phase II applications for the validation and optimization of existing and emerging technologies and approaches. This includes the iterative refinement of emergent technologies and approaches that have already demonstrated their transformative potential through initial proof-of-concept testing in the phase I STTR or SBIR, with an end-goal of broad dissemination and incorporation into neuroscience labs.

**Awards:** Standard awards

**Letter of Intent:** Not Required

**Deadline: Full Proposal Deadline(s)** [Standard dates](#) apply, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.